



The  
Information  
Centre  
for health and social care

**Health Survey for England**

**2007**

Volume 1

**Healthy lifestyles:  
knowledge, attitudes  
and behaviour**

A survey carried out on behalf of The NHS Information Centre

*Edited by Rachel Craig and Nicola Shelton*

*Joint Health Surveys Unit*



National Centre for Social Research

National Centre for Social Research



Department of Epidemiology and Public Health,  
UCL Medical School

# **Health Survey for England 2007**

Volume 1

## **Healthy lifestyles: knowledge, attitudes and behaviour**

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# **Healthy lifestyles: knowledge, attitudes and behaviour**

*Edited by*

Rachel Craig and Nicola Shelton

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## Foreword

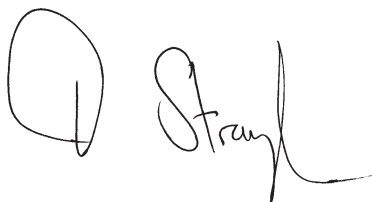
This report presents the findings of the seventeenth annual survey of health in England. I am pleased to present this important research which has been undertaken on behalf of The NHS Information Centre for health and social care.

The Health Survey for England is conducted annually and collects information about a representative sample of the general population. It is vital to our understanding of the health situation and behaviours of the public in England and helps to ensure that policies are informed by these data.

The survey combines information gathered through interviewing the sampled respondents, including a wealth of socio-demographic variables, with objective measures of health, such as blood pressure measurements. Thus we can study the inter-relationship of the characteristics and circumstances of adults and their children, with their health situation.

The primary focus of the Health Survey for England in 2007 was knowledge and attitudes about key aspects of lifestyle: smoking, drinking, eating and physical activity. Lifestyle behaviours have a major impact on health and are among the important risk factors for many illnesses and health conditions. The 2007 survey focussed on two further areas. One was childhood obesity and other health risk factors for children, including fruit and vegetable consumption, physical activity, drinking and smoking. The remaining topic focus was the impact of the smokefree legislation which came into force in England on the 1st July 2007, making all enclosed public places and workplaces in England smokefree.

I am honoured to welcome this valuable report and to thank all my colleagues in The NHS Information Centre and our counterparts in the Joint Health Surveys Unit for their work. Surveys of this complexity are a team effort. The dedication of the skilled interviewing force is especially noteworthy. May I also thank the anonymous respondents across England who gave up their time to take part in the survey and who were willing to submit to various health tests. Without their help we would lose a public tool of enormous potential to benefit and protect the health of every one of us.

A handwritten signature in black ink, appearing to read 'Tim Straughan'. The signature is fluid and cursive, with a large initial 'T' and 'S'.

**Tim Straughan**

Chief Executive

The NHS Information Centre for health and social care



## Editors' acknowledgements

We wish to thank, first of all, all those who gave up their time to be interviewed and who welcomed interviewers and nurses into their homes. We would also like to acknowledge the debt the survey's success owes to the commitment and professionalism of the interviewers and nurses who worked on the survey throughout the year.

We would like to thank all those colleagues who contributed to the survey and this report. In particular we would like to thank:

- The authors of all the chapters: Moushumi Chaudhury, Emanuela Falaschetti, Elizabeth Fuller, Helen Mackenzie, Jennifer Mindell, Soazig Nicholson, Deanna Pickup, Marilyn Roth, Shaun Scholes, Faiza Tabassum, Joanne Thompson and Heather Wardle.
- Emily Diment and Claire Deverill, whose hard work and support have been crucial in putting this report together.
- Other research colleagues, especially Shaun Scholes, Kevin Pickering and Sarah Tipping.
- Operations staff, especially Lesley Mullender, Sue Roche and the Area Managers at NatCen and Barbara Carter-Szatynska at UCL.
- The principal programmers, Jo Periam, Sven Sjodin and Colin Micelli.
- All the field interviewers and nurses who worked on the project.

We would also like to express our thanks to Professor Ian Gibb and his staff at the Department of Clinical Biochemistry at the Royal Victoria Infirmary in Newcastle upon Tyne, and to Dr Colin Feyerabend and his staff at ABS Laboratories, London, for their helpfulness and efficiency.

Last, but certainly not least, we wish to express our appreciation of the work of the staff at The NHS Information Centre at all stages of the project, and in particular the contribution made by Andy Sutherland, Alison Crawford, Alyson Whitmarsh, Adam Millican-Slater, Nicola Dawes, James Greenwood and Andrew Hayton.

*Rachel Craig and Nicola Shelton*

1. The data used in the report have been weighted. The weighting is described in Chapter 7, in Volume 2 of this report. Both unweighted and weighted sample sizes are shown at the foot of each table. The weighted numbers reflect the relative size of each group in the population, not numbers of interviews made, which are shown by the unweighted bases.
2. Children's data each year have been weighted to adjust for the probability of selection, since a maximum of two children are selected in each household. This ensures that children from larger households are not under-represented. Since 2003, as for adults, non-response weighting has also been applied.
3. Three different non-response weights have been used: one for non-response at the interview stage, one for non-response to the nurse visit, and one for non-response to the cotinine sample. In addition in Chapter 9, Children's physical activity, there is a separate weight for children in the boost sample only (relating to physical activity behaviour).
4. The following conventions have been used in tables:
  - no observations (zero value)
  - 0 non-zero values of less than 0.5% and thus rounded to zero
  - [ ] used to warn of small sample bases, if the unweighted base is less than 50. If a group's unweighted base is less than 30, data are normally not shown for that group.
5. Because of rounding, row or column percentages may not add exactly to 100%.
6. A percentage may be quoted in the text for a single category that aggregates two or more of the percentages shown in a table. The percentage for the single category may, because of rounding, differ by one percentage point from the sum of the percentages in the table.
7. Values for means, medians, percentiles and standard errors are shown to an appropriate number of decimal places. Standard Error may sometimes be abbreviated to SE for reasons of space.
8. 'Missing values' occur for several reasons, including refusal or inability to answer a particular question; refusal to co-operate in an entire section of the survey (such as the nurse visit or a self-completion questionnaire); and cases where the question is not applicable to the participant. In general, missing values have been omitted from all tables and analyses. Some questions in the self-completion questionnaire included 'don't know' categories, and these are generally included in the relevant tables.
9. The group to whom each table refers is stated at the upper left corner of the table.
10. The term 'significant' refers to statistical significance (at the 95% level) and is not intended to imply substantive importance.

## 1.1 The Health Survey for England Series

The Health Survey for England (HSE) comprises a series of annual surveys, of which the 2007 survey is the seventeenth. All surveys have covered the adult population aged 16 and over living in private households in England. Since 1995, the surveys have also covered children aged 2-15 living in households selected for the survey, and since 2001 infants aged under two have been included as well as older children.

The Health Survey for England (HSE) is part of a programme of surveys currently commissioned by The NHS Information Centre for health and social care, and before April 2005 commissioned by the Department of Health. The surveys provide regular information that cannot be obtained from other sources on a range of aspects concerning the public's health and many of the factors that affect health. The series of Health Surveys for England was designed to:

1. Provide annual data from nationally representative samples to monitor trends in the nation's health;
2. Estimate the proportion of people in England who have specified health conditions;
3. Estimate the prevalence of certain risk factors associated with these conditions;
4. Examine differences between subgroups of the population (by age, sex or income) in their likelihood of having specified conditions or risk factors;
5. Assess the frequency with which particular combinations of risk factors are found, and in which groups these combinations most commonly occur;
6. Monitor progress towards selected health targets;
7. (Since 1995) measure the height of children at different ages, replacing the National Study of Health and Growth; and
8. (Since 1995) monitor the prevalence of overweight and obesity in children.

Each survey in the series includes core questions and measurements such as blood pressure, anthropometric measurements and analysis of saliva and urine samples, as well as modules of questions on specific issues that vary from year to year. In recent years, the core sample has also been augmented by an additional boosted sample from a specific population subgroup, such as minority ethnic groups, older people or, as in 2007, children.

The Health Survey for England has been designed and carried out since 1994 by the Joint Health Surveys Unit of the National Centre for Social Research (NatCen) and the Department of Epidemiology and Public Health at the UCL Medical School (UCL).

## 1.2 The 2007 survey

The primary focus of the Health Survey for England in 2007 was knowledge and attitudes about key aspects of lifestyle: smoking, drinking, eating and physical activity. Lifestyle behaviours have a major impact on health and are among the important risk factors for many illnesses and health conditions. The HSE has traditionally measured lifestyle

behaviour, and in 2007 a new area of questioning was introduced to explore the extent to which people are aware of current government recommendations, and their attitudes to key health issues. It is intended that the data will inform policy making and ensure that appropriate messages about adopting healthy lifestyles can be targeted at different groups within the population.

The Health Survey for England 2007 also focussed on two further areas. One was childhood obesity and other health risk factors for children, including fruit and vegetable consumption, physical activity, drinking and smoking. Childhood obesity is associated with many illnesses, and in adulthood is linked to increased mortality and reduced life expectancy. Data from the HSE has demonstrated that levels of obesity among children are increasing, and the Public Service Agreement (PSA) shared by the Department of Health, Department for Children, Schools and Families and Department of Culture, Media and Sport aims to 'Reduce the proportion of overweight and obese children to 2000 levels by 2020 in the context of tackling obesity across the population'.

The remaining topic focus was the impact of the smokefree legislation introduced during 2007. From 1st July 2007, virtually all enclosed public places and workplaces in England became smokefree. The 2007 data allow an initial examination of the effect of the legislation by looking at adults' and children's smoking behaviour, and their exposure to other people's smoke, pre and post 1st July.

A total of 6,882 adults and 7,504 children were interviewed, with 1,727 children from the core sample and 5,777 from the boost.

Data collection involved an interview, followed by a visit from a specially trained nurse for all those in the core sample who agreed. The nurse visit included measurements and collection of urine and saliva samples, as well as additional questions.

## **1.3 Ethical approval**

Ethical approval for the 2007 survey was obtained from the London Multi-centre Research Ethics Committee (MREC).

## **1.4 2007 survey design**

### **1.4.1 Introduction**

The survey was designed to yield a representative sample of the general population of any age, and a boost sample of children aged 2-15, living in private households in England. More detailed information about the survey design is presented in Chapters 2-7, Volume 2 of this report.

People living in institutions, who are likely to be older and, on average, in poorer health than those in private households, were not covered. This should be borne in mind when considering the Health Survey's account of the population's health.

### **1.4.2 The core general population sample**

A random sample of 7,200 addresses was selected from the Postcode Address File (PAF), using a multi-stage sample design with appropriate stratification. This was to ensure that households were sampled proportionately across the nine Government Office Regions of England. 720 postcode sectors were selected, and 10 addresses selected within each sector. Where an address was found to have multiple dwelling units, one was selected at random. Where there were multiple households at a dwelling unit, up to three households were included, and if there were more than three, a random selection was made.

Each individual within a selected household was eligible for inclusion. Where there were

more than two children in a household, two were randomly selected for inclusion, to limit the burden on any household.

### **1.4.3 The child boost sample**

To increase the number of children in the sample, a boost sample was used. The boost sample of children aged 2-15 was obtained by randomly selecting 26,100 addresses. 18,720 addresses were selected in the same postcode sectors as the core sample (26 per sector); and 7,380 addresses were selected in an additional 180 postcode sectors (41 per sector) to supplement the sample obtained in the core sectors. As for the core sample, where there were three or more children in a household, two of the children were selected at random to limit the respondent burden for parents.

An additional 5,777 children were interviewed in the boost sample, giving a total child sample of 7,504.

### **1.4.4 Fieldwork**

#### *Interview*

A letter stating the purpose of the survey was sent to each sampled address before the interviewer visited. The interviewer sought the permission of each eligible selected adult in the household to be interviewed, and both parents' and children's consent to interview selected children aged up to 15.

Computer-assisted interviews were conducted. The content of the interview is detailed in Volume 2, Chapter 3; full documentation is provided in the Appendices to Volume 2.

The 2007 survey for adults focused on lifestyle behaviour, knowledge and attitudes. Adults were asked modules of questions on general health, alcohol consumption, smoking, and fruit and vegetable consumption. Knowledge and attitudes were covered in self-completion questionnaires.

Children aged 13-15 were interviewed themselves, and parents of children aged 0-12 were asked about their children, with the interview including questions on eating habits (fat and sugar consumption) and fruit and vegetable consumption. Children aged 8-15 were asked to fill in self-completion booklets covering smoking, drinking, and lifestyle knowledge and attitudes. Children in the boost sample only were asked about physical activity.

Height and weight measurements were taken at the end of the interview.

#### *Nurse visit*

Nurse visits were offered to all participants in the core sample. Questions were asked about prescribed medication, vitamin supplements and use of nicotine replacements; smokers were asked about their current brand of cigarette. For infants, additional information was collected on immunisations. Nurses measured infant length (for those aged six weeks to under 2 years). The nurse also took the blood pressure of those aged 5 and over, and took waist and hip measurements for those aged 11 and over. Demi-span measurements (the length between the sternal notch and the end of the outstretched arm) were taken for participants aged 25-44 and 65 and over.

Spot urine samples were taken from participants aged 16 and over, and samples of saliva (for the analysis of cotinine, a derivative of nicotine) were taken from adults aged 16 and over and children aged 4-15. Written consent was obtained for these samples.

Nurses administered a self-completion booklet about eating habits to those aged 16 and over.

## 1.5 Survey response

Interviews were held in 4,200 households with 6,882 adults aged 16 or over, and 1,727 children from the general population. The boost sample resulted in an additional 5,777 children aged 2-15 being interviewed, giving a total child sample of 7,504. Among the general population sample, 4,998 adults and 1,233 children had a nurse visit. More detailed information on survey response can be found in Volume 2, Chapter 6.

Response to the survey can be calculated in two ways: at a household level and at an individual level. Interviews were carried out at 66% of sampled eligible households in the general population (after removing vacant addresses etc.), and at 75% of known eligible boost sample households. Within the general population sample, interviews were obtained with 88% of adults and 95% of (sampled) children in 'co-operating' households (where at least one person was interviewed).

Assuming that households where the number of adults and children was not known contained, on average, the same number of adults and children as households where it was known, the individual response rate for the general population sample, based on all eligible households, was estimated to be 58% among adults and 65% among (sampled) children.

The table below shows individual response rates to the different stages of the survey for adults in the general population sample. The first column gives the individual response rates for adults in all eligible households, and the second column gives individual response rates for adults in co-operating households.

Table 1A		
Individual response: adults in the general population sample		
	Adults in all eligible households	Adults in co-operating households
	%	%
Interviewed	58	88
Height measured	53	80
Weight measured	51	78
Saw nurse	42	64
Waist and hip measured	41	62
Blood pressure measured	41	62
Saliva sample obtained	39	60
Urine sample obtained	36	55

In the core sample, the response among eligible children in all eligible households was 65%, and 47% saw a nurse. The table below shows a summary of responses obtained to the interview component of the survey among the total sample of children, from the core and boost sample, in co-operating households.

Table 1B	
Individual response: children in core and boost samples	
Children aged 0-15 in co-operating households	
	%
Interviewed	99
Height measured	88
Weight measured	87

Only children in the core sample were eligible for the nurse visit. The table below shows, for children in core co-operating households only, the response to the nurse visit and nurse measures.

Table 1C	
<b>Individual response: children in the core sample</b>	
<b>Children aged 0-15 in core co-operating households</b>	
	%
Saw nurse	68
Infant length measured	47
Waist and hip measured	61
Blood pressure measured	62
Saliva sample obtained	59

## 1.6 Data analysis

### 1.6.1 Introduction

The HSE is a cross-sectional survey of the population. It examines associations between health states, personal characteristics and behaviour, and in 2007, attitudes to health and lifestyles. However, such associations do not necessarily imply causality. In particular, associations between current health states and current behaviour need careful interpretation, as current health may reflect past, rather than present, behaviour. Similarly, current behaviour may be influenced by advice or treatment for particular health conditions.

### 1.6.2 Weighting the samples

#### *The general population sample*

For the general population sample, weights were calculated at the household level and at the individual participant level. The household weight corrected for the probability of selection where additional dwelling units or households were identified at a selected address. Calibration weighting was also used for adults to reduce non-response bias resulting from differential non-response at the household level, based on the age and sex profile of the residents and the region in which the household was situated. 88% of adults in participating households were interviewed, and weights were therefore also calculated at an individual level to correct for non-response within participating households.

#### *The sample of children*

The sample of children comprised all those aged 0-15 from either the core or boost sample. The weights for the child sample include selection weights for the dwelling unit/household, selection weights for the children in the household, and calibration weighting to adjust the sex and age profile of the achieved sample.

There were two sets of questions (physical activity and the Strengths and Difficulties questionnaire) that were included only in the child boost sample, where children 2-15 were interviewed. Separate weights were needed for analysis of these questions, and were calculated in the same way as for the combined child sample.

#### *Non-response weighting for the nurse visit and saliva samples*

Two further weights were calculated for the core sample, as well as weights to allow for non-response at the interview stage. One was to adjust for non-response to the nurse visit, and the second to adjust for non-response for obtaining a saliva sample, used to obtain cotinine values. Further details on the weighting procedures are given in Volume 2, Chapter 7.



### 1.6.3 Weighted and unweighted data and bases in the report

All 2007 data in this report are weighted. Both weighted and unweighted bases are given in each table. The unweighted bases show the number of participants involved. The weighted bases show the relative sizes of the various sample elements after weighting, reflecting their proportions in the population in England, so that data from different columns can be combined in their correct proportions.

Non-response weighting was introduced to the HSE in 2003, and has been used in all subsequent years. In this report, most chapters focus on 2007 results, but in a small number of chapters trend tables are presented. In trend tables that show years with and without non-response weighting, data for the first year where non-response weighting was applied are shown in two rows or columns, one showing unweighted results and the other weighted results. For tables showing trends in children's data, results for years up to 2002 have selection weighting only, and results for 2003 onwards have selection and non-response weighting.

### 1.6.4 Age as an analysis variable

Age is a continuous variable but results are presented in the report by age groups. Age in Health Survey for England reports always refers to age at last birthday.

### 1.6.5 Age standardisation

Adult data have been age-standardised throughout the 2007 report to allow comparisons between groups after adjusting for the effects of any differences in their age distributions. When different sub-groups are compared in respect of a variable on which age has an important influence, any differences in age distributions between these sub-groups are likely to affect the observed differences in the proportions of interest.

It should be noted that all analyses in the report are presented separately for men and women. All age standardisation has been undertaken separately within each sex, expressing male data to the overall male population and female data to the overall female population. When comparing data for the two sexes, it should be remembered that no age standardisation has been introduced to remove the effects of the sexes' different age distributions.

Details of the direct standardisation method used are given in Volume 2, Methodology and documentation.

### 1.6.6 Standard analysis breakdowns

For most tables in this report, two standard analysis breakdowns have been used as well as age. The first of these is Government Office Region (GOR) and Strategic Health Authority (SHA), and the second is equivalised household income.

#### **Government Office/Strategic Health Authority**

Government Office Region (GOR) is the key classification system used for regional statistics. There are nine Government Office Regions in England: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East and South West. The nine-category system has been used since 1998, although GOR boundaries may change from year to year as they reflect administrative boundaries.

From July 2006 a new configuration of Strategic Health Authorities (SHAs) was introduced in England, reducing the number from 28 to 10 SHAs. The boundaries are the same as those of the Government Office Regions with the exception of the South East, which has been divided into South East Coast SHA and South Central SHA. Tables in the report show the nine GORs to the left of the table, and the final two right hand columns show the South East Coast SHA and South Central SHA.

Both observed and age-standardised data are provided by GOR and SHA in the tables. Observed data can be used to examine actual prevalence or mean values within a region;



age-standardised data are required for comparisons between areas to exclude age-related effects, and may be discussed in the report text.

It should be noted that base sizes for GORs are often relatively small, and caution should be exercised in examining regional differences.

### **Equivalised household income**

The second standard breakdown looks at equivalised household income. Household income was established by means of a show-card (see Volume 2, Appendix A) on which banded incomes were presented. This can be used as an analysis variable, but there has been increasing interest recently in using measures of equivalised income that adjust income to take account of the number of persons in the household. To derive this, each household member is given a score depending, for adults, on the number of adults apart from the household reference person, and for dependent children, on their age. The total household income is divided by the sum of the scores to provide the measure of equivalised household income. All individuals in each household were allocated to the equivalised household income quintile to which their household had been allocated.

### **1.6.7 Logistic regression analysis**

Logistic regression modelling has been used in a number of chapters to examine the factors associated with selected outcome variables, after adjusting for other predictors. For instance in Chapter 3 in this volume, regression analyses have been performed to examine the association between health risk based on BMI and raised waist circumference (the outcome variable), and a variety of predictor variables including age, perceptions of participants' own physical activity and diet, and income. Forward stepwise models have been used for men and women separately. A wide range of possible predictor variables were tested in each model, and any that were significant among men or women were included in the final model in both sexes, as is customary practice in HSE reports. This gives an estimate of the independent effect of each predictor variable on the outcome when all the other independent variables were included in the model.

The results of the regression analyses are presented in tables showing odds ratios for the final models, together with the probability that the association is statistically significant. The predictor variable is significantly associated with the outcome variable if  $p < 0.05$ . The models show the odds of being in the particular category of the outcome variable (e.g. being 'most at risk' in the regression in Chapter 3) for each category of the independent variable (e.g. quintiles of equivalised household income). Odds are expressed relative to a reference category, which has a given value of 1. Odds ratios greater than 1 indicate higher odds, and odds ratios less than 1 indicate lower odds. For instance, looking at risk factors associated with being 'most at risk' using the combined BMI and waist circumference measurements, women in the lowest income quintile had an odds ratio of 1.7, and were therefore considerably more likely to be considered 'most at risk' than women in the highest quintile (the reference category). Also shown are the 95% confidence intervals for the odds ratios. Where the interval does not include 1, this category is significantly different from the reference category. Missing values were included in the analyses, that is, people were included even if they did not have a valid answer, score or classification in one or more of the explanatory variables. Where this was a large number of people, the missing values were included as a separate category (e.g. income), and where there were few records with a missing value, these individuals were included with the category containing the largest number of informants (e.g. current smokers).

### **1.6.8 Presentation of results**

Commentary in the report highlights differences that are statistically significant at the 95% level. It should be noted that statistical significance is not intended to imply substantive importance.

A summary of findings is presented at the beginning of each chapter. Following the chapter introduction and details of methods and definitions, the results are outlined in detail, and a

discussion section at the end of the chapter makes comparisons with other data sources and trend data, and sets the results in a broader context.

### 1.6.9 Availability of unpublished data

As with the previous surveys, an anonymised copy of the 2007 Health Survey for England data will be deposited at The Data Archive at the University of Essex. Copies of the data files can be obtained for specific research projects from the Archive: [www.data-archive.ac.uk](http://www.data-archive.ac.uk).

In addition, trend tables showing data for variables collected every year ('core' modules) for adults and children are available on The NHS Information Centre's website.<sup>1</sup>

## 1.7 Content of this report

This volume contains chapters with substantive results from the HSE 2007, and is one of two volumes based on the survey, published as a set as 'The Health Survey for England 2007':

1. Healthy lifestyles: knowledge, attitudes and behaviour<sup>2</sup>
2. Methodology and documentation<sup>3</sup>

Volume 2 gives full details of the survey methodology and documentation. This includes a description of the survey design and response rates; sampling errors; analysis of non-response; description of weighting procedures; and information on laboratory techniques and quality control of urine and salivary cotinine samples. Appendices to Volume 2 are as follows:

Appendix A: Questions asked by interviewers and nurses and copies of other key fieldwork documents

Appendix B: Protocols for measurements

Appendix C: Glossary and definitions

## References and notes

- 1 <http://www.ic.nhs.uk/pubs/hse07trends>
- 2 Craig R and Shelton N (eds). *Health Survey for England 2007. Volume 1: Healthy lifestyles: knowledge, attitudes and behaviour*. The NHS Information Centre, Leeds, 2008.
- 3 Craig R and Shelton N (eds). *Health Survey for England 2007. Volume 2: Methodology and Documentation*. The NHS Information Centre, Leeds, 2008.

*Emanuela Falaschetti*

## Summary

- This chapter looks at the prevalence of hypertension in adults aged 16 and over. Treatment and control rates are also reported.
- Overall the prevalence of hypertension was 31% in men and 29% in women. The prevalence increased with age in both sexes.
- The prevalence of hypertension did not show a significant relationship with income or Government Office Region.
- The treatment rate among participants with survey-defined hypertension was 46% in men and 53% in women, and increased with age in both sexes. The control rate (BP below 140/90 mmHg) among those on treatment was 56% in men and 55% in women.
- Among participants aged 35 and over on treatment for hypertension, a higher proportion of men (23%) than women (15%) were taking three or more antihypertensive drugs. The most common class of drug used was ACE inhibitors.

## 2.1 Introduction

This chapter reports on the prevalence of hypertension (high blood pressure) in the adult population in England aged 16 and over. Prevalence of hypertension is analysed in relation to socio-demographic characteristics, and additional analysis examines the treatment and control of hypertension and the use of antihypertensive drugs in Health Survey for England (HSE) 2007 participants.

There is a range of factors that are associated with hypertension, including age, family history, race, tobacco use, excessive alcohol consumption, physical inactivity, and increased levels of stress. Hypertension is usually defined as sustained raised blood pressure, and it should be noted that in the HSE measurements of blood pressure are only taken at one point in time.

Hypertension is an important public health challenge worldwide because of its high prevalence and the concomitant increase in risk of disease. It is the most important modifiable risk factor for cardiovascular, cerebrovascular and renal disease. A recent systematic review on worldwide prevalence of hypertension concluded that significant numbers of individuals with hypertension are unaware of their condition and, among those with diagnosed hypertension, treatment is frequently inadequate. Measures are required at a population level to prevent the development of hypertension and to improve awareness, treatment and control of hypertension in the community.<sup>1</sup>

The systolic arterial pressure is defined as the peak pressure in the arteries, which occurs near the beginning of the cardiac cycle; the diastolic arterial pressure is the lowest pressure at the resting phase of the cardiac cycle. The latest guidelines from the British Hypertension Society state that antihypertensive therapy should be initiated in people with sustained levels of systolic blood pressure (SBP) at or greater than 160 mmHg or diastolic blood pressure (DBP) at or greater than 100 mmHg. In people with levels of SBP between 140 and 159 mmHg and/or DBP between 90 and 99 mmHg, drug treatment should be decided on the basis of presence or absence of cardiovascular disease (CVD) or diabetes, other target organ damage (e.g. kidney) or an estimated CVD risk of 20% or more over 10 years.<sup>2</sup> The guidance recommends the use of more than one drug if blood pressure is otherwise not well controlled, and advises on choice of drug(s) by age and ethnicity.<sup>3</sup> The guidance was updated in 2006, jointly by the British Hypertension Society and the National Institute for Clinical Excellence (NICE), to reduce the use of beta-blockers because of the risk of precipitating diabetes.<sup>4</sup>

Guidelines for defining and treating hypertension vary internationally.<sup>5,6,7</sup> For example in the US, irrespective of risk status, people with a SBP of 140 mmHg or DBP 90 mmHg or greater are currently regarded as candidates for treatment. Patients with renal disease, diabetes and CVD are recommended treatment if their BP exceeds 130/85 mmHg. Guidelines set in Canada in the 1990s recommended treatment at 160/100 mmHg in 'low-risk' individuals, decreasing to 140/90 mmHg in patients with diabetes and renal disease,<sup>8</sup> very similar to current British guidance. A number of European guidelines have been promulgated, broadly consistent with the World Health Organisation/International Society for Hypertension (WHO/ISH). This sets 150/95 mmHg as the threshold for treating low risk individuals, decreasing to 130/85 mmHg in those with diabetes and renal disease.

In 2003 an updated summary of the WHO/ISH Guidelines for the Management of Hypertension stated that since publication of the 1999 guidelines, more evidence has become available to support a systolic blood pressure threshold of 140 mmHg for even 'low-risk' patients. In high-risk patients there is evidence to support using lower thresholds. Lifestyle modification is recommended for all individuals.<sup>9</sup>

It has been estimated that reducing the proportion of the population with high systolic blood pressure (140 mmHg) by 50% would prevent around 18,100 coronary heart disease events in England.<sup>10</sup> An analysis of hypertension management in England from 1994 to 2003 showed a great improvement, with more awareness, treatment and control of hypertension; nevertheless in 2003 the majority of hypertensive adults in England had blood pressure levels above the currently recommended targets.<sup>11</sup>

This chapter presents 2007 data. Trend tables of key variables including blood pressure are available in *Health Survey for England 2007 Latest Trends* on the NHS Information Centre's website.<sup>12</sup>

## 2.2 Methods and definitions

### 2.2.1 Measurements

Blood pressure was measured with the Omron HEM 907, an oscillometric automated device. It was introduced in the HSE 2003 as a replacement for the Dinamap 8100, which had become obsolete.

From 2003 the definition of hypertension, based on blood pressure levels and medication, also changed. Prior to HSE 2003, taking any medication which *may affect* blood pressure was used in the definition, whereas from HSE 2003 onwards, taking medication for high blood pressure has been used in the definition (see section 2.1.2 below).

The protocol for the measurement of blood pressure has remained unchanged. As in previous years, three blood pressure readings were taken, at one-minute intervals, using an appropriately sized cuff on the right arm, with the participant in a seated position after five minutes' rest. Systolic and diastolic pressures were displayed on the Omron from each measurement. As in previous reports, participants were excluded if they were pregnant.

The blood pressure variables used in this chapter are the means of the second and third measurements obtained from the participants in whom three readings were successfully obtained, excluding those who had eaten, drunk alcohol, exercised, or smoked in the 30 minutes before the measurement was taken.

### 2.2.2 Classification of blood pressure levels

The levels of blood pressure used to define hypertension in HSE 2007 are in accordance with the latest guidelines on hypertension management.<sup>4</sup> Adult participants were classified in one of four groups on the basis of their SBP and DBP readings and their current use of anti-hypertensive medication.

Normotensive untreated	SBP<140 mmHg and DBP<90 mmHg, not currently taking medication specifically prescribed to treat high blood pressure
Hypertensive controlled	SBP<140 mmHg and DBP<90 mmHg, currently taking medication specifically prescribed to treat their high blood pressure
Hypertensive uncontrolled	SBP≥140 mmHg or DBP≥90 mmHg, currently taking medication specifically prescribed to treat their high blood pressure
Hypertensive untreated	SBP≥140 mmHg or DBP≥90 mmHg, not currently taking medication specifically prescribed to treat their high blood pressure

The last three categories together are considered as 'hypertensive' for the purpose of this report.

The threshold of 140/90 mmHg used in the Health Survey for England (HSE) is in accordance with the guidelines on hypertension management.<sup>2</sup>

An additional more severe category of 'hypertensive untreated (160/100 mmHg)' has also been defined and is used in this report, as treatment is always indicated for persistent hypertension at this level.

2.2.3 Definitions of treatment, and control

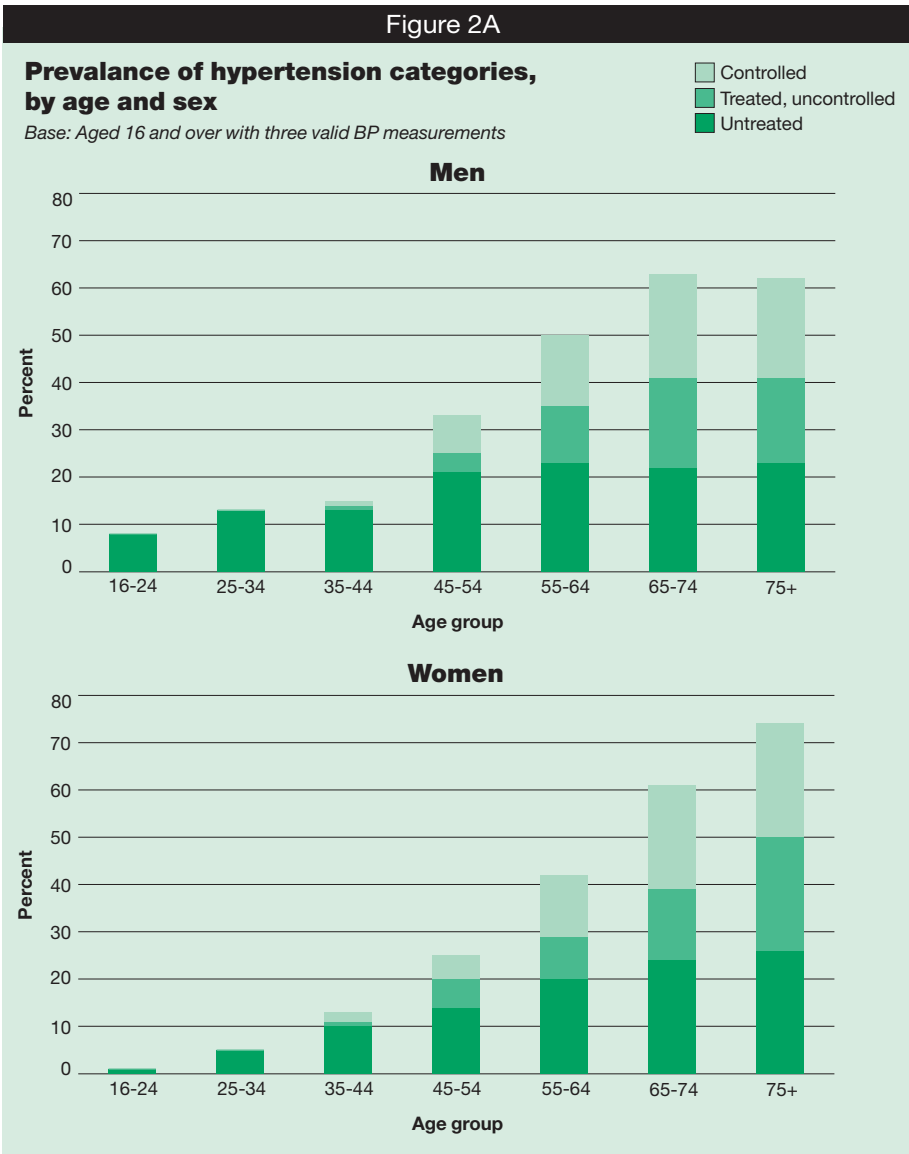
Treatment rates were estimated by examining the proportion of all those defined as having high blood pressure (at least 140mmHg systolic or 90 mmHg diastolic or on treatment for hypertension) who were on treatment at the time of the survey.

The control of hypertension was estimated by calculating, among those on treatment for hypertension at the time of the survey, the proportion with measured BP below 140/90 mmHg. Control rates among those with hypertension were also calculated.

2.3 Prevalence, treatment and control of hypertension

2.3.1 Prevalence of hypertension by age and sex

Overall the prevalence of hypertension was 31% in men and 29% in women. It increased with age in both sexes, ranging from 8% of men and 1% of women aged 16-24 to 62% of men and 74% of women aged 75 and over. Prevalence of hypertension was higher among men than women up to age 64, with the gap reducing at age 65-74. Prevalence was higher among women than men by age 75 and over.



The prevalence of untreated hypertension of at least 160 mmHg systolic or 100 mmHg diastolic also increased with age, ranging from fewer than 1% in both men and women aged 16-24 to 7% of men and 9% of women aged 75 and over.

Table 2.2, Figure 2A

2.3.2 Prevalence of hypertension by region

There was no significant variation in prevalence of hypertension across regions. Table 2.3

2.3.3 Prevalence of hypertension by equivalised household income

Table 2.4 shows the age-standardised prevalence of hypertension by equivalised household income and sex. Prevalence did not show a significant relationship with income.

Table 2.4

2.3.4 Treatment and control of hypertension

Among participants with survey-defined hypertension, 46% of men and 53% of women were on treatment, and 26% of men and 29% of women had their hypertension controlled (BP below 140/90 mm/Hg). The treatment rate increased with age in both sexes, ranging from 30% of men and 37% of women aged 35-54 to 64% of men and 65% of women aged 75 and over.

56% of men and 55% of women who were on treatment for hypertension had their blood pressure controlled.

Tables 2.5, 2.6, Figure 2B



Table 2.7 examines the use of medication for hypertension among participants aged 35 and over who were on treatment for hypertension. 46% of women and 39% of men were taking a single class of drug to treat their condition. A higher proportion of men (23%) than women (15%) were taking three or more antihypertensive drugs. This difference was more marked

in younger age groups. The most common class of drug used in both sexes was ACE inhibitors, with more men (66%) than women (54%) taking these. The prevalence of calcium blockers was also higher among men (39%) than women (32%). The use of diuretics increased with age among women, but not among men.

The table below shows the use of antihypertensive medication by control of blood pressure among those aged 35 and over. Men with uncontrolled hypertension were more likely than men with controlled hypertension to take three or more drugs and to take calcium blockers, while fewer took beta blockers.

Table 2A				
Use of antihypertensive medication, by control of blood pressure and sex				
Aged 35 and over on treatment for hypertension				
	Men		Women	
	Controlled <sup>a</sup>	Uncontrolled	Controlled <sup>a</sup>	Uncontrolled
No. of antihypertensive drugs <sup>b</sup>				
1	38	41	48	42
2	43	30	38	41
3+	19	29	14	17
Class of antihypertensive drugs				
ACE inhibitors	66	65	54	55
Beta blockers	35	25	33	32
Calcium blockers	34	46	30	34
Diuretics	41	42	46	50
Other drugs affecting BP	8	17	5	6

<sup>a</sup> BP below 140/90 mmHg.

<sup>b</sup> Some participants may have been on two different types of diuretic drugs. Therefore the number of classes of drugs taken is counted, not the number of individual drugs.

Table 2.7

## 2.4 Discussion

### 2.4.1 Interpretation of results

The definition of hypertension used for clinical purposes is based on 'sustained' levels of high blood pressure. HSE measures blood pressure at one point in time only, since no repeated measurements are possible, and the survey definition of hypertension will include some whose blood pressure may not be high when checked later by healthcare professionals. The HSE may therefore slightly overestimate the prevalence of hypertension. This needs to be taken into account when interpreting the results.

### 2.4.2 Treatment and control of hypertension

About half of participants with survey-defined hypertension were receiving treatment for their condition, and among those on treatment more than half had their blood pressure controlled. As previously reported, treatment rates were quite low in people aged under 55. Only 30% of men and 37% of women aged 35-54 with survey defined hypertension were treated, while the rate was around twice as high in those aged 75 and over. This is probably due in part to the increased likelihood of older people visiting their GP,<sup>13,14</sup> as most diseases increase with age, and therefore there may be more opportunistic measurement of blood pressure, leading to diagnosis of and treatment for hypertension among older people. Additionally, this finding might be explained by current strategies, for example the Quality and Outcomes Framework of the 2003 GP contract, focusing more on secondary than primary prevention.<sup>15</sup> Interventions are encouraged for patients at highest risk of



cardiovascular disease, particularly those with established CHD, who are more likely to be older.

Comparing within age groups, the treatment rate was similar between men and women, but a higher proportion of men than women were taking three or more antihypertensive drugs. However, among those on treatment the control rate did not differ by age or sex, and there were only small differences in the choice of drugs used.

The finding that men with uncontrolled hypertension were more likely than men with controlled hypertension to be taking three or more classes of drug was surprising. One explanation would be that many men have hypertension that is difficult to control, despite increasing the number of drugs taken (guidance recommends that more than one drug should be used if blood pressure is not well controlled). A further possible explanation is that those with uncontrolled hypertension are prescribed additional drugs but do not take them all. This may reflect gender differences in attitudes to health and healthcare.<sup>16,17</sup>

### 2.4.3 Comparison with results from Quality Outcomes Framework (QOF)

Primary care (GP) practices have been submitting data to the Quality Management Analysis System (QMAS) since April 2004. These data are used to calculate individual practices' Quality and Outcomes Framework (QOF) achievement to support practice payment processes. Prevalence in 19 clinical areas is also available, and for the fourth year of the QOF (April 2007 to March 2008) used data from 8,294 practices, representing 99.8% of registered patients in England.<sup>18,19</sup>

Using data from QOF, in 2007/08 the national prevalence of hypertension was 12.8% in the whole population (assuming that nobody younger than 16 is hypertensive, this prevalence is equivalent to 16% among those aged 16 and over, who represent 80% of the population). The figure is similar to previous years and it is still about half the prevalence of survey-defined hypertension among HSE informants (31% of men and 29% of women). It is impossible to ascertain from these data to what extent the survey is over-estimating hypertension, to what extent GPs are under-reporting it in their QOF returns, and to what extent the survey is identifying undiagnosed hypertension.

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- 19 Figures published by the Information Centre are derived from the Quality Management Analysis System (QMAS), a national system developed by NHS Connecting for Health. QMAS uses data from general practices to calculate individual practices' QOF achievement. Users of data derived from QMAS should recognise that QMAS was established as a mechanism to support the calculation of practice QOF payments. It is not a comprehensive source of data on quality of care in general practice, but it is potentially a rich and valuable source of such information, providing that the limitations of the data are acknowledged.

The 2007/08 disease prevalence tables were based on prevalence submissions to QMAS at the end of the 2007/08 financial year. The disease prevalence figures are therefore based on 8,294 general practices. These practices covered 99.8% of registered patients in England (based on registration data from the Prescription Pricing Division of the NHS Business Services Authority for the quarter January to March 2008).

## Tables

- 2.1 Response to blood pressure measurement, by age and sex
- 2.2 Hypertension categories, by age and sex
- 2.3 Hypertension categories (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex
- 2.4 Hypertension categories (age-standardised), by equivalised household income and sex
- 2.5 Treatment and control of hypertension among participants with survey-defined hypertension, by age and sex
- 2.6 Control of hypertension among participants on treatment for hypertension, by age and sex
- 2.7 Use of antihypertensive medication, by age and sex

Table 2.1

**Response to blood pressure measurement, by age and sex***Aged 16 and over with a nurse visit*

2007

Response to blood pressure	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Valid blood pressure measurement <sup>a</sup>	78	82	81	84	86	89	87	84
Ate, drank, smoked, exercised in previous half hour	17	15	16	13	12	10	6	13
Three valid readings not obtained	3	1	1	1	2	1	7	2
Refused, attempted but not obtained, not attempted	2	2	1	2	0	1	1	1
<b>Women</b>								
Valid blood pressure measurement <sup>a</sup>	74	79	81	81	85	88	88	82
Ate, drank, smoked, exercised in previous half hour	18	10	16	16	12	9	7	13
Three valid readings not obtained	2	2	1	2	2	3	5	2
Pregnant	5	8	2	0	-	-	-	2
Refused, attempted but not obtained, not attempted	1	0	0	1	1	0	1	1
<i>Bases (unweighted)</i>								
<i>Men</i>	235	295	413	388	365	325	218	2239
<i>Women</i>	260	413	515	468	439	388	276	2759

<sup>a</sup> Three valid readings of systolic and diastolic blood pressure.

Table 2.2

**Hypertension categories, by age and sex**

Aged 16 and over with three valid BP measurements

2007

Hypertension levels	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Normotensive untreated <sup>a</sup>	92	87	85	67	50	37	38	69
Hypertensive controlled <sup>a</sup>	-	0	1	8	15	22	21	8
Hypertensive uncontrolled <sup>a</sup>	-	-	1	4	12	19	18	6
Hypertensive untreated <sup>a</sup>	8	13	13	21	23	22	23	17
<i>All with hypertension</i>	8	13	15	33	50	63	62	31
Hypertensive untreated (160/100) <sup>b</sup>	0	1	3	4	4	6	7	3
<b>Women</b>								
Normotensive untreated <sup>a</sup>	99	94	88	74	57	39	26	71
Hypertensive controlled <sup>a</sup>	-	0	2	5	13	22	24	8
Hypertensive uncontrolled <sup>a</sup>	-	0	1	6	9	15	24	7
Hypertensive untreated <sup>a</sup>	1	5	10	14	20	24	26	14
<i>All with hypertension</i>	1	6	12	26	43	61	74	29
Hypertensive untreated (160/100) <sup>b</sup>	0	0	2	3	5	6	9	3
<i>Bases (unweighted)</i>								
<i>Men</i>	184	243	336	327	315	289	189	1883
<i>Women</i>	193	327	415	380	372	340	242	2269
<i>Bases (weighted)</i>								
<i>Men</i>	285	329	380	340	316	218	154	2021
<i>Women</i>	262	326	387	330	318	235	230	2090

- <sup>a</sup> Normotensive untreated: SBP <140mmHg and DBP <90mmHg and **not** taking medication prescribed for high blood pressure
- Hypertensive controlled: SBP <140mmHg and DBP <90mmHg and taking medication prescribed for high blood pressure
- Hypertensive uncontrolled: SBP ≥ 140mmHg or DBP ≥ 90mmHg and taking medication prescribed for high blood pressure
- Hypertensive untreated: SBP ≥ 140mmHg or DBP ≥ 90mmHg and **not** taking medication prescribed for high blood pressure
- All with hypertension* SBP ≥ 140mmHg or DBP ≥ 90mmHg or taking medication prescribed for high blood pressure.

- <sup>b</sup> Hypertensive untreated (160/100): SBP ≥ 160mmHg or DBP ≥ 100mmHg and **not** taking medication prescribed for high blood pressure; if this level of BP is sustained, it always warrants treatment, according to current guidelines.

Table 2.3

**Hypertension categories (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over with three valid BP measurements

2007

Hypertension levels	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
Normotensive untreated <sup>b</sup>	61	67	66	63	65	66	78	68	75	71	79
Hypertensive controlled <sup>b</sup>	11	8	6	13	10	8	8	5	6	5	7
Hypertensive uncontrolled <sup>b</sup>	7	7	9	7	7	5	6	4	4	4	3
Hypertensive untreated <sup>b</sup>	20	18	19	17	18	20	7	22	16	19	12
All with hypertension	39	33	34	37	35	34	22	32	25	29	21
Hypertensive untreated (160/100) <sup>c</sup>	3	3	2	4	6	4	2	5	1	2	0
<b>Standardised</b>											
Normotensive untreated <sup>b</sup>	62	68	69	64	69	68	76	72	75	73	77
Hypertensive controlled <sup>b</sup>	11	8	5	13	8	7	9	4	6	5	8
Hypertensive uncontrolled <sup>b</sup>	7	6	8	6	6	5	7	4	4	4	3
Hypertensive untreated <sup>b</sup>	20	18	17	17	17	20	8	20	15	18	13
All with hypertension	38	32	31	36	31	32	24	28	25	27	23
Hypertensive untreated (160/100) <sup>c</sup>	4	3	2	3	5	4	2	4	1	2	1
<b>Bases (unweighted)</b>											
Men	134	256	245	181	158	197	189	181	342	178	164
<b>Bases (weighted)</b>											
Men	118	272	223	171	210	231	261	192	344	180	165

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Normotensive untreated: SBP <140mmHg and DBP <90mmHg and **not** taking medication prescribed for high blood pressure

Hypertensive controlled: SBP <140mmHg and DBP <90mmHg and taking medication prescribed for high blood pressure

Hypertensive uncontrolled: SBP ≥ 140mmHg or DBP ≥ 90mmHg and taking medication prescribed for high blood pressure

Hypertensive untreated: SBP ≥ 140mmHg or DBP ≥ 90mmHg and **not** taking medication prescribed for high blood pressure

All with hypertension SBP ≥ 140mmHg or DBP ≥ 90mmHg or taking medication prescribed for high blood pressure.

<sup>c</sup> Hypertensive untreated (160/100): SBP ≥ 160mmHg or DBP ≥ 100mmHg and **not** taking medication prescribed for high blood pressure: if this level of BP is sustained, it always warrants treatment, according to current guidelines.

Continued...

Table 2.3 continued

Aged 16 and over with three valid BP measurements

2007

Hypertension levels	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Observed</b>											
Normotensive untreated <sup>b</sup>	70	66	68	74	66	72	80	73	72	69	75
Hypertensive controlled <sup>b</sup>	10	10	7	7	10	9	8	7	7	7	8
Hypertensive uncontrolled <sup>b</sup>	7	8	9	4	8	7	6	5	7	10	4
Hypertensive untreated <sup>b</sup>	14	16	16	15	16	12	6	15	14	15	13
All with hypertension	30	34	32	26	34	28	20	27	28	31	25
Hypertensive untreated (160/100) <sup>c</sup>	2	3	2	5	4	4	1	5	3	3	3
<b>Standardised</b>											
Normotensive untreated <sup>b</sup>	72	69	67	75	69	75	74	76	73	71	76
Hypertensive controlled <sup>b</sup>	9	9	7	7	9	8	11	6	7	6	8
Hypertensive uncontrolled <sup>b</sup>	5	7	9	4	8	7	8	5	7	9	4
Hypertensive untreated <sup>b</sup>	13	15	16	14	15	11	7	13	13	13	13
All with hypertension	28	31	33	25	31	25	26	24	27	29	24
Hypertensive untreated (160/100) <sup>c</sup>	2	3	2	6	4	3	2	5	3	3	3
<b>Bases (unweighted)</b>											
Women	170	327	285	204	194	235	226	224	404	216	188
<b>Bases (weighted)</b>											
Women	122	316	229	162	207	231	268	210	346	184	162

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Normotensive untreated: SBP <140mmHg and DBP <90mmHg and **not** taking medication prescribed for high blood pressure  
Hypertensive controlled: SBP <140mmHg and DBP <90mmHg and taking medication prescribed for high blood pressure  
Hypertensive uncontrolled: SBP ≥ 140mmHg or DBP ≥ 90mmHg and taking medication prescribed for high blood pressure  
Hypertensive untreated: SBP ≥ 140mmHg or DBP ≥ 90mmHg and **not** taking medication prescribed for high blood pressure  
All with hypertension SBP ≥ 140mmHg or DBP ≥ 90mmHg or taking medication prescribed for high blood pressure.

<sup>c</sup> Hypertensive untreated (160/100): SBP ≥ 160mmHg or DBP ≥ 100mmHg and **not** taking medication prescribed for high blood pressure: if this level of BP is sustained, it always warrants treatment, according to current guidelines.

Table 2.4

**Hypertension categories (age-standardised),  
by equivalised household income and sex**

Aged 16 and over with three valid BP measurements

2007

Hypertension levels	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
Normotensive untreated <sup>a</sup>	68	72	73	67	74
Hypertensive controlled <sup>a</sup>	7	7	9	8	6
Hypertensive uncontrolled <sup>a</sup>	7	5	5	6	6
Hypertensive untreated <sup>a</sup>	18	15	14	19	14
<i>All with hypertension</i>	32	28	27	33	26
Hypertensive untreated (160/100) <sup>b</sup>	2	4	2	4	3
<b>Women</b>					
Normotensive untreated <sup>a</sup>	76	71	74	71	71
Hypertensive controlled <sup>a</sup>	7	6	7	9	11
Hypertensive uncontrolled <sup>a</sup>	4	4	7	8	7
Hypertensive untreated <sup>a</sup>	13	19	12	13	11
<i>All with hypertension</i>	24	29	26	29	29
Hypertensive untreated (160/100) <sup>b</sup>	3	3	3	3	3
<i>Bases (unweighted)</i>					
<i>Men</i>	423	337	311	312	173
<i>Women</i>	404	369	358	440	276
<i>Bases (weighted)</i>					
<i>Men</i>	447	376	328	308	199
<i>Women</i>	366	352	326	376	265

<sup>a</sup> Normotensive untreated: SBP <140mmHg and DBP <90mmHg and **not** taking medication prescribed for high blood pressure

Hypertensive controlled: SBP <140mmHg and DBP <90mmHg and taking medication prescribed for high blood pressure

Hypertensive uncontrolled: SBP ≥ 140mmHg or DBP ≥ 90mmHg and taking medication prescribed for high blood pressure

Hypertensive untreated: SBP ≥ 140mmHg or DBP ≥ 90mmHg and **not** taking medication prescribed for high blood pressure

*All with hypertension* SBP ≥ 140mmHg or DBP ≥ 90mmHg or taking medication prescribed for high blood pressure.

<sup>b</sup> Hypertensive untreated (160/100): SBP ≥ 160mmHg or DBP ≥ 100mmHg and **not** taking medication prescribed for high blood pressure: if this level of BP is sustained, it always warrants treatment, according to current guidelines.



Table 2.5

**Treatment and control of hypertension among participants with survey-defined hypertension, by age and sex**

Aged 16 and over with survey-defined hypertension

2007

Treatment and control levels	Age group					Total
	16-34	35-54	55-64	65-74	75+	
	%	%	%	%	%	%
<b>Men</b>						
Treatment rate (proportion with hypertension who were on treatment)	1	30	53	65	64	46
Control rate among those with hypertension <sup>a</sup>	1	19	30	35	34	26
<b>Women</b>						
Treatment rate (proportion with hypertension who were on treatment)	b	37	53	61	65	53
Control rate among those with hypertension <sup>a</sup>	b	19	31	36	32	29
<i>Bases (unweighted)</i>						
Men	50	159	157	183	115	664
Women	22	148	157	210	177	714
<i>Bases (weighted)</i>						
Men	67	170	158	138	96	628
Women	23	132	137	144	170	606

<sup>a</sup> Control rate among those with hypertension: the proportion of those with survey-defined hypertension whose blood pressure was controlled (BP less than 140/90mmHg).

<sup>b</sup> Results are not shown because of small bases.

Table 2.6

**Control of hypertension among participants on treatment for hypertension, by age and sex**

Aged 35 and over on treatment for hypertension

2007

Control levels	Age group				Total
	35-54	55-64	65-74	75+	
	%	%	%	%	%
<b>Men</b>					
Control rate <sup>a</sup>	[63]	57	54	54	56
<b>Women</b>					
Control rate <sup>a</sup>	52	58	59	49	55
<i>Bases (unweighted)</i>					
Men	49	83	118	72	322
Women	55	80	127	115	377
<i>Bases (weighted)</i>					
Men	50	84	90	61	285
Women	49	72	88	110	319

<sup>a</sup> Control rate: the proportion of those on treatment for hypertension whose blood pressure was controlled (below 140/90mmHg).

Table 2.7

**Use of antihypertensive medication,  
by age and sex***Aged 35 and over on treatment for hypertension**2007*

Number and type of drugs	Age group				Total
	35-54	55-64	65-74	75+	
	%	%	%	%	%
<b>Men</b>					
<b>No. of antihypertensive drugs<sup>a</sup></b>					
1	[38]	44	37	35	39
2	[44]	29	41	41	38
3+	[18]	27	22	24	23
<b>Class of antihypertensive drugs</b>					
ACE inhibitors	[79]	61	60	70	66
Beta blockers	[23]	32	32	34	31
Calcium blockers	[34]	38	45	38	39
Diuretics	[44]	42	37	44	41
Other drugs affecting BP	[5]	18	14	6	12
<b>Women</b>					
<b>No. of antihypertensive drugs<sup>a</sup></b>					
1	58	51	42	40	46
2	34	40	40	40	39
3+	8	9	18	20	15
<b>Class of antihypertensive drugs</b>					
ACE inhibitors	57	55	57	51	54
Beta blockers	31	28	32	36	32
Calcium blockers	24	28	34	36	32
Diuretics	33	45	51	54	48
Other drugs affecting BP	6	3	7	5	5
<i>Bases (unweighted)</i>					
<i>Men</i>	49	83	118	72	322
<i>Women</i>	55	80	127	115	377
<i>Bases (weighted)</i>					
<i>Men</i>	50	84	90	61	285
<i>Women</i>	49	72	88	110	319

<sup>a</sup> Some participants may have been on two different types of diuretic drugs. Therefore the number of classes of drugs taken is counted, not the number of individual drugs.

# Adult anthropometric measures, overweight, and obesity

## 3

Faiza Tabassum

### Summary

- This chapter reports on measurements relevant to obesity: body mass index (BMI), prevalence of overweight and obesity, and waist circumference.
- Body mass index (BMI), defined as weight in kilograms divided by the square of the height in metres ( $\text{kg/m}^2$ ), was used to categorise adult participants into categories such as overweight and obese.
- Overall, mean BMI in men ( $27.1 \text{ kg/m}^2$ ) was similar to women ( $26.8 \text{ kg/m}^2$ ). Mean BMI was generally higher in older age groups.
- 65% of men and 56% of women were either overweight or obese. A greater proportion of men than women were overweight (41% and 32% respectively). There was no difference in the proportion of men and women that were obese (24%).
- Mean BMI and the prevalence of obesity increased in both sexes between 1993 and 2007. Mean BMI increased from  $25.9 \text{ kg/m}^2$  in 1993 to  $27.1 \text{ kg/m}^2$  in 2007 among men, and from  $25.7 \text{ kg/m}^2$  in 1993 to  $26.8 \text{ kg/m}^2$  in 2007 among women. There was a marked increase in the proportion who were obese over the same period, from 13% of men in 1993 to 24% in 2007 and from 16% of women in 1993 to 24% in 2007. The proportion of men who were overweight decreased from 44% to 41% over the period, while the proportion of overweight women stayed at the same level (32% in 2007).
- Mean waist circumference was 96.7 cm in men and 86.5 cm in women. The proportion of participants with a raised waist circumference was higher in women (41%) than in men (33%).
- The age-standardised prevalence of obesity and raised waist circumference rose as the quintile of equivalised household income fell among women. These measures were not related to income in men.
- Mean BMI and mean waist circumference were higher among those participants who reported their health as bad/very bad compared with those who reported their health status as very good/good.

Men and women who had uncontrolled hypertension (i.e. had high blood pressure although they were on treatment for it) had higher mean BMI than those who did not have hypertension. More of those with hypertension were obese or had a raised waist circumference, compared with those who were not hypertensive.

- National Institute for Health and Clinical Excellence (NICE) guidelines define low, high and very high waist measurements for men and women. A high or very high waist circumference is associated with increased health risks for those with a BMI below  $35 \text{ kg/m}^2$ ; health risks are very high for those with a BMI of  $35 \text{ kg/m}^2$  or more with any waist circumference.
- Using the NICE categories, most men and women who were overweight or obese tended also to have a high or very high waist circumference, and were therefore at increased health risk. Using combined categories of BMI and waist circumference to

assess risk, 19% of men were estimated to be at increased risk, 13% at high risk and 21% at very high risk. The equivalent percentages for women were 15% at increased risk, 16% at high risk and 23% at very high risk.

- Logistic regression was used to identify the risk factors associated with being in the 'most at risk' categories (high or very high risk). Being 'most at risk' was positively associated with age, with being an ex-cigarette smoker, with self-perceptions of not eating healthily and not being physically active, and with hypertension in both men and women. Income was also associated, with a positive association for men and a negative association for women. Additionally, among women only, moderate alcohol consumption was associated with being 'most at risk'.

## 3.1 Introduction

### 3.1.1 Contents of the chapter

The anthropometric measures presented in this chapter for adults (aged 16 and over) focus on measurements relevant to obesity. Height and weight data used to calculate Body Mass Index (BMI) have been collected in each year of the Health Survey series. Height and weight data were used to calculate BMI; waist circumference was used to assess central obesity. First, the methods and definitions of these measurements are described. Relationships are examined between BMI, underweight, overweight, obesity and raised waist circumference prevalence, and Government Office Regions and equivalised household income. Associations of BMI, overweight, obesity and raised waist circumference with general health and hypertension are explored, followed by classification of participants according to the National Institute for Health and Clinical Excellence (NICE) obesity categories. Finally, multivariate analysis was carried out to examine the relationships of being in the high or very high risk category for BMI and waist circumference with a number of other risk factors.

### 3.1.2 Context

It is well reported that the prevalence of obesity in England is increasing at all ages; almost two-thirds of adults and a third of children are either overweight or obese.<sup>1</sup> In 2006, 38% of adults were overweight and 24% were classified as obese, meaning that 67% of men and 56% of women were either overweight or obese;<sup>2</sup> as this chapter shows, in 2007 a similar proportion were overweight or obese (65% of men and 56% of women). It has been reported that England has some of the highest levels of obesity in Europe.<sup>3</sup> Additionally, it has been forecast that by the year 2010, 12 million adults plus 1 million children in England will be obese if trends up to 2003 continue.<sup>4</sup> The report expects approximately one third of all adults and one fifth of all children aged 2-15 in England to be obese by 2010.

Obesity or overweight is of particular interest because it is a major risk factor for disease and mortality. A number of studies have established that overweight or obesity are associated with cardiovascular risk, cardiovascular related mortality, cancer, disability during older age and a large decrease in life expectancy.<sup>5,6,7,8</sup> Furthermore, obesity is associated with serious chronic conditions such as Type 2 diabetes, hypertension, and hyperlipidaemia (i.e. high levels of lipids (fat) in the blood that can lead to narrowing and blockages of blood vessels), which are major risk factors for cardiovascular disease.<sup>9</sup>

It is generally recognised that the central deposition of fat (abdominal or visceral obesity) is closely associated with chronic diseases and is a key constituent of the metabolic syndrome,<sup>10</sup> a disorder characterised by increased risk of developing diabetes and cardiovascular disease. A World Health Organisation (WHO) report in 2000<sup>11</sup> highlighted that the co-morbidities of obesity would be more easily predicted if intra-abdominal fat were also monitored, in addition to BMI, by simple measures such as waist circumference. Moreover, the NICE guidance<sup>12</sup> is now moving towards a combination of BMI and waist circumference in order to classify health risk from obesity.

Experts have recognised overweight and obesity as a public health problem in Britain which is comparable with climate change in both in its scale and its complexity.<sup>3</sup> The UK government has announced its ambition to be the first major country to reverse the rising tide of obesity and overweight in the population, with an initial focus on children, aiming to reduce the proportion of overweight and obese children to 2000 levels by 2020.<sup>13</sup> There is a general consensus that the increase in prevalence of obesity in the United Kingdom is mostly due to two major lifestyle factors: the energy content of modern diet and an increasingly sedentary lifestyle. Overwhelming evidence indicates that the incorporation of physical activity into individual lifestyles will result in health benefits, and the government has already acknowledged this through its latest obesity strategy.<sup>13</sup> The public health white paper *Choosing Health: Making healthy choices easier*<sup>14</sup> set out the government's commitments for action on obesity. *Choosing a Better Diet, Food and Health Action Plan*<sup>15</sup> and *Choosing Activity: Physical Activity Plan*<sup>16</sup> specified the action that needs to be taken at

national, regional and local level to combat obesity and improve people's health through better diet and nutrition and increasing physical activity.

At the same time, the *UK Obesity Strategy* (2008) has put emphasis on the need for individuals' knowledge and understanding of healthy eating, lifestyle factors and causes and consequences of the rise in unhealthy weight.<sup>4</sup> Moreover, NICE has developed national guidance<sup>12</sup> for healthcare organisations (both within and external to the NHS) on prevention, identification, assessment and management of overweight and obesity.

### 3.1.3 Trend data

This chapter examines 2007 data in detail, and also looks at trends in obesity and overweight since 1993. Trend data on adult and child obesity, and other key measures, can also be found in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre website.<sup>17</sup>

## 3.2 Methods and definitions

Full details of the protocols for carrying out the measurements are contained in Volume 2 of this report, Methodology and Documentation, Appendix B, and are briefly summarised here. Height and weight were measured during the interviewer visit while waist and hip circumferences were measured during the nurse visit.<sup>18</sup>

### 3.2.1 Methods

#### Height

Height was measured using a portable stadiometer with a sliding head plate, a base plate and three connecting rods marked with a metric measuring scale. Participants were asked to remove their shoes. One measurement was taken, with the participant stretching to the maximum height and the head positioned in the Frankfort plane.<sup>19</sup> The reading was recorded to the nearest even millimetre. Participants who were unable to stand or unsteady on their feet were not measured.

#### Weight

Weight was measured using Soehnle, Seca and Tanita electronic scales with a digital display. Participants were asked to remove their shoes and any bulky clothing. A single measurement was recorded to the nearest 100g. Participants who were pregnant, unable to stand, or unsteady on their feet were not weighed. Participants who weighed more than 130 kg were asked for their estimated weight because the scales are inaccurate above this level. These estimated weights were included in the analysis.

In the analysis of height and weight, data from those who were considered by the interviewer to have unreliable measurements, for example those who had excessive clothing on, were excluded from the analysis.

#### Waist circumference

The waist was defined as the midpoint between the lower rib and the upper margin of the iliac crest. It was measured using a tape with an insertion buckle at one end. The measurement was taken twice, using the same tape, and was recorded to the nearest even millimetre. Those whose two waist measurements differed by more than 3 cm had a third measurement taken. The mean of the two valid measurements (the two out of the three measurements that were the closest to each other, if there were three measurements) were used in the analysis.

For waist measurements, all those who reported that they had a colostomy or ileostomy, or were unable to stand, were excluded from the measurement. All those with measurements considered unreliable by the nurse, due to excessive clothing or movement, for example, were also excluded from the analysis.

### Response to anthropometric measures

Response rates to anthropometric measurements are shown in Table 3.1. Generally, the response rate to anthropometric measurements varied between 86% and 98%, and there was little variation by age, except among those aged 75 and over where response was lowest.

Table 3.1

### 3.2.2 Definitions

#### Body mass index (BMI)

In order to define overweight or obesity, a measurement is required that allows for differences in weight due to height. A widely accepted measure of weight for height, the Body Mass Index (BMI), defined as weight in kilograms divided by the square of the height in metres ( $\text{kg}/\text{m}^2$ ), has been used for this purpose in the Health Survey series.

BMI was calculated for all those participants for whom both a valid height and weight measurement were recorded. Adult participants were classified into the following BMI groups according to the WHO and NICE BMI classification.<sup>12,20</sup>

BMI ( $\text{kg}/\text{m}^2$ )	Description
Less than 18.5	Underweight
18.5 to less than 25	Normal
25 to less than 30	Overweight
30 or more	Obese
40 or more	Morbidly obese

BMI categories of overweight and obesity have frequently been combined to show the proportion who are either overweight or obese. As in the 1998, 2003, 2005 and 2006 reports, a sub-set of the obese category has also been defined, namely those with morbid obesity (BMI  $40 \text{ kg}/\text{m}^2$  or more) who are at highest risk of morbidity and mortality.<sup>21</sup>

#### Waist measurement

BMI does not distinguish between mass due to body fat and mass due to muscular physique. It also does not take account of the distribution of fat. It has therefore been postulated that waist circumference may be a better measure than BMI or waist to hip ratio (WHR)<sup>22</sup> to identify those with a health risk from being overweight.

A raised waist circumference has been taken to be greater than 102 cm in men and greater than 88 cm in women, in accordance with the definition of abdominal obesity used by the National Institutes of Health (USA) ATP (Adult Treatment Panel) III.<sup>23</sup> These levels identified people at risk of the metabolic syndrome, a disorder characterised by increased risk of developing diabetes and cardiovascular disease. It has been shown recently that these cut-offs corresponded fairly closely to the 95th percentile of waist circumference for healthy people, indicating that few healthy people have values of waist circumference above these cut offs.<sup>24</sup>

#### Combined assessment of health risk from obesity

The NICE evidence-based guidelines include details on prevention, identification, assessment and management of overweight and obesity, with the aim of allowing health professionals to be made more aware of how to manage overweight and obesity in primary care. The guidelines highlight the impact of overweight and obesity on risk factors for developing other long-term health problems such as coronary heart disease, type 2 diabetes, osteoarthritis and some cancers. It states that risk of these co-morbidities should be identified using both BMI and waist circumference as assessment tools in those with a BMI less than  $35 \text{ kg}/\text{m}^2$ . The NICE guidance<sup>12</sup> states that 'waist circumference is a valid measure of abdominal fat mass and disease risk in individuals with a BMI less than 35. If BMI is 35 or more, waist circumference adds little to the absolute measure of risk provided by BMI'.

The NICE categories are defined as below:

BMI classification	Waist circumference		
	Low	High	Very high
Normal weight	No increased risk	No increased risk	Increased risk
Overweight (25 to less than 30 kg/m <sup>2</sup> )	No increased risk	Increased risk	High risk
Obesity I (30 to less than 35 kg/m <sup>2</sup> )	Increased risk	High risk	Very high risk

Source: NICE guidelines<sup>12</sup>

For men, low waist circumference is defined as less than 94 cm, high as 94–102 cm, and very high as greater than 102 cm. For women, low waist circumference is less than 80 cm, high is 80–88 cm and very high is greater than 88 cm.

NICE also defines categories of Obesity II (35 to less than 40 kg/m<sup>2</sup>) and Obesity III (40 kg/m<sup>2</sup> or more). For adults with a BMI of 35 kg/m<sup>2</sup> or more, risks are assumed to be very high with any waist circumference.

### Hypertension

People were classified as having high blood pressure (BP) if they had a systolic blood pressure (SBP) of 140 mmHg or above, or a diastolic blood pressure (DBP) of 90 mmHg or above, or were currently taking medication specifically prescribed to treat their high blood pressure. Those with hypertension were further divided into the following categories:

Controlled	SBP below 140 mmHg/ DBP below 90 mmHg but taking medication for blood pressure
Treated but uncontrolled	SBP at or above 140 mmHg/ DBP at or above 90 mmHg and taking medication for blood pressure
Untreated	SBP at or above 140 mmHg/ DBP at or above 90 mmHg and not taking medication for blood pressure

Remaining participants, who did not have hypertension, were classified as normotensive.

## 3.3 Prevalence of overweight, obesity and raised waist circumference

### 3.3.1 Prevalence of overweight, obesity and raised waist circumference by age

Table 3.2 shows mean BMI and BMI status (WHO categories) by age and sex. Overall, mean BMI in men was similar to women (27.1 kg/m<sup>2</sup> and 26.8 kg/m<sup>2</sup>). Mean BMI was generally higher in older age groups among both men and women.

Figure 3A shows the prevalence of overweight and obesity by age. Almost a quarter of adults (24% of both men and women) were obese, and 65% of men and 56% of women were overweight or obese. 34% of men and 42% of women had a BMI in the normal range.

Overweight and obesity showed a similar pattern to mean BMI, being lowest in the 16–24 age group, and higher in the older age groups among both men and women.

**Table 3.2, Figure 3A**

Table 3.7 shows the distribution of mean waist circumference and prevalence of raised waist circumference by age and sex. Women were significantly more likely than men to have a raised waist circumference (41% and 33% respectively). Both mean waist circumference and the prevalence of a raised waist circumference were generally higher in older age groups.

**Table 3.7**





### 3.3.2 Prevalence of overweight, obesity and raised waist circumference by Government Office Region

Table 3.3 presents the observed and age-standardised prevalence of overweight and obesity by region. No statistically significant differences were observed in men or women in mean BMI or prevalence of overweight and obesity by Government Office Region (GOR). The distribution of waist circumference by region is presented in Table 3.8. There was significant variation in the distribution of mean waist circumference by GOR, and the prevalence of raised waist circumference was greatest in Yorkshire and the Humber.

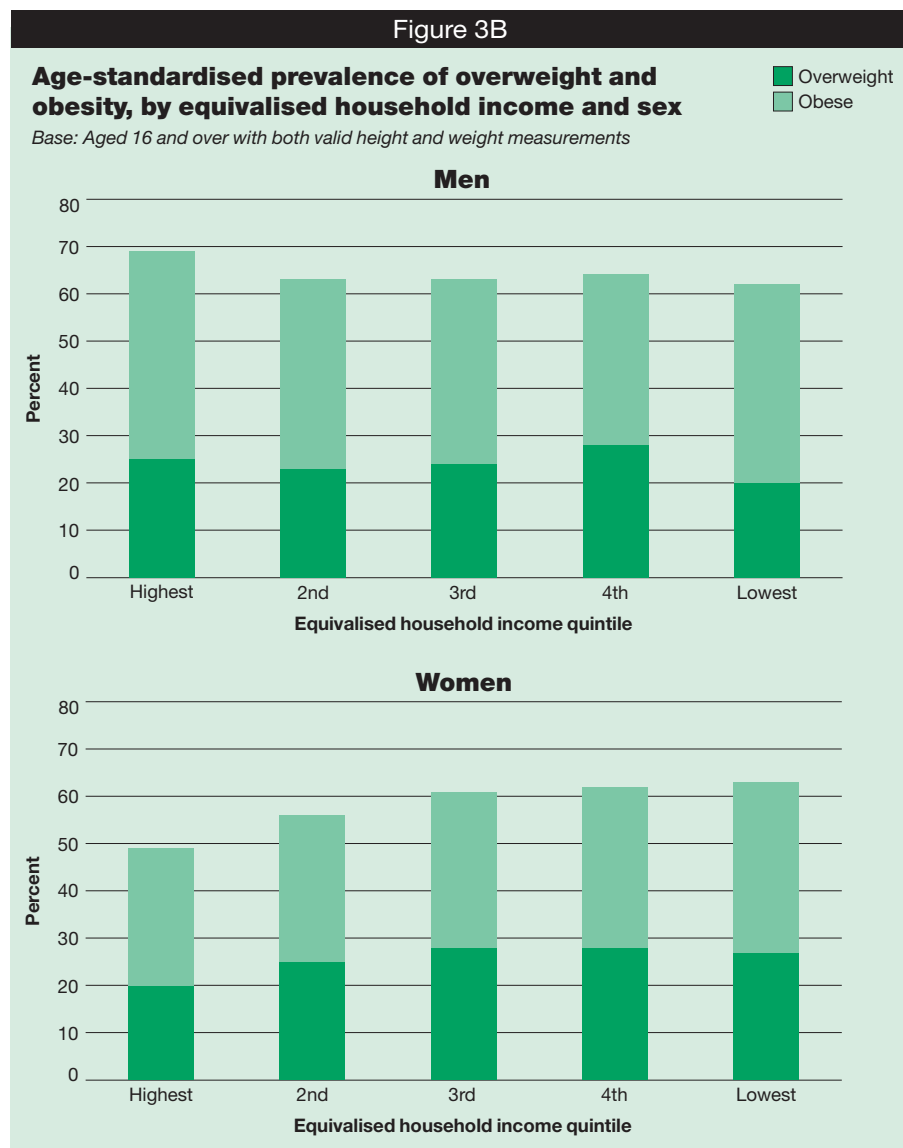
Tables 3.3-3.8

### 3.3.3 Prevalence of overweight, obesity and raised waist circumference by equivalised household income

Table 3.4 presents age-standardised BMI by equivalised household income. No differences in mean BMI by household income were found in men, but in women those in the lower income quintiles had a higher mean BMI than women in the highest quintile. Similarly, the prevalence of overweight and obesity was higher among women in the lower three income quintiles (ranging from 33%-36% overweight and 27%-28% obese) than women in the highest quintile (29% and 20% respectively). The associations of income with overweight and obesity in men and women are shown in Figure 3B.

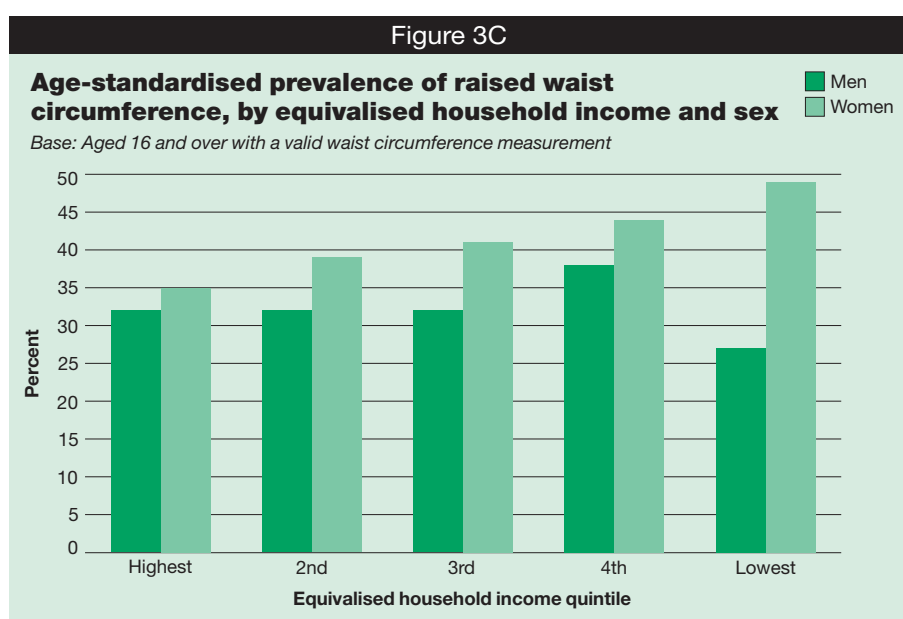
Table 3.4, Figure 3B

Table 3.9 shows age-standardised mean waist and raised waist circumference by equivalised household income. As with obesity and overweight, no significant differences in mean waist circumference by equivalised income were found in men. However, in women, the mean waist circumference was higher for those in the lower two income quintiles (88.5



cm and 88.4 cm for the 4th and the lowest quintile respectively) than for women in the highest income quintile (84.9 cm). Likewise, the prevalence of raised waist circumference was higher among women in the lowest quintile (49%) than women in the highest quintile (35%). The prevalence of raised waist circumference by equivalised household income is shown in Figure 3C.

**Table 3.9, Figure 3C**



### 3.3.4 Prevalence of overweight, obesity and raised waist circumference, by general health

Table 3.5 shows BMI by self-reported general health. In men and women the age-standardised mean BMI was lower for those who reported their health as 'very good/good' (26.9 kg/m<sup>2</sup> for men, 26.3 kg/m<sup>2</sup> for women) than for men and women who reported their health as 'bad/very bad' (29.3 kg/m<sup>2</sup> and 28.1 kg/m<sup>2</sup> respectively). The prevalence of obesity was higher in those reporting 'bad/very bad' general health (38% of men, 40% of women) than those reporting 'very good/good' health (21% of both men and women).

Table 3.5

Table 3.10 presents the association between age-standardised waist circumference and general health. Mean waist circumference was lower for those who reported their health as 'very good/good' (95.7cm for men, 85.2cm for women) than for those who reported their health as 'bad/very bad' (100.0 cm and 90.9 cm respectively). Similarly, the prevalence of a raised waist circumference was lower in men and women reporting 'very good/ good' general health than those reporting 'bad/very bad' health.

Table 3.10

### 3.3.5 Prevalence of overweight, obesity and raised waist circumference, by hypertension

Table 3.6 presents BMI by hypertension, identified during the nurse visit; see section 3.2.2 for the definition of survey defined hypertension.

There were clear associations between obesity and hypertension. Those who were categorised as having uncontrolled hypertension had higher mean BMI (31.3 kg/m<sup>2</sup> and 31.7 kg/m<sup>2</sup> for men and women respectively) than those who were normotensive (26.6 kg/m<sup>2</sup> for men and 26.1 kg/m<sup>2</sup> for women). In both men and women, the prevalence of obesity was also higher among those who had hypertension (37%-49% among men, 33%-59% among women) than those who were normotensive (20%).

Table 3.11 reports the association of hypertension with waist circumference. Mean waist circumference was higher among those with uncontrolled hypertension (107.4 cm for men and 100.6 cm for women) than those who were normotensive (95.1 cm and 84.6 cm for men and women respectively). Following the same pattern as for obesity, the prevalence of raised waist circumference was higher among those with hypertension (44%-71% among men, 48%-74% among women) than those who were normotensive (26% of men, 36% of women).

Tables 3.6 and 3.11

### 3.3.6 Health risk category with overweight, obesity and waist circumference

NICE guidelines on prevention, identification, assessment and management of overweight and obesity highlight the impact of overweight and obesity on risk factors for developing other long-term health problems. The recommendation is to use both BMI and waist circumference as assessment tools to identify the risk of co-morbidities, and different levels of health risk have been defined for different combinations of these two measures (as outlined in section 3.2.2). The NICE guidance states that for those with a BMI of 35 or more, waist circumference adds little to the absolute measure of risk provided by BMI.<sup>12</sup>

Table 3.12 and Figure 3D show the proportion by age and sex that were in different health risk categories, as determined by the combination of measures of generalised obesity (BMI) and abdominal obesity (waist circumference). Using combined categories of BMI and waist circumference to assess risk, 19% of men were at increased risk, 13% at high risk and 21% at very high risk. The equivalent proportions for women were 15% at increased risk, 16% at high risk and 23% at very high risk.

Table 3.12, Figure 3D

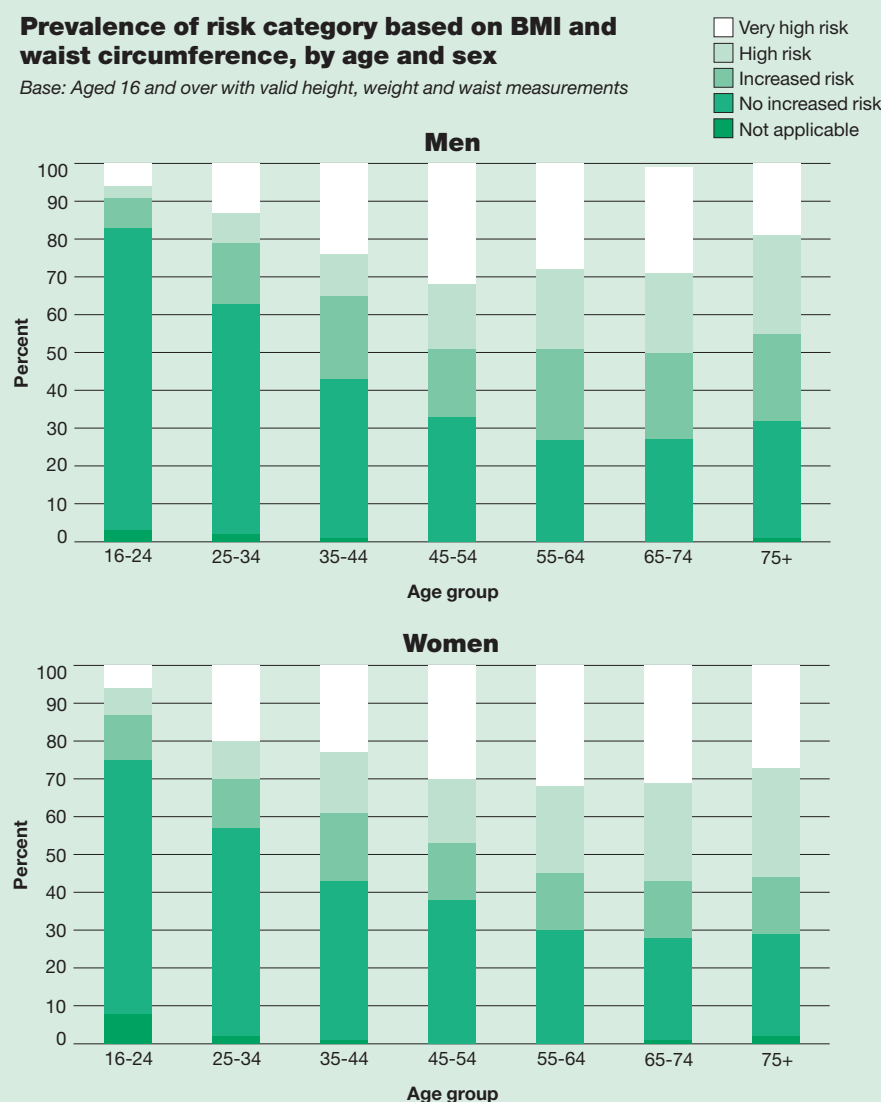
A very small proportion of men and women had both a normal BMI and a very high waist circumference, putting them at **increased risk** of health problems (1% of men and 2% of women).

Those who were overweight and had a high waist circumference were defined as being at **increased risk** of health problems from obesity, as were the very small proportion who were

Figure 3D

### Prevalence of risk category based on BMI and waist circumference, by age and sex

Base: Aged 16 and over with valid height, weight and waist measurements



either normal weight but with a very high waist circumference, or obese I but with a low waist circumference. The proportion with increased risk was 19% for men and 15% for women. The prevalence of increased risk was lowest among the youngest age groups.

Those who were overweight with a very high waist circumference were defined as being at **high risk** of health problems. 11% of men and 15% of women were in this category, and prevalence increased with age.

Those who were obese (category I) had **increased health risks**, even with a low waist circumference (fewer than 1% of men and women). 2% of men and 1% of women were categorised as obese I with a high waist circumference (**high risk**); a further 16% of men and 15% of women were categorised as obese I with a very high waist circumference (**very high risk**).

People who were obese II or III (BMI 35 and over) were defined as being at **very high risk** of health problems, regardless of their waist circumference. 4% of men and 7% of women were in the obese II group; 1% of men and 2% of women were in the obese III group.

### 3.3.7 Logistic regression for 'most at risk' categories

Multivariate logistic regression was used to explore the risk factors associated with being at the highest health risk in terms of BMI and waist circumference. The dependent variable was being in the high or very high health risk categories according to NICE guidelines, termed here the 'most at risk' category. This 'most at risk' category included those defined

as being at **high risk** of health problems (overweight with a very high waist circumference, or obese I with a high waist circumference) or at **very high risk** (obese I with a very high waist circumference, or obese II or III, BMI 35 and over, regardless of waist circumference).

The independent variables included in the original models were: age, equivalised household income, cigarette smoking, alcohol consumption, self-perception of own activity level, self-perception of healthiness of own diet, hypertension status, self-reported general health and Government Office Region (GOR). All except GOR were retained in the final model.<sup>25</sup> Separate models were constructed for men and women.

The risk factors indicate associations, not causes. These variations in risk are expressed as odds ratios, the degree to which the probability of the key outcome increases or decreases relative to the reference category. Odds ratios greater than one indicate higher odds of being in the highest risk category, and odds ratios less than one indicate lower odds. The 95% confidence intervals are shown, and where the interval does not include one, this category is significantly different from the reference category.

Table 3.13 presents a model of the risk factors associated with being 'most at risk'; the odds ratios presented are after adjustment for the other risk factors. Although the model was run separately for men and women, factors of significance in the model for one sex were included in both models.

Being 'most at risk' was positively associated with age, being an ex-cigarette smoker, self-perceptions of not eating healthily and not being physically active, and hypertension in both men and women. Income was associated with being 'most at risk', with a positive association for men and a negative association for women. Additionally, among women only, moderate alcohol consumption was negatively associated with being 'most at risk'. There was some indication that for men who reported their health as 'fair' there was an association with being 'most at risk' compared with men in the 'very good/good' general health category.

The associations of various risk factors with the 'most at risk' category in the multivariate model are described in more detail below:

### **Age**

Age was associated with being in the 'most at risk' category of BMI and waist circumference in both sexes. Relative to the youngest age group (16-24), the odds ratio of being in the 'most at risk' category increased progressively with age up to 22.5 in men aged 65-74 and up to 10.9 in women aged 55-64. In both sexes, the odds were also high (18.5 in men, 7.9 in women) among those aged 75 and over, compared with the youngest group.

### **Cigarette smoking**

Compared with non-smokers, former regular cigarette smokers were more likely to be in the 'most at risk' category (odds ratios 1.4 for men and women).

### **Alcohol consumption**

Alcohol consumption was associated with risk category in women but not in men. The odds of being in the 'most at risk' category were lower for those women who consumed alcohol up to six units per week than for women who did not consume alcohol during the last 12 months.

### **Self-perception of own physical activity level**

Self-perception of physical activity level was associated with being in the 'most at risk' category in both men and women. The odds of being 'most at risk' were greater for those who regarded themselves as not being physically active (odds ratios 5.1 for men and 3.9 for women) or 'fairly physically active' (2.2 for men, 1.7 for women), compared with those who reported being very physically active.

### **Self-perception of eating healthily**

Compared with those who described what they usually eat as 'very healthy', those who reported their diet to be either 'quite healthy' or 'not healthy' had higher odds of being in the 'most at risk' category. The odds ratios of being in the 'most at risk' category were 3.4 and 1.8 respectively for men and women who considered that they did not eat healthily.

### **Blood pressure**

Men and women with hypertension had increased odds of being in the 'most at risk' category compared with those who did not have hypertension (odd ratios 3.1 and 2.4 for men and women respectively).

### **Equivalised household income**

The highest income quintile was chosen as the reference group. Once the other independent variables were included in the model, income quintile was significantly related to odds of being in the 'most at risk' category, with the relationship working in different directions in men and women. Women in the third and lowest income quintiles had higher odds of being in the 'most at risk' category than those in the highest income quintile. For men, those in the third and lowest income quintiles had significantly lower odds of being 'most at risk' compared with the highest income quintile.

### **Self-reported general health**

Self-reported general health was marginally associated with risk category in men but not in women (i.e. although the significance of the variable overall was marginally outside statistical significance, one of the categories within the variable was significant). The odds of being in the 'most at risk' category were higher for those men who reported their health status as 'fair' than men who reported their health status as very good/good.

## **3.4 Trends in obesity**

Mean BMI and prevalence of obesity increased in both sexes between 1993 and 2007. Mean BMI increased from 25.9 kg/m<sup>2</sup> in 1993 to 27.1 kg/m<sup>2</sup> in 2007 among men, and from 25.7 kg/m<sup>2</sup> in 1993 to 26.8 kg/m<sup>2</sup> in 2007 among women.<sup>17</sup>

Among men the proportion who were overweight (BMI 25 to less than 30) decreased from 44% in 1993 to 41% in 2007, while the proportion of overweight women stayed at the same level (32% in 2007). There was a marked increase in the proportion who were obese, a proportion that has gradually increased over the period examined. The proportion who were categorised as obese (BMI 30 or over) increased from 13% of men in 1993 to 24% in 2007 and from 16% of women in 1993 to 24% in 2007. Figure 3E shows the trends in obesity, and overweight including obesity, using three year moving averages to smooth out any unusually high or low values in individual years.

**Table 3.14, Figure 3E**

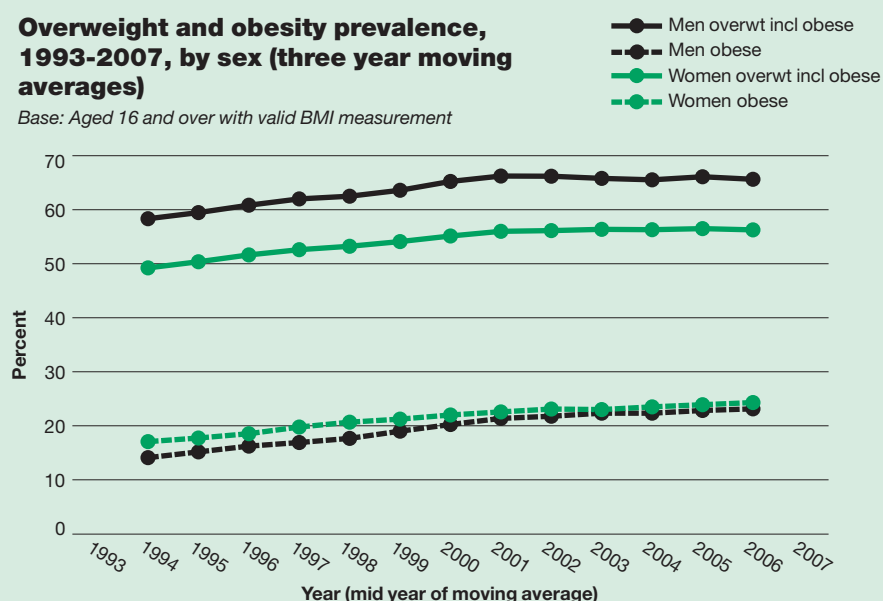
## **3.5 Discussion**

41% men and 32% women in England were overweight while 24% of both men and women were obese in 2007. Mean BMI increased with age in both men and women, and correspondingly, more participants were overweight or obese in the older age groups than at younger ages. Mean waist circumference and the proportion of participants with raised waist circumference also increased with age. 33% of men and 41% of women had raised waist circumference. There has been no change in the prevalence of obesity, overweight or raised waist circumference since 2006. Previous analyses of nationally representative data from the HSE have highlighted the consistent independent association between obesity and diabetes, hypertension and associated co-morbidities.<sup>26,27</sup>

Figure 3E

### Overweight and obesity prevalence, 1993-2007, by sex (three year moving averages)

Base: Aged 16 and over with valid BMI measurement



Note: Data from 1993 to 2002 are unweighted. Data from 2003 onwards are weighted for non-response. In these moving averages, some points combine weighted and unweighted estimates.

There was significant regional variation in the mean age-standardised distribution of waist circumference in men and women, and the prevalence of raised waist circumference was greatest in Yorkshire and the Humber. However, the regional differences in the prevalence of obesity and the distribution of mean BMI were not significant.

Mean BMI and prevalence of obesity increased in both sexes since 1993. Among men the proportion who were overweight decreased from 1993 to 2007 while the proportion of overweight women stayed at the same level.

No differences in mean BMI by equivalised household income were found in men, but women in the lower income quintiles had higher BMI and a greater prevalence of overweight and obesity than women in the highest income quintile. The associations between BMI and socio-economic status (e.g. income or wealth or education) have been reported previously.<sup>28</sup> Similar associations between waist circumference and household income were observed in women. Women in the lower income quintiles had a higher mean waist circumference than women in the highest income quintile.

Among men and women, there was a statistically significant linear association between mean BMI, prevalence of overweight and obesity, and self-reported health. The proportion of participants reporting very good/good health tended to decrease with increasing levels of obesity. The results of this study are in agreement with other studies providing evidence that obesity or overweight has a negative association with self-rated health among adults.<sup>29</sup>

The analyses in this chapter have indicated a link between BMI, waist circumference and hypertension. More of those who had hypertension and were on treatment (uncontrolled hypertension) had raised BMI compared with those who did not have hypertension (normotensive). There are probably two factors involved. First, obesity contributes to raised blood pressure,<sup>30</sup> so the prevalence of hypertension is greater among those who are obese. Secondly, obese individuals are more likely to have hypertension and dyslipidaemia diagnosed and treated than people with these risk factors who are not obese.<sup>31</sup>

The analysis with the NICE categories has shown that the great majority of men and women who were overweight or obese had a high or very high waist circumference. This highlights the importance of early identification of abdominal obesity and the need to consider both BMI and waist circumference when assessing risks of obesity and obesity-related co-morbidities.

The results of the multivariate logistic regression indicate a number of factors associated with the 'most at risk' category (combining those identified in the NICE categorisation as



being at 'high' or 'very high' risk), which takes into account both raised BMI and raised waist circumference. The 'most at risk' category was positively associated in men and women with age, being an ex-cigarette smoker, self-perception of not eating healthily and not being physically active, and with hypertension. Income was positively associated for men, and negatively associated for women. Additionally, among women only, moderate alcohol consumption was negatively associated with being 'most at risk'.

The consistent independent association between the 'most at risk' category and other risk factors shown in these data, and in other studies, confirms the need for healthcare professionals to incorporate into clinical decision-making the NICE guidelines which take into account both the waist circumference measurements and BMI. Treatment of overweight and obesity should be implemented through effective evidence-based weight management interventions such as those highlighted in the NICE guidelines, alongside broader preventive strategies at the population level.<sup>32</sup>

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- 19 The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye. A participant's head is positioned so that the Frankfort Plane is horizontal. In this position the headplate of the stadiometer will rest on the crown of the head.
- 20 World Health Organisation body mass index (BMI) classification. [On-line]



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- 3.1 Response to anthropometric measurements, by age and sex
- 3.2 Body Mass Index (BMI), overweight and obesity prevalence, by age and sex.
- 3.3 Body Mass Index (BMI), overweight and obesity prevalence (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex
- 3.4 Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by equivalised household income and sex
- 3.5 Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by self-reported general health and sex
- 3.6 Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by hypertension and sex
- 3.7 Waist circumference, by age and sex
- 3.8 Waist circumference (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex
- 3.9 Waist circumference (age-standardised), by equivalised household income and sex
- 3.10 Waist circumference (age-standardised), by self-reported general health and sex
- 3.11 Waist circumference (age-standardised), by hypertension and sex
- 3.12 Health risk category associated with overweight and obesity in adults based on Body Mass Index (BMI) and waist circumference, by age and sex
- 3.13 Estimated odds ratios for 'most at risk' category, by associated risk factors and sex
- 3.14 Trends in overweight and obesity prevalence, 1993 to 2007, by age and sex

Table 3.1

**Response to anthropometric measurements, by age and sex***Aged 16 and over who were interviewed/had a nurse visit*

2007

Proportion providing valid measurement	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Height	92	91	92	93	90	89	77	90
Weight	90	89	90	92	90	89	84	90
BMI	89	88	90	91	88	87	77	88
Waist circumference	97	96	98	99	98	98	95	98
<b>Women</b>								
Height	90	92	93	92	89	87	72	89
Weight	85	92	90	89	88	87	79	88
BMI	85	90	90	88	87	84	69	86
Waist circumference	97	99	98	99	98	97	93	98
<i>Bases (unweighted)</i>								
<i>Men</i>								
<i>Height, weight, BMI (interviewed)</i>	357	426	569	504	493	421	300	3070
<i>Waist circumference (saw nurse)</i>	235	295	413	388	365	325	218	2239
<i>Women</i>								
<i>Height (interviewed)</i>	388	575	707	636	605	494	407	3812
<i>Weight, BMI (interviewed)<sup>a</sup></i>	376	525	698	635	605	494	407	3740
<i>Waist circumference (saw nurse)</i>	247	379	504	467	439	388	276	2700
<i>Bases (weighted)</i>								
<i>Men</i>								
<i>Height, weight, BMI (interviewed)</i>	515	558	664	559	505	337	247	3384
<i>Waist circumference (saw nurse)</i>	370	405	480	405	366	245	179	2451
<i>Women</i>								
<i>Height (interviewed)</i>	489	568	673	564	521	373	366	3554
<i>Weight, BMI (interviewed)<sup>a</sup></i>	476	515	665	563	521	373	366	3479
<i>Waist circumference (saw nurse)</i>	336	377	475	408	379	271	264	2510

<sup>a</sup> Excluding pregnant women.

Table 3.2

**Body Mass Index (BMI), overweight and obesity prevalence, by age and sex***Aged 16 and over with both valid height and weight measurements**2007*

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
Mean BMI (kg/m <sup>2</sup> )	24.1	26.1	27.7	28.6	28.4	28.2	27.1	27.1
Standard error of the mean	0.25	0.25	0.22	0.24	0.22	0.22	0.25	0.10
% Underweight	4	1	1	0	0	-	0	1
% Normal	63	44	28	25	20	23	28	34
% Overweight	24	39	47	40	48	49	50	41
% Obese, excluding morbidly obese	9	15	23	32	29	28	22	22
% Morbidly obese	1	1	2	2	2	1	-	1
% Overweight, including obese	33	54	71	75	79	77	71	65
% Obese	9	16	25	35	31	28	22	24
Women								
Mean BMI (kg/m <sup>2</sup> )	24.0	25.8	27.0	27.4	28.0	28.0	27.2	26.8
Standard error of the mean	0.28	0.26	0.23	0.23	0.24	0.24	0.29	0.10
% Underweight	7	2	1	1	1	1	2	2
% Normal	61	54	41	37	32	30	30	42
% Overweight	22	25	35	32	37	37	40	32
% Obese, excluding morbidly obese	9	17	20	28	29	29	25	22
% Morbidly obese	1	2	3	2	3	2	1	2
% Overweight, including obese	32	44	58	62	68	69	67	56
% Obese	10	19	24	30	31	32	27	24
Bases (unweighted)								
Men	321	383	518	463	436	370	231	2722
Women	324	474	632	559	522	415	281	3207
Bases (weighted)								
Men	461	499	603	514	446	296	189	3008
Women	405	466	599	497	452	312	252	2983

<sup>a</sup> Underweight: less than 18.5 kg/m<sup>2</sup>Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>Overweight: 25 to less than 30 kg/m<sup>2</sup>Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>Morbidly obese: 40 kg/m<sup>2</sup> or moreOverweight, including obese: 25 kg/m<sup>2</sup> or moreObese: 30 kg/m<sup>2</sup> or more

Table 3.3

**Body Mass Index (BMI), overweight and obesity prevalence (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over with both valid height and weight measurements

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>b</sup>	Government Office Region										Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central	
Men												
Observed												
Mean BMI (kg/m <sup>2</sup> )	27.8	27.5	27.4	27.2	26.8	27.4	26.8	27.1	26.9	27.3	26.5	
Standard error of the mean	0.41	0.22	0.40	0.34	0.29	0.29	0.31	0.23	0.25	0.34	0.36	
% Underweight	1	1	1	2	2	2	1	0	1	2	0	
% Normal	32	32	27	29	33	35	41	35	35	30	40	
% Overweight	36	43	45	44	42	41	37	41	43	43	42	
% Obese, excluding morbidly obese	29	22	25	24	23	22	19	22	20	25	15	
% Morbidly obese	2	2	1	1	-	1	2	1	1	0	2	
% Overweight, including obese	67	67	71	69	65	63	58	64	64	68	59	
% Obese	31	24	27	25	23	23	21	23	21	25	17	
Standardised												
Mean BMI (kg/m <sup>2</sup> )	28.0	27.4	27.4	27.1	26.7	27.3	26.9	27.0	26.9	27.1	26.6	
Standard error of the mean	0.42	0.22	0.40	0.37	0.29	0.29	0.32	0.23	0.25	0.34	0.34	
% Underweight	1	1	1	2	2	2	1	0	1	2	0	
% Normal	31	32	28	31	34	35	39	36	35	31	39	
% Overweight	36	43	45	44	41	41	38	41	43	43	43	
% Obese, excluding morbidly obese	30	22	25	23	23	21	20	22	20	24	16	
% Morbidly obese	2	2	1	1	-	1	2	1	1	0	2	
% Overweight, including obese	68	67	71	68	65	63	60	63	64	67	61	
% Obese	32	24	26	24	23	22	22	23	21	24	18	
Bases (unweighted)												
Men	165	386	288	262	265	315	297	290	454	226	228	
Bases (weighted)												
Men	169	390	300	262	327	352	408	317	483	239	244	

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Underweight: less than 18.5 kg/m<sup>2</sup>

Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>

Overweight: 25 to less than 30 kg/m<sup>2</sup>

Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>

Morbidly obese: 40 kg/m<sup>2</sup> or more

Overweight, including obese: 25 kg/m<sup>2</sup> or more

Obese: 30 kg/m<sup>2</sup> or more

Continued...

Table 3.3 continued

Aged 16 and over with both valid height and weight measurements

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
<b>Women</b>											
<b>Observed</b>											
Mean BMI (kg/m <sup>2</sup> )	27.6	26.8	27.2	26.9	26.6	26.8	26.2	26.7	26.6	26.8	26.4
Standard error of the mean	0.68	0.26	0.24	0.40	0.28	0.30	0.27	0.32	0.25	0.33	0.36
% Underweight	3	2	2	1	2	1	2	2	2	1	3
% Normal	36	39	37	46	42	43	45	41	43	45	41
% Overweight	32	36	33	31	33	30	30	34	30	28	32
% Obese, excluding morbidly obese	24	20	28	19	20	24	21	21	23	23	23
% Morbidly obese	5	3	1	4	2	2	2	2	2	3	1
% Overweight, including obese	62	59	62	53	55	56	53	57	55	54	55
% Obese	29	22	28	23	22	26	23	23	25	26	24
<b>Standardised</b>											
Mean BMI (kg/m <sup>2</sup> )	27.7	26.9	27.2	26.9	26.5	26.7	26.4	26.7	26.5	26.7	26.4
Standard error of the mean	0.68	0.26	0.24	0.39	0.28	0.31	0.27	0.33	0.24	0.34	0.34
% Underweight	2	2	2	1	2	1	2	3	2	1	3
% Normal	36	39	36	45	43	43	43	41	44	46	41
% Overweight	32	37	34	31	33	30	30	34	29	28	31
% Obese, excluding morbidly obese	25	20	27	19	20	24	22	21	22	22	23
% Morbidly obese	5	3	0	4	2	2	2	2	2	3	1
% Overweight, including obese	61	59	62	54	55	55	54	56	54	53	56
% Obese	30	22	28	23	22	26	25	23	25	25	25
<b>Bases (unweighted)</b>											
Women	191	472	358	306	323	352	348	326	531	276	255
<b>Bases (weighted)</b>											
Women	157	424	327	254	312	334	389	311	475	246	229

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Underweight: less than 18.5 kg/m<sup>2</sup>

Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>

Overweight: 25 to less than 30 kg/m<sup>2</sup>

Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>

Morbidly obese: 40 kg/m<sup>2</sup> or more

Overweight, including obese: 25 kg/m<sup>2</sup> or more

Obese: 30 kg/m<sup>2</sup> or more

Table 3.4

**Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by equivalised household income and sex**
*Aged 16 and over with both valid height and weight measurements* *2007*

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>a</sup>	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
<b>Men</b>					
Mean BMI (kg/m <sup>2</sup> )	27.4	27.0	27.0	27.4	26.9
Standard error of the mean	0.22	0.22	0.23	0.32	0.38
% Underweight	0	1	1	2	3
% Normal	31	36	36	34	35
% Overweight	44	40	39	36	42
% Obese, excluding morbidly obese	24	22	23	27	17
% Morbidly obese	1	1	1	1	3
% Overweight, including obese	69	63	63	64	62
% Obese	25	23	24	28	20
<b>Women</b>					
Mean BMI (kg/m <sup>2</sup> )	25.9	26.9	27.3	27.4	27.4
Standard error of the mean	0.27	0.27	0.24	0.30	0.30
% Underweight	2	1	3	2	3
% Normal	49	43	36	37	34
% Overweight	29	31	33	34	36
% Obese, excluding morbidly obese	19	23	26	25	24
% Morbidly obese	2	2	3	3	3
% Overweight, including obese	49	56	62	62	63
% Obese	20	25	28	28	27
<i>Bases (unweighted)</i>					
Men	575	485	424	407	294
Women	551	504	490	548	442
<i>Bases (weighted)</i>					
Men	635	556	465	410	333
Women	516	486	454	472	415

- <sup>a</sup> Underweight: less than 18.5 kg/m<sup>2</sup>  
 Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>  
 Overweight: 25 to less than 30 kg/m<sup>2</sup>  
 Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>  
 Morbidly obese: 40 kg/m<sup>2</sup> or more  
 Overweight, including obese: 25 kg/m<sup>2</sup> or more  
 Obese: 30 kg/m<sup>2</sup> or more

Table 3.5

**Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by self-reported general health and sex**

Aged 16 and over with both valid height and weight measurements

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>a</sup>	Self-reported general health		
	Very good/good	Fair	Bad/very bad
<b>Men</b>			
Mean BMI (kg/m <sup>2</sup> )	26.9	27.8	29.3
Standard error of the mean	0.10	0.34	1.09
% Underweight	1	3	4
% Normal	35	31	25
% Overweight	44	34	33
% Obese, excluding morbidly obese	20	29	30
% Morbidly obese	1	3	8
% Overweight, including obese	65	66	71
% Obese	21	32	38
<b>Women</b>			
Mean BMI (kg/m <sup>2</sup> )	26.3	28.1	28.1
Standard error of the mean	0.11	0.27	0.69
% Underweight	2	2	8
% Normal	44	34	29
% Overweight	33	30	22
% Obese, excluding morbidly obese	19	31	35
% Morbidly obese	2	3	6
% Overweight, including obese	54	64	63
% Obese	21	34	40
<i>Bases (unweighted)</i>			
Men	2076	484	160
Women	2393	620	193
<i>Bases (weighted)</i>			
Men	2345	501	160
Women	2248	565	168

<sup>a</sup> Underweight: less than 18.5 kg/m<sup>2</sup>

Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>

Overweight: 25 to less than 30 kg/m<sup>2</sup>

Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>

Morbidly obese: 40 kg/m<sup>2</sup> or more

Overweight, including obese: 25 kg/m<sup>2</sup> or more

Obese: 30 kg/m<sup>2</sup> or more



Table 3.6

**Body Mass Index (BMI), overweight and obesity prevalence (age-standardised), by hypertension and sex**

Aged 16 and over with both valid height and weight measurements

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%) <sup>a</sup>	Hypertension <sup>b</sup>			
	Normotensive	Controlled	Treated, uncontrolled	Untreated
<b>Men</b>				
Mean BMI (kg/m <sup>2</sup> )	26.6	28.9	31.3	29.2
Standard error of the mean	0.14	1.22	0.98	0.37
% Underweight	1	-	-	-
% Normal	37	36	7	20
% Overweight	42	28	43	43
% Obese, excluding morbidly obese	19	30	47	34
% Morbidly obese	1	6	3	3
% Overweight, including obese	62	64	93	80
% Obese	20	37	49	38
<b>Women</b>				
Mean BMI (kg/m <sup>2</sup> )	26.1	31.0	31.7	28.4
Standard error of the mean	0.14	0.83	2.16	0.56
% Underweight	2	0	-	1
% Normal	46	15	14	35
% Overweight	32	26	37	32
% Obese, excluding morbidly obese	19	52	28	31
% Morbidly obese	1	7	21	2
% Overweight, including obese	52	85	86	65
% Obese	20	59	49	33
<i>Bases (unweighted)</i>				
Men	1148	163	122	312
Women	1442	178	152	299
<i>Bases (weighted)</i>				
Men	1298	127	76	319
Women	1367	129	111	256

<sup>a</sup> Underweight: less than 18.5 kg/m<sup>2</sup>Normal weight : 18.5 to less than 25 kg/m<sup>2</sup>Overweight: 25 to less than 30 kg/m<sup>2</sup>Obese, excluding morbidly obese: 30 to less than 40 kg/m<sup>2</sup>Morbidly obese: 40 kg/m<sup>2</sup> or moreOverweight, including obese: 25 kg/m<sup>2</sup> or moreObese: 30 kg/m<sup>2</sup> or more<sup>b</sup> Definitions for HT:

Controlled SBP below 140 mmHg/ DBP below 90 mmHg but taking medication for blood pressure

Treated but uncontrolled SBP at or above 140 mmHg/ DBP at or above 90 mmHg and taking medication for blood pressure

Untreated SBP at or above 140 mmHg/ DBP at or above 90 mmHg and not taking medication for blood pressure

Table 3.7

**Waist circumference, by age and sex***Aged 16 and over with a valid waist measurement*

2007

Waist circumference (cm) and raised waist circumference (%)	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
Mean waist circumference (cm)	85.5	92.1	97.1	100.9	101.9	102.6	100.6	96.7
Standard error of the mean	0.92	0.83	0.58	0.65	0.64	0.65	0.79	0.33
% with raised waist circumference <sup>a</sup>	8	18	30	47	48	48	42	33
Women								
Mean waist circumference (cm)	76.4	82.9	86.2	88.7	91.1	91.2	90.3	86.5
Standard error of the mean	0.67	0.72	0.55	0.66	0.68	0.65	0.80	0.29
% with raised waist circumference <sup>a</sup>	13	30	40	46	55	57	54	41
Bases (unweighted)								
Men	227	286	406	382	359	317	208	2185
Women	239	376	494	463	429	376	257	2634
Bases (weighted)								
Men	357	390	473	399	360	239	171	2390
Women	326	374	465	404	371	262	246	2448

<sup>a</sup> Raised waist circumference has been taken to be greater than 102cm in men and greater than 88cm in women.

Table 3.8

**Waist circumference, (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over with a valid waist measurement

2007

Waist circumference (cm) and raised waist circumference (%)	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
<b>Men</b>											
<b>Observed</b>											
Mean waist circumference (cm)	96.8	96.6	98.6	95.3	95.9	97.3	95.9	96.3	97.3	98.8	95.8
Standard error of the mean	1.31	0.81	1.22	0.87	1.24	0.92	0.86	0.94	0.80	1.10	1.13
% with raised waist circumference <sup>b</sup>	34	32	40	30	34	33	28	30	36	40	33
<b>Standardised</b>											
Mean waist circumference (cm)	97.4	96.9	98.4	94.9	95.4	97.0	96.5	95.4	96.9	98.1	96.0
Standard error of the mean	1.34	0.77	1.18	0.90	1.23	0.93	0.82	1.08	0.81	1.09	1.14
% with raised waist circumference <sup>b</sup>	35	32	40	30	33	32	30	28	35	38	34
<b>Women</b>											
<b>Observed</b>											
Mean waist circumference (cm)	84.8	85.6	88.2	84.9	86.5	88.1	85.7	86.2	87.2	87.8	86.6
Standard error of the mean	1.50	0.74	0.72	1.12	0.94	1.03	0.79	0.92	0.62	0.95	0.95
% with raised waist circumference <sup>b</sup>	38	39	48	36	42	46	38	40	43	42	43
<b>Standardised</b>											
Mean waist circumference (cm)	84.6	85.6	88.6	85.0	86.1	87.7	87.2	85.6	86.6	87.1	86.0
Standard error of the mean	1.50	0.74	0.72	1.12	0.94	1.03	0.79	0.92	0.62	0.96	0.84
% with raised waist circumference <sup>b</sup>	37	39	49	36	40	45	41	39	41	40	41
<b>Bases (unweighted)</b>											
Men	149	299	270	215	182	236	231	214	389	197	192
Women	183	370	324	251	231	272	284	261	458	239	219
<b>Bases (weighted)</b>											
Men	133	323	246	211	247	282	328	230	390	198	192
Women	132	355	263	204	250	270	338	245	391	204	188

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Raised waist circumference has been taken to be greater than 102cm in men and greater than 88cm in women.

Table 3.9

**Waist circumference (age-standardised), by equivalised household income and sex**

Aged 16 and over with a valid waist measurement

2007

Waist circumference (cm) and raised waist circumference (%)	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
<b>Men</b>					
Mean waist circumference (cm)	96.8	96.8	95.9	97.5	95.4
Standard error of the mean	0.75	0.64	0.77	1.13	0.88
% with raised waist circumference <sup>a</sup>	32	32	32	38	27
<b>Women</b>					
Mean waist circumference (cm)	84.9	85.6	86.7	88.5	88.4
Standard error of the mean	0.67	0.71	0.68	0.78	0.80
% with raised waist circumference <sup>a</sup>	35	39	41	44	49
<i>Bases (unweighted)</i>					
Men	490	388	353	346	225
Women	464	427	414	498	339
<i>Bases (weighted)</i>					
Men	520	435	382	354	264
Women	420	405	381	430	332

<sup>a</sup> Raised waist circumference has been taken to be greater than 102cm in men and greater than 88cm in women.

Table 3.10

**Waist circumference (age-standardised), by self-reported general health and sex***Aged 16 and over with a valid waist measurement* 2007

Waist circumference (cm) and raised waist circumference (%)	Self-reported general health		
	Very good/good	Fair	Bad/very bad
<b>Men</b>			
Mean waist circumference (cm)	95.7	99.7	100.0
Standard error of the mean	0.34	1.14	2.36
% with raised waist circumference <sup>a</sup>	30	43	42
<b>Women</b>			
Mean waist circumference (cm)	85.2	89.4	90.9
Standard error of the mean	0.32	0.72	2.08
% with raised waist circumference <sup>a</sup>	38	49	58
<i>Bases (unweighted)</i>			
Men	1637	397	150
Women	1934	522	178
<i>Bases (weighted)</i>			
Men	1834	405	150
Women	1811	483	154

<sup>a</sup> Raised waist circumference has been taken to be greater than 102cm in men and greater than 88cm in women.

Table 3.11

**Waist circumference (age-standardised), by hypertension and sex***Aged 16 and over with a valid waist measurement* 2007

Waist circumference (cm) and raised waist circumference (%)	Hypertension <sup>b</sup>			
	Normotensive	Controlled	Treated, uncontrolled	Untreated
<b>Men</b>				
Mean waist circumference (cm)	95.1	100.0	107.4	101.8
Standard error of the mean	0.41	4.22	1.84	1.05
% with raised waist circumference <sup>a</sup>	26	44	71	49
<b>Women</b>				
Mean waist circumference (cm)	84.6	97.9	100.6	89.7
Standard error of the mean	0.35	2.00	6.23	1.80
% with raised waist circumference <sup>a</sup>	36	74	68	48
<i>Bases (unweighted)</i>				
Men	1203	178	134	337
Women	1527	202	164	325
<i>Bases (weighted)</i>				
Men	1373	134	80	339
Women	1457	146	122	276

<sup>a</sup> Raised waist circumference has been taken to be greater than 102cm in men and greater than 88cm in women.

<sup>b</sup> Definitions for HT:

Controlled	SBP below 140 mmHg/ DBP below 90 mmHg but taking medication for blood pressure
Treated but uncontrolled	SBP at or above 140 mmHg/ DBP at or above 90 mmHg and taking medication for blood pressure
Untreated	SBP at or above 140 mmHg/ DBP at or above 90 mmHg and not taking medication for blood pressure

Table 3.12

**Health risk category associated with overweight and obesity in adults based on Body Mass Index (BMI) and waist circumference, by age and sex**
Aged 16 and over with valid height, weight and waist circumference measurements<sup>a</sup>

2007

Waist circumference <sup>b</sup> and BMI classification <sup>c</sup>	Health risk category <sup>d</sup>	Age group							Total
		16-24	25-34	35-44	45-54	55-64	65-74	75+	
		%	%	%	%	%	%	%	%
<b>Men</b>									
<b>Underweight</b>									
Low waist circumference	Not applicable	3	2	1				1	1
High waist circumference	Not applicable	-	-	-	-	-	-	-	-
Very high waist circumference	Not applicable	-	-	-	-	-	-	-	-
<i>All underweight</i>		3	2	1	-	-	-	1	1
<b>Normal</b>									
Low waist circumference	No increased risk	62	42	25	21	16	16	22	30
High waist circumference	No increased risk	1	3	3	2	3	5	5	3
Very high waist circumference	Increased risk		1	1	1	1	0	0	1
<i>All normal</i>		63	45	29	24	20	22	27	34
<b>Overweight</b>									
Low waist circumference	No increased risk	17	17	15	10	10	9	5	13
High waist circumference	Increased risk	7	15	22	18	23	21	24	18
Very high waist circumference	High risk	2	5	7	13	18	19	22	11
<i>All overweight</i>		25	37	44	41	51	48	51	41
<b>Obesity I</b>									
Low waist circumference	Increased risk	1	-	1	1	-	0	-	0
High waist circumference	High risk	2	3	3	2	1	1	2	2
Very high waist circumference	Very high risk	4	7	18	22	22	21	18	16
<i>All obese I</i>		7	10	21	24	23	23	20	18
<b>Obesity II</b>									
Low waist circumference	Very high risk	-	-	-	-	-	-	-	-
High waist circumference	Very high risk	-	-	-	-	-	-	-	-
Very high waist circumference	Very high risk	1	4	4	8	4	6	1	4
<i>All obese II</i>	<i>Very high risk</i>	1	4	4	8	4	6	1	4
<b>Obesity III</b>									
Low waist circumference	Very high risk	-	-	-	-	-	-	-	-
High waist circumference	Very high risk	-	-	-	-	-	-	-	-
Very high waist circumference	Very high risk	1	1	1	2	2	1		1
<i>All obese III</i>	<i>Very high risk</i>	1	1	1	2	2	1	-	1
<b>Men – Overall risk<sup>d</sup></b>									
	Not applicable	3	2	1				1	1
	No increased risk	80	62	43	34	29	30	32	46
	Increased risk	8	16	24	19	24	21	24	19
	High risk	3	8	9	15	19	20	24	13
	Very high risk	6	12	23	32	28	28	19	21
<i>Bases (unweighted)</i>									
<i>Men</i>		215	270	388	361	336	296	177	2043
<i>Bases (weighted)</i>									
<i>Men</i>		337	368	452	379	335	222	144	2237

<sup>a</sup> Percentages and bases in this table are based on those who have a valid measurement for waist circumference, in addition to valid measurements of height and weight. Therefore subtotals for BMI categories by age and sex in this table are not definitive and may vary from estimates shown in Table 3.2.

<sup>b</sup> Waist circumference categories according to NICE guidelines: for men, less than 94cm is low, 94–102cm is high, and more than 102cm is very high. For women, less than 80cm is low, 80–88cm is high, and more than 88cm is very high.

<sup>c</sup> BMI categories according to NICE guidelines: Underweight: Less than 18.5 kg/m<sup>2</sup>, Normal: 18.5 to less than 25 kg/m<sup>2</sup>, Overweight: 25 to less than 30 kg/m<sup>2</sup>, Obesity I: 30 to less than 35 kg/m<sup>2</sup>, Obesity II: 35 to less than 40 kg/m<sup>2</sup>, Obesity III: 40 kg/m<sup>2</sup> or more.

<sup>d</sup> Health risk category according to NICE guidelines.

Continued...

Table 3.12 continued

Aged 16 and over with valid height, weight and waist circumference measurements<sup>a</sup>

2007

Waist circumference <sup>b</sup> and BMI classification <sup>c</sup>	Health risk category <sup>d</sup>	Age group							Total
		16-24	25-34	35-44	45-54	55-64	65-74	75+	
		%	%	%	%	%	%	%	%
<b>Women</b>									
<b>Underweight</b>									
Low waist circumference	Not applicable	8	2	1	0	0	1	2	2
High waist circumference	Not applicable	-	-	-	-	-	-	-	-
Very high waist circumference	Not applicable	-	-	-	-	-	-	-	-
<i>All underweight</i>		8	2	1	0	0	1	2	2
<b>Normal</b>									
Low waist circumference	No increased risk	58	44	29	25	19	15	16	30
High waist circumference	No increased risk	4	8	8	8	10	11	9	8
Very high waist circumference	Increased risk	1	2	2	2	2	3	2	2
<i>All normal</i>		62	54	40	36	31	29	28	41
<b>Overweight</b>									
Low waist circumference	No increased risk	6	5	5	6	2	3	2	4
High waist circumference	Increased risk	9	10	16	13	13	13	14	13
Very high waist circumference	High risk	6	8	14	14	22	23	25	15
<i>All overweight</i>		22	22	35	33	37	38	41	32
<b>Obesity I</b>									
Low waist circumference	Increased risk	2	-	-	-	-	-	-	0
High waist circumference	High risk	0	2	2	2	1	1	2	1
Very high waist circumference	Very high risk	4	11	13	18	20	22	18	15
<i>All obese I</i>		6	13	14	20	21	23	20	16
<b>Obesity II</b>									
Low waist circumference	Very high risk	-	-	-	-	-	-	-	-
High waist circumference	Very high risk	-	-	-	-	-	-	-	-
Very high waist circumference	Very high risk	1	6	7	9	8	6	7	7
<i>All obese II</i>	<i>Very high risk</i>	1	6	7	9	8	6	7	7
<b>Obesity III</b>									
Low waist circumference	Very high risk	-	-	-	-	-	-	-	-
High waist circumference	Very high risk	-	-	-	-	-	-	-	-
Very high waist circumference	Very high risk	1	2	2	2	3	2	1	2
<i>All obese III</i>	<i>Very high risk</i>	1	2	2	2	3	2	1	2
<b>Women – Overall risk<sup>d</sup></b>									
	Not applicable	8	2	1	0	0	1	2	2
	No increased risk	68	57	43	39	31	29	28	43
	Increased risk	12	12	18	15	15	16	16	15
	High risk	7	10	16	16	22	24	27	16
	Very high risk	6	19	23	29	31	30	27	23
<b>Bases (unweighted)</b>									
<i>Women</i>		220	351	469	432	396	341	202	2411
<b>Bases (weighted)</b>									
<i>Women</i>		296	350	441	377	343	236	193	2235

<sup>a</sup> Percentages and bases in this table are based on those who have a valid measurement for waist circumference, in addition to valid measurements of height and weight. Therefore subtotals for BMI categories by age and sex in this table are not definitive and may vary from estimates shown in Table 3.2.

<sup>b</sup> Waist circumference categories according to NICE guidelines: for men, less than 94cm is low, 94–102cm is high, and more than 102cm is very high. For women, less than 80cm is low, 80–88cm is high, and more than 88cm is very high.

<sup>c</sup> BMI categories according to NICE guidelines: Underweight: Less than 18.5 kg/m<sup>2</sup>, Normal: 18.5 to less than 25 kg/m<sup>2</sup>, Overweight: 25 to less than 30 kg/m<sup>2</sup>, Obesity I: 30 to less than 35 kg/m<sup>2</sup>, Obesity II: 35 to less than 40 kg/m<sup>2</sup>, Obesity III: 40kg/m<sup>2</sup> or more.

<sup>d</sup> Health risk category according to NICE guidelines.

Table 3.13

**Estimated odds ratios for 'most at risk' category, by associated risk factors and sex**

Aged 16 and over with valid height, weight and waist circumference measurements

2007

Variable	N	Odds ratio	95% C.I. <sup>a</sup>	Variable	N	Odds ratio	95% C.I. <sup>a</sup>
<b>Men</b> Base (weighted) 1791				<b>Women</b> Base (weighted) 1857			
<b>Age (<math>p \leq 0.001</math>)</b>				<b>Age (<math>p \leq 0.001</math>)</b>			
16-24	300	1		16-24	236	1	
25-34	304	2.82	(1.51-5.27)	25-34	300	3.47	(2.04-5.89)
34-44	342	6.11	(3.26-11.45)	34-44	357	5.81	(3.56-9.48)
45-54	308	11.13	(5.88-21.07)	45-54	318	7.46	(4.50-12.37)
55-64	255	11.22	(5.82-21.63)	55-64	291	10.95	(6.31-19.00)
65-74	175	22.45	(9.46-53.26)	65-74	197	9.74	(3.94-24.05)
75+	108	18.50	(7.51-45.55)	75+	157	7.97	(3.13-20.30)
<b>Cigarette smoking status (<math>p = 0.002</math>)</b>				<b>Cigarette smoking status (<math>p=0.008</math>)</b>			
Never smoked <sup>b</sup>	875	1		Never smoked <sup>b</sup>	1074	1	
Former regular smoker	495	1.38	(1.04-1.82)	Former regular smoker	402	1.36	(1.08-1.72)
Current smoker	421	0.71	(0.51-1.00)	Current smoker	380	0.86	(0.65-1.13)
<b>Alcohol consumption (<math>P = 0.360</math>)</b>				<b>Alcohol consumption (<math>P = 0.003</math>)</b>			
None	449	1		None	737	1	
Up to and including 4 units <sup>c</sup>	578	0.84	(0.61-1.14)	Up to and including 3 units <sup>c</sup>	498	0.65	(0.51-0.83)
More than 4, up to and including 8 units	297	0.93	(0.64-1.36)	More than 3, up to and including 6 units	324	0.83	(0.62-1.12)
More than 8 units	467	1.12	(0.81-1.54)	More than 6 units	298	1.06	(0.77-1.47)
<b>Self-perception of own physical activity level (<math>p \leq 0.001</math>)</b>				<b>Self-perception of own physical activity level (<math>p \leq 0.001</math>)</b>			
Very active	269	1		Very active	155	1	
Fairly active	780	2.24	(1.51-3.34)	Fairly active	803	1.73	(1.18-2.54)
Not active	367	5.11	(3.09-8.47)	Not active	475	3.87	(2.55-5.85)
Question not answered	375	0.97	(0.44-2.12)	Question not answered	423	1.94	(0.83-4.50)
<b>Self-perception of own diet (<math>p \leq 0.001</math>)</b>				<b>Self-perception of own diet (<math>p=0.031</math>)</b>			
Very healthy	265	1		Very healthy	341	1	
Quite healthy	1230	1.77	(1.26-2.50)	Quite healthy	1296	1.30	(0.99-1.70)
Not healthy	216	3.41	(2.02-5.75)	Not healthy	155	1.83	(1.14-2.93)
Question not answered	81	2.44	(1.17-5.06)	Question not answered	64	1.23	(0.55-2.76)
<b>Blood pressure (<math>p \leq 0.001</math>)</b>				<b>Blood pressure (<math>p \leq 0.001</math>)</b>			
Not hypertensive <sup>d</sup>	1032	1		Not hypertensive <sup>d</sup>	1126	1	
Hypertensive <sup>e</sup>	447	3.13	(2.27-4.32)	Hypertensive <sup>e</sup>	441	2.44	(1.85-3.20)
Not measured	312	1.39	(0.98-1.96)	Not measured	290	1.65	(1.24-2.20)
<b>Equivalised household income quintile (<math>p=0.011</math>)</b>				<b>Equivalised household income quintile (<math>p=0.021</math>)</b>			
Highest quintile	387	1		Highest quintile	339	1	
2nd quintile	330	0.76	(0.54-1.08)	2nd quintile	322	1.15	(0.81-1.62)
3rd quintile	290	0.66	(0.44-0.98)	3rd quintile	296	1.58	(1.11-2.25)
4th quintile	258	0.98	(0.66-1.47)	4th quintile	315	1.35	(0.97-1.89)
Lowest quintile	197	0.50	(0.33-0.78)	Lowest quintile	248	1.70	(1.16-2.49)
Question not answered	329	0.79	(0.54-1.15)	Question not answered	337	1.20	(0.84-1.71)
<b>Self-reported general health (<math>p = 0.068</math>)</b>				<b>Self-reported general health (<math>p = 0.129</math>)</b>			
Very good/good	1378	1		Very good/good	1386	1	
Fair	304	1.49	(1.06-2.08)	Fair	360	1.27	(0.95-1.69)
Bad/very bad	109	1.09	(0.65-1.84)	Bad/very bad	110	1.45	(0.87-2.40)

<sup>a</sup> Confidence interval.<sup>b</sup> Includes 14 cases ( 11 men, 3 women) where the information was not given.<sup>c</sup> Includes 36 cases (23 men, 13 women), where the information was not given.<sup>d</sup> Not hypertensive: Systolic blood pressure (BP)<140mmHg, diastolic BP<90mmHg, and not taking medication for BP.<sup>e</sup> Hypertensive: Systolic BP  $\geq$  140mmHg, diastolic BP  $\geq$  90mmHg or on medication for hypertension.



Table 3.14

### Trends in overweight and obesity prevalence, 1993 to 2007, by age and sex

Aged 16 and over with both valid height and weight measurements 1993-2007

BMI status (%) <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
1993								
Overweight	21	39	48	52	51	54	46	44
Obese	5	10	14	17	20	15	11	13
1994								
Overweight	25	40	46	51	51	53	48	44
Obese	6	10	16	17	18	18	15	14
1995								
Overweight	24	40	47	49	51	50	49	44
Obese	6	12	16	19	22	18	14	15
1996								
Overweight	22	43	48	49	51	52	47	45
Obese	6	13	16	21	24	20	16	16
1997								
Overweight	22	43	48	52	47	56	50	45
Obese	5	13	18	22	27	18	12	17
1998								
Overweight	23	40	48	52	52	55	48	46
Obese	5	16	17	21	23	21	16	17
1999								
Overweight	21	39	46	49	52	49	52	44
Obese	6	16	21	23	21	22	18	19
2000								
Overweight	18	41	48	49	53	50	52	45
Obese	9	20	21	25	26	24	17	21
2001								
Overweight	27	44	48	51	51	52	52	47
Obese	10	16	23	26	27	24	18	21
2002								
Overweight	21	42	47	48	47	52	52	43
Obese	9	18	24	28	28	26	19	22
2003 (unweighted) <sup>b</sup>								
Overweight	23	42	47	48	50	49	50	44
Obese	9	18	25	28	27	29	21	23
2003 (weighted) <sup>b</sup>								
Overweight	23	41	47	48	50	49	50	43
Obese	9	18	25	28	27	29	21	22
2004 <sup>b</sup>								
Overweight	23	41	50	48	48	48	54	44
Obese	8	18	25	30	30	28	19	23
2005 <sup>b</sup>								
Overweight	24	44	46	47	47	47	49	43
Obese	8	17	27	28	29	28	17	22
2006 <sup>b</sup>								
Overweight	25	41	48	48	47	49	51	43
Obese	9	21	25	28	33	31	18	24
2007 <sup>b</sup>								
Overweight	24	39	47	40	48	49	50	41
Obese	9	16	25	35	31	28	22	24

<sup>a</sup> Overweight: 25 to less than 30 kg/m<sup>2</sup>

Obese, including morbidly obese: 30 kg/m<sup>2</sup> or more

<sup>b</sup> From 2003 data have been weighted for non-response. For 2003, two rows of data are shown: one unweighted, and one with non-response weighting. For 2004-2007, data are weighted.

Continued...

Table 3.14 continued

Aged 16 and over with both valid height and weight measurements

1993-2007

BMI status (%) <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
1993								
Overweight	20	25	29	37	39	41	42	32
Obese	8	11	17	19	24	22	16	16
1994								
Overweight	20	25	28	36	39	41	36	31
Obese	8	13	17	18	26	25	16	17
1995								
Overweight	19	25	31	36	42	45	41	33
Obese	8	13	17	22	23	24	17	18
1996								
Overweight	19	28	30	39	41	43	40	34
Obese	8	15	18	19	28	25	20	18
1997								
Overweight	19	27	32	36	37	44	41	33
Obese	9	15	18	23	30	25	22	20
1998								
Overweight	17	27	30	36	39	41	35	32
Obese	11	16	21	24	29	29	21	21
1999								
Overweight	19	27	34	35	40	40	40	33
Obese	10	16	19	26	29	30	20	21
2000								
Overweight	22	27	31	36	41	41	41	34
Obese	9	16	19	24	29	30	23	21
2001								
Overweight	22	26	31	36	38	41	41	33
Obese	12	19	22	28	31	30	20	23
2002								
Overweight	21	27	34	38	36	38	43	34
Obese	11	21	23	25	29	28	22	23
2003 (unweighted) <sup>b</sup>								
Overweight	19	28	33	33	39	41	40	33
Obese	13	19	22	27	28	30	26	23
2003 (weighted) <sup>b</sup>								
Overweight	18	28	33	33	39	41	40	33
Obese	13	18	22	26	28	30	26	23
2004 <sup>b</sup>								
Overweight	24	31	30	36	37	40	46	34
Obese	12	17	24	27	32	29	21	23
2005 <sup>b</sup>								
Overweight	19	27	30	35	37	42	40	32
Obese	12	19	25	28	28	34	26	24
2006 <sup>b</sup>								
Overweight	20	29	30	35	36	38	42	32
Obese	12	18	24	27	30	35	27	24
2007 <sup>b</sup>								
Overweight	22	25	35	32	37	37	40	32
Obese	10	19	24	30	31	32	27	24

<sup>a</sup> Overweight: 25 to less than 30 kg/m<sup>2</sup>Obese, including morbidly obese: 30 kg/m<sup>2</sup> or more<sup>b</sup> From 2003 data have been weighted for non-response. For 2003, two rows of data are shown: one unweighted, and one with non-response weighting. For 2004-2007, data are weighted.

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Table 3.14 continued

Aged 16 and over with both valid height and weight measurements 1993-2007

	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Bases (unweighted)								
Men 1993	990	1444	1313	1231	1020	841	408	7247
Men 1994	935	1373	1288	1076	925	816	382	6795
Men 1995	869	1309	1296	1078	919	820	416	6707
Men 1996	908	1290	1348	1247	938	831	435	6997
Men 1997	476	710	714	667	511	414	193	3685
Men 1998	825	1261	1229	1197	910	745	433	6600
Men 1999	389	566	626	579	466	383	195	3204
Men 2000	400	591	662	528	469	376	234	3260
Men 2001	757	1051	1220	1112	958	766	403	6267
Men 2002	1553	464	629	485	445	329	203	2969
Men 2003	686	962	1178	1001	997	736	406	5966
Men 2004	255	388	478	390	424	319	190	2444
Men 2005	367	463	505	531	501	355	208	2930
Men 2006	577	762	1084	933	986	735	446	5523
Men 2007	321	383	518	463	436	370	231	2722
Women 1993	1020	1544	1459	1306	1060	991	657	8037
Women 1994	990	1524	1418	1227	988	1048	689	7884
Women 1995	979	1521	1394	1258	1028	936	613	7729
Women 1996	1016	1500	1493	1385	1007	986	677	8064
Women 1997	510	816	780	766	552	479	351	4254
Women 1998	903	1433	1449	1373	1043	853	676	7730
Women 1999	459	647	744	689	465	410	285	3699
Women 2000	362	674	778	632	509	422	326	3703
Women 2001	856	1221	1513	1331	1038	871	584	7414
Women 2002	1719	513	737	590	519	403	300	3509
Women 2003	788	1088	1452	1142	1194	810	616	7090
Women 2004	294	453	649	527	538	393	281	3135
Women 2005	385	531	668	614	588	364	259	3409
Women 2006	679	935	1308	1125	1106	776	575	6504
Women 2007	324	474	632	559	522	415	281	3207
Bases (weighted) <sup>b</sup>								
Men 2003	960	1194	1316	1073	943	664	369	6519
Men 2004	418	481	573	465	399	276	160	2772
Men 2005	491	552	620	521	462	311	187	3144
Men 2006	930	991	1246	993	888	599	368	6014
Men 2007	461	499	603	514	446	296	189	3008
Women 2003	912	1085	1289	1073	982	694	536	6570
Women 2004	378	460	564	459	425	295	231	2812
Women 2005	432	524	628	517	489	322	272	3184
Women 2006	866	942	1207	996	914	637	511	6074
Women 2007	405	466	599	497	452	312	252	2983

<sup>a</sup> Overweight: 25 to less than 30 kg/m<sup>2</sup>Obese, including morbidly obese: 30 kg/m<sup>2</sup> or more<sup>b</sup> From 2003 data have been weighted for non-response. For 2003, two rows of data are shown: one unweighted, and one with non-response weighting. For 2004-2007, data are weighted.

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# Adult physical activity: knowledge and attitudes

## 4

*Moushumi Chaudhury*

### Summary

- This chapter examines knowledge of and attitudes towards physical activity among adults aged 16-64. Topics include knowledge of current recommended physical activity targets, perception of own physical activity levels, barriers to doing more physical activity and desire to do more physical activity.
- About a quarter of adults (27% of men and 29% of women) thought they knew the current recommendations for physical activity, but when asked how much physical activity they thought people their own age should do, fewer than 1 in 10 adults specified a level equivalent to the Chief Medical Officer's (CMO's) minimum recommended target. Thus only 6% of men and 9% of women thought people their age should participate in physical activity for at least 30 minutes on at least 5 days per week. A further 25% of men and 23% of women specified a level of physical activity greater than the CMO's minimum recommendations.
- Attitudes to physical activity were very similar between men and women aged 16-64. 44% of men and 45% of women agreed that they could get enough physical activity in their daily life without specific activities such as jogging or going to the gym. A high proportion of adults agreed that physical activity was good for health even if it was moderate, including activities such as housework and gardening (94% of men and 97% of women). Similarly, 88% of men and 92% of women agreed that physical activity was good even if it was for only 10 minutes at a time.
- A high proportion of men and women aged 16-64 perceived themselves to be either very or fairly physically active compared with other people in their age group (75% of men and 67% of women). The proportion of men who perceived themselves to be very physically active decreased with age from 27% aged 16-24 to 15% aged 55-64. This contrasts with a significant increase in women in the same age groups, from 9% of those aged 16-24 to 16% of those aged 55-64.
- Women were slightly more likely than men to want to do more physical activity than at present (69% and 66% respectively). Both men and women in the lowest equivalised income quintile category were less likely to want to do more physical activity (56% and 59% respectively) than those in the higher income groups.
- About half of adults aged 16-64 expected to do more physical activity in the next year, 49% of men and 54% of women. Expected future participation decreased with age for both sexes. 11% of men and 9% of women said that they were unlikely ever to do more physical activity in the future. 27% of men and 22% of women reported they would not like to do more physical activity than at the moment.
- Differences by sex were found in barriers to doing more physical activity. The two most frequently mentioned barriers were work commitments and not having enough leisure time; work commitments were cited most by men (45%), while lack of leisure time was the barrier most frequently cited by women (37%). Caring for children or older people was cited by a quarter of women (25%) but only 13% of men.

- Overall 13% of men and 16% of women cited lack of money, and 10% of men and 13% of women cited poor health as barriers to doing more physical activity. There were significant variations by age, with the proportion mentioning poor health increasing with increasing age. In contrast work commitments, lack of leisure time and lack of money became less of a barrier with age.
- Lack of motivation was another important barrier that prevented people from doing more physical activity. 21 % of men and 25% of women reported they were not motivated to do more; however, almost no one thought exercise was a waste of time.
- Having more leisure time (42% of both men and women) and self-motivation (32% of men and 38% of women) were the most frequently reported factors that would encourage people to do more physical activity, exercise or sport. Further factors that might encourage more activity included the participant's own ill health or advice from a doctor or nurse.

## 4.1 Introduction

Physical activity is an important public health issue: the health benefits of a physically active lifestyle have been well documented.<sup>1,2</sup> There is evidence that physical inactivity is associated with many chronic conditions, including ischaemic heart disease,<sup>3</sup> diabetes,<sup>4</sup> osteoporosis,<sup>5</sup> certain types of cancer,<sup>6,7</sup> and obesity.<sup>1</sup> Physically active adults have 20-30% reduced risk of premature death and up to 50% reduced risk of developing major chronic diseases.<sup>1</sup> Moreover, participation in regular physical activity can increase the quality of life and independence in older age<sup>8</sup> and, by increasing muscle strength, reduces the risk of falls and broken hips which are a major cause of mortality amongst the elderly.<sup>8</sup> The amount of habitual physical activity accrued is also closely linked with all-cause mortality risk,<sup>9</sup> yet the majority of people in many countries do not accumulate sufficient exercise to derive health-related benefits.<sup>10,11</sup>

Increasing physical activity amongst adults has been a subject of public health promotion policies and government health strategies in England since the early 1990s.<sup>1,12,13,14</sup> Guidelines for physical activity for maintaining optimal health have been available since the mid to late 1970s.<sup>15</sup> Recent National Institute for Health and Clinical Excellence (NICE) guidance highlights the contribution of regular physical activity to promoting the health of communities.<sup>16</sup> In 2004, the Chief Medical Officer published '*At least five a week: evidence on the impact of physical activity and its relationship to health*', which reiterated the recommendation for adults' physical activity levels (see Section 4.2.2).<sup>1</sup>

The UK government set a target in its '*Game Plan: a strategy for delivering government's sport and physical activity objectives*' in 2002 for 70% of the population to be reasonably active by 2020.<sup>17</sup> The Health Survey for England (HSE) 2006 showed that 40% of men and 28% of women in England met the government recommendations, and trend data show that the proportion of adults who are meeting the recommendations has increased significantly from 1997 to 2006 for both men and women.<sup>11</sup>

There is a need to present these physical activity guidelines in a way that they can be incorporated into individuals' regular behaviour patterns. The activity could be lifestyle activity, or structured exercise or sports, or a combination of these. Since many people attribute their failure to achieve the current target for exercise to a lack of time,<sup>16</sup> guidance may be needed about how activity and exercise can be built into daily life.

In order to encourage more physical activity among the population the determinants of physical activity behaviour need to be understood, and particularly how these vary between different ages, sexes, and socio-economic groups. HSE has previously included questions on behaviour but not on knowledge or attitudes. A pan-European model of determinants of physical activity<sup>18</sup> grouped them into three categories. These were:

- Knowledge and attitudes
- Social influences
- Barriers and self efficacy.

These areas were covered in the HSE 2007 among adults aged 16-64, the first time that knowledge of and attitudes towards physical activity have been investigated in this survey series. Information was collected by self completion, using questions drawn from previous surveys that looked at these topics.<sup>10,18,19,20,21</sup> To keep respondent burden to a reasonable level, questions on physical activity behaviour were not included in the 2007 survey.

This chapter presents results from the 2007 survey. Trend tables for key measures (including physical activity behaviour up to 2006) are available in *The Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>22</sup>

## 4.2 Methods and definitions

### 4.2.1 Methods

In 2007, the HSE introduced a new self completion questionnaire specifically to obtain information on knowledge of and attitudes to four areas of lifestyle behaviour, including physical activity. The new module on knowledge of and attitudes to physical activity was based on questions relating to knowledge and attitudes, social influences, and barriers to and factors encouraging physical activity.<sup>10,14,18</sup> The new questionnaire underwent cognitive testing prior to being piloted in autumn 2006. The questionnaire was administered by the interviewer to those aged 16-64; those aged 65 and over were not asked these questions to avoid an over-long interview for older people.

The following details concerning knowledge of and attitudes towards physical activity were collected:

- Knowledge of current recommended physical activity levels: how many days per week and minutes per day an adult should do physical activity
- Perception of how physically active adults believe they are compared to other people their own age
- Desire to do more physical activity
- Barriers to doing more physical activity, exercise or sport
- What would encourage adults to do more physical activity, exercise or sport.

### 4.2.2 Definition of recommended level of physical activity for adults

According to the 2004 Chief Medical Officer's (CMO's) published report *'At least five a week, evidence on the impact of physical activity and its relationship to health'*,<sup>1</sup> it is recommended that adults should be active on at least five days a week, at moderate or greater intensity, for at least 30 minutes a day. This can be either in one session or in a number of shorter bouts of activity of 10 minutes or longer.

## 4.3 Awareness of and attitudes to physical activity

### 4.3.1 Awareness of recommendations for physical activity target

When asked if they were aware of the government's guidelines for physical activity, only 27% of men and 29% of women aged 16-64 thought they knew the physical activity recommendations. A higher proportion were aware that there were government recommended levels of physical activity, but did not know what they were (39% of men and 42% of women), while 34% of men and 29% of women had not heard about the CMO's current guidelines.<sup>1</sup>

Table 4.1

Further questions asked the number of days per week, and number of minutes per day, that adults were recommended to do; the questions were phrased in terms of what 'people of your age' should do rather than specifically referring to the CMO's guidelines.<sup>23</sup> Very few adults aged 16-64 specified a level equivalent to the CMO's minimum recommended target. Only 6% of men and 9% of women thought that people their age should participate in physical activity for at least 30 minutes on at least five days a week. Some adults indicated that they should be active either for 30 minutes per day or for five days per week, but not both. 13% of men and 15% of women thought that adults should exercise five days per week, while 36% of men and 44% of women thought that activity should last for 30 minutes.

Women were marginally more likely than men to think that adults should do physical activity at the level of current recommendations. Adults aged 16-24 were more likely than older adults to believe that the recommendation was 60 minutes or more, rather than 30 minutes per day.



While only a small proportion of adults aged 16-64 specified physical activity at the correct thresholds for the physical activity targets, around a quarter over-estimated the minimum amount of physical activity adults should do, over-estimates being five to seven days per week and more than 30 minutes per day, or 6 or 7 days for at least 30 minutes. Around a quarter thought that adults should exercise seven days per week (26% of men, 28% of women), while 20% of men and 15% of women thought activity should be for an hour or more per day. However, it remains the case that over two thirds of adults aged 16-64 either did not know the amount of physical activity they should do, or they under-estimated compared with the CMO's recommendations.

Table 4A below summarises adults' awareness of how much physical activity people their age should take, related in analysis to the government's current minimum recommendation.

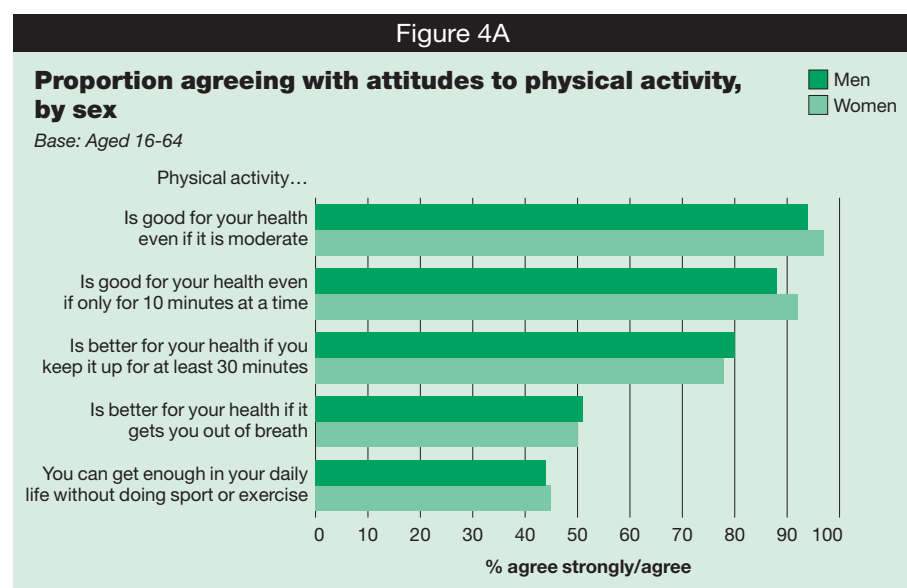
Table 4A		
<b>Adults' knowledge of how much physical activity they should do, compared with government recommendations</b>		
	<b>Men</b>	<b>Women</b>
	<b>%</b>	<b>%</b>
<b>Proportion who thought adults should do:</b>		
Equivalent to current minimum recommendation <sup>a</sup>	6	9
More than current minimum recommendation	25	23
Less than current minimum recommendation or did not know	69	68

<sup>a</sup> The current minimum recommendation for adults is 30 minutes of moderate intensity activity on 5 days a week.

Table 4.2

### 4.3.2 Attitudes about physical activity, by sex and age

Adults aged 16-64 were asked to say how much they agreed or disagreed with a series of true statements about the benefits of physical activity and exercise. For all statements agreement outweighed disagreement, substantially so in most cases. Men and women generally expressed very similar views, as shown in Figure 4A.



The vast majority of adults agreed that physical activity is good for health even if it is moderate, including such activities as housework and gardening (94% of men and 97% of women). Women were more likely than men to agree *strongly* with this statement (36% of

women, 29% of men). This may reflect women's actual patterns of physical activity, as shown in the HSE 2006 report, where more women than men were in medium or low physical activity groups.<sup>11</sup>

Two further statements dealt with the amount of time spent on physical activity or exercise. While most adults agreed that physical activity was good for health even if it was only for 10 minutes, women were more likely than men to agree (92% of women, 88% of men). The difference between the sexes lay in the proportion that agreed *strongly* (26% and 21% respectively). Fewer agreed that physical activity was better for health if it lasted at least 30 minutes (80% of men and 78% of women).

44% of men and 45% of women agreed that they could get enough physical activity in their daily life without specific sport or exercise such as jogging or going to a gym. However, very few agreed *strongly* with this statement (7% of men and 8% of women). Around one in five gave a neutral opinion (19% and 22% respectively) and around a third disagreed (37% and 33% respectively). Similarly about half of men and women thought that physical activity was more beneficial 'if it gets you out of breath', while the remainder were fairly evenly divided between neutral views (26% of men and 25% of women) and disagreement (23% and 24% respectively).

**Table 4.3, Figure 4A**

There were variations according to age for most of the attitudes investigated. Levels of agreement generally increased with age for the statements:

- Physical activity is good for your health even if it is moderate (ranging from 88% of men aged 16-24 to 97% aged 55-64, and 92% to 97% among women)
- Physical activity is good for your health even if only for 10 minutes at a time (from 81% of men aged 16-24 to 93% aged 55-64, and 87% of women aged 16-24 to 94%-95% of women aged 45-64)
- You can get enough physical activity in your daily life without doing sport or exercise like jogging or going to the gym (from 40% of those aged 16-24 to 54% of those aged 55-64 among both men and women).

**Table 4.4**

### 4.3.3 Perception of own physical activity levels

Adults aged 16-64 were asked about their perception of their own physical activity levels compared with other people their own age. Significantly more men than women perceived themselves as very physically active compared with others their age (18% and 11% respectively). Most adults perceived themselves as fairly physically active (57% of men and 56% of women). In contrast, only 5% of men and 6% of women considered themselves to be not at all physically active. Self-perception of physical activity levels varied by age, with different patterns among men and women, as shown in Figure 4B. The proportion of men who reported being very physically active decreased with age (from 27% aged 16-24 to 15% aged 55-64), whereas the proportion of women who reported being very physically active increased among older women (from 9%-10% among women aged 16-44 to 16% of women aged 55-64). Younger women aged 16-24 were much more likely than those aged 55-64 to perceive themselves as 'not very physically active' (35% and 19% respectively).

There were significant regional variations in perceptions of own physical activity levels. Among men, 62% in the North East perceived themselves as very or fairly physically active, compared with 74%-82% in other regions. Among women, there was less variation overall, with no individual regions standing out.

Perceptions of own physical activity levels varied by equivalised household income. More in the higher two quintiles considered themselves very or fairly active compared with those in the lower quintiles, while the proportion rating themselves 'not at all physically active' increased from the highest to the lowest quintile.

**Tables 4.5-4.7, Figures 4B, 4C**

Figure 4B



#### 4.3.4 Perception of adequacy of own physical activity, by perceived activity level and sex

All adults aged 16-64, except those who perceived themselves as 'not at all physically active' were asked about whether they felt they did enough physical activity at the moment. Of these people 40% of men and 31% of women considered that they currently did enough. There were marked contrasts between those who thought they did, or did not, do enough physical activity in relation to their perceptions of their own activity levels. 95% of both men and women who thought they did enough physical activity perceived themselves as either very or fairly physically active compared with other people of their own age. Men were more likely than women in this group to say that they were 'very' rather than 'fairly' physically active. Among those who thought that they did not currently do enough physical activity, again more men than women perceived themselves as relatively physically active (63% of men and 56% of women), while 32% of men and 39% of women perceived themselves as 'not very' physically active.

A small proportion of adults who thought that they did enough physical activity perceived themselves as not very physically active (5% for both sexes), and similarly 5% of men and women who thought they did not do enough physical activity perceived themselves as very physically active compared with others their own age.

**Table 4.8**

Figure 4C

### Perception of own physical activity levels, by equivalised household income and sex

Base: Aged 16-64

Not very/not at all physically active  
Fairly physically active  
Very physically active



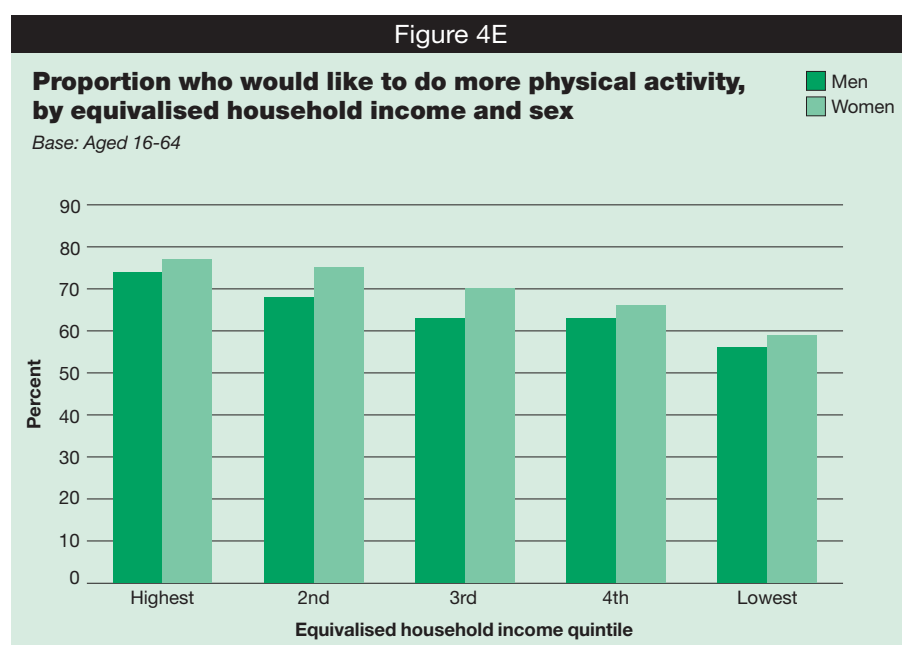
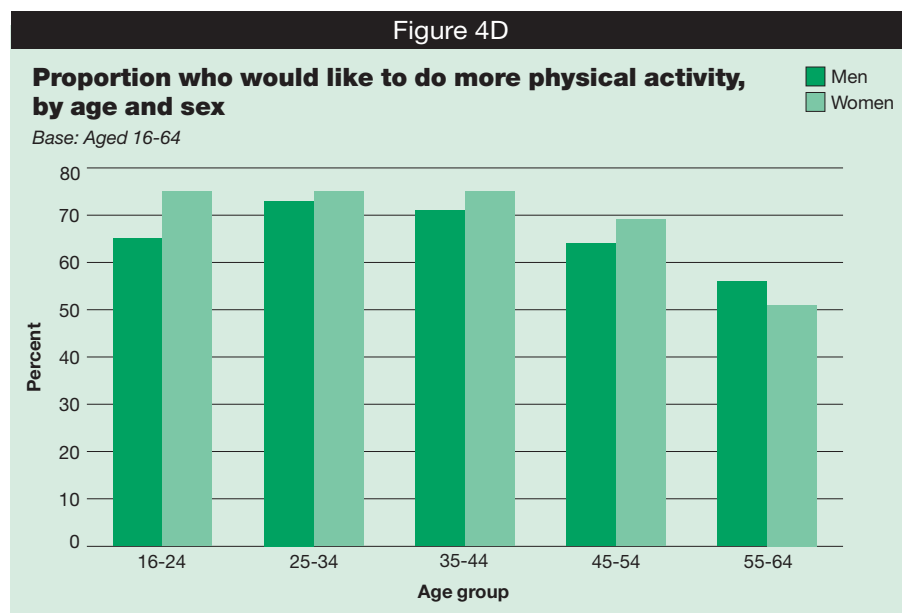
## 4.4 Future intentions, barriers and encouragement

### 4.4.1 Desire to do more physical activity in the future

More than two thirds of adults aged 16-64 said that they would like to do more physical activity than they did at the moment, with women slightly more likely to say this than men (66% of men and 69% of women). This pattern was apparent across all age groups, except those aged 55-64. Among men, the proportion who would like to do more was highest among those aged 25-44 (71%-73%), and lowest among those aged 55-64 (56%). Among women, similar proportions said they would like to do more physical activity up to the age of 44 (75%), with lower proportions among older women (51% aged 55-64). 27% of men and 22% of women said they did not want to do more physical activity. This remained relatively constant across age groups for men, but increased with age for women. Fewer than 10% of all adults reported that they were unable to do more physical activity at the moment.

The proportion of adults who wanted to do more physical activity did not vary significantly by region. For both men and women, the desire to do more physical activity increased with income. 74% of men and 77% of women in the highest income quintile wanted to do more physical activity compared with only 56% of men and 59% of women in the lowest income quintile.

Tables 4.9-4.11, Figures 4D, 4E



#### 4.4.2 Expected participation in exercise in the future, by age and sex

Adults who said they would like to do more physical activity than at the moment were asked about their future expectations. Table 4.12 shows, among all adults aged 16-64, the proportion who did not want to do more, and among those who did, when they expected to increase their level of activity. About half of adults expected to do more physical activity, exercise or sport in the next year (49% of men and 54% of women), and this generally decreased with age. A small proportion of adults reported that they were unlikely ever to do more physical activity in the future (11% of men and 9% of women), or that they expected to do more physical activity, but not in the next year (5% of men, 4% of women). 27% of men and 22% of women reported that they would not like to do more physical activity than at the moment.

**Table 4.12**

#### 4.4.3 Barriers to doing more physical activity, exercise or sport, by sex and age

Two questions were asked to determine the main barriers adults faced to participating in physical activity: The first question presented a list of primarily practical barriers that might stop people from doing more physical activity, exercise or sport than they did now, and the second question listed other factors including psychological barriers that might prevent

people from doing more physical, exercise or sport. The responses in Tables 4.13-4.15 are ranked in order of prevalence for men.

The two most frequently mentioned barriers were work commitments and lack of leisure time, and there were clearly different patterns of barriers to doing more physical activity among men and women. Among men work commitments were the most common barrier, followed by lack of leisure time (45% and 38% respectively). Women were most likely to report a lack of leisure time (37%), with work commitments almost as frequently mentioned (34%). Caring for children or older people also showed large differences by sex. Women were twice as likely as men to report this as a barrier (25% and 13% respectively).

A range of other practical barriers to doing more physical activity were identified from the list presented, including lack of money, poor health, physical limitations or injury. Only 5% of both men and women reported 'No suitable places to do it in my area' and only 2% of men and 3% of women reported that they 'Have not got the right clothes or equipment'. Among more psychological barriers, some felt that they were 'Not the sporty type' (14% of men and 21% of women), and that they were 'Too shy or embarrassed' (4% and 10% respectively).

17% of men and 12% of women said that they did not need to do any more physical activity. For a further group, a lack of motivation to do more was an important barrier (21% of men and 25% of women respectively). Nevertheless, almost no adults thought that exercise was a waste of time (fewer than 1% of men or women).

As might be expected, certain barriers became more or less of a problem with age. Among men, work commitments, lack of leisure time and caring for children or older people were less of a barrier for those aged 16-24 and 55-64 than for those in the middle age groups. The pattern was similar for women for lack of leisure time and caring for others, but slightly different for work commitments, these being seen as a barrier by similar proportions up to the age of 54, and much less of a barrier for those aged 55-64. This is shown in Figure 4F.

Certain barriers were much more important among younger than older adults, as illustrated in Figure 4G. These include lack of money, having no-one to exercise with, having no local facilities, and not having the right clothes or equipment. Young women were more likely than young men to cite all of these barriers apart from lack of local facilities. Women of all ages were also generally more likely than men to say that they were too shy or embarrassed, and that they were 'Not the sporty type', with the difference between men and women aged 16-24 being the largest.

A final group of barriers became more important with increasing age, as illustrated in Figure 4H. These include poor health or physical limitations, and injuries that prevent sport or exercise. The proportion of women who mentioned that they did not need to do more physical activity also increased with age, although the pattern was different for men, where there was little variation.

**Table 4.13, Figures 4F, 4G, 4H**

#### **4.4.4 Barriers to doing more physical activity, exercise or sport, by equivalised household income**

The importance of different barriers varied with equivalised household income. The proportion of both men and women citing work commitments and lack of leisure time decreased sharply as income decreased. 58% of men and 49% of women in the highest income quintile reported 'Work commitments' as a barrier to doing more physical activity, compared with only 20% and 17% respectively in the lowest income quintile. In contrast, the proportion of people reporting a lack of money or poor health or physical limitations increased in lower income groups. Only 5% of men and 9% of women in the highest income quintile cited poor health or physical limitations as a barrier compared with 24% of men and 19% of women in the lowest income quintile.

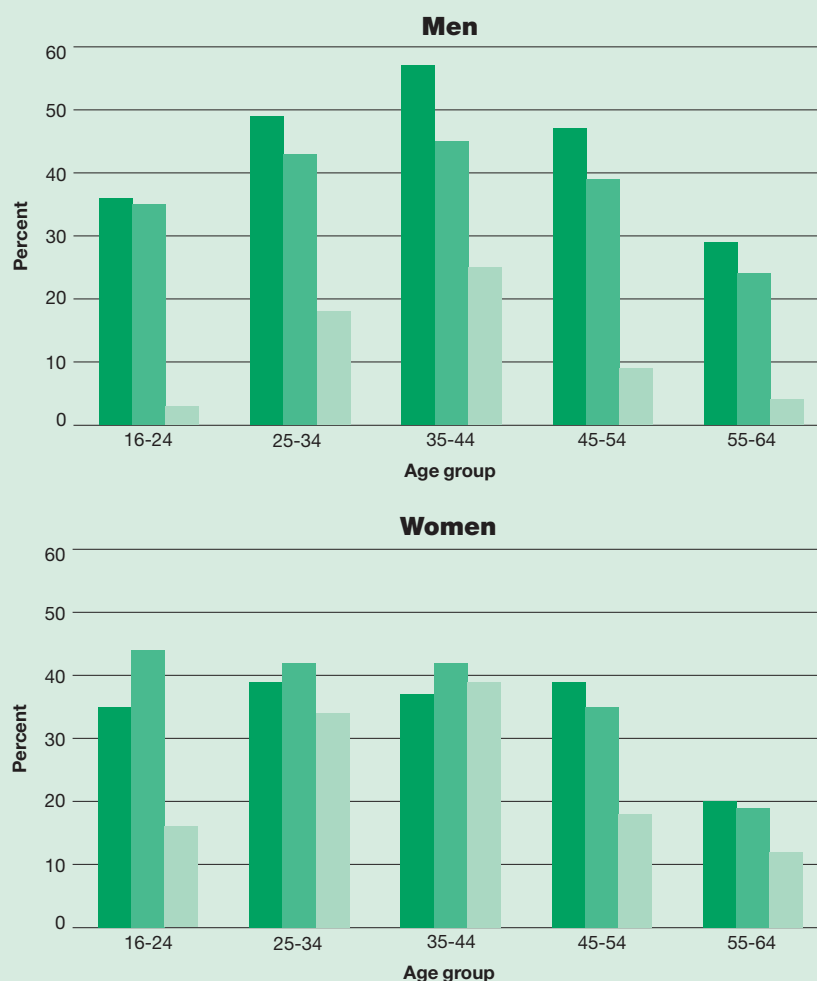
**Table 4.15**

Figure 4F

### Barriers to doing more physical activity, exercise or sport, by age and sex

Base: Aged 16-64

Work commitments  
Lack of leisure time  
Caring for children or older people



#### 4.4.5 Factors that would encourage more physical activity, exercise or sport

After exploring barriers to taking more physical activity, exercise or sport, adults were asked what factors would encourage them to do more, with a list of factors presented in the questionnaire. Echoing the barriers identified, the most commonly reported factor for both men and women (42%) was having more leisure time. Similarly, having someone to do exercise with (20% of men, 26% of women), and increased income (14% of men and 15% of women) reflected the barriers mentioned earlier.

Self-motivation was recognised as important by 32% of men and 38% of women. Further factors that might encourage people to take more exercise or become more active were issues surrounding health: the participant's own ill health, advice from a doctor or nurse, or a relative's ill health were mentioned by 31%, 28% and 9% of men respectively, and 29%, 23% and 9% of women. Some adults said that they would be encouraged if they could find types of physical activity they were capable of (9% of men, 14% of women). Very few reported that clearer advice from the government would encourage them to do more physical activity (4% of men and 2% of women).

As was the case with barriers, factors encouraging people to do more physical activity varied with age. More men and women in the younger age groups than in the oldest age group felt they would be encouraged to do more physical activity if they had more leisure time, increased income or someone to take exercise with. Younger adults were also the most likely to feel that self-motivation would be effective for them (35% of men and 51% of women aged 16-24, compared with 23% of both men and women aged 55-64).

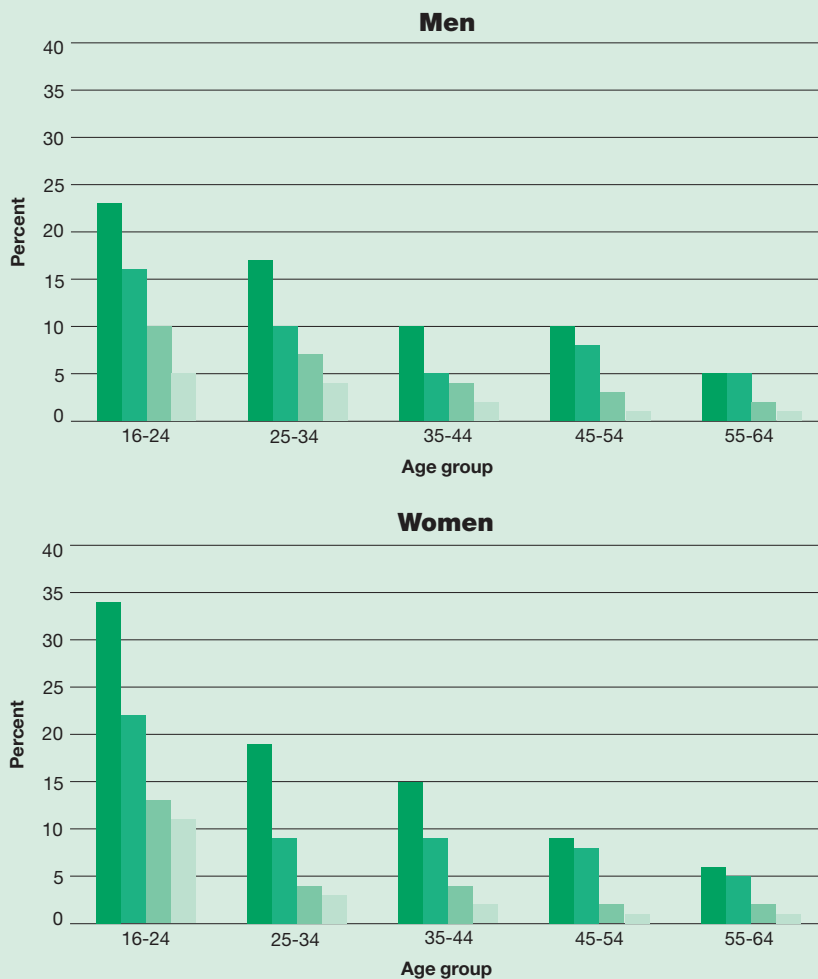
**Table 4.16**

Figure 4G

### Barriers to doing more physical activity, exercise, or sport, by age and sex

Base: Aged 16-64

- Don't have enough money
- Have no one to exercise with
- No suitable places to do it in area
- Haven't got the right clothes or equipment



## 4.5 Discussion

### 4.5.1 Limitations of collecting physical activity data by questionnaire

All the data about attitudes to physical activity, perceived activity levels and future intentions described in this chapter rely on participants' own assessments and self-reports. It is possible that some responses were influenced by social desirability bias, a factor that should be considered when interpreting the results. It should also be remembered that adults aged 16-64 were asked about physical activity, and those aged 65 and over were not included.

### 4.5.2 Awareness and knowledge of physical activity targets

The recommendation for physical activity for adults is at least 30 minutes of at least moderate intensity activity, on at least 5 days per week. Over two thirds of men and women aged 16-64 reported that they were aware there were official recommended levels of physical activity, and over a quarter of adults believed they knew the recommended levels. However a considerably smaller proportion of adults, only 6% of men and 9% of women, specified a level of physical activity equivalent to the Chief Medical Officer's (CMO's) minimum recommended target when asked to indicate how much people of their age should do. An additional quarter of adults over-estimated the minimum recommendations, thus suggesting a level of activity within the recommendations. However, most either under-

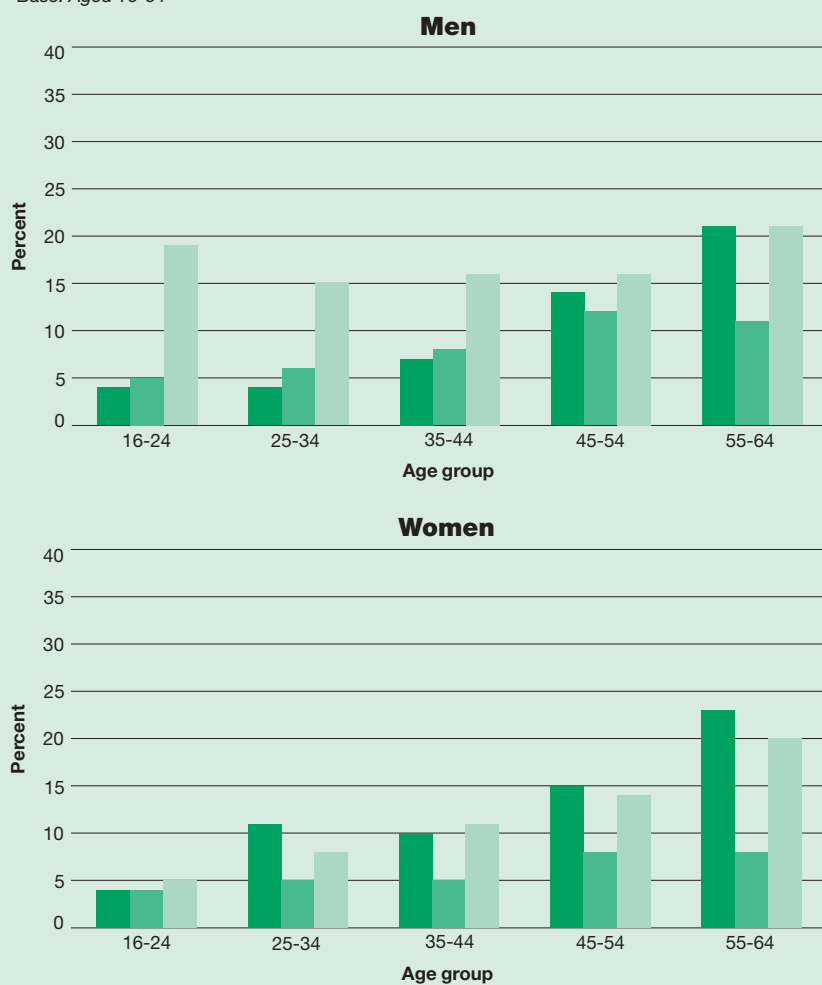


Figure 4H

**Barriers to doing more physical activity, exercise, or sport, by age and sex**

Base: Aged 16-64

■ Poor health or physical limitations  
■ Injuries which prevent me  
■ Don't need to do more



estimated how much physical activity adults should do or did not know. When asked about the government's recommendations, large proportions were either aware of guidelines without knowing their content, or not even aware that guidelines existed. There is clearly a substantial lack of awareness that adults should be taking part in physical activity at least at the level of the government's current minimum guidelines

The physical activity guidelines were established in England in 2004. The CMO's paper '*At least five a week*' indicates that most adults who do not currently reach this level of activity may be able to achieve these targets by making small changes to their daily routines.<sup>1</sup> Yet the HSE 2007 findings suggest that improved awareness is required as a first step, with clear communication of the guidelines so that people know what levels of physical activity they should be aiming for.

There are important implications that arise with the lack of awareness of physical activity targets. Firstly, it may act as a barrier to behaviour change in adults who do not see the need to change their current physical activity levels, and who may therefore be unaffected by key public health messages concerning physical activity.<sup>24</sup> Secondly, people with an exaggerated perception that they are physically active may be overlooked in health promotion efforts, as these usually target people who regard themselves as relatively inactive.

One way of raising awareness of individual physical activity levels compared with perceived activity levels is to monitor objective measures of physical activity, for instance by using a pedometer. This is something that has been used in small scale and local interventions and exercise programmes, and could be used more widely.<sup>16</sup> The Health Survey for England is

monitoring physical activity using objective measures in 2008, and it will be possible to compare self-perception of physical activity levels with the objective measures at a population level.

### 4.5.3 Adults' attitudes to physical activity

Adults' attitudes to physical activity varied by age and sex, as described in the chapter. A large majority of both men and women aged 16-64 agreed that:

- Physical activity is good for your health even if it is moderate
- Physical activity is good for your health even if it lasts for only 10 minutes
- Physical activity is better for your health if you keep it up for 30 minutes at a time.

In contrast, fewer than half of adults thought that they could get enough physical activity in their daily life without doing sport or exercise such as jogging or going to the gym, so there is a belief among many that specific efforts will be required to achieve appropriate levels of activity.

Most adults aged 16-64 perceived themselves to be very or fairly physically active compared with people of their own age. Generally, more men than women perceived themselves to be very or fairly physically active across almost all age groups. In the HSE 2006, it was reported that 40% of men and 28% women were classified as being in the high activity group, meeting the government recommendations for physical activity.<sup>11</sup> These proportions were considerably lower than those who thought they were fairly physically active in 2007 (57% of men and 56% of women). This discrepancy suggests the need both for raising awareness of the targets, and ensuring that people have more accurate self-perception of their own activity levels. This second message is especially important for women.

### 4.5.4 Barriers and encouragement to doing more activity, exercise or sport

Barriers may be described as internal, such as lack of motivation or not feeling the need to do more, or they may be external, such as lack of facilities, poor health or physical limitations.<sup>25</sup> This distinction is important as external barriers are more amenable to change. People who only quote internal barriers as an obstacle to doing more exercise are less likely to change their exercise behaviour than those who report external barriers.<sup>3,19</sup> Principal barriers to exercise, found in a previous study of the general population in the UK, were lack of time, poor motivation and negative self image.<sup>19</sup>

This chapter found that among men, work commitments (45%) and among women, lack of leisure time (37%) were the most commonly reported barriers. However, barriers varied by age group and socio-economic status. For both men and women, lack of leisure time and not having enough money decreased with age. Echoing the barriers people cited, more leisure time was the main factor that both men and women felt would encourage them to do more physical activity, exercise or sport. This was something suggested especially among younger adults. While this is a difficult area to address, depending to a large extent on individuals' lifestyles, measures that could help include planning buildings and developments to improve access to sports or leisure centres or gyms close to workplaces.<sup>16</sup>

A recent review of qualitative studies on understanding participation in sports and physical activity found that significant shifts in life course, such as the transition from childhood to adulthood, or the move from college to full time employment, have implications for participation in physical activity. Barriers to participation include these transitional changes at key stages of the life course.<sup>26</sup> A number of barriers were mentioned much more frequently among young adults aged 16-24 than among older adults. These were expressed as 'external' barriers including lack of money, having no-one to exercise with, having no local facilities, and not having the right clothes or equipment. Most of these barriers were more frequently mentioned by young women than young men, and young women were also more likely than young men to specify the 'internal barriers' that they were

too shy or embarrassed, and that they were 'Not the sporty type'. Other research has also found that young women may be discouraged from participation in physical activity by perceptions that sport is unfeminine. Conversely, it has been shown that those who do participate in sport gain in self-esteem and benefit from the social networks they develop through participation.<sup>26</sup>

Results from this chapter suggest that interventions seeking to increase physical activity in the general population should be aimed at increasing awareness of personal activity levels as well as encouraging more activity. Men and women, and different age groups within the sexes, had different perceptions of their own levels of physical activity, and of barriers and factors encouraging them to doing more. Thus guidelines must be translated into meaningful and helpful messages that target men and women, and specific age and socio-economic groups. Physical activity messages need to address key issues such as:

- Reducing the barriers and making it easier to participate in physical activity
- Offering choice
- Being tailored to the needs and life-stage of individuals.

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|------|---|------|---|
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Table 4.1

**Awareness of recommendations for physical activity, by sex***Aged 16-64**2007*

Awareness of physical activity recommendations	Men	Women
	%	%
Said they knew the recommended level of physical activity	27	29
Heard of recommended level of physical activity but did not know what it is	39	42
Had not heard about recommended level of physical activity	34	29
<i>Bases (unweighted)</i>	<i>2349</i>	<i>2911</i>
<i>Bases (weighted)</i>	<i>2800</i>	<i>2815</i>

Table 4.2

# **Knowledge of how much physical activity adults should do, by age and sex**

Aged 16-64

2007

Amount of physical activity adults of own age should do (days and minutes)	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
Men						
Days						
0-2 days	5	5	5	5	5	5
3 days	18	21	21	18	14	19
4 days	19	14	13	10	8	13
5 days	14	16	13	12	10	13
6 days	5	2	4	4	3	3
7 days	26	21	25	27	34	26
Don't know	13	20	20	23	27	21
Minutes						
1-19 mins per day	3	3	4	5	7	4
20 mins per day	4	9	10	11	10	9
21-29 mins per day	1	0	0	0	0	0
30 mins per day	26	41	41	38	31	36
31-59 mins per day	6	6	7	4	4	5
60 mins per day	24	13	13	11	11	14
More than 60 mins per day	18	4	2	4	3	6
Don't know	18	23	23	26	34	25
Compared with government recommendation: <sup>a</sup>						
Equivalent to current minimum recommendation	5	9	7	6	3	6
More than current minimum recommendation <sup>b</sup>	32	22	23	24	25	25
Less than current minimum recommendation or did not know	63	69	70	71	71	69
Bases (unweighted) <sup>c</sup>						
Men	310	390	519	468	457	2144
Bases (weighted) <sup>c</sup>						
Men	444	511	604	519	466	2544

<sup>a</sup> The current minimum recommendation for adults is 30 minutes of moderate intensity activity on 5 days a week.

<sup>b</sup> 'More than current minimum recommendation' includes all those who specified 5-7 days per week and more than 30 minutes per day, or 6 or 7 days per week and at least 30 minutes per day.

<sup>c</sup> Table shows responses to two separate questions for which the bases vary but are of a similar size; those shown are for knowledge of days per week.

Continued...

Table 4.2

Table 4.2 continued

Aged 16-64

2007

Amount of physical activity adults of own age should do (days and minutes)	Age group					Total  %
	16-24 %	25-34 %	35-44 %	45-54 %	55-64 %	
Women						
Days						
0-2 days	6	4	3	3	4	4
3 days	26	25	24	21	17	23
4 days	13	11	10	8	8	10
5 days	13	19	18	13	11	15
6 days	4	1	1	2	2	2
7 days	19	23	29	33	32	28
Don't know	18	15	16	19	25	19
Minutes						
1-19 mins per day	2	2	4	6	7	4
20 mins per day	6	11	15	12	11	12
21-29 mins per day	-	0	0	1	0	0
30 mins per day	40	50	47	46	35	44
31-59 mins per day	6	5	4	2	2	4
60 mins per day	20	13	11	9	11	13
More than 60 mins per day	5	2	1	1	2	2
Don't know	21	16	17	24	31	21
Compared with government recommendation: <sup>a</sup>						
Equivalent to current minimum recommendation	9	13	9	7	7	9
More than current minimum recommendation <sup>b</sup>	22	21	24	25	22	23
Less than current minimum recommendation or did not know	69	66	67	68	71	68
Bases (unweighted) <sup>c</sup>						
Women	339	533	655	602	560	2689
Bases (weighted) <sup>c</sup>						
Women	424	527	620	533	482	2587

<sup>a</sup> The current minimum recommendation for adults is 30 minutes of moderate intensity activity on 5 days a week.

<sup>b</sup> 'More than current minimum recommendation' includes all those who specified 5-7 days per week and more than 30 minutes per day, or 6 or 7 days per week and at least 30 minutes per day.

<sup>c</sup> Table shows responses to two separate questions for which the bases vary but are of a similar size; those shown are for knowledge of days per week.



Table 4.3

**Attitudes about physical activity: summary of agreement and disagreement, by sex**

Aged 16-64

2007

Attitudes about physical activity <sup>b</sup>	Agree strongly %	Agree %	Neither <sup>a</sup> %	Disagree %	Disagree strongly %	Total agree %	Total disagree %
<b>Men</b>							
Physical activity is good for your health even if it is moderate	29	65	4	1	0	94	1
Physical activity is good for your health even if only for 10 minutes at a time	21	66	8	4	0	88	4
Physical activity is better for your health if you keep it up for at least 30 minutes at a time	29	50	17	4	0	80	4
Physical activity is better for your health if it gets you out of breath	16	35	26	20	3	51	23
You can get enough physical activity in your daily life without doing sport or exercise such as jogging or going to the gym	7	37	19	32	5	44	37
<b>Women</b>							
Physical activity is good for your health even if it is moderate	36	60	3	1	-	97	1
Physical activity is good for your health even if only for 10 minutes at a time	26	66	6	2	0	92	2
Physical activity is better for your health if you keep it up for at least 30 minutes at a time	30	47	17	5	0	78	5
Physical activity is better for your health if it gets you out of breath	15	35	25	22	2	50	24
You can get enough physical activity in your daily life without doing sport or exercise such as jogging or going to the gym	8	38	22	30	3	45	33

<sup>a</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

<sup>b</sup> Bases for the statement 'You can get enough physical activity in your daily life' are:

Unweighted: Men 2127 Women 2673

Weighted: Men 2522 Women 2570.

Bases for other statements vary but are of similar size.

Table 4.4

### Proportion agreeing with attitudes about physical activity, by age and sex

Aged 16-64

2007

Attitudes about physical activity: % strongly agree/ agree	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
Men						
Physical activity is good for your health even if it is moderate	88	93	96	98	97	94
Physical activity is good for your health even if only for 10 minutes at a time	81	85	89	90	93	88
Physical activity is better for your health if you keep it up for at least 30 minutes at a time	79	85	82	74	78	80
Physical activity is better for your health if it gets you out of breath	48	53	50	53	53	51
You can get enough physical activity in your daily life without doing sport or exercise such as jogging or going to the gym	40	40	40	48	54	44
Women						
Physical activity is good for your health even if it is moderate	92	96	97	98	97	97
Physical activity is good for your health even if only for 10 minutes at a time	87	89	93	95	94	92
Physical activity is better for your health if you keep it up for at least 30 minutes at a time	75	82	78	78	76	78
Physical activity is better for your health if it gets you out of breath	41	48	50	54	56	50
You can get enough physical activity in your daily life without doing sport or exercise such as jogging or going to the gym	40	42	46	45	54	45
Bases (unweighted) <sup>a</sup>						
Men	296	391	521	467	453	2128
Women	325	535	657	602	560	2679
Bases (weighted) <sup>a</sup>						
Men	425	512	606	518	461	2523
Women	408	529	623	533	482	2575

<sup>a</sup> Bases shown are for the sample aged 16-64 who were asked the question. Bases for each statement vary but are of similar size.

Table 4.5

**Perception of own physical activity levels, by age and sex**

<i>Aged 16-64</i>						<i>2007</i>
<b>Perception of own physical activity levels compared with other people of own age</b>	<b>Age group</b>					<b>Total</b>
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Men</b>						
Very physically active	27	21	14	14	15	18
Fairly physically active	54	55	60	56	60	57
Not very physically active	15	21	23	22	18	20
Not at all physically active	4	3	2	7	7	5
<i>Very or fairly physically active</i>	<i>81</i>	<i>76</i>	<i>75</i>	<i>71</i>	<i>75</i>	<i>75</i>
<i>Not very or not at all physically active</i>	<i>19</i>	<i>24</i>	<i>25</i>	<i>29</i>	<i>25</i>	<i>25</i>
<b>Women</b>						
Very physically active	9	10	9	12	16	11
Fairly physically active	51	57	58	56	57	56
Not very physically active	35	30	29	25	19	27
Not at all physically active	6	4	3	7	8	6
<i>Very or fairly physically active</i>	<i>60</i>	<i>66</i>	<i>67</i>	<i>68</i>	<i>73</i>	<i>67</i>
<i>Not very or not at all physically active</i>	<i>40</i>	<i>34</i>	<i>33</i>	<i>32</i>	<i>27</i>	<i>33</i>
<i>Bases (unweighted)</i>						
<i>Men</i>	<i>293</i>	<i>387</i>	<i>519</i>	<i>468</i>	<i>453</i>	<i>2120</i>
<i>Women</i>	<i>326</i>	<i>534</i>	<i>656</i>	<i>605</i>	<i>562</i>	<i>2683</i>
<i>Bases (weighted)</i>						
<i>Men</i>	<i>421</i>	<i>506</i>	<i>604</i>	<i>519</i>	<i>462</i>	<i>2513</i>
<i>Women</i>	<i>409</i>	<i>527</i>	<i>622</i>	<i>536</i>	<i>484</i>	<i>2578</i>

Table 4.6

**Perception of own physical activity levels (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16-64

2007

Perception of own physical activity levels compared with other people of own age	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
Very physically active	12	12	13	22	19	14	22	25	19	19	20
Fairly physically active	51	64	60	58	57	62	56	49	55	54	56
Not very physically active	30	19	19	15	21	20	18	22	22	24	20
Not at all physically active	7	5	8	4	3	4	4	4	4	3	4
<i>Very or fairly physically active</i>	63	76	73	81	76	76	78	74	74	73	76
<i>Not very or not at all physically active</i>	37	24	27	19	24	24	22	26	26	27	24
<b>Standardised</b>											
Very physically active	12	12	13	23	19	14	22	26	20	19	20
Fairly physically active	50	64	61	58	57	62	56	48	55	54	56
Not very physically active	31	20	19	14	21	20	18	22	22	24	20
Not at all physically active	7	5	7	4	3	4	4	4	4	3	4
<i>Very or fairly physically active</i>	62	75	74	82	76	77	78	74	75	73	76
<i>Not very or not at all physically active</i>	38	25	26	18	24	23	22	26	25	27	24
<b>Women</b>											
<b>Observed</b>											
Very physically active	8	8	9	12	11	11	16	10	11	11	11
Fairly physically active	56	54	60	58	53	57	50	60	59	59	60
Not very physically active	31	30	26	28	27	26	27	28	25	25	25
Not at all physically active	5	8	5	3	8	5	7	1	5	5	4
<i>Very or fairly physically active</i>	64	61	69	69	65	68	66	70	71	70	71
<i>Not very or not at all physically active</i>	36	39	31	31	35	32	34	30	29	30	29
<b>Standardised</b>											
Very physically active	7	8	9	12	11	10	16	10	11	11	11
Fairly physically active	56	54	60	57	53	58	50	60	59	59	60
Not very physically active	32	30	26	28	28	26	27	29	25	25	25
Not at all physically active	5	8	5	3	8	5	7	1	5	5	4
<i>Very or fairly physically active</i>	63	62	68	69	64	68	66	70	71	70	71
<i>Not very or not at all physically active</i>	37	38	32	31	36	32	34	30	29	30	29
<b>Bases (unweighted)</b>											
Men	140	302	215	210	197	233	240	217	366	173	193
Women	155	383	310	264	269	280	307	262	453	225	228
<b>Bases (weighted)</b>											
Men	153	324	243	224	269	279	355	253	413	198	216
Women	129	354	294	224	269	278	355	257	418	207	211

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 4.7

**Perception of own physical activity levels (age-standardised), by equivalised household income and sex**

Aged 16-64

2007

Perception of own physical activity levels compared with other people of own age	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Men</b>					
Very physically active	18	19	19	13	18
Fairly physically active	57	61	56	59	50
Not very physically active	21	17	19	23	22
Not at all physically active	3	3	6	4	10
<i>Very or fairly physically active</i>	<i>76</i>	<i>80</i>	<i>75</i>	<i>72</i>	<i>68</i>
<i>Not very or not at all physically active</i>	<i>24</i>	<i>20</i>	<i>25</i>	<i>28</i>	<i>32</i>
<b>Women</b>					
Very physically active	14	8	9	8	12
Fairly physically active	60	62	55	55	50
Not very physically active	24	28	31	28	27
Not at all physically active	2	3	5	9	11
<i>Very or fairly physically active</i>	<i>74</i>	<i>70</i>	<i>64</i>	<i>63</i>	<i>63</i>
<i>Not very or not at all physically active</i>	<i>26</i>	<i>30</i>	<i>36</i>	<i>37</i>	<i>37</i>
<i>Bases (unweighted)</i>					
<i>Men</i>	<i>539</i>	<i>433</i>	<i>333</i>	<i>235</i>	<i>218</i>
<i>Women</i>	<i>550</i>	<i>486</i>	<i>396</i>	<i>354</i>	<i>384</i>
<i>Bases (weighted)</i>					
<i>Men</i>	<i>608</i>	<i>516</i>	<i>390</i>	<i>267</i>	<i>270</i>
<i>Women</i>	<i>524</i>	<i>477</i>	<i>380</i>	<i>316</i>	<i>367</i>

Table 4.8

**Perception of own physical activity levels (age-standardised), by sex and perception of whether participant did enough physical activity**
Aged 16-64, excluding those who reported that they are not at all physically active<sup>a</sup>

2007

Perception of own physical activity levels compared with other people of own age	Perception of whether participant did enough physical activity	
	Did enough %	Did not do enough %
<b>Men</b>		
Very physically active	40	5
Fairly physically active	55	63
Not very physically active	5	32
<b>Women</b>		
Very physically active	27	5
Fairly physically active	68	56
Not very physically active	5	39
<i>Bases (unweighted)</i>		
<i>Men</i>	<i>783</i>	<i>1204</i>
<i>Women</i>	<i>784</i>	<i>1700</i>
<i>Bases (weighted)</i>		
<i>Men</i>	<i>942</i>	<i>1416</i>
<i>Women</i>	<i>737</i>	<i>1653</i>

<sup>a</sup> The question 'Do you think you do enough physical activity, exercise or sport to keep as fit as you like?' was not asked of those who said they were 'not at all physically active' compared with other people their own age at an earlier question.

Table 4.9

**Proportion who would like to do more physical activity, by age and sex***Aged 16-64**2007*

Would like to do more physical activity	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Men</b>						
Yes	65	73	71	64	56	66
No	29	24	23	28	32	27
At the moment I am unable to	6	4	6	8	12	7
<b>Women</b>						
Yes	75	75	75	69	51	69
No	17	16	19	23	34	22
At the moment I am unable to	8	9	6	8	15	9
<i>Bases (unweighted)</i>						
Men	295	389	518	468	455	2125
Women	326	534	656	602	560	2678
<i>Bases (weighted)</i>						
Men	424	510	603	519	464	2520
Women	409	528	622	533	482	2574

Table 4.10

**Proportion who would like to do more physical activity (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16-64

2007

Would like to do more physical activity	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
Yes	65	73	63	69	65	68	60	64	68	70	66
No	26	19	29	24	30	26	33	30	26	27	25
At the moment I am unable to	9	7	8	7	5	7	7	6	6	4	9
<b>Standardised</b>											
Yes	65	74	63	68	65	68	59	64	67	69	66
No	26	19	29	25	30	25	33	30	26	27	25
At the moment I am unable to	9	7	8	7	5	6	8	6	7	4	9
<b>Women</b>											
<b>Observed</b>											
Yes	70	69	65	73	66	70	71	69	70	72	68
No	18	20	25	22	23	22	20	25	21	18	23
At the moment I am unable to	12	10	10	5	10	8	10	6	9	10	9
<b>Standardised</b>											
Yes	72	69	65	73	66	70	70	70	70	72	68
No	17	20	24	22	24	22	20	24	20	18	23
At the moment I am unable to	11	10	10	5	10	8	10	6	10	10	9
<b>Bases (unweighted)</b>											
Men	140	303	214	210	196	236	241	214	371	176	195
Women	156	382	308	263	268	282	304	262	453	226	227
<b>Bases (weighted)</b>											
Men	153	325	242	224	268	283	356	250	419	202	218
Women	130	353	292	224	268	280	352	257	418	208	210

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 4.11

**Proportion who would like to do more physical activity (age-standardised), by equivalised household income and sex**

Aged 16-64

2007

Would like to do more physical activity	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
Yes	74	68	63	63	56
No	20	27	29	28	31
At the moment I am unable to	6	4	9	9	12
<b>Women</b>					
Yes	77	75	70	66	59
No	16	18	19	24	28
At the moment I am unable to	6	7	10	10	12
<i>Bases (unweighted)</i>					
Men	542	435	331	233	221
Women	546	483	396	355	385
<i>Bases (weighted)</i>					
Men	613	518	388	265	274
Women	520	474	380	317	368



Table 4.12

**Expected participation in physical activity, exercise or sport in the future, by age and sex***Aged 16-64**2007*

Expected future participation	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Men</b>						
Would not like to do more exercise or physical activity than at the moment	29	24	23	29	32	27
Would like to do more exercise or physical activity than at the moment and...						
Expect to do more in the next year	54	60	55	40	33	49
Expect to do more, but not in next year	7	5	4	6	4	5
Unlikely ever to do more	5	5	10	15	19	11
Don't know whether likely to do more activity in future	5	5	8	11	11	8
<b>Women</b>						
Would not like to do more exercise or physical activity than at the moment	17	16	20	23	35	22
Would like to do more exercise or physical activity than at the moment and...						
Expect to do more in the next year	67	65	59	49	31	54
Expect to do more, but not in next year	5	5	4	3	4	4
Unlikely ever to do more	3	6	8	12	15	9
Don't know whether likely to do more activity in future	8	8	9	13	15	11
<i>Bases (unweighted)</i>						
<i>Men</i>	294	387	515	464	447	2107
<i>Women</i>	326	528	649	596	549	2648
<i>Bases (weighted)</i>						
<i>Men</i>	423	507	599	515	455	2499
<i>Women</i>	409	523	616	528	471	2547

Table 4.13

# **Barriers to doing more physical activity, exercise or sport, by age and sex**

Aged 16-64

2007

Barriers <sup>a</sup>	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Men</b>						
<b>What stops you from doing more than you do now</b>						
My work commitments	36	49	57	47	29	45
Don't have enough leisure time	35	43	45	39	24	38
Caring for children or older people	3	18	25	9	4	13
Don't have enough money	23	17	10	10	5	13
Poor health or physical limitations	4	4	7	14	21	10
Have no one to exercise with	16	10	5	8	5	8
Injuries which prevent me	5	6	8	12	11	8
No suitable places to do it in my area	10	7	4	3	2	5
Haven't got the right clothes or equipment	5	4	2	1	1	2
Don't need to do any more	19	15	16	16	21	17
<b>Other factors that apply</b>						
Not motivated to do more	21	23	23	22	17	21
Prefer to do other things	20	17	13	15	11	15
Not the sporty type	14	13	11	17	15	14
Worried about injury	4	4	6	7	5	5
Don't enjoy physical activity	5	7	4	7	2	5
Too shy or embarrassed	7	5	4	3	2	4
Too old	-	1	3	4	9	3
Too overweight	4	2	5	5	4	4
Think exercise is a waste of time	-	0	1	1	-	0
<b>Bases (unweighted)</b>						
Men	297	390	517	467	457	2128
<b>Bases (weighted)</b>						
Men	427	511	601	518	466	2522

<sup>a</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Continued...

Table 4.13 continued

Aged 16-64						2007
Barriers <sup>a</sup>	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Women</b>						
<b>What stops you from doing more than you do now</b>						
My work commitments	35	39	37	39	20	34
Don't have enough leisure time	44	42	42	35	19	37
Caring for children or older people	16	34	39	18	12	25
Don't have enough money	34	19	15	9	6	16
Poor health or physical limitations	4	11	10	15	23	13
Have no one to exercise with	22	9	9	8	5	10
Injuries which prevent me	4	5	5	8	8	6
No suitable places to do it in my area	13	4	4	2	2	5
Haven't got the right clothes or equipment	11	3	2	1	1	3
I don't need to do any more	5	8	11	14	20	12
<b>Other factors that apply</b>						
Not motivated to do more	36	27	26	22	16	25
Prefer to do other things	25	13	10	12	13	14
Not the sporty type	27	19	18	24	21	21
Worried about injury	4	4	6	7	5	5
Don't enjoy physical activity	9	7	8	9	8	8
Too shy or embarrassed	21	10	8	7	3	10
Too old	0	1	1	3	5	2
Too overweight	6	6	9	8	7	7
Think exercise is a waste of time	-	0	0	0	0	0
<b>Bases (unweighted)</b>						
Women	327	535	656	601	555	2674
<b>Bases (weighted)</b>						
Women	410	529	622	532	478	2571

<sup>a</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Table 4.14

**Barriers to doing more physical activity, exercise or sport (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16-64

2007

Barriers <sup>b</sup>	Government Office Region									Strategic Health Authority			
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central		
	%	%	%	%	%	%	%	%	%	%	%		
Men													
What stops you from doing more than you do now													
Observed													
My work commitments	42	46	42	49	43	39	46	45	46	46	45		
Don't have enough leisure time	31	41	32	42	43	37	39	33	38	38	38		
Caring for children or older people	12	12	11	11	15	12	14	16	13	13	12		
Don't have enough money	13	13	10	13	18	11	13	12	13	14	12		
Poor health or physical limitations	13	12	11	13	9	6	6	9	12	12	13		
Have no one to exercise with	12	10	6	9	10	8	5	5	11	15	7		
Injuries which prevent me	8	7	11	8	11	7	7	12	7	3	9		
No suitable places to do it in my area	3	5	4	6	9	2	6	4	5	8	3		
Haven't got the right clothes or equipment	4	2	1	1	2	1	4	2	4	6	1		
I don't need to do any more	14	14	16	18	18	20	21	15	17	17	16		
Standardised													
My work commitments	43	48	43	48	43	39	45	46	45	46	46		
Don't have enough leisure time	32	42	33	41	43	37	38	33	37	37	37		
Caring for children or older people	12	13	12	10	15	12	13	16	12	11	12		
Don't have enough money	13	13	10	14	19	11	12	13	13	14	12		
Poor health or physical limitations	13	11	10	13	9	6	6	9	12	12	12		
Have no one to exercise with	11	10	6	10	10	9	5	5	11	16	8		
Injuries which prevent me	9	7	11	8	11	7	7	12	6	3	9		
No suitable places to do it in my area	3	5	4	7	9	2	5	4	6	9	3		
Haven't got the right clothes or equipment	3	2	1	2	2	1	4	2	4	6	1		
I don't need to do any more	14	14	15	19	17	19	22	15	17	17	16		
Bases (unweighted)													
Men			139	302	217	210	197	238	239	215	371	176	195
Bases (weighted)													
Men	151	323	246	224	269	286	353	251	419	202	218		

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Continued...

Table 4.14

Table 4.14 continued

Aged 16-64

2007

Barriers <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Other factors that apply</b>											
<b>Observed</b>											
Not motivated to do more	25	20	22	20	20	21	18	23	23	28	19
Prefer to do other things	14	14	17	11	18	18	15	14	14	18	11
Not the sporty type	11	16	16	10	15	15	11	15	14	16	12
Worried about injury	8	5	4	4	6	4	5	7	5	3	7
Don't enjoy physical activity	7	3	5	6	7	4	5	4	4	5	4
Too shy or embarrassed	6	4	4	2	3	4	2	7	5	7	3
Too old	2	3	4	2	8	2	3	3	3	3	3
Too overweight	4	3	5	3	4	3	5	3	5	7	3
Think exercise is a waste of time	1	-	-	0	1	1	-	-	0	0	-
<b>Standardised</b>											
Not motivated to do more	25	20	22	20	20	23	18	24	24	30	20
Prefer to do other things	13	15	17	11	18	19	15	14	15	19	12
Not the sporty type	11	15	16	10	15	15	11	15	15	17	13
Worried about injury	8	5	4	4	6	4	5	7	5	3	6
Don't enjoy physical activity	6	3	5	6	7	4	5	4	4	5	4
Too shy or embarrassed	6	4	4	2	3	4	2	8	5	8	3
Too old	2	2	4	2	8	2	4	3	3	3	3
Too overweight	4	3	5	2	4	3	5	3	5	7	3
Think exercise is a waste of time	1	-	-	0	1	1	-	-	0	0	-
<b>Bases (unweighted)</b>											
Men	139	302	217	210	197	238	239	215	371	176	195
<b>Bases (weighted)</b>											
Men	151	323	246	224	269	286	353	251	419	202	218

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Continued...

Table 4.14 continued

Aged 16-64

2007

Barriers <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>What stops you from doing more than you do now</b>											
<b>Observed</b>											
My work commitments	42	46	42	49	43	39	46	45	46	31	35
Don't have enough leisure time	33	40	38	36	41	33	32	40	36	32	40
Caring for children or older people	24	26	24	22	31	21	27	23	25	25	24
Don't have enough money	15	18	16	19	16	10	17	18	16	16	17
Poor health or physical limitations	20	13	12	12	15	12	11	11	13	15	10
Have no one to exercise with	10	10	9	11	13	10	10	10	10	11	9
Injuries which prevent me	5	6	6	5	5	7	5	6	5	6	5
No suitable places to do it in my area	3	7	6	5	5	3	4	3	4	16	17
Haven't got the right clothes or equipment	5	5	1	2	5	2	3	2	3	3	4
I don't need to do any more	6	12	12	13	12	12	11	14	13	11	15
<b>Standardised</b>											
My work commitments	31	39	35	36	35	33	33	33	33	31	35
Don't have enough leisure time	34	40	39	36	41	34	32	40	36	32	39
Caring for children or older people	25	27	26	22	29	20	27	23	24	25	23
Don't have enough money	15	17	16	21	18	10	16	19	17	16	17
Poor health or physical limitations	19	13	12	11	15	12	11	11	13	15	10
Have no one to exercise with	10	10	9	12	14	11	10	10	10	12	9
Injuries which prevent me	5	6	6	6	5	6	5	6	5	6	5
No suitable places to do it in my area	3	7	6	5	6	3	4	3	4	4	4
Haven't got the right clothes or equipment	5	5	1	3	6	2	3	3	4	3	4
I don't need to do any more	6	12	12	13	12	12	11	13	13	11	15
<b>Bases (unweighted)</b>											
Women	156	382	307	261	266	281	307	263	451	227	224
<b>Bases (weighted)</b>											
Women	130	353	291	222	266	279	355	258	417	210	207

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Continued...

Table 4.14

Table 4.14 continued

Aged 16-64

2007

Barriers <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Other factors that apply</b>											
<b>Observed</b>											
Not motivated to do more	24	29	26	21	23	26	27	23	25	25	25
Prefer to do other things	18	14	11	12	14	17	15	14	14	15	13
Not the sporty type	22	24	20	23	20	26	21	19	18	17	20
Worried about injury	2	4	4	3	6	5	4	8	3	3	3
Don't enjoy physical activity	8	9	8	8	8	9	10	5	7	6	7
Too shy or embarrassed	9	10	7	8	11	11	10	11	9	10	8
Too old	3	3	1	1	3	2	3	1	2	2	1
Too overweight	11	8	5	7	7	8	7	6	7	8	6
Think exercise is a waste of time	-	1	-	-	0	1	1	-	-	-	-
<b>Standardised</b>											
Not motivated to do more	25	28	26	22	24	26	27	23	26	26	26
Prefer to do other things	19	14	11	14	15	18	15	15	14	15	13
Not the sporty type	22	24	20	24	20	27	21	19	18	17	20
Worried about injury	2	4	4	3	6	5	4	7	3	3	3
Don't enjoy physical activity	7	9	8	8	9	9	10	5	7	6	8
Too shy or embarrassed	10	9	7	9	13	11	9	12	9	10	9
Too old	2	3	1	1	3	2	3	1	2	2	1
Too overweight	11	8	5	7	8	8	7	6	7	8	6
Think exercise is a waste of time	-	1	-	-	0	1	1	-	-	-	-
<b>Bases (unweighted)</b>											
Women	156	382	307	261	266	281	307	263	451	227	224
<b>Bases (weighted)</b>											
Women	130	353	291	222	266	279	355	258	417	210	207

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Table 4.15

**Barriers to doing more physical activity, exercise or sport (age-standardised), by equivalised household income and sex**

Aged 16-64

2007

Barriers <sup>a</sup>	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Men</b>					
<b>What stops you from doing more than you do now</b>					
My work commitments	58	49	42	34	20
Don't have enough leisure time	44	41	37	30	25
Caring for children or older people	14	11	15	13	8
Don't have enough money	7	11	18	17	21
Poor health or physical limitations	5	8	9	16	24
Have no one to exercise with	7	9	8	9	5
Injuries which prevent me	6	7	9	13	15
No suitable places to do it in my area	5	5	5	7	4
Haven't got the right clothes or equipment	1	2	3	5	2
I don't need to do any more	14	17	20	16	18
<b>Other factors that apply</b>					
Not motivated to do more	22	21	21	25	18
Prefer to do other things	16	17	16	16	12
Not the sporty type	15	13	13	15	15
Worried about injury	4	6	5	7	8
Don't enjoy physical activity	6	4	4	7	4
Too shy or embarrassed	4	5	4	6	4
Too old	2	2	5	5	4
Too overweight	3	4	3	7	4
Think exercise is a waste of time	0	0	-	1	-
<i>Bases (unweighted)</i>					
<i>Men</i>	545	435	331	236	220
<i>Bases (weighted)</i>					
<i>Men</i>	616	518	387	269	272

<sup>a</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Continued...



Table 4.15 continued

Aged 16-64

2007

Barriers <sup>a</sup>	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Women</b>					
<b>What stops you from doing more than you do now</b>					
My work commitments	49	41	35	24	17
Don't have enough leisure time	45	46	40	33	19
Caring for children or older people	21	22	32	29	29
Don't have enough money	6	13	22	23	25
Poor health or physical limitations	9	12	10	17	19
Have no one to exercise with	6	7	13	14	13
Injuries which prevent me	6	4	3	7	6
No suitable places to do it in my area	2	5	6	5	6
Haven't got the right clothes or equipment	0	3	3	4	6
I don't need to do any more	9	10	11	11	16
<b>Other factors that apply</b>					
Not motivated to do more	24	24	27	27	18
Prefer to do other things	17	16	17	14	11
Not the sporty type	18	23	22	28	23
Worried about injury	4	3	4	4	5
Don't enjoy physical activity	7	9	9	8	8
Too shy or embarrassed	7	8	13	14	13
Too old	1	1	3	2	3
Too overweight	4	6	9	8	11
Think exercise is a waste of time	0	0	1	0	-
<b>Bases (unweighted)</b>					
Women	545	485	394	354	383
<b>Bases (weighted)</b>					
Women	520	477	378	316	366

<sup>a</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.

Table 4.16

### What would encourage adults to do more physical activity, exercise or sport, by age and sex

Aged 16-64

2007

Factors that would encourage more physical activity, exercise or sport <sup>a</sup>	Age group					Total
	16-24	25-34	35-44	45-54	55-64	
	%	%	%	%	%	%
<b>Men</b>						
More leisure time	40	51	51	41	26	42
Self-motivation	35	39	33	30	23	32
Own ill health	28	31	34	33	29	31
Advice from a doctor or a nurse	19	25	30	31	33	28
Having someone to do it with	32	23	18	16	12	20
Increased income	24	21	13	9	6	14
Advice from a family member	11	12	10	10	8	10
Family member's ill health	11	9	9	9	5	9
Having physical activity I am capable of	10	6	7	13	12	9
Clearer advice from the government	4	4	3	5	4	4
Don't need to do more	25	20	20	20	25	22
<b>Women</b>						
More leisure time	51	48	49	42	21	42
Self-motivation	51	43	38	35	23	38
Own ill health	33	25	28	34	27	29
Advice from a doctor or a nurse	20	18	22	29	24	23
Having someone to do it with	47	29	22	22	15	26
Increased income	28	20	14	11	7	15
Advice from a family member	15	6	7	6	4	8
Family member's ill health	13	9	9	10	4	9
Having physical activity I am capable of	18	11	12	17	13	14
Clearer advice from the government	3	3	2	3	1	2
Don't need to do more	8	12	14	16	26	15
<i>Bases (unweighted)</i>						
Men	296	384	516	464	454	2114
Women	324	529	652	595	548	2648
<i>Bases (weighted)</i>						
Men	425	502	600	514	463	2504
Women	407	521	619	527	472	2546

<sup>a</sup> Factors for both men and women are ranked according to the proportion of men that mentioned each.

# Adult diet and healthy eating

# 5

Joanne Thompson

## Summary

- Overall, 27% of men and 31% of women met the recommended guidelines of eating five or more portions of fruit and vegetables per day. Amongst all age groups, apart from those aged 64 and above, a higher proportion of women than men consumed five or more portions a day. The proportion meeting the guidelines was lowest among adults aged 16-24. The mean daily number of portions of fruit and vegetables was 3.6 for men and 3.9 for women.
- Fruit and vegetable consumption varied by Government Office Region. Consumption was lowest in the North East (17% of men, 23% of women had eaten five or more portions).
- Participants in the top two quintiles of equivalised income (those with the highest income) were significantly more likely to meet the recommended levels of fruit and vegetable consumption (34% for men and 36%-37% for women in the highest two quintiles), compared with those in the lowest two quintiles (20% for men in the lowest two quintiles and 23%-25% for women).
- Mean fat scores were higher among men than women, with a mean of 26.5 for men and 23.4 for women. There were fewer men than women with a low fat score (below 30), representing a fat intake of 83g or less (67% and 76% respectively).
- A higher proportion of men than women said that they added salt to their food at the table without tasting it first (18% compared with 13%). Overall, 63% of women and 58% of men reported that they rarely or never add salt to food.
- The majority of adults were able to identify an apple as a portion of fruit and vegetables from a list (89% of men and 91% of women). 14% of men and 11% of women were completely correct in identifying only the correct answer, but a further 76% of men and 80% of women were partially correct in selecting an apple and at least one other option.
- When asked about the recommended number of portions of fruit and vegetables that should be eaten every day, a higher proportion of women (78%) than men (62%) correctly stated five portions. The proportion accurately reporting five portions per day decreased as age increased amongst men; among women it increased between the ages of 16-24 and 35-44, and then decreased with age.
- The majority of participants believed their diet to be 'quite' healthy (71% for men and 72% for women). Women were more likely to consider that they had a 'very' healthy diet compared with men (19% and 16% respectively) and less likely to report their diet as being 'unhealthy' (8% of women and 12% of men). Overall, younger adults were less likely than older adults to report their diet was very healthy, and more likely to state that it was 'unhealthy'.
- The majority of men and women agreed with the statements 'Healthy foods are enjoyable' (66% of men and 80% of women) and 'I really care about what I eat' (64% of men and 74% women). Few agreed, and most disagreed, that 'Healthy eating is just

another fad' (68% of men and 73% of women disagreed). More women than men agreed with the first two, and more women than men disagreed with the third.

- More men than women agreed with the statements 'I get confused over what's supposed to be healthy and what isn't' (30% compared with 24% for women) and 'If you do enough exercise you can eat whatever you like' (20% compared with 14%). The only statement for which there was no significant difference between men and women was 'The tastiest foods are the ones that are bad for you' (35% of both men and women agreed).
- There was a significant difference in attitudes to healthy eating between those who believed their diet to be healthy or unhealthy. More of those who thought their diet was healthy agreed that 'healthy foods are enjoyable' and 'I really care about what I eat'. More of those who considered their diet unhealthy agreed that 'the tastiest foods are the ones that are bad for you' and 'I get confused over what is supposed to be healthy and what isn't'.
- Participants who felt that they would benefit from making changes to their diet (80% of men and 77% of women) were asked about any barriers that would prevent making improvements to the way they eat. The most common barriers were 'I don't have enough time' (28% of men and 29% of women), 'It is hard to change my eating habits' (29% of men and 28% of women) followed by 'It costs too much' (22% of men and 21% of women).

## 5.1 Introduction

This chapter examines a number of aspects regarding diet together with key measures of participants' knowledge of and attitudes towards healthy eating. The first part of this chapter focuses on the consumption of fruit and vegetables, consumption of salt and fat intake amongst adults aged 16 and over. The second part focuses on knowledge and attitudes towards healthy eating amongst the same age group. The inclusion of questions about knowledge and attitudes in the 2007 survey provides an opportunity to link knowledge about, and attitudes towards food to actual behaviour, such as fruit and vegetable intake.

The nation's diet and associated health outcomes have been the subject of important government focus for some time. The government consultation into issues concerning healthy eating (2004) resulted in a food and health action plan and also highlighted the need for the population to have sufficient information and knowledge to make informed choices regarding their diet.<sup>1</sup> The subsequent government white paper *'Choosing a better diet: a food and health action plan'*, identified a number of priorities for action surrounding health and nutrition, and to contribute to a reduction in cardiovascular disease, cancer and obesity, through encouraging the population to adopt a healthy lifestyle.<sup>2</sup>

There is a clear link between unhealthy diet and poor health across the world, with a poor diet and lack of nutrition being attributed as a significant cause of ill health.<sup>3</sup> Recent analysis by the Cabinet Office's Strategy Unit as part of a broader project focusing on UK food policy<sup>4</sup> found that not only does a poor diet have many health risks, but it also contributes to one in 10 premature deaths. Obesity is linked to an increased risk of developing heart disease and cancer and it is asserted that an improvement in diet could save 70,000 lives a year.<sup>4</sup> Reducing obesity and improving diet and nutrition was one of the key priorities in the government's 2004 white paper *'Choosing Health: making healthy choices easier'*.<sup>5</sup>

It is not only the social costs of a poor diet that have been increasing in recent times, but also the economic costs.<sup>4</sup> The annual financial burden on the NHS from treating conditions resulting from a poor diet has been estimated to be at least £2 billion, and it is anticipated that this figure will rise to £3.6 billion by 2010.<sup>6</sup>

In highlighting the importance of a healthy diet, a number of nutritional priorities have been set by the government. These include providing guidance about consumption of fruit and vegetables, reducing average salt intake to 6 grams and intake of saturated fat to 11% of food energy.<sup>1</sup> It is recognised that the intake of fat, salt and sugar is higher than recommended levels among a significant proportion of the population, and the consumption of fruit and vegetables is lower. It is acknowledged that this poor nutrition is a major contributory factor to ill health and premature death in England.<sup>2</sup>

There have been clear government initiatives to highlight the benefit of eating a diet high in fruit and vegetables. The Department of Health's '5 A DAY' campaign aims to raise awareness about the health benefits of eating at least five portions (400g) of a variety of fruit and vegetables per day.<sup>7</sup> The programme also provides information about what constitutes a portion and foods which count towards '5 A DAY'.<sup>1</sup> The benefits of a diet high in fruit and vegetables are well documented and have been found to lower the risk of developing a number of health conditions including chronic diseases such as obesity, diabetes, cancer and cardiovascular disease.<sup>3</sup>

The government guidelines for the consumption of salt are that adults should eat no more than 6g of salt a day, and the current target is to achieve this level by 2010.<sup>8</sup> Salt intake amongst men and women has been found to be above the government guidelines,<sup>9</sup> and although salt intake amongst men and women has decreased slightly over the last five years there is much progress to be made to meet the target by 2010.<sup>10</sup> There are a number of health conditions, such as high blood pressure and, in turn an increased risk of developing heart disease and stroke, which are linked to a diet with a high salt intake, highlighting the need to reduce average consumption levels.<sup>8</sup> A report by the Food Standard's Agency found that three-quarters of salt in the diet comes from consumption of processed food.<sup>8</sup>

Saturated fat intake amongst the general population has been found to be higher (13.3%) than the public health recommendation of 11% of food energy.<sup>1</sup> The government has highlighted that balancing energy intake and energy expenditure is key to reducing the prevalence of obesity, and that reducing the energy intake of total fat among the population remains a priority.<sup>1</sup>

This chapter also contains findings from knowledge and attitude questions which were asked as part of the self completion questionnaire administered during the individual interview. There have been relatively few studies which have examined people's attitudes to healthy eating and very few which have compared perceived dietary behaviour with measures of dietary behaviour amongst the same population.<sup>11,12</sup> Findings from other countries, such as the USA, have shown a link between people's awareness and knowledge and their propensity to change their diet.<sup>1</sup>

However, findings from the UK have shown that there is still some confusion around amounts and recommended types of food to consume. Although it has been found that there is a general awareness about what constitutes a healthy diet, there is less certainty about what this means in practice. For example, fruit and vegetable intake has been found to be below the recommended level, especially amongst men, and this has been linked to health related nutritional knowledge as one possible explanation.<sup>13</sup>

The 2003 Food Standards Agency (FSA) Consumer Attitudes Survey<sup>14</sup> found that only 59% of respondents knew that the recommendation for fruit and vegetables was to eat at least five portions a day. Furthermore, findings from a 2004 Consumers' Association survey found that the majority of respondents were uncertain about the maximum daily recommended amount of fat, sugar and salt that should be consumed.<sup>15</sup>

This chapter presents results from the 2007 survey. Trend data on key HSE measures, including fruit and vegetable consumption, are available in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre website.<sup>16</sup>

## 5.2 Methods and definitions

### 5.2.1 Fruit and vegetable consumption

Questions about fruit and vegetable consumption have been included as part of HSE since 2001 and form part of the individual interview conducted by CAPI (computer assisted personal interviewing). All respondents aged 5 and above are asked about their intake of fruit and vegetables. The questions are designed to examine fruit and vegetable consumption in terms of the '5 A DAY' programme.

The questions in this section focused on participants' consumption of fruit and vegetables on the day before the interview, which is defined as the 24 hours from midnight to midnight. This time period is selected to ensure that variations in the participants' work patterns and times of meals do not affect the average measure of daily consumption.

### 5.2.2 Portion size

Fruit and vegetable consumption is measured in portions per day. Using the '5 A DAY' guidelines, five portions are defined as 400g per day, with an average portion being an 80g serving. An assortment of foodstuffs constitute a portion, including vegetables (fresh, frozen and tinned), vegetables in composite dishes, salads, pulses, fruit (fresh, frozen, tinned and dried), fruit in composites and fruit juice.

To make it easier for participants to report their fruit and vegetable consumption, portion size was converted into everyday household measures. Examples were given in the questionnaire to aid the recall process. For example, participants were asked to report how many tablespoons of vegetables, cereal bowls full of salad, pieces of medium fruit (such as apples), or handfuls of very small fruit (such as berries) they had eaten in the previous 24 hours. The table below shows the portion sizes for the different food items included in the analysis.

Table 5A

Food item	Portion size
Vegetables (fresh, raw, tinned and frozen)	3 tablespoons
Pulses	3 tablespoons
Salad	1 cereal bowl
Vegetables in composites e.g. vegetable curry	3 tablespoons
Very large fruit e.g. melon	1 average slice
Large fruit e.g. grapefruit	Half a fruit
Medium fruit e.g. apples	1 fruit
Small fruit e.g. plums	2 fruits
Very small fruit and berries	1 average handful
Dried fruit	1 tablespoon
Frozen fruit/tinned fruit	3 tablespoons
Fruit in composites e.g. stewed fruit	3 tablespoons
Fruit juice	1 small glass (150ml)

The '5 A DAY' policy clearly advises which food items count towards the recommendation; these guidelines were incorporated within questions asked of participants. For example, questions about vegetable consumption specified the exclusion of potatoes, pasta or rice. Additionally, the consumption of fruit juice, pulses and dried fruit were each counted as one portion, regardless of how much had been consumed in a given day. Eating a variety of fruit and vegetable sources provides a range of vitamins, minerals and fibre essential in the diet.

### 5.2.3 Interpretation of data

The fruit and vegetable consumption module is based on self-reported information which is collected during a 24-hour recall period. Every attempt has been made to ensure that participants report an accurate picture of consumption levels by identifying portions using everyday measures. However, it should be noted that there may be variations in the way that questions are interpreted by participants, for example when assessing the amount of fruit contained in composite foods such as apple pie. In addition, evidence has indicated that participants may intentionally over-report their consumption to indicate socially desirable behaviour.<sup>17</sup> Nevertheless, survey estimates can still provide useful comparisons of consumption patterns of the population.

Within specific groups, mean consumption may also be increased by a small number of participants eating a large amount of fruit and vegetables. Median consumption is also shown, where appropriate, to give an indication of the mid-range value as an alternative measure that is not influenced by extreme values.

### 5.2.4 Dietary recommendations for fat intake

Participants' total fat intake has been measured as part of the Health Survey for England since 1998. As in each year of HSE, it was assessed through a number of questionnaire items adopted from the Dietary Instrument for Nutrition Education (DINE),<sup>18</sup> devised by Imperial Cancer Research Fund's General Practice Research Group. The DINE questionnaire is a weighted food frequency questionnaire designed to assess fat intake (among other measures).

The DINE questions were asked of participants aged 16 and over in the form of a self-completion booklet administered during the nurse visit, which is consistent with previous years of HSE (see Volume 2, Methodology and Documentation, Appendix A). The questionnaire items provide information about the frequency of consumption of a range of foodstuffs including white meat, red meat, fried foods, cheese, cakes and snacks, spreads and cooking fats, and the type and amount of milk consumed.

Fat scores have been derived based on the frequency of consumption of these foods and the fat content of a standard portion. The DINE instrument does not provide an estimate of



daily food energy intake as recommended by the Government's Committee on Medical Aspects of Food and Nutrition Policy (COMA).<sup>19</sup> Dietary fat has been classified as total fat intake rather than percentage of energy. Therefore, the percentage of energy contributed by fat cannot be calculated and direct comparisons cannot be made with COMA recommendations.

Total fat intake, as calculated from the DINE questionnaire, was given a score and grouped into three categories: low intake (less than 30), medium intake (30-40) and high intake (more than 40).<sup>18</sup> These groupings use the criteria that a low fat score, of less than 30, represents the consumption of an average of 83g, or less, of fat per day, a medium fat score, of 30-40, represents a fat intake of 84 to 122g per day, and a high fat score, of more than 40, represents a fat intake greater than 122g per day.<sup>18</sup> These groupings are based on the recommendation that fat intake makes up 35% of total energy,<sup>19</sup> together with the Recommended Dietary Allowances (RDA) for energy for moderately active adults.

The data are shown for the intake of total fat (including saturated fatty acids), and mean fat scores are presented, based on the consumption of certain foods.

5.2.5 Salt intake

The 2007 HSE included a measure of participants' salt intake and knowledge surrounding salt consumption guidelines. As part of the face-to-face CAPI interview, questions were asked about salt used during cooking and patterns of salt use at mealtimes. In addition, as part of the self-completion booklet, participants were asked about their knowledge of salt intake guidelines; whether they had heard of the guidelines and what they believed the official guidelines for maximum daily salt intake to be.

5.2.6 Attitudes towards healthy eating

A range of measures about knowledge of and attitudes towards healthy eating were introduced in the 2007 survey and collected by self completion as part of the individual interview.

These questions collected information relating to participants' knowledge and attitudes on a range of areas about healthy eating. Participants' were asked about what constitutes one 'portion' of fruit and vegetables from a list of varying portion sizes of fruit and vegetables (see Table 5B below). The correct answer is the portion which comprises an 80g serving in line with government guidelines. The participants have been categorised into 3 groupings; completely correct, where they selected only the correct option (one apple), partially correct, where the correct option and other items were selected and incorrect where the correct option was not chosen.

Table 5B	
Food item	Answer
2 cherry tomatoes	Incorrect
1 apple	Correct
1 melon	Incorrect
4 grapes	Incorrect
1 jacket potato	Incorrect
2 tablespoons of carrots	Incorrect

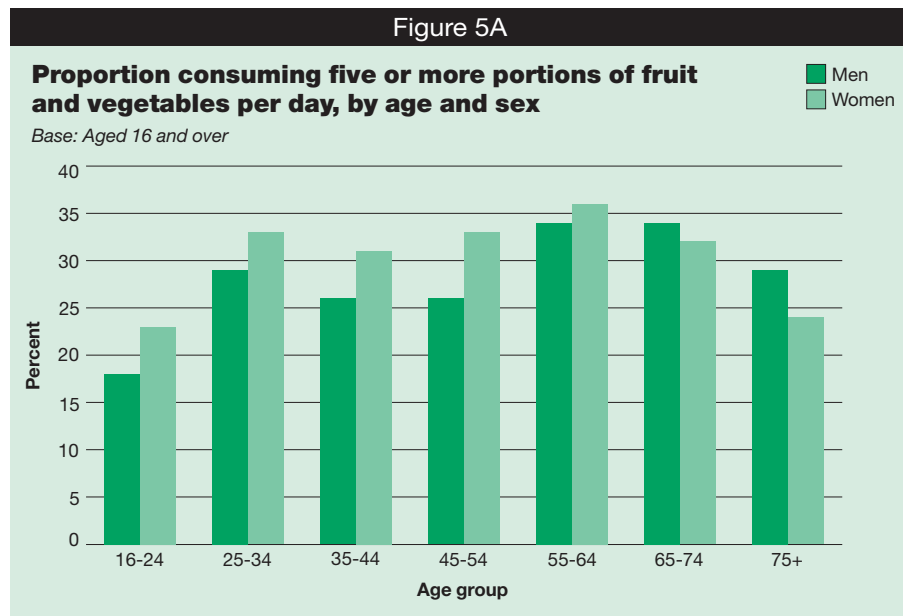
Participants' knowledge about the number of portions of fruit and vegetables people should eat per day was also ascertained. Further questions focussed on attitudes to healthy eating, where participants were asked for their level of agreement to six attitude statements<sup>20</sup> and were asked to assess how healthy they regard their diet to be. Adults were also asked about barriers that stopped them from eating more healthily, amongst other questions.



## 5.3 Eating patterns

### 5.3.1 Portions of fruit and vegetables consumed

Figure 5A shows the proportion of participants who consumed five or more portions of fruit and vegetables a day, in line with government guidelines. More women than men met the recommendations (31% and 27% respectively). The proportion meeting the guidelines was lowest among adults aged 16-24, was higher among those aged 25-54 rising to a peak among older men and women; levels dropped among the oldest age group.



The mean daily number of portions of fruit and vegetables was 3.6 for men and 3.9 for women. This varied by age, with consumption lowest amongst participants aged 16-24 for both men (2.9) and women (3.2). Mean consumption of fruit and vegetables was highest amongst those aged 55-74 (4.2-4.3) and a broadly similar pattern was observed for both sexes.

Overall, 93% of men and 95% of women had eaten any fruit or vegetables in the previous day. 69% of men and 76% of women reported consuming fresh, frozen or tinned fruit or fruit in composites in the previous 24 hours, and 69% of men and 77% of women had consumed raw, tinned or frozen vegetables and vegetables in composites or salad over the same time period. Younger participants were less likely to report eating most types of fruit and vegetables than older participants, with the exception of pulses and salad, where there was little age difference, and fruit juice, which was mentioned more by younger than older adults. The main source of fruit and vegetables eaten in the previous day, reported by men and women, was fresh fruit (63% of men and 70% of women), and fresh, raw, tinned and frozen vegetables (55% of men and 61% of women).

Tables 5.1, 5.2, Figure 5A

### 5.3.2 Fruit and vegetable consumption by Government Office Region

Fruit and vegetable consumption varied by Government Office Region amongst men and women. Consumption was lowest in the North East (17% among men, 23% among women had eaten five or more portions).

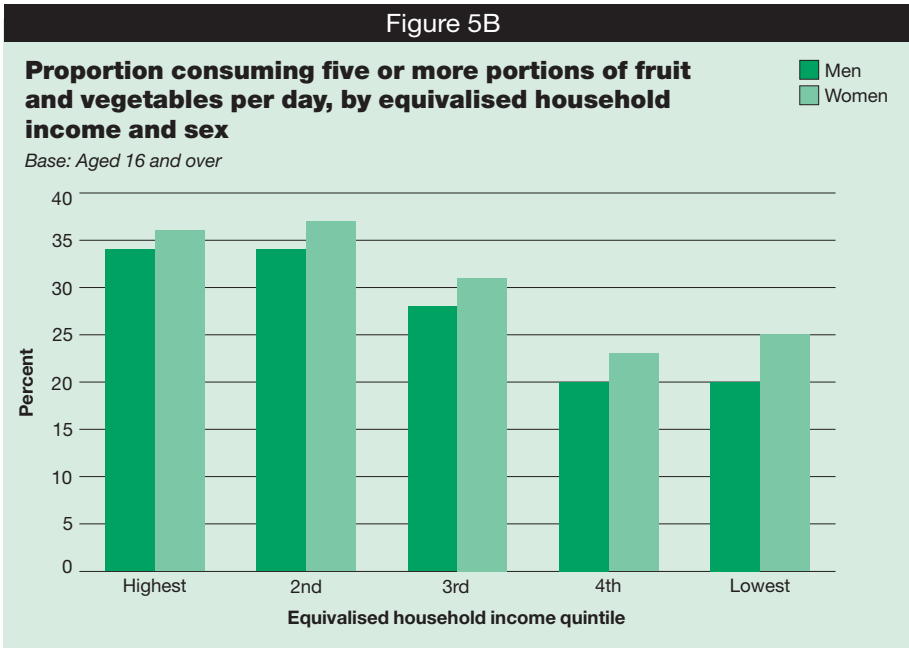
Table 5.3

### 5.3.3 Fruit and vegetable consumption by equivalised household income

A pattern was evident between equivalised household income and fruit and vegetable consumption, with an increase in the proportion of those who consumed five or more portions a day between lower and higher household income groups. More participants in the highest two quintiles met the recommended levels of fruit and vegetable consumption (34% for men and 36%-37% for women) compared with those in the lowest two quintiles

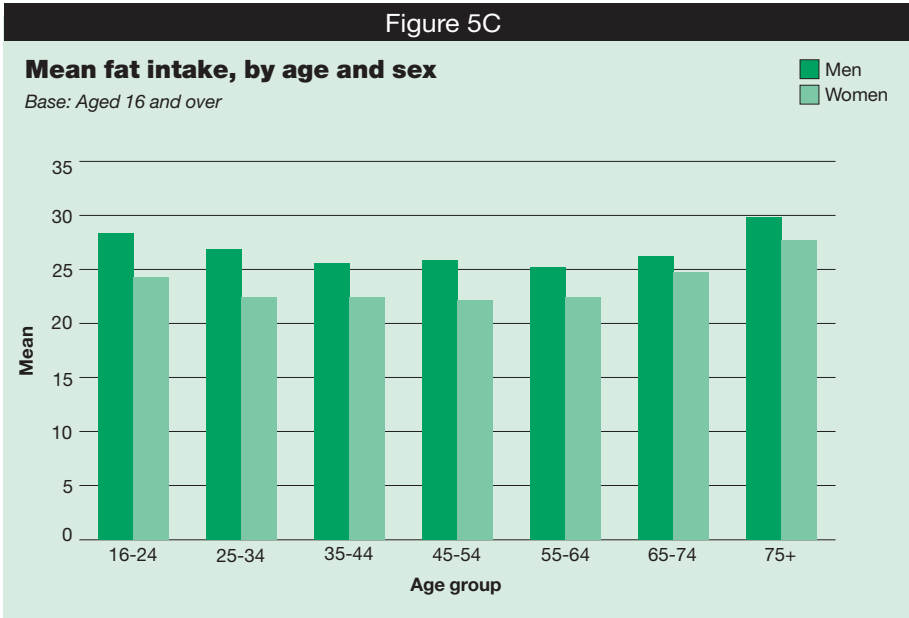
(20% for men and 23%-25% for women) . Mean consumption ranged between 4.1 for men and 4.2-4.3 for women in the highest two quintiles to 3.0 for men and 3.4 for women in the lowest two quintiles.

Table 5.4, Figure 5B



5.3.4 Mean fat score by age and sex

Figure 5C shows mean fat scores by age and sex. Mean fat scores were higher amongst men than women, with a mean of 26.5 for men and 23.4 for women. There were fewer men than women with a low fat score (below 30), representing a fat intake of 83g or less (67% and 76% respectively).



There was a similar pattern with age among men and women: those in the youngest and oldest age groups had higher mean fat scores than those in the middle age groups (mean fat scores were 28.4 among men aged 16-24, 29.9 among those aged 75 and over; the equivalent figures for women were 24.3 and 27.7).

Table 5.5

5.3.5 Salt added at table by age and sex

Adults were asked about the nature of their salt usage; whether they add salt to food without tasting it first, taste food but generally add salt, taste food and occasionally add

salt, or rarely or never add salt to food. This question does not take into account the fact that up to three quarters of adults' salt intake may come from processed food,<sup>9</sup> and therefore the fact that adults did not add salt frequently at the table may not be an indication of a low salt diet. Nevertheless, the question provides an indication of those who may have higher levels of salt consumption.

A higher proportion of men than women said that they added salt to their food without tasting it first (18% compared with 13%). Overall, 63% of women and 58% of men reported that they rarely or never add salt to food.

**Table 5.6**

## 5.4 Knowledge and attitudes

### 5.4.1 Knowledge of recommended fruit and vegetable consumption and portion size

To establish awareness of what constitutes a portion of fruit or vegetables, adults were asked, as part of the self-completion questionnaire, which of a number of quantities of fruit and vegetables constituted one portion (see section 5.2.6 for full explanation). Table 5C below summarises the proportions identifying each item as a portion.

Table 5C			
Quantity of fruit or vegetable	Answer	Men %	Women %
2 cherry tomatoes	Incorrect	30	30
1 apple	Correct	89	91
1 melon	Incorrect	34	33
4 grapes	Incorrect	25	31
1 jacket potato	Incorrect	52	52
2 tablespoons of carrots	Incorrect	59	71
<i>Base:</i>			
<i>Weighted</i>		3068	3275
<i>Unweighted</i>		2795	3530

The majority of participants were partially correct in identifying which fruit and vegetables constituted a portion by selecting 'one apple' and at least one other quantity of food; this was the case for 76% of men and 80% of women. Men were more likely than women correctly to identify only 'one apple', with a difference of three percentage points (14% of men and 11% of women were completely correct).

'One apple' was most commonly (and correctly) reported by both men and women (89% of men and 91% of women) as a quantity of fruit or vegetables which comprises one portion. 59% of men and 71% of women identified two tablespoons of carrots (two thirds of a portion).

Just over half identified a jacket potato as a portion; while this is around the correct quantity, potatoes are not included within the '5 A DAY' recommendations since they count as starchy foods.

There was an association between giving a completely correct answer and age, with those aged 16-24 being more likely than older age groups to select only the option 'one apple'.

**Table 5.7**

Participants were asked to state the number of portions of fruit and vegetables that should be eaten every day. A higher proportion of women (78%) than men (62%) correctly stated that five portions of fruit and vegetables should be consumed per day. The proportion accurately reporting five portions per day was highest in the younger age groups and decreased as age increased, to 41% of men and 52% of women among those aged 75 and over.

There was also a pattern in the opposite direction for participants who said they did not know how many portions should be eaten daily, with the proportion increasing as age increased (9% of men and 7% of women aged 16-24 compared with 30% of men and 23% of women aged 75 and over).

Table 5.8, Figure 5D



### 5.4.2 Knowledge of guidelines for salt intake

Participants were asked whether they were aware of guidelines for salt intake, and if so what they thought the official guideline was for maximum daily salt intake.

Around a quarter of adults said that they were aware of the guidelines (25% of men, 26% of women), but only a minority were aware that the recommendation was for a maximum of 6g (7% of men, 10% of women). There was no significant variation in reported salt usage at the table by whether participants could correctly report the government guidelines for salt intake.

Table 5.9

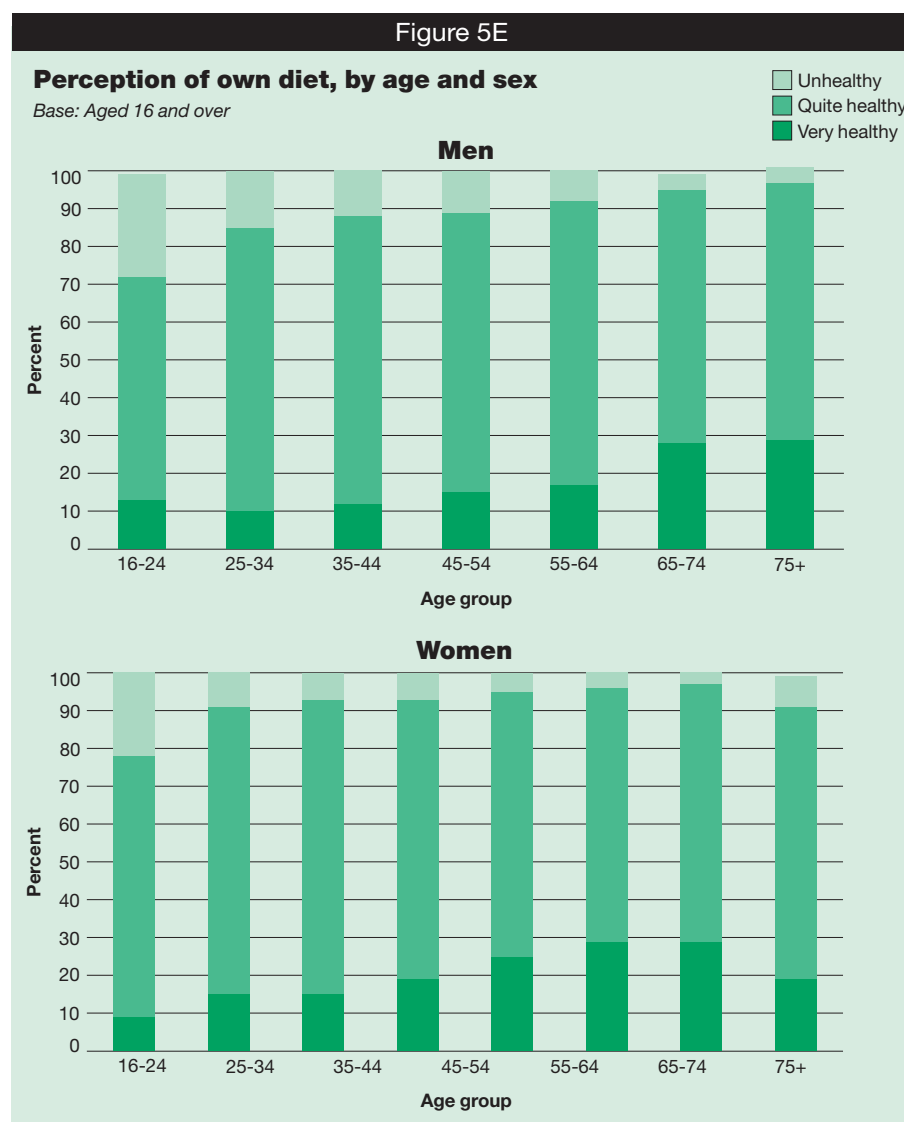
### 5.4.3 Perceptions of own diet

A question was asked about how healthy participants believed their diet to be, using a four point scale ranging from very healthy to very unhealthy. In analyses the 'not very healthy' and 'very unhealthy' categories have been combined since very few regarded their diet as 'very unhealthy' (1% of men and fewer than 1% of women).

The majority of participants believed their diet to be 'quite' healthy (71% for men and 72% for women). Women were more likely to consider that they had a 'very' healthy diet

compared with men (19% and 16% respectively) and less likely to report their diet as being 'unhealthy' (8% of women and 12% of men). Overall, younger adults were less likely than older adults to report their diet was very healthy, and more likely to state that it was 'unhealthy'.

Table 5.10, Figure 5E



Participants who did not say that they ate 'very healthily' were asked whether they would like to eat more healthily in the future, and if so they were asked about the likelihood of eating more healthily by selecting one of three statements<sup>21</sup> that applied to them. 16% of men and 20% of women said that they ate very healthily, and a further 32% of men and 25% of women did not say that they would like to eat more healthily in the future. This left just over half of adults (52% of men, 55% of women) who had stated that they would like to eat more healthily and were asked about their future intentions. The majority of these adults reported that they expected to eat more healthily in the next year (40% of women, 34% of men).

There was a clear pattern by age. As age increased, there was an increasing proportion who already regarded their diet as very healthy, and among those who did not, there was an increasing proportion who did not feel that they would like to eat more healthily. There were correspondingly much larger proportions of younger adults than older adults who reported their intention of eating a more healthy diet in the next year (more than 40% of men and more than 50% of women aged 16-44, compared with 17% of men and 21% of women aged 65-74, and 7% of men and 11% of women aged 75 and over).

Table 5.11

5.4.4 Attitudes towards healthy eating

Participants were asked how much they agreed or disagreed with six statements about healthy eating which were presented in the self-completion element of the interviewer visit. A summary of the levels of agreement (strongly agree and agree) for men and women are given in Figure 5F.

The majority of men and women agreed with the statements ‘Healthy foods are enjoyable’ (66% of men and 80% of women) and ‘I really care about what I eat’ (64% of men and 74% women). Few agreed, and most disagreed that ‘Healthy eating is just another fad’. 10% of men and 8% of women agreed and 68% of men and 73% of women disagreed with this statement.

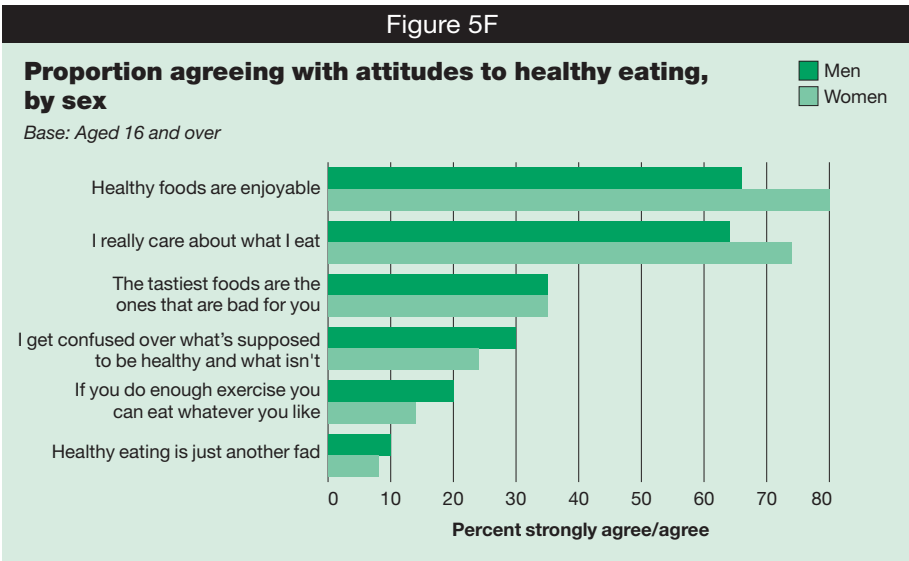
Significant differences were found between men and women for most of the attitude statements. Women were more likely than men to agree that ‘healthy foods are enjoyable’ and ‘I really care about what I eat’.

Conversely, more men agreed (and fewer disagreed) with the statement ‘I get confused over what’s supposed to be healthy and what isn’t’ (30% agreed compared with 24% for women). Similarly, a higher proportion of men than women agreed that ‘If you do enough exercise you can eat whatever you like’ (20% compared with 14%) and that ‘Healthy eating is just another fad’ (10% compared with 8% for women).

The only statement for which there was no significant difference between men and women was ‘The tastiest foods are the ones that are bad for you’.

Looking at the pattern of agreement and disagreement with statements overall between men and women, it appears that women were more likely to agree strongly with statements and less likely to give a neutral response (‘don’t know’, or ‘can’t choose’), compared with men.

Table 5.12, Figure 5F



Attitudes to healthy eating varied by age of participant. A smaller proportion of younger adults than older adults agreed with the statement ‘I really care about what I eat’: 47% of men and 55% of women aged 16-24 agreed with this, compared with 77% of men and 82% of women aged 75 and over. Similarly, older adults were more likely to endorse the statement ‘I get confused over what’s supposed to be healthy and what isn’t’, with 20% of men and 19% of women aged 16-24 agreeing with this statement compared with 46% of men and 37% of women aged 75 and over. Those aged 65 and over were also the most likely to agree that ‘Healthy eating is just another fad’.

For the statement ‘If you do enough exercise you can eat whatever you like’, levels of agreement were similar across all age groups for women, but among men those in the youngest and oldest age groups were the most likely to agree (28% aged 16-24, 29% aged 75 and over, compared with 15%-23% in other age groups).

Table 5.13

#### 5.4.5 Attitudes to healthy eating by Government Office Region

There were no significant variations in attitudes by Government Office Region. **Table 5.14**

#### 5.4.6 Attitudes to healthy eating by equivalised household income

Attitudes to healthy eating were similar across the quintiles of equivalised household income for the statements 'Healthy foods are enjoyable' and 'I really care about what I eat'. Among both men and women, levels of agreement increased from highest to lowest income quintile for 'I get confused over what's supposed to be healthy and what isn't', 'If you do enough exercise you can eat whatever you like' and 'Healthy eating is just another fad'.

**Table 5.15**

#### 5.4.7 Attitudes towards healthy eating by perception of own diet

Participants' attitudes to healthy eating were examined in relation to their perception of their diet, in terms of whether they regarded it to be healthy (either very or quite healthy) or unhealthy (not very healthy or very unhealthy). A summary of the levels of agreement by perception of diet are given in Table 5D.

Table 5D		
Percent strongly agree/ agree	Perception of own diet	
	Healthy	Unhealthy
	%	%
<b>Men</b>		
Healthy foods are enjoyable	70	41
I really care about what I eat	69	24
The tastiest foods are the ones that are bad for you	32	52
I get confused over what's supposed to be healthy and what isn't	29	43
If you do enough exercise you can eat whatever you like	20	27
Healthy eating is just another fad	10	17
<b>Women</b>		
Healthy foods are enjoyable	82	55
I really care about what I eat	78	33
The tastiest foods are the ones that are bad for you	33	56
I get confused over what's supposed to be healthy and what isn't	23	39
If you do enough exercise you can eat whatever you like	14	13
Healthy eating is just another fad	8	16

There was a significant difference in the proportion of those who agreed with each statement between those who believed their diet to be healthy or unhealthy. A much higher proportion of those who perceived their diet to be healthy believed that 'healthy foods are enjoyable' compared with those who thought they ate unhealthily (70% of men and 82% of women who thought their diet healthy, compared with 41% of men and 55% of women who thought their diet unhealthy). Those who perceived their diet to be healthy were also more likely to agree with the statement 'I really care about what I eat' (69% of men and 78% of women who perceived their diet to be healthy, compared with 24% of men and 33% of women who perceived they have unhealthy diets).

For some of the statements, there was a higher level of agreement among participants who considered their diets unhealthy rather than healthy. A higher proportion of those who perceived their diet to be unhealthy (52% of men and 56% of women) agreed that 'The tastiest foods are the ones that are bad for you' compared with those who thought they ate healthily (32% of men and 33% of women). This relationship was also observed for the

statement 'I get confused over what's supposed to be healthy and what isn't' and 'Healthy eating is just another fad'.

Among men, those who regarded their diet as unhealthy were significantly more likely than those who regarded their diet as healthy to agree with the statement 'If you do enough exercise you can eat whatever you like'. However, there was no similar pattern among women.

Table 5.16

#### 5.4.8 Factors that prevent improvements in diet

Participants who felt that they would benefit from making changes to their diet (80% of men and 77% of women) were asked about any barriers that would stop them from making improvements to the way they eat. The most common reasons which would prevent changes were 'I don't have enough time' (28% of men and 29% of women), 'It is hard to change my eating habits' (29% of men and 28% of women) followed by 'It costs too much' (22% of men and 21% of women). Men and women had very similar views; however results varied by age group.

The proportion identifying 'I don't have enough time' as a barrier was higher among younger participants aged up to 44. This was especially notable amongst those aged 25-34 (43% of men and 40% of women), compared with those aged 55-64 (15% for both men and women). A similar pattern was observed for the statement 'It costs too much', with 32% of men and 30% of women aged 16-24 agreeing with this as a barrier, compared with 17% of men and 9% of women aged 75 and over.

Table 5.17

#### 5.4.9 Perceptions of diet and actual diet

The 2007 HSE questionnaire collected information about participants' actual diet (fruit and vegetable consumption, fat intake) as well as including attitude questions such as perception of how healthy they regard their diet to be. This provides the opportunity to compare how participants perceive their diet with their actual behaviour.

There was a strong association between adults' perception of their diet and their consumption of fruit and vegetables, with the proportion eating five or more portions of fruit and vegetables per day highest amongst those who regarded their diet as healthy and lowest amongst those who regarded their diet as unhealthy. The mean number of fruit and vegetables consumed met the recommended government guidelines amongst participants who judged their diet to be very healthy (4.9 for men and 5.0 for women). The mean was lower for those who regarded their diet to be 'quite' healthy (3.6 amongst men and 3.8 amongst women) and lowest for those who felt their diet to be unhealthy (2.2 for both men and women).

In line with this finding, a pattern in the opposite direction was evident amongst participants who had not consumed any fruit or vegetables in the past 24 hours. The proportion who had consumed no fruit or vegetables was lowest amongst participants who judged their diet to be healthy and highest amongst those judging their diets unhealthy. 3% of men and 2% of women who perceived their diet to be very healthy had consumed no fruit and vegetables in the previous 24 hours compared with 14% of men and 17% of women who felt they had unhealthy diets.

Table 5.18, 5E

There was also a strong association between fat intake and how healthy participants regarded their diet to be, with the mean fat score increasing as the perception that the diet was healthy decreased. The mean fat score amongst those who felt they had very healthy diets was lowest at 23.9 for men and 20.8 for women. This compares with a mean fat score of 29.0 among men and 26.1 among women who judged their diet to be unhealthy.

Table 5.19

#### 5.4.10 Logistic regression for perception of own diet in relation to risk factors

This chapter examines the link between perception of participant's own diet and possible risk factors in a logistic regression model developed separately for men and women. The dependent variable was perception of own diet, taken as healthy (very healthy and quite healthy combined) versus unhealthy (not very healthy and very unhealthy combined).



Table 5E			
Fruit and vegetable consumption per day, by perceptions of own diet and sex			
Portions per day	Very healthy	Quite healthy	Unhealthy
	%	%	%
<b>Men</b>			
None	3	6	14
5 or more portions	47	27	10
<b>Women</b>			
None	2	4	17
5 or more portions	48	29	11

The regression technique adjusts for several explanatory variables simultaneously. The initial models included a number of socio-demographic variables: age, quintile of equivalised household income and Government Office Region (GOR). Other independent variables of interest were included in the models in order to look at associations between the perception of being healthy and health and lifestyle factors. These were: how active the participant perceived themselves to be, fruit and vegetable consumption, BMI (body mass index), fat score and awareness and knowledge of guidelines for salt intake. The level of agreement to the following six attitude statements was also included in the models: the tastiest foods are the ones that are bad for you, healthy foods are enjoyable, I get confused over what's supposed to be healthy and what isn't, I really care about what I eat, healthy eating is just another fad and if you do enough exercise you can eat whatever you like.

Initial iterations identified variables with no significant link to the outcomes of interest and these were excluded from the final regression models.<sup>22</sup> Ten independent variables were included in the final model for men and women.

The risk factors indicate associations, not causes. These variations in risk are expressed as odds ratios, the degree to which the probability of the key outcome increases or decreases relative to the reference category. Odds ratios greater than one indicate higher odds of being in the highest risk category, and odds ratios less than one indicate lower odds. The 95% confidence intervals are shown, and where the interval does not include one, this category is significantly different from the reference category.

Table 5.20 presents a model of the risk factors associated with perception of own diet; the odds ratios presented are after adjustment for the other risk factors. Although the model was run separately for men and women, factors of significance in the model for one sex were included in both models.

### Age

Perception of having a healthy diet was linked to age. Compared to the youngest adult age group (16-24) amongst both men and women, the odds of perceiving diet as healthy were higher amongst all other age groups. For men, the odds were highest amongst the 45-54 age group and for women, amongst the 55-64 and 75 and over age groups.

### Income

Perception of diet was associated with equivalised household income amongst men only.

Men in fourth lowest income group had decreased odds of perceiving their diet to be healthy compared to those in top two income quintiles.

### BMI

Compared to women of a normal weight, women who were obese had lower odds of perceiving their diet to be healthy.

### Perceptions of physical activity

For both men and women, perceiving their diet as healthy was strongly related to their

perception of how physically active they were. Men who considered themselves to be fairly active, or not very/not at all physically active, and women who considered themselves not very/not at all active, had reduced odds of perceiving their diet as healthy, compared with those who felt they were very active.

### **Consumption of fruit and vegetables**

There was a strong relationship between perception of diet and fruit and vegetable intake. The odds of perceiving their diet as healthy declined as the number of portions of fruit and vegetables consumed reduced. Compared with those who consumed 5 or more portions, men and women who consumed 3 to 4 portions and 2 portions or less had reduced odds of perceiving their diet as healthy.

### **Knowledge of guidelines for salt intake**

Perception of diet was associated with knowledge of guidelines for salt intake amongst men only. For men, those who were not aware that there are salt guidelines had lower odds of perceiving their diet as healthy, compared with those who correctly knew the guidelines.

### **Attitude statements**

The models also included various attitude statements relating to diet and health. Amongst both men and women, disagreement with the statement 'The tastiest foods are the ones that are bad for you' was linked to increased odds of perceiving their diet as healthy. A similar pattern was found for the attitude statements 'Healthy foods are enjoyable' and 'I really care about what I eat' where for both men and women, those who disagreed with the attitude statements had lower odds of perceiving their diet to be healthy. For women disagreement with the statement 'Healthy eating is just another fad' was associated with an increased likelihood of perceiving their diet to be healthy, as opposed to unhealthy.

Table 5.20

## **5.5 Discussion**

27% of men and 31% of women reported that their fruit and vegetable intake was in line with the recommended government levels, eating five or more portions per day. Fruit and vegetable consumption varied by age, with a higher proportion of the older population eating five or more portions a day, compared with younger age groups. There were also differences by household income, with participants in higher income households being more likely to eat five or more portions per day. Knowledge about the number of portions that should be consumed was relatively high amongst men and women overall, with 62% of men and 78% of women correctly identifying that five portions should be consumed per day. Those in younger age groups were more likely correctly to identify what constitutes a portion of fruit or vegetables, when asked to select from a variety of quantities. This indicates that awareness of the 5-A-DAY campaign is relatively high amongst certain age groups, especially amongst younger age groups. However, this is not necessarily translated directly into dietary behaviour, with fruit and vegetable consumption lowest among those aged 16-24.

Overall, the majority of participants believed their diet to be 'quite' healthy (71% of men and 72% of women). Comparing perceptions of diet by actual dietary behaviour (namely the number of portions of fruit and vegetables consumed per day and fat intake), there was a strong association between participants' perception of their diet and their consumption, suggesting that most were making a relatively accurate assessment of their diet. This supports findings from other studies that the way in which people perceive the healthiness of their diet is often quite accurate.<sup>11</sup> Perceptions of diet were also strongly associated with attitudes to healthy eating.

Most adults agreed that 'Healthy foods are enjoyable' and that 'I really care about what I eat', and most disagreed that 'Healthy eating is just a fad'. The main barriers to making improvements to diet were reported as being lack of time, cost incurred and difficulty in

making changes. Time and cost were reported more often by younger age groups but were not significantly different between men and women.

Significant differences in knowledge and attitudes were found between men and women, and between age and income groups. Different messages are likely to be appropriate to provide information about and encouragement to adopt healthy lifestyles.

There are indications that women were more knowledgeable about some aspects of healthy eating, and their attitudes suggested that they were more concerned about the healthiness of their diets. This may to some extent reflect women's traditional role in assuming the main responsibility for buying and preparing food for a family or household unit. Women were more likely than men to be following good dietary practice in terms of fruit and vegetable consumption, fat intake and adding salt to their food. More women than men were aware of fruit and vegetable guidelines (though they were no more likely to identify a correct portion size). More women than men perceived their diet to be very healthy, and among those who did not, more said that they intended to improve their diet within the next year. Women were more likely than men to agree that 'Healthy foods are enjoyable' and that 'I really care about what I eat', and less likely to agree that 'I get confused over what's supposed to be healthy and what isn't'.

Comparison across age groups shows that those at the extremes of the age range had distinctive behaviour and attitudes. Those in the youngest and oldest groups were the least likely to eat five portions of fruit and vegetables a day, and younger and older men and women tended to have a relatively high fat intake. Perhaps recognising this, younger adults were the most likely to say that their diet was not healthy, although it is notable that those in the oldest groups were the most likely to feel that their diet was very healthy. Older adults were more likely than younger adults to feel that they did not need to change their diet, whereas younger adults were more likely to state that they intended to improve their diet in the next year. There are indications that knowledge about healthy eating was greater among younger adults, with awareness of the recommended number of portions of fruit and vegetables increasing with age; the younger group was least likely to agree that they are often confused about what is healthy. The youngest group was also least likely to agree that they really care about what they eat.

There were some important differences according to quintile of equivalised income. As in previous years, fruit and vegetable consumption was lower in the lower income quintiles than in the higher quintiles. Those in the lower income quintiles were more likely than those in the highest quintile to agree that 'I get confused over what's supposed to be healthy and what isn't', 'If you do enough exercise you can eat whatever you like' and 'Healthy eating is just another fad'. There was a similar pattern among women, but not men, for 'The tastiest foods are the ones that are bad for you'.

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- 20 The attitude statements were:
  - Healthy foods are enjoyable
  - I really care about what I eat
  - The tastiest foods are the ones that are bad for you
  - I get confused over what's supposed to be healthy and what isn't
  - If you do enough exercise you can eat whatever you like
  - Healthy eating is just another fad.
- 21 The three statements were:
  - I'm unlikely ever to eat more healthily
  - I expect to eat more healthily within the next year
  - I expect to eat more healthily but not in the next year.
- 22 There were some variables included in the initial models that were not significant for men or women and were therefore excluded from the final models; Government Office Region and the attitude statements 'I get confused over what's supposed to be healthy and what isn't' and 'if you do enough exercise you can eat whatever you like'.

- |      |  |      |  |
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Table 5.1

**Daily fruit and vegetable consumption, by age and sex***Aged 16 and over**2007*

Portions per day	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
None	10	10	7	7	4	4	4	7
Less than 1 portion	2	3	3	3	2	1	3	2
1 portion or more but less than 2	19	18	17	15	11	13	13	16
2 portions or more but less than 3	21	18	17	20	17	16	19	18
3 portions or more but less than 4	18	12	14	16	17	18	15	16
4 portions or more but less than 5	12	10	15	12	14	16	17	13
5 portions or more	18	29	26	26	34	34	29	27
Mean	2.9	3.6	3.6	3.6	4.0	4.2	3.8	3.6
Standard error of the mean	0.15	0.16	0.12	0.12	0.12	0.14	0.12	0.06
Median	2.7	3.0	3.0	3.0	3.8	3.7	3.7	3.2
<b>Women</b>								
None	9	5	7	3	2	4	3	5
Less than 1 portion	1	3	3	3	1	2	6	3
1 portion or more but less than 2	21	14	11	10	14	11	14	13
2 portions or more but less than 3	18	15	18	18	13	15	20	17
3 portions or more but less than 4	15	17	17	15	17	19	18	17
4 portions or more but less than 5	13	14	14	17	18	16	16	15
5 portions or more	23	33	31	33	36	32	24	31
Mean	3.2	4.0	4.0	4.1	4.3	4.0	3.5	3.9
Standard error of the mean	0.13	0.12	0.12	0.11	0.11	0.10	0.11	0.05
Median	3.0	3.7	3.5	3.8	4.0	3.8	3.2	3.5
<i>Base (unweighted)</i>								
Men	356	426	569	504	493	421	300	3069
Women	386	575	706	636	605	494	407	3809
<i>Base (weighted)</i>								
Men	514	558	664	559	505	337	247	3383
Women	487	568	671	564	521	373	366	3550

Table 5.2

**Types of fruit and vegetable consumed daily, by age and sex**

<i>Aged 16 and over</i>								2007
Types of fruit and vegetables consumed	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Any fruit and vegetables	90	90	93	93	96	96	96	93
Any vegetables and salads (excludes pulses)	57	66	68	69	76	76	76	69
Any vegetables (excludes salad and pulses)	49	55	57	57	64	63	69	58
Any fruit (includes fruit juice)	76	76	76	77	83	88	88	79
Any fruit (excludes fruit juice)	58	61	66	68	76	82	82	69
Vegetables (fresh, raw, tinned and frozen)	47	52	53	53	62	61	66	55
Pulses	35	35	30	36	36	41	37	35
Salad	26	27	33	32	30	30	27	30
Vegetables in composites	7	8	7	7	6	5	5	7
Fresh fruit	54	57	60	62	70	74	70	63
Fruit in composites	5	4	7	7	10	12	19	8
Dried fruit	3	8	10	10	13	17	18	10
Frozen/tinned fruit	2	2	2	4	5	9	10	4
Fruit juice	50	50	44	40	40	41	43	44
<b>Women</b>								
Any fruit and vegetables	91	95	93	97	98	96	97	95
Any vegetables and salads (excludes pulses)	63	77	76	80	82	80	79	77
Any vegetables (excludes salad and pulses)	53	63	63	63	69	65	70	63
Any fruit (includes fruit juice)	80	82	81	87	89	90	89	85
Any fruit (excludes fruit juice)	64	72	75	78	82	84	82	76
Vegetables (fresh, raw, tinned and frozen)	52	59	60	60	66	63	67	61
Pulses	33	35	33	32	36	35	31	34
Salad	31	37	39	42	38	36	28	36
Vegetables in composites	6	11	8	7	6	5	5	7
Fresh fruit	58	67	70	74	77	77	73	70
Fruit in composites	4	4	5	6	10	11	13	7
Dried fruit	8	12	14	14	17	21	15	14
Frozen/tinned fruit	2	4	4	4	4	7	11	5
Fruit juice	58	50	43	43	42	43	43	46
<i>Base (unweighted)</i>								
Men	356	426	569	504	493	421	300	3069
Women	386	575	706	636	604	494	406	3807
<i>Base (weighted)</i>								
Men	514	558	664	559	505	337	247	3383
Women	487	568	671	564	520	373	365	3548

Table 5.3

**Daily fruit and vegetable consumption (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Portions per day	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
None	9	7	10	6	7	7	7	6	5	6	4
Less than 1 portion	1	3	2	2	3	2	2	2	4	6	1
1 portion or more but less than 2	17	15	18	18	19	13	13	16	14	15	14
2 portions or more but less than 3	25	21	17	17	18	19	15	16	20	16	24
3 portions or more but less than 4	14	13	15	15	16	14	15	18	19	20	18
4 portions or more but less than 5	18	13	15	15	14	12	13	13	11	11	11
5 portions or more	16	27	23	27	22	32	35	29	27	27	28
Mean	3.1	3.6	3.3	3.7	3.4	3.9	4.0	3.7	3.6	3.6	3.6
Standard error of the mean	0.15	0.11	0.23	0.15	0.15	0.20	0.20	0.13	0.12	0.14	0.13
Median	2.7	3.0	3.0	3.3	3.0	3.3	3.7	3.2	3.0	3.0	3.0
<b>Standardised</b>											
None	9	7	11	6	7	8	6	7	5	5	4
Less than 1 portion	1	3	2	2	4	2	2	2	4	6	1
1 portion or more but less than 2	16	16	18	18	19	13	13	16	14	15	14
2 portions or more but less than 3	24	21	17	18	18	20	15	15	19	16	23
3 portions or more but less than 4	15	13	14	14	16	14	15	18	19	21	18
4 portions or more but less than 5	18	14	15	15	14	12	13	13	11	10	12
5 portions or more	17	27	23	27	22	32	36	29	27	27	28
Mean	3.2	3.6	3.3	3.6	3.4	3.8	4.0	3.7	3.6	3.6	3.7
Standard error of the mean	0.15	0.12	0.24	0.15	0.16	0.21	0.19	0.13	0.12	0.19	0.14
Median	2.9	3.0	3.0	3.1	3.0	3.3	3.7	3.2	3.0	3.0	3.0
<b>Base (unweighted)</b>											
Men	187	447	332	293	293	346	339	317	515	256	259
<b>Base (weighted)</b>											
Men	191	450	345	291	358	384	467	345	552	277	276

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Continued...



Table 5.3 continued

Aged 16 and over

2007

Portions per day	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
Women											
Observed											
None	5	5	6	3	5	6	4	6	4	2	6
Less than 1 portion	2	4	2	3	3	2	3	3	3	3	3
1 portion or more but less than 2	18	12	18	14	14	12	11	14	11	10	12
2 portions or more but less than 3	21	18	17	18	22	14	12	16	15	18	13
3 portions or more but less than 4	19	17	13	14	16	15	20	13	20	17	24
4 portions or more but less than 5	12	13	16	16	14	18	16	11	18	16	20
5 portions or more	22	31	27	32	26	33	36	36	29	34	23
Mean	3.4	3.9	3.5	4.0	3.6	4.1	4.4	4.0	3.9	4.1	3.6
Standard error of the mean	0.20	0.11	0.13	0.17	0.15	0.11	0.17	0.16	0.10	0.14	0.13
Median	3.0	3.3	3.3	3.7	3.0	4.0	4.0	3.7	3.7	4.0	3.3
Standardised											
None	5	5	6	3	6	7	4	7	4	2	6
Less than 1 portion	2	4	2	3	3	2	3	3	3	3	3
1 portion or more but less than 2	18	12	18	15	14	13	11	14	11	10	12
2 portions or more but less than 3	21	17	17	17	22	14	12	15	15	18	13
3 portions or more but less than 4	19	17	13	14	16	15	20	13	20	16	24
4 portions or more but less than 5	11	13	16	16	14	18	15	11	18	16	20
5 portions or more	23	32	28	32	25	32	35	36	29	35	22
Mean	3.5	4.0	3.5	3.9	3.5	4.0	4.3	4.0	3.9	4.1	3.6
Standard error of the mean	0.21	0.11	0.14	0.17	0.14	0.12	0.16	0.17	0.11	0.15	0.13
Median	3.0	3.4	3.3	3.7	3.0	3.8	4.0	3.7	3.7	4.0	3.3
Base (unweighted)											
Women	226	568	414	365	383	413	430	377	633	322	311
Base (weighted)											
Women	185	512	380	303	370	394	483	357	566	288	279

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 5.4

**Daily fruit and vegetable consumption (age-standardised), by equivalised household income and sex**

Aged 16 and over

2007

Portions per day	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
None	4	5	7	8	14
Less than 1 portion	3	3	1	3	1
1 portion or more but less than 2	11	11	16	25	21
2 portions or more but less than 3	17	19	16	18	18
3 portions or more but less than 4	16	13	19	16	14
4 portions or more but less than 5	15	15	14	9	12
5 portions or more	34	34	28	20	20
Mean	4.1	4.1	3.6	3.0	3.0
Standard error of the mean	0.10	0.15	0.13	0.14	0.16
Median	3.8	3.7	3.3	2.5	2.3
<b>Women</b>					
None	3	3	4	7	10
Less than 1 portion	1	2	2	4	3
1 portion or more but less than 2	12	12	13	16	16
2 portions or more but less than 3	15	14	17	20	19
3 portions or more but less than 4	18	13	20	17	16
4 portions or more but less than 5	16	19	14	13	11
5 portions or more	36	37	31	23	25
Mean	4.2	4.3	4.0	3.4	3.4
Standard error of the mean	0.11	0.12	0.11	0.12	0.12
Median	4.0	4.0	3.5	3.0	3.0
<i>Base (unweighted)</i>					
Men	627	526	460	462	344
Women	627	565	546	659	532
<i>Base (weighted)</i>					
Men	691	603	502	464	390
Women	593	547	504	571	498

Table 5.5

**Fat intake, by age and sex***Aged 16 and over**2007*

Fat intake and mean fat score	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
% Low fat (under 30) <sup>a</sup>	58	70	72	68	69	68	52	67
% Medium fat (30-40)	29	18	21	23	24	21	32	23
% High fat (Over 40)	13	12	7	9	7	11	16	10
Mean fat score	28.4	26.9	25.6	25.9	25.2	26.2	29.9	26.5
Standard error of the mean	0.74	0.94	0.47	0.62	0.56	0.69	0.80	0.26
<b>Women</b>								
% Low fat (under 30)	76	78	79	81	79	68	61	76
% Medium fat (30-40)	18	18	16	16	16	22	27	18
% High fat (Over 40)	7	3	5	3	5	10	12	6
Mean fat score	24.3	22.4	22.5	22.2	22.4	24.8	27.7	23.4
Standard error of the mean	0.62	0.45	0.43	0.45	0.52	0.59	0.64	0.20
<i>Bases (unweighted)</i>								
<i>Men</i>	224	276	402	369	349	304	200	2124
<i>Women</i>	243	394	504	446	411	361	252	2611
<i>Bases (weighted)</i>								
<i>Men</i>	319	350	462	408	356	242	164	2301
<i>Women</i>	303	387	473	395	352	273	226	2409

<sup>a</sup> Low fat is a score of under 30 on the DINE questionnaire, which is the equivalent to 83g of fat or less.

Medium fat is a score of 30-40 on the DINE questionnaire, which is the equivalent to 84-122g of fat.

High fat is a score of over 40 on the DINE questionnaire, which is the equivalent to over 122g of fat.

Table 5.6

**Salt added at table, by age and sex***Aged 16 and over*

2007

Salt added at table	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Add salt to food without tasting it first	17	13	16	19	19	23	24	18
Taste food but generally add salt	6	9	8	6	7	8	10	8
Taste food and occasionally add salt	17	16	19	17	17	13	14	17
Rarely, or never add salt to food	60	61	56	58	56	56	52	58
<b>Women</b>								
Add salt to food without tasting it first	15	9	15	13	12	15	15	13
Taste food but generally add salt	8	7	9	8	7	8	6	8
Taste food and occasionally add salt	14	17	15	17	19	16	15	16
Rarely, or never add salt to food	63	66	61	62	62	60	64	63
<i>Bases (unweighted)</i>								
Men	357	426	569	504	493	421	300	3070
Women	387	575	705	636	604	494	407	3808
<i>Bases (weighted)</i>								
Men	515	558	664	559	505	337	247	3384
Women	488	568	670	564	520	373	366	3549

Table 5.7

**Knowledge of what constitutes one portion of fruit or vegetables, by age and sex**

Aged 16 and over

2007

Knowledge of portion size <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Incorrect	8	11	10	10	11	12	18	11
Partially correct	70	75	78	78	74	77	74	76
Completely correct	22	14	12	12	15	10	8	14
<b>Women</b>								
Incorrect	10	8	7	7	9	10	15	9
Partially correct	69	82	83	83	83	84	76	80
Completely correct	20	10	10	10	9	6	9	11
<i>Base (unweighted)</i>								
Men	309	391	519	468	456	392	260	2795
Women	344	534	658	607	573	467	347	3530
<i>Base (weighted)</i>								
Men	443	513	602	518	465	313	213	3068
Women	430	529	624	536	493	352	311	3275

<sup>a</sup> The list of fruit and vegetables shown to participants comprised:

2 cherry tomatoes

1 apple

1 melon

4 grapes

1 jacket potato and

2 tablespoons of carrots.

The correct answer is 1 apple. Participants were classified as 'incorrect' if they did not specify the correct answer; 'partially correct' if they specified the correct answer and other answers; and 'completely correct' if they only specified the correct answer.

Table 5.8

**Knowledge of the recommended daily number of portions of fruit and vegetables, by age and sex**

Aged 16 and over

2007

Number of portions	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
None	0	-	-	-	-	-	-	0
One portion	2	1	3	3	4	2	3	2
Two portions	4	6	5	6	4	5	8	5
Three portions	6	7	6	5	6	8	5	6
Four portions	5	5	5	9	8	10	8	7
Five portions	69	66	69	63	58	51	41	62
More than five portions	4	3	3	3	4	4	5	4
Don't know	9	11	9	10	16	20	30	13
Mean	4.7	4.6	4.6	4.5	4.6	4.5	4.3	4.6
Standard error of the mean	0.07	0.06	0.05	0.06	0.07	0.07	0.10	0.03
Median	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
<b>Women</b>								
None	-	-	-	-	-	-	-	-
One portion	1	1	1	1	2	1	2	1
Two portions	3	2	2	3	3	3	6	3
Three portions	5	4	3	4	5	4	7	4
Four portions	3	2	2	4	5	6	7	4
Five portions	79	81	87	82	75	73	52	78
More than five portions	2	3	2	2	5	3	3	3
Don't know	7	6	3	5	6	12	23	8
Mean	4.8	4.8	4.9	4.8	4.8	4.8	4.4	4.8
Standard error of the mean	0.06	0.04	0.03	0.03	0.04	0.04	0.07	0.02
Median	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
<i>Base (unweighted)</i>								
Men	314	389	528	472	464	395	268	2830
Women	345	538	656	605	577	468	357	3546
<i>Base (weighted)</i>								
Men	449	511	614	523	472	316	220	3105
Women	431	532	622	534	496	353	320	3288

Table 5.9

**Salt added at table (age-standardised),  
by knowledge of guidelines for salt  
intake and sex**

Aged 16 and over

2007

Salt added at table	Knowledge of guidelines	
	Yes	No
	%	%
<b>Men</b>		
Add salt to food without tasting it first	14	17
Taste food but generally add salt	6	8
Taste food and occasionally add salt	21	19
Rarely, or never add salt to food	59	56
<b>Women</b>		
Add salt to food without tasting it first	11	13
Taste food but generally add salt	6	6
Taste food and occasionally add salt	15	19
Rarely, or never add salt to food	68	62
<i>Bases (unweighted)</i>		
<i>Men</i>	223	537
<i>Women</i>	363	638
<i>Bases (weighted)</i>		
<i>Men</i>	250	590
<i>Women</i>	342	589

Table 5.10

**Perception of own diet, by age and sex***Aged 16 and over*

2007

What you usually eat is...	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Very healthy	13	10	12	15	17	28	29	16
Quite healthy	59	75	76	74	75	67	68	71
Not very healthy	26	14	11	10	7	4	3	12
Very unhealthy	1	1	0	1	1	0	0	1
<i>Very healthy/ quite healthy</i>	73	85	88	89	92	96	96	88
<i>Not very healthy/ very unhealthy</i>	27	15	12	11	8	4	4	12
<b>Women</b>								
Very healthy	9	15	15	19	25	29	29	19
Quite healthy	69	76	78	74	70	67	68	72
Not very healthy	20	9	7	7	5	4	3	8
Very unhealthy	2	0	0	1	0	0	0	0
<i>Very healthy/ quite healthy</i>	78	91	93	93	95	96	97	92
<i>Not very healthy/ very unhealthy</i>	22	9	7	7	5	4	3	8
<i>Base (unweighted)</i>								
<i>Men</i>	312	392	525	470	458	395	270	2822
<i>Women</i>	342	537	651	607	573	469	356	3535
<i>Base (weighted)</i>								
<i>Men</i>	447	513	611	521	467	316	222	3096
<i>Women</i>	428	532	617	537	493	354	320	3280



Table 5.11

**Perception of diet and likelihood of eating more healthily, by age and sex***Aged 16 and over**2007*

Likelihood of eating more healthily	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Perceive own diet to be very healthy	14	10	12	16	18	29	30	16
Do not see need to eat more healthily <sup>a</sup>	23	26	30	33	34	40	48	32
Would like to eat more healthily <sup>b</sup> and...								
Unlikely ever to eat more healthily	7	6	7	8	11	9	9	8
Expect to eat more healthily within the next year	43	46	41	32	28	17	7	34
Expect to eat more healthily, but not in next year	7	4	4	4	2	1	0	4
Don't know when	6	8	7	6	7	4	6	7
<b>Women</b>								
Perceive own diet to be very healthy	10	16	15	20	26	30	29	20
Do not see need to eat more healthily <sup>a</sup>	19	18	21	20	28	34	48	25
Would like to eat more healthily <sup>b</sup> and...								
Unlikely ever to eat more healthily	4	5	5	8	8	8	7	6
Expect to eat more healthily within the next year	56	54	50	43	30	21	11	40
Expect to eat more healthily, but not in next year	6	3	1	2	2	1	0	2
Don't know when	5	5	8	7	7	6	5	6
<i>Base (unweighted)</i>								
<i>Men</i>	173	216	270	204	181	105	43	1192
<i>Women</i>	222	318	356	316	218	138	62	1630
<i>Base (weighted)</i>								
<i>Men</i>	247	281	313	224	185	84	35	1368
<i>Women</i>	277	317	336	279	188	104	55	1555

<sup>a</sup> This category includes those who perceived their own diet to be 'quite healthy/not very healthy/very unhealthy' but at the subsequent question did not say that they would like to eat more healthily; those who perceived their diet to be very healthy were not asked whether they would like to eat more healthily.

<sup>b</sup> This category includes those who perceived their own diet to be 'quite healthy/not very healthy/very unhealthy' and said that they would like to eat more healthily at the subsequent question.

Table 5.12

**Attitudes to healthy eating, summary of agreement and disagreement, by sex***Aged 16 and over<sup>a</sup>**2007*

Attitudes to healthy eating <sup>b</sup>	Strongly agree	Agree	Neither <sup>c</sup>	Disagree	Strongly disagree	Total agree	Total disagree
	%	%	%	%	%	%	%
<b>Men</b>							
Healthy foods are enjoyable	15	51	27	6	1	66	7
I really care about what I eat	18	46	25	9	2	64	11
The tastiest foods are the ones that are bad for you	9	26	34	24	6	35	30
I get confused over what's supposed to be healthy and what isn't	4	26	27	33	9	30	42
If you do enough exercise you can eat whatever you like	4	16	22	50	8	20	57
Healthy eating is just another fad	2	8	22	48	20	10	68
<b>Women</b>							
Healthy foods are enjoyable	25	55	16	3	0	80	4
I really care about what I eat	25	49	18	6	2	74	8
The tastiest foods are the ones that are bad for you	10	25	31	29	5	35	34
I get confused over what's supposed to be healthy and what isn't	4	20	24	40	11	24	51
If you do enough exercise you can eat whatever you like	3	11	21	55	9	14	65
Healthy eating is just another fad	2	6	18	49	24	8	73

<sup>a</sup> Bases for the first statement are:

Unweighted: Men 2814 Women 3534

Weighted: Men 3086 Women 3279

Bases for other statements vary but are of similar size.

<sup>b</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.<sup>c</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

Table 5.13

**Proportion agreeing with attitudes to healthy eating, by age and sex***Aged 16 and over*

2007

Attitudes to healthy eating: % strongly agree/agree <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Healthy foods are enjoyable	61	70	67	64	67	66	68	66
I really care about what I eat	47	58	64	63	71	79	77	64
The tastiest foods are the ones that are bad for you	38	38	34	32	34	38	32	35
I get confused over what's supposed to be healthy and what isn't	20	27	25	30	34	46	46	30
If you do enough exercise you can eat whatever you like	28	19	16	23	15	17	29	20
Healthy eating is just another fad	13	7	7	9	9	17	18	10
<b>Women</b>								
Healthy foods are enjoyable	73	81	84	82	81	78	79	80
I really care about what I eat	55	72	75	73	81	82	82	74
The tastiest foods are the ones that are bad for you	51	37	32	28	30	37	31	35
I get confused over what's supposed to be healthy and what isn't	19	17	19	22	28	38	37	24
If you do enough exercise you can eat whatever you like	19	14	11	11	12	17	17	14
Healthy eating is just another fad	7	6	5	6	10	14	17	8
<i>Base (unweighted)</i>								
Men	310	391	525	469	452	395	268	2810
Women	343	540	648	600	567	464	345	3507
<i>Base (weighted)</i>								
Men	443	512	611	519	461	316	220	3081
Women	429	534	614	530	488	350	310	3255

<sup>a</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.

Table 5.14

**Proportion agreeing with attitudes to healthy eating (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Attitudes to healthy eating: % strongly agree/agree <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
Healthy foods are enjoyable	60	65	70	65	67	67	68	67	66	64	69
I really care about what I eat	68	64	62	61	60	61	70	64	64	65	63
The tastiest foods are the ones that are bad for you	35	38	37	32	37	36	35	31	34	36	32
I get confused over what's supposed to be healthy and what isn't	30	32	27	28	35	28	34	30	29	25	32
If you do enough exercise you can eat whatever you like	28	20	23	21	17	20	23	15	18	17	20
Healthy eating is just another fad	9	11	13	11	11	8	10	12	9	9	8
<b>Standardised</b>											
Healthy foods are enjoyable	60	65	70	64	66	66	68	67	66	64	68
I really care about what I eat	70	64	62	59	59	59	71	64	64	65	63
The tastiest foods are the ones that are bad for you	34	38	36	32	37	37	35	31	34	36	32
I get confused over what's supposed to be healthy and what isn't	30	32	27	28	34	27	35	30	29	25	33
If you do enough exercise you can eat whatever you like	28	19	22	22	17	20	23	16	18	17	20
Healthy eating is just another fad	9	11	12	11	11	9	11	12	9	9	8
<b>Base (unweighted)<sup>c</sup></b>											
Men	175	402	305	278	275	323	289	285	478	235	243
<b>Base (weighted)<sup>c</sup></b>											
Men	179	402	316	274	337	356	399	310	508	250	259

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and Strategic Health Authorities (SHAs). The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.

<sup>c</sup> Bases are shown for the statement 'The tastiest foods are the ones that are bad for you'; bases for other statements vary but are of similar size.

Continued...

Table 5.14 continued

Aged 16 and over

2007

Attitudes to healthy eating: % strongly agree/agree <sup>b</sup>	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Observed</b>											
Healthy foods are enjoyable	78	79	76	86	77	84	79	82	80	83	77
I really care about what I eat	73	73	70	75	71	73	76	76	77	76	78
The tastiest foods are the ones that are bad for you	43	36	36	32	34	32	43	28	32	33	32
I get confused over what's supposed to be healthy and what isn't	27	30	25	21	27	21	26	20	22	20	24
If you do enough exercise you can eat whatever you like	13	12	12	14	16	12	18	10	15	13	16
Healthy eating is just another fad	6	8	9	8	10	8	13	7	6	6	7
<b>Standardised</b>											
Healthy foods are enjoyable	77	80	77	87	76	83	78	81	80	83	77
I really care about what I eat	72	74	70	74	69	71	77	76	76	76	77
The tastiest foods are the ones that are bad for you	43	35	36	32	34	33	43	29	33	33	33
I get confused over what's supposed to be healthy and what isn't	26	29	26	21	27	21	27	20	22	20	24
If you do enough exercise you can eat whatever you like	13	12	12	14	17	12	18	10	15	14	17
Healthy eating is just another fad	6	7	10	8	10	8	13	7	7	6	7
<b>Base (unweighted)<sup>c</sup></b>											
Women	205	511	394	343	360	382	363	348	601	307	294
<b>Base (weighted)<sup>c</sup></b>											
Women	167	459	363	285	347	362	405	329	538	274	264

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and Strategic Health Authorities (SHAs). The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.

<sup>c</sup> Bases are shown for the statement 'The tastiest foods are the ones that are bad for you'; bases for other statements vary but are of similar size.

Table 5.15

**Proportion agreeing with attitudes to healthy eating (age-standardised), by equivalised household income and sex**

Aged 16 and over

2007

Attitudes to healthy eating: % strongly agree/agree <sup>a</sup>	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
Healthy foods are enjoyable	67	67	63	66	63
I really care about what I eat	68	64	63	57	59
The tastiest foods are the ones that are bad for you	32	32	39	35	36
I get confused over what's supposed to be healthy and what isn't	22	28	33	34	40
If you do enough exercise you can eat whatever you like	16	19	20	24	30
Healthy eating is just another fad	7	7	11	12	17
<b>Women</b>					
Healthy foods are enjoyable	82	78	79	77	75
I really care about what I eat	76	75	74	71	70
The tastiest foods are the ones that are bad for you	28	31	38	34	41
I get confused over what's supposed to be healthy and what isn't	16	20	24	30	35
If you do enough exercise you can eat whatever you like	11	11	12	17	15
Healthy eating is just another fad	5	6	6	9	16
<i>Base (unweighted)<sup>b</sup></i>					
Men	602	498	432	425	303
Women	602	543	518	603	473
<i>Base (weighted)<sup>b</sup></i>					
Men	664	568	471	422	343
Women	568	524	479	518	441

<sup>a</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.

<sup>b</sup> Bases are shown for the statement 'The tastiest foods are the ones that are bad for you'; bases for other statements vary but are of similar size.

Table 5.16

**Proportion agreeing with attitudes to healthy eating (age-standardised), by perception of own diet and sex**

Aged 16 and over

2007

Attitudes to healthy eating: % strongly agree/agree <sup>a</sup>	Perception of diet	
	Very/ quite healthy	Not very healthy/ very unhealthy
<b>Men</b>		
Healthy foods are enjoyable	70	41
I really care about what I eat	69	24
The tastiest foods are the ones that are bad for you	32	52
I get confused over what's supposed to be healthy and what isn't	29	43
If you do enough exercise you can eat whatever you like	20	27
Healthy eating is just another fad	10	17
<b>Women</b>		
Healthy foods are enjoyable	82	55
I really care about what I eat	78	33
The tastiest foods are the ones that are bad for you	33	56
I get confused over what's supposed to be healthy and what isn't	23	39
If you do enough exercise you can eat whatever you like	14	13
Healthy eating is just another fad	8	16
<i>Base (unweighted)</i>		
<i>Men</i>	2483	321
<i>Women</i>	3220	276
<i>Base (weighted)</i>		
<i>Men</i>	2692	384
<i>Women</i>	2967	278

<sup>a</sup> Attitude statements for both men and women are ranked by the total level of agreement with each statement among men.

Table 5.17

**Barriers to improving diet, by age and sex***Aged 16 and over and consider they may benefit from changes to diet*

2007

Barriers to improving diet <sup>a</sup>	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
It is hard to change my eating habits	29	27	27	29	33	33	31	29
I don't have enough time	33	43	32	31	15	4	2	28
It costs too much	32	26	20	20	19	15	17	22
I am not motivated to	24	22	22	21	20	14	15	21
I eat what I am given	26	11	16	20	23	23	29	19
It doesn't satisfy hunger	18	11	14	13	12	9	3	13
I don't have the cooking ability	19	13	10	9	10	10	15	12
I don't like healthy foods	9	6	5	5	3	5	2	6
My family won't eat healthy foods	4	2	4	4	2	1		3
None of these	12	11	15	16	18	26	27	16
<b>Women</b>								
It is hard to change my eating habits	37	28	25	24	26	30	38	28
I don't have enough time	37	40	37	30	15	7	3	29
It costs too much	30	26	21	16	20	18	9	21
I am not motivated to	22	18	19	15	13	16	23	18
I eat what I am given	18	2	3	2	2	6	2	5
It doesn't satisfy hunger	15	10	6	9	5	9	6	9
I don't have the cooking ability	23	10	7	6	3	4	3	9
I don't like healthy foods	10	3	1	3	2	2	3	4
My family won't eat healthy foods	6	6	8	5	3	2	1	5
None of these	9	17	20	23	29	29	30	21
<i>Base (unweighted)</i>								
Men	288	347	447	397	349	233	121	2182
Women	319	480	548	505	390	276	141	2659
<i>Base (weighted)</i>								
Men	414	452	521	439	356	186	100	2468
Women	400	475	520	445	337	209	126	2512

<sup>a</sup> Barriers for both men and women are ranked according to the proportion of men that mentioned each.



Table 5.18

**Daily fruit and vegetable consumption (age-standardised), by perceptions of own diet and sex**

Aged 16 and over

2007

Portions per day	Perception of diet		
	Very healthy	Quite healthy	Unhealthy <sup>a</sup>
	%	%	%
<b>Men</b>			
None	3	6	14
Less than 1 portion	1	2	5
1 portion or more but less than 2	9	14	32
2 portions or more but less than 3	12	20	17
3 portions or more but less than 4	12	17	14
4 portions or more but less than 5	15	14	8
5 portions or more	47	27	10
Mean	4.9	3.6	2.2
Standard error of the mean	0.18	0.06	0.11
Median	4.7	3.2	2.0
<b>Women</b>			
None	2	4	17
Less than 1 portion	1	3	6
1 portion or more but less than 2	9	14	23
2 portions or more but less than 3	11	18	20
3 portions or more but less than 4	12	18	14
4 portions or more but less than 5	16	15	8
5 portions or more	48	29	11
Mean	5.0	3.8	2.2
Standard error of the mean	0.14	0.06	0.11
Median	4.7	3.5	2.0
<i>Base (unweighted)</i>			
Men	479	2020	322
Women	700	2558	277
<i>Base (weighted)</i>			
Men	498	2212	385
Women	630	2371	279

<sup>a</sup> 'Not very healthy' and 'very unhealthy' combined.

Table 5.19

**Fat intake (age-standardised), by perceptions of own diet and sex**

Aged 16 and over

2007

Fat intake and mean fat score	Perception of diet		
	Very healthy	Quite healthy	Unhealthy <sup>a</sup>
	%	%	%
<b>Men</b>			
% Low fat (under 30)	77	66	59
% Medium fat (30-40)	15	24	28
% High fat (Over 40)	8	10	14
Mean fat score	23.9	26.7	29.0
Standard error of mean	0.65	0.32	0.97
<b>Women</b>			
% Low fat (under 30)	82	76	65
% Medium fat (30-40)	14	19	25
% High fat (Over 40)	5	6	11
Mean fat score	20.8	23.8	26.1
Standard error of mean	0.49	0.25	0.82
<i>Base (unweighted)</i>			
Men	340	1477	211
Women	487	1816	200
<i>Base (weighted)</i>			
Men	349	1595	249
Women	436	1671	199

<sup>a</sup> 'Not very healthy' and 'very unhealthy' combined.

Table 5.20

**Estimated odds ratios for perceptions of eating a healthy diet, by associated risk factors and sex**
*Aged 16 and over with valid response on how healthy they perceive their diet to be*

2007

Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>	Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>
<b>Men</b> Base (weighted) 3096				<b>Women</b> Base (weighted) 3280			
<b>Age group (p&lt;0.001)</b>				<b>Age group (p&lt;0.001)</b>			
16-24	447	1		16-24	428	1	
25-34	513	2.67	(1.64-4.35)	25-34	532	2.04	(1.26-3.29)
35-44	611	3.55	(2.19-5.76)	35-44	617	2.47	(1.52-4.00)
45-54	521	4.51	(2.80-7.25)	45-54	537	2.33	(1.44-3.77)
55-64	467	3.93	(2.47-6.26)	55-64	493	3.21	(1.87-5.51)
65-74	316	2.57	(0.81-8.20)	65-74	354	2.53	(0.87-7.37)
75+	222	2.92	(0.86-9.97)	75+	320	3.43	(1.13-10.42)
<b>Equivalised income quintiles (p=0.036)</b>				<b>Equivalised income quintiles (p=0.207)</b>			
Highest	347	1		Highest	446	1	
2nd	425	1.08	(0.64-1.86)	2nd	522	1.17	(0.72-1.89)
3rd	473	0.80	(0.46-1.38)	3rd	482	1.59	(0.96-2.64)
4th	569	0.53	(0.32-0.89)	4th	525	1.17	(0.71-1.91)
Lowest	662	0.74	(0.43-1.28)	Lowest	568	1.75	(1.05-2.91)
Not known	620	1.07	(0.59-1.92)	Not known	736	1.69	(1.04-2.74)
<b>BMI (p=0.574)</b>				<b>BMI (p=0.005)</b>			
Not overweight (up to 25)	976	1		Not overweight (up to 25)	1223	1	
Overweight (25 to less than 30)	1174	0.84	(0.56-1.24)	Overweight (25 to less than 30)	911	1.32	(0.88-1.97)
Obese (30 or more)	676	0.82	(0.56-1.22)	Obese (30 or more)	692	0.67	(0.45-1.00)
Not known	270	1.27	(0.70-2.28)	Not known	454	0.90	(0.58-1.39)
<b>Perception of how physically active (p&lt;0.001)</b>				<b>Perception of how physically active (p&lt;0.001)</b>			
Very physically active	448	1		Very physically active	280	1	
Fairly physically active	1432	0.45	(0.27-0.75)	Fairly physically active	1436	0.95	(0.49-1.83)
Not very/not at all physically active	623	0.15	(0.09-0.25)	Not very/not at all physically active	841	0.41	(0.22-0.78)
Not known	593	0.90	(0.30-2.66)	Not known	724	1.14	(0.37-3.47)
<b>Consumption of fruit and vegetables (p&lt;0.001)</b>				<b>Consumption of fruit and vegetables (p&lt;0.001)</b>			
5 portions or more	868	1		5 portions or more	1027	1	
3 to 4 portions	904	0.56	(0.33-0.94)	3 to 4 portions	1039	0.62	(0.39-0.98)
2 portions or less	1322	0.30	(0.19-0.47)	2 portions or less	1214	0.32	(0.21-0.50)
<b>Knowledge of guidelines for salt intake (p=0.009)</b>				<b>Knowledge of guidelines for salt intake (p=0.367)</b>			
Correct knowledge	250	1		Correct knowledge	340	1	
Incorrect knowledge	587	0.61	(0.32-1.16)	Incorrect knowledge	583	1.02	(0.55-1.90)
Unaware of guidelines	1156	0.42	(0.24-0.75)	Unaware of guidelines	896	0.75	(0.41-1.37)
Not known	1102	0.51	(0.29-0.92)	Not known	1461	0.77	(0.44-1.37)
<b>The tastiest foods are the ones that are bad for you (p&lt;0.001)</b>				<b>The tastiest foods are the ones that are bad for you (p&lt;0.001)</b>			
Agree	1083	1		Agree	1127	1	
Disagree	937	2.46	(1.66-3.65)	Disagree	1118	1.80	(1.21-2.69)
Neither	1055	2.12	(1.50-3.00)	Neither	1000	1.97	(1.42-2.73)
Not known	20	b		Not known	35	7.54	(1.10-51.60)
<b>Healthy foods are enjoyable (p&lt;0.001)</b>				<b>Healthy foods are enjoyable (p&lt;0.001)</b>			
Agree	2042	1		Agree	2617	1	
Disagree	217	0.30	(0.18-0.49)	Disagree	114	0.33	(0.20-0.54)
Neither	821	0.48	(0.34-0.67)	Neither	537	0.62	(0.44-0.89)
Not known	16	b		Not known	12	b	

Continued...

Table 5.20 continued

Aged 16 and over with valid response on how healthy they perceive their diet to be

2007

Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>	Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>
<b>Men</b> Base (weighted) 3096				<b>Women</b> Base (weighted) 3280			
<b>I really care what I eat (p&lt;0.001)</b>				<b>I really care what I eat (p=&lt;0.001)</b>			
Agree	1970	1		Agree	2414	1	
Disagree	353	0.13	(0.89-0.20)	Disagree	254	0.20	(0.13-0.31)
Neither	757	0.25	(0.18-0.35)	Neither	595	0.25	(0.18-0.36)
Not known	16	b		Not known	17	b	
<b>Healthy eating is just another fad (p=0.510)</b>				<b>Healthy eating is just another fad (p=0.027)</b>			
Agree	318	1		Agree	273	1	
Disagree	2099	1.29	(0.80-2.07)	Disagree	2369	1.50	(0.93-2.41)
Neither	658	1.34	(0.80-2.21)	Neither	595	0.97	(0.58-1.63)
Not known	20	b		Not known	43	0.97	(0.16-5.96)

<sup>a</sup> Confidence interval.<sup>b</sup> Results not shown due to small base sizes.

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# Adult cigarette smoking

## 6

Heather Wardle and Jennifer Mindell

### Summary

- This chapter presents information on cigarette smoking prevalence. It also examines data assessing the impact of smokefree legislation, introduced on 1st July 2007, upon smoking behaviour and secondary exposure to other people's smoke.
- In 2007, 24% of men and 21% of women aged 16 and over reported that they were current smokers. As in previous years, prevalence varied by age group. Among both men and women, smoking prevalence was highest among younger adults and decreased with advancing age from age 55 onwards.
- 30% of male smokers and 21% of female smokers reported smoking more than 20 cigarettes per day. Looking at the mean number of cigarettes smoked, male smokers reported smoking more cigarettes a day on average than female smokers (14.0 cigarettes and 12.4 cigarettes respectively).
- For both men and women, older smokers had the greatest daily consumption of cigarettes, with younger age groups smoking the fewest cigarettes.
- As in previous years, there were pronounced differences in cigarette smoking prevalence by quintile of equivalised household income. Among both men and women, those in lowest income households had the highest rates of smoking prevalence.
- Over the past decade, the overall trend in cigarette smoking prevalence has been one of a slow but gradual decline. Smoking prevalence among men has fallen from 28% in 1993 to 24% in 2007, and among women from 26% in 1993 to 21% in 2007.
- Cotinine is a derivative of nicotine and a high cotinine level (15ng/ml or more) is indicative of personal tobacco use. 26% of men and 22% of women had a cotinine level consistent with having smoked in the past 24 hours. The proportions with a cotinine level of 15ng/ml were two percentage points higher among men and one percentage point higher among women than self-reported estimates of cigarette smoking, pointing to a low but persistent level of under-reporting of smoking behaviour among adults.
- Overall, there was no significant difference in cigarette smoking prevalence after the implementation of the smokefree legislation on 1st July. Among smokers the mean number of cigarettes smoked per day did not fall significantly overall, but there were significant reductions by men aged 35 and over. Men aged 35-54 smoked around one and half cigarettes fewer per day on average, and men aged 55 and over smoked about three fewer. However, these decreases were in contrast to a slight increase of around one and half cigarettes smoked per day by men aged 16-34.
- 40% of male smokers and 41% of female smokers interviewed post 1st July reported that the implementation of the smokefree legislation had made them reduce the number of cigarettes they smoked. However, this was significantly lower than the proportion who thought, pre 1st July, that the smokefree legislation would encourage them to cut down (49% of male smokers and 53% of female smokers), pointing to a disparity in translating intentions into behavioural change.

- As with cigarette smoking prevalence, there were no differences in the proportion of men and women with a cotinine level of 15ng/ml or above, pre and post 1st July. Looking only at current cigarette smokers, however, mean cotinine values were significantly lower post 1st July. Among male smokers, cotinine values fell from 316.6ng/ml (pre 1st July) to 283.3ng/ml (post 1st July). Among female smokers, mean cotinine values fell from 277.7ng/ml to 239.7ng/ml.
- Mean cotinine levels varied significantly by NS-SEC pre and post 1st July among both male and female smokers. Mean cotinine levels fell among male smokers living in non-routine/non-manual households, although not among those in routine/manual households. Among female smokers, the opposite pattern was true, with mean cotinine levels falling significantly among those in routine/manual households, but not among those in non-routine/ non-manual households.
- Mean cotinine levels among male non-smokers did not vary pre and post 1st July. However, mean cotinine levels among female non-smokers were lower after the introduction of the smokefree legislation, falling from 0.6ng/ml (pre 1st July) to 0.4ng/ml (post 1st July)
- One third of male and female smokers reported that the introduction of the smokefree legislation had encouraged them to stay at home where they could smoke.
- All adults were asked to estimate their total hours of exposure to other people's tobacco smoke. The mean number of hours reported was significantly lower after the introduction of the smokefree legislation, falling from 7.2 hours (pre 1st July) to 3.8 hours (post 1st July) among men and from 5.2 hours (pre 1st July) to 3.1 hours (post 1st July) among women.

## 6.1 Introduction

Smoking is recognised to be the greatest single cause of preventable illness and premature death in the United Kingdom. Figures from the report *Statistics on Smoking: England 2008* estimated that in England in 2007 around 82,900 deaths among adults aged 35 and over were caused by smoking, accounting for 23% of deaths in men and 14% of deaths in women aged 35 and over. These included around 37,200 deaths from cancer, 22,300 deaths from respiratory diseases, 22,000 deaths from circulatory diseases and 1,400 deaths from diseases of the digestive system. The same report also showed that in 2006/07, around 5% (445,100) of all hospital admissions among adults aged 35 and over in England were attributable to smoking. Looking at all hospital admissions where the primary diagnosis was respiratory disease, 26% (107,600) of these admissions were attributable to smoking. A further 16% (139,600) of all admissions where the primary diagnosis was circulatory diseases and 13% (163,200) of all admissions with a primary diagnosis of cancer were also attributable to smoking. In 1998, the cost to the NHS of treating diseases caused by smoking was estimated to be between £1.4 and £1.5 billion a year.<sup>1</sup> Smoking is acknowledged as the greatest contributor to inequalities in health and mortality in this country.<sup>2</sup>

Furthermore, exposure to other people's smoke causes conditions such as heart disease and lung cancer;<sup>3</sup> it exacerbates asthma,<sup>4,5</sup> and, among children, contributes to ear and respiratory problems<sup>5</sup> and cot deaths.<sup>3</sup> Exposure to other people's smoke affects the intrauterine growth of the foetus, though less than active smoking by pregnant women. There is no threshold for exposure to secondhand smoke below which it is harmless.<sup>6</sup>

The government is committed to reducing the number of people smoking and has set the target that smoking rates among adults should be 21% or less by 2010, with a reduction in prevalence among routine and manual groups to 26% or less, a commitment emphasised in the revised PSA targets published in 2007.<sup>7</sup> It is widely recognised that levels of smoking vary between different socio-economic groups; the white paper, *Smoking Kills*, stated that reductions in levels of smoking should occur equitably among manual and non-manual groups.<sup>8</sup> In 2004, the government set out its strategy to tackle smoking and the effects of smoking on other people in the white paper, *Choosing Health: Making healthy choices easier*. This contained a number of initiatives to reduce smoking prevalence including a commitment to establishing smokefree public places, and announced a programme of consultation about the possible use of picture health warnings on tobacco packets.<sup>9</sup> On 1st July 2007, smokefree legislation was implemented within England and picture health warnings were introduced onto cigarette packets from 1st October 2008.

This chapter presents data assessing the impact of this legislation upon smoking behaviour, secondary exposure to other people's smoke, and attitudes to the smoking ban. To achieve this both self-reported data about smoking behaviour and objective cotinine data are presented. Cotinine data have also been used to assess levels of secondary exposure to tobacco smoke among adults, with a specific focus upon non-smokers. Where data permit, the chapter assesses whether there have been any inequalities in the impact of the smokefree legislation.

As well as reporting on results from 2007, this chapter includes trend data since 1993. Trend data are also available on smoking and other key variables in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>10</sup>

## 6.2 Methods and definitions

### 6.2.1 Self-reported data

Questions about cigarette smoking have been asked of adults aged 16 and over as part of the HSE series since its inception in 1991. Participants aged 25 and over were asked about their smoking behaviour within the face to face interview. The interview collected

information about the use of various tobacco products including cigarettes, cigars and among men, pipes. Those who reported smoking cigarettes were asked to estimate their daily consumption of cigarettes. For those aged 16-17, information about smoking status was collected through a self-completion questionnaire to offer participants more privacy and to allow them to reply without disclosing their smoking behaviour to other household members. At the interviewer's discretion, those aged 18-24 could answer the smoking questions either through the face to face interview or through the self-completion questionnaire. 22% of adults aged 18-24 answered the smoking behaviour questions through the self-completion questionnaire.

All participants aged 16 and over were asked to estimate the total number of hours that they were exposed to other people's smoke and to report whether they were exposed to other people's smoke in a variety of settings, including their own home, pubs and restaurants and on public transport.

In 2007, a number of new measures were specifically included within the self-completion questionnaire for all participants to capture a range of information relevant to the introduction of the smokefree legislation. This included questions about knowledge of the risks of smoking, attitudes to the smokefree legislation and, among current smokers, the impact of the legislation upon smoking behaviour. Questionnaires administered prior to 1st July asked about anticipated changes in behaviour, and questionnaires administered on or after 1st July asked about actual changes in behaviour as a consequence of the legislation implementation.

### 6.2.2 Cotinine

Cotinine is a metabolite of nicotine. It is generally considered to be the most useful of various biological markers that are indicators of personal tobacco use.<sup>11</sup> It can be measured in serum or saliva. For this survey, cotinine levels were measured using saliva. All participants who completed the stage one interviewer visit were asked if they would be willing to participate in the next stage of the survey, a visit by a qualified nurse. As part of the nurse visit, participating adults were asked if they would be willing to provide a small saliva sample which was analysed for cotinine. An additional weight has been applied to the cotinine data to account for differential non-response to the saliva sample (see Volume 2, Methodology and Documentation, Section 7.2.8).

Cotinine has a half-life in the body of around 16-20 hours, which means that it will detect regular tobacco use, but not occasional tobacco use if the last occasion was several days ago.<sup>12</sup> A level of 15 nanograms per millilitre (ng/ml) is regarded as indicative of smoking; it is unlikely to be due to anything other than personal use of tobacco.

Using a sensitive assay, cotinine levels less than 15ng/ml are indicative of either occasional smoking, particularly if the participants reported only occasionally smoking cigarettes, or indicative of exposure to environmental tobacco smoke, particularly if the participant reported that they did not currently smoke.<sup>13</sup> The latter provides a useful measure to monitor levels of secondary exposure to other people's smoke at both the population level and by sub-groups, as personal tobacco use, nicotine replacement therapy, and breathing other people's tobacco smoke, are the only sources of detectable cotinine levels.<sup>14</sup>

### 6.2.3 National Statistics Socio-economic Classification (NS-SEC)

NS-SEC is a social classification system that attempts to classify groups on the basis of employment relations, based on characteristics such as career prospects, autonomy, mode of payment and period of notice. It was introduced in 2001. It has similarities to Registrar General's Social Class. Participants are assigned to an NS-SEC category based on the current or former occupation of the household reference person.<sup>15</sup> Because base sizes are small for analyses using NS-SEC in this chapter, two groups are presented, with managerial and professional and intermediate categories grouped together as 'non routine/non-manual', and other categories grouped as 'routine and manual'.<sup>16</sup>



## 6.3 The overall picture of smoking behaviour in England

### 6.3.1 Introduction

This section provides an overview of smoking behaviour in England. It focuses upon providing accurate information about cigarette smoking prevalence, how many cigarettes smokers consume on an average day and gives an overview of geographical and socio-economic differences in smoking prevalence. These results are considered in the context of overall trends in smoking prevalence, and cotinine levels are presented. The aim of this section is to 'set the scene' of smoking behaviour in England before considering the impact so far of the smokefree legislation in section 6.4.

### 6.3.2 Self-reported cigarette smoking prevalence and cigarette consumption

In 2007, 24% of men and 21% of women aged 16 and over reported that they were current smokers.

As in previous years, prevalence varied by age group. For both men and women, cigarette smoking prevalence was highest among younger adults and from 55 onwards decreased with advancing age: 10% of men and 8% of women aged 75 and over reported smoking cigarettes.

For all age groups, except those aged 25-34, smoking prevalence for men and women was similar. Among those aged 25-34, men were more likely than women to report smoking cigarettes: smoking prevalence was nine percentage points higher among men aged 25-34 than women of the same age (34% and 25% respectively).

Table 6.1

Current smokers were asked to estimate their daily consumption of cigarettes on both weekdays and weekends. 30% of male smokers and 21% of female smokers reported smoking more than 20 cigarettes per day.

Looking at the mean number of cigarettes smoked, male smokers reported smoking more cigarettes a day on average than female smokers (14.0 cigarettes and 12.4 cigarettes respectively). Mean cigarette consumption was also significantly associated with age with younger age groups smoking the fewest cigarettes.

Table 6.2

### 6.3.3 Self-reported cigarette smoking prevalence by socio-demographic factors

#### *Government Office Region*

Table 6.3 shows cigarette smoking prevalence by Government Office Region. Estimates have been age-standardised to account for the differing age profile within each region. There were significant regional variations; smoking prevalence was highest in the North East among both men and women.

Table 6.3

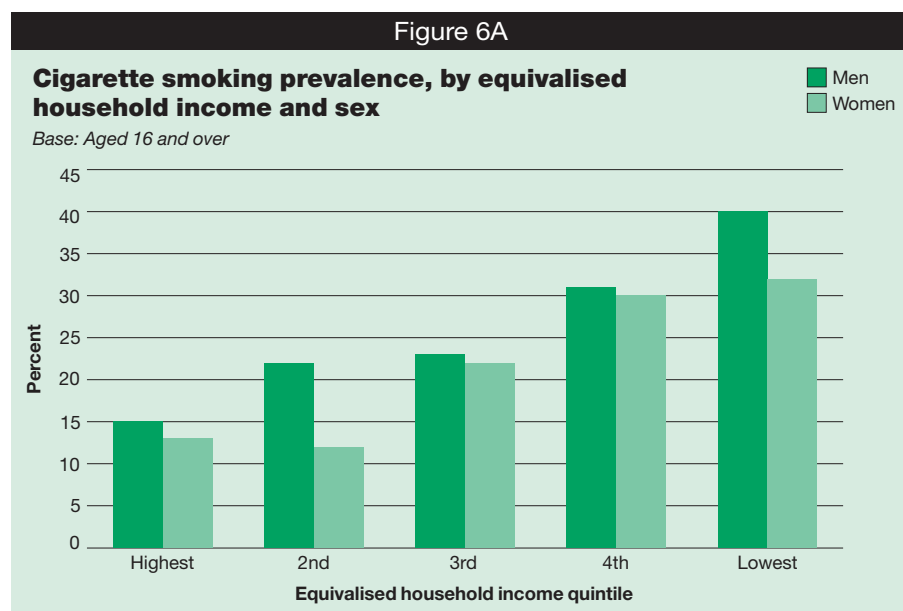
#### *Equivalent household income*

As in previous years, differences in cigarette smoking prevalence by sub-groups were pronounced when looking at the variation by equivalent household income. Equivalent household income is a measure of income that takes into account the total number of people living in the household. Estimates have been age-standardised. There was a similar pattern among men and women, with smoking prevalence being higher among lower income households than higher income households.

Table 6.4, Figure 6A

### 6.3.4 Trends in cigarette smoking prevalence

Over the past decade, the overall trend in cigarette smoking prevalence has been one of a slow but gradual decline. HSE has asked questions about cigarette smoking since its inception in 1991 and these questions have been administered using the same method outlined in section 6.2.1 since 1993, allowing trends to be monitored. Since then, smoking prevalence among men has fallen from 28% in 1993 to 24% in 2007, and among women decreased from 26% in 1993 to 21% in 2007. This pattern is similar to that reported in the

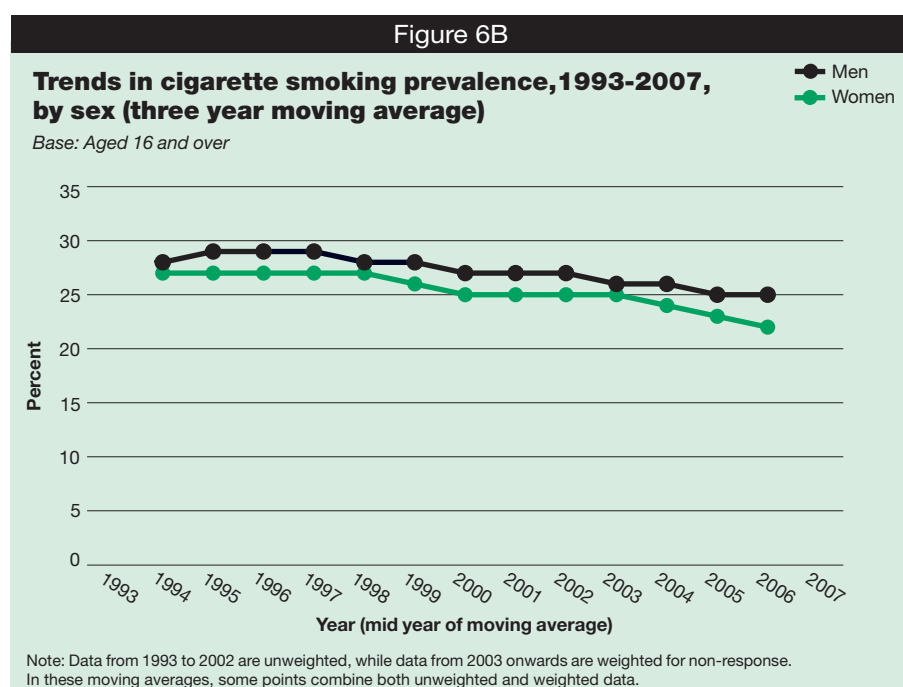


latest General Household Survey (GHS) which is used by the government to monitor progress towards its smoking prevalence targets. In 2006, the GHS estimated that 23% of men and 21% of women were current cigarette smokers.<sup>17</sup>

As with any continuous survey, there is the potential that difference between survey years could be subject to sampling error. It is therefore important to consider the whole picture when analysing trends. Figure 6B shows trends in smoking prevalence since 1993 with estimates presented as three year moving averages to smooth out random variation and difference in sample sizes.

Figure 6B illustrates the continuing gradual decline in smoking prevalence since the mid 1990s. It will be of interest to see if this pattern of gradual decline persists in future years.

**Table 6.5, Figure 6B**

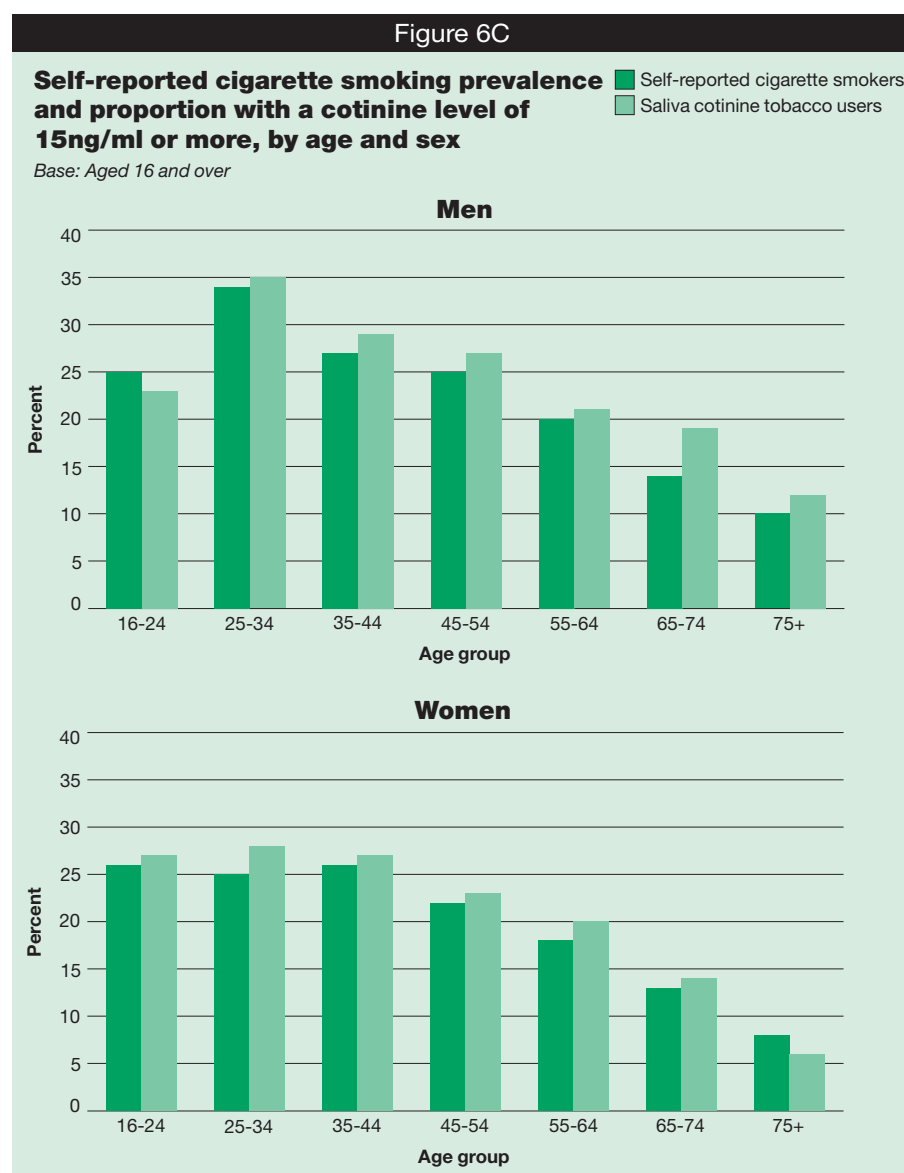


### 6.3.5 Cotinine levels

Cotinine is a derivative of nicotine and a high cotinine level is indicative of personal tobacco use.<sup>12</sup> A threshold of 15ng/ml has generally been used as an indicator of personal tobacco use in the past 24 hours. Saliva cotinine levels can therefore provide an objective cross

check of self-reported smoking behaviour as well as providing information about levels of exposure to other people's smoke among non-smokers.<sup>11</sup>

Table 6.6 shows the proportion of participants with a saliva cotinine level of 15ng/ml or more. Overall, 26% of men and 22% of women had a cotinine level consistent with having smoked in the past 24 hours, a significant difference. Cotinine results can include nicotine through use of nicotine replacements as an adjunct to smoking cessation. However, only around 1% of HSE participants in 2007 reported using nicotine replacement products in the last seven days. Therefore, a cotinine measurement of 15ng/ml is likely to be the result of personal tobacco use. It is notable that the overall proportions with a cotinine level of 15ng/ml were higher than self-reported estimates of cigarette smoking. Among men, some of the difference may be explained through pipe or cigar smoking. However, some under-reporting of cigarette smoking status is evident. Figure 6C shows the comparison of self-reported cigarette smoking status and cotinine data by age group and sex.



For men, the proportion with a cotinine value of 15ng/ml or more was greater than self-reported cigarette smoking prevalence in all age groups except those aged 16-24, where self-reported cigarette smoking was two percentage points higher (25%) than those with a cotinine level of 15ng/ml or more (23%). This perhaps is due to the differences in the two measures, as self-reported cigarette smoking also includes those who smoke cigarettes occasionally or would define themselves as 'social' smokers, whereas cotinine measures smoking in the last 24 hours. It may be, therefore, that a slightly greater proportion of male smokers aged 16-24 than male smokers in other age groups are occasional rather than

regular, everyday smokers. Among women, the proportion with a cotinine value of 15ng/ml or more was higher than self-reported smoking status in all age groups except those aged 75 and over.

These differences, although not large, are important. A chief concern of researchers monitoring trends in smoking prevalence has been the extent to which the increasing view of smoking as a socially unacceptable habit impacts upon people's willingness to report this behaviour.<sup>17</sup> These cotinine results points to a low but persistent level of under-reporting of smoking behaviour.

**Table 6.6, Figure 6C**

Table 6.7 shows mean cotinine values among smokers. For both male and female smokers, mean cotinine values varied with age, being lower among younger smokers and increasing with age. This broadly conforms to the pattern of mean cigarette consumption observed in Table 6.2.

Mean cotinine levels among self-reported and cotinine validated non-smokers also varied with age, with no clear pattern, ranging from 0.2ng/ml among men aged 75 and over to 0.7ng/ml among men and women aged 16-24.

**Table 6.7**

## 6.4 The impact of the smokefree legislation

### 6.4.1 Introduction

On the 1st July 2007, the smokefree legislation in England came into force. This section looks at any changes observed in smoking behaviour (both actual and intended), cigarette consumption, saliva cotinine levels and exposure to other people's smoke pre and post 1st July, to assess the impact of this legislation. It should be noted that the primary focus of the overall HSE 2007 survey was to provide information about knowledge of and attitudes to health, and monitoring the impact of the smokefree legislation was a secondary objective. Within the scope of a survey of this size, it would be very difficult to detect changes in behaviour between the six months prior to the introduction of the smokefree legislation and the six months after the policy implementation unless the changes were drastic (for instance, a very large fall in smoking prevalence). However, examination of a combination of analyses, though not all significant, can give a broad indication of where changes in behaviour are apparent, and can highlight areas for further investigation once HSE 2008 data are available.<sup>18</sup>

### 6.4.2 Cigarette smoking prevalence, cigarette consumption and smoking at home pre and post 1st July

Overall, there was no significant difference in cigarette smoking prevalence after the implementation of the smokefree legislation. 24% of men and 21% of women who were interviewed post 1st July reported that they were current smokers compared with 23% of men and 21% of women interviewed prior to 1st July. The age profile of cigarette smokers also did not alter significantly post 1st July, with smoking prevalence for both men and women being highest among those aged 44 or under.

**Table 6.8**

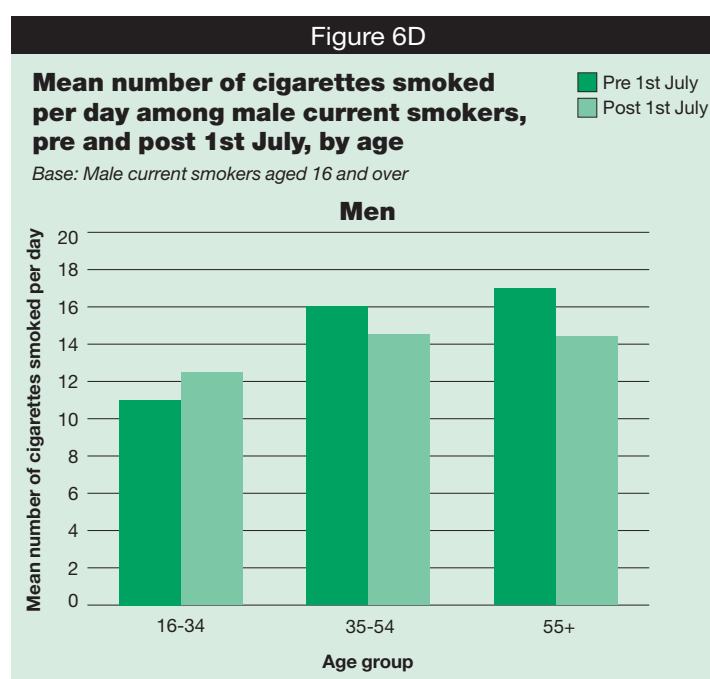
The lack of discernible impact upon cigarette smoking prevalence may, however, mask some important changes. When asked to report their daily consumption of cigarettes, fewer male smokers reported that they smoked at least 20 cigarettes per day after 1st July than before. Before the introduction of the smokefree legislation, 33% of male smokers smoked at least 20 cigarettes per day, whilst after the legislation had been introduced this fell to 27%. This decrease, though marked, is on the borderline of statistical significance, probably due to small base sizes among this group.<sup>19</sup> Equivalent figures for women were 23% prior to 1st July and 19% post 1st July. However, this difference was not significant.

The mean number of cigarettes smoked per day by smokers, although slightly lower for both men and women post 1st July, did not fall significantly. However, among men, this masks some differences by age group. The average number of cigarettes smoked by men

Table 6A		
Cigarette smoking status, pre and post 1st July 2007		
	Pre 1st July %	Post 1st July %
<b>Men</b>		
Current cigarette smoker	23	24
Used to smoke cigarettes regularly	28	28
Never regularly smoked	49	48
<b>Women</b>		
Current cigarette smoker	21	21
Used to smoke cigarettes regularly	22	21
Never regularly smoked	58	58

aged 35 and over shows that men of this age reported smoking significantly fewer cigarettes after the implementation of the smokefree legislation. Men aged 35-54 smoked around 1.5 cigarettes fewer per day on average (mean consumption 16.1 pre 1st July; 14.5 post 1st July), and men aged 55 and over smoked about three cigarettes fewer per day on average (mean 17.2 pre 1st July; 14.4 post 1st July). However, these decreases were in contrast to a slight rise in the average number of cigarettes smoked per day by men aged 16-34, rising from 10.9 pre 1st July to 12.5 post 1st July. Such marked differences were not observed among women.

Table 6.9, Figure 6D



The results in relation to cigarette consumption are supported by the findings in Table 6.9, which shows that 40% of male smokers and 41% of female smokers interviewed post 1st July reported that the implementation of the smokefree legislation had made them reduce the number of cigarettes they smoked. However, it should be noted that for both men and women, this was significantly lower than the proportion of male and female smokers who thought that the smokefree legislation would encourage them to cut down on the number of cigarettes smoked. Prior to the 1st July, 49% of male smokers and 53% of female smokers felt that they would cut down on the number of cigarettes smoked once the smokefree legislation was implemented, thus pointing to a disparity in translating intentions into behavioural change. This disparity was greatest among younger adults. Prior to 1st July, 61% of male smokers and 60% of female smokers aged 16-34 reported that the smokefree legislation would encourage them to cut down on the number of cigarettes smoked.

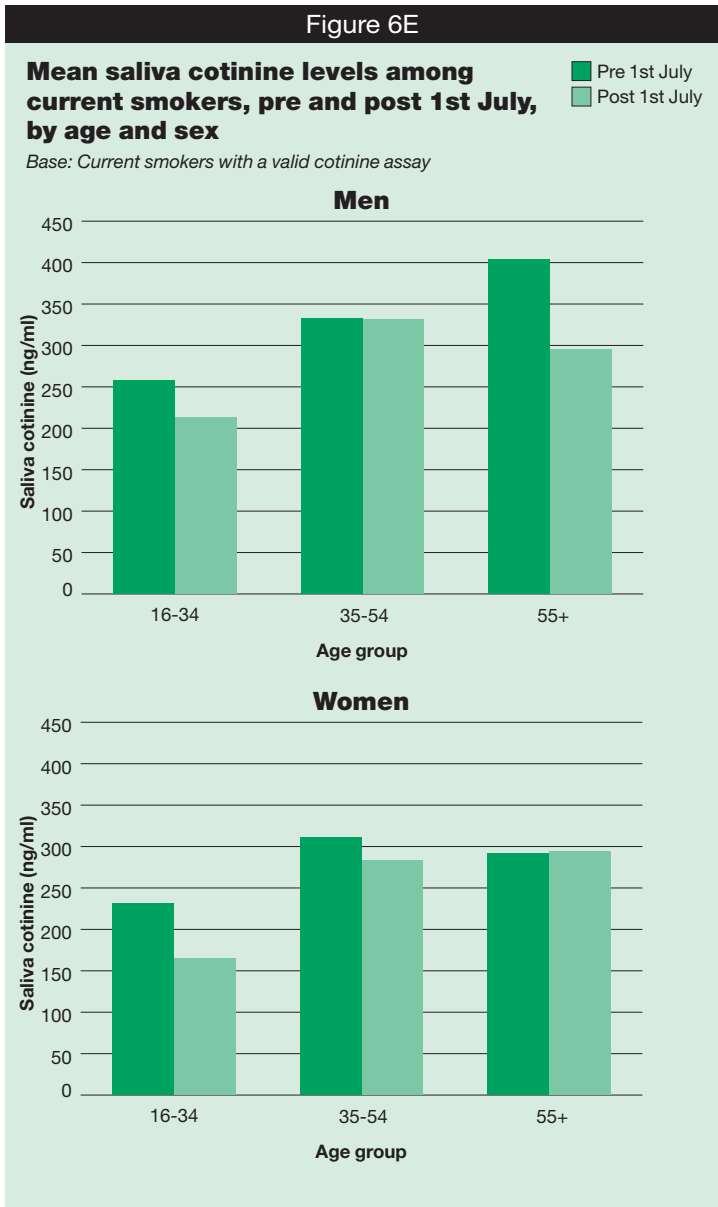
However, after 1st July, 45% of both male and female smokers of the same age reported that the smokefree legislation had actually made them smoke fewer cigarettes. **Table 6.10**

Table 6.11 shows the proportion of smokers prior to 1st July who felt the introduction of the smokefree legislation would encourage them to stay at home where they could smoke. Among both men and women, around one third of smokers (34%) reported that they believed this would be an outcome of the smokefree legislation. The intentions expressed pre 1st July do appear to have been borne out, with around a third of male and female smokers interviewed after the 1st July reporting that the introduction of the smokefree public places had made them stay at home where they could smoke cigarettes (37% of men and 32% of women). The potential displacement of smoking from public to private places has been noted as an unintentional by-product of the smokefree legislation, the consequences of which need to be assessed fully. **Table 6.11**

### 6.4.3 Cotinine levels, pre and post 1st July, by age and sex

As with cigarette smoking prevalence, there were no differences in the proportion of men and women with a cotinine level of 15ng/ml or above. Estimates for men were 26% pre 1st July and 25% post 1st July, while estimates for women were 22% both pre and post policy implementation. **Table 6.12**

Looking only at current cigarette smokers, there were some significant differences in mean cotinine levels. For both male and female smokers, mean cotinine values were significantly lower after the introduction of the smokefree legislation. Among male smokers, cotinine



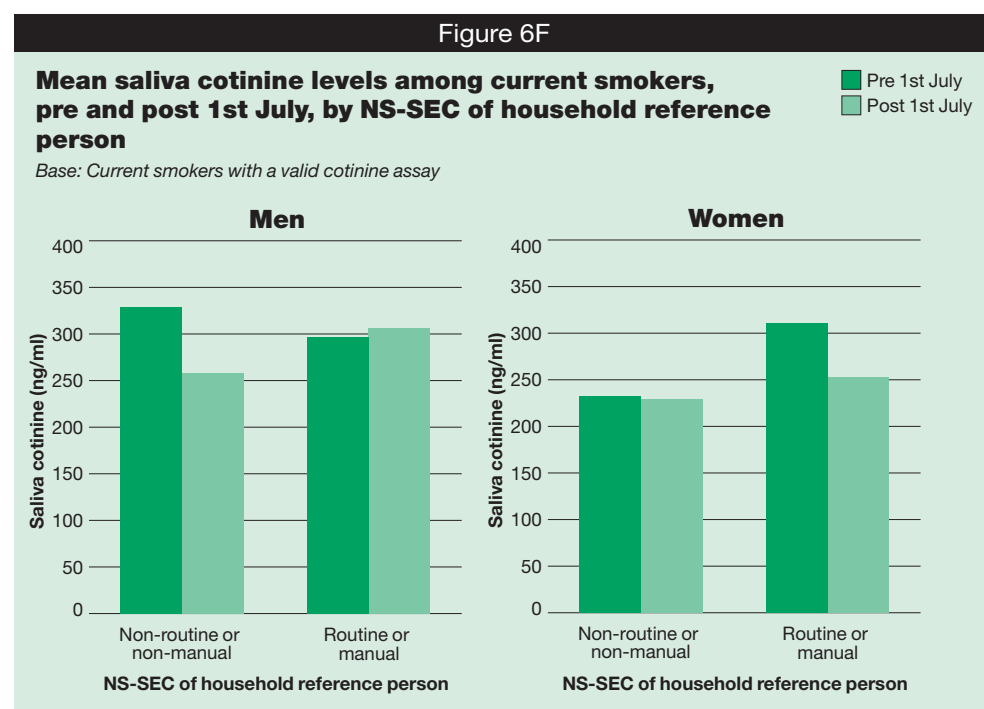
values fell from 316.6ng/ml (pre 1st July) to 283.3ng/ml (post 1st July). Among female smokers, mean cotinine values fell from 277.7ng/ml to 239.7ng/ml. **Figure 6E**

Among men, the sharpest decline was observed among those aged 55 and over, with mean cotinine decreasing by more than 100 ng/ml from 403.7ng/ml (pre 1st July) to 295.6ng/ml (post 1st July). This is in line with findings presented in section 6.4.2, which showed that men aged 55 and over reported smoking significantly fewer cigarettes post policy implementation. Among women, the largest decline was observed among those aged 16-35, with mean cotinine falling from 231.7ng/ml to 165.1ng/ml, a decrease of 66ng/ml on average. **Table 6.13**

Table 6.13 also presents mean saliva cotinine among non-smokers. To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine lower than 15ng/ml. Among men, there were no significant differences in mean cotinine levels among non-smokers pre and post 1st July, indicating that levels of secondhand exposure to tobacco smoke were consistent at around 0.4-0.5ng/ml for men throughout 2007. However, among women, mean cotinine levels among non-smokers were significantly lower post 1st July (0.4ng/ml) than pre 1st July (0.6ng/ml). **Table 6.13**

### 6.4.4 Cotinine levels, pre and post 1st July, by NS-SEC

Table 6.14 shows mean cotinine levels for all current smokers and all non-smokers by NS-SEC (National Statistics Socio-economic Classification) of household reference person. NS-SEC is a classification of social position that was introduced in 2001. Due to small bases, two categories are presented in this chapter, non-routine/non-manual occupations and routine/manual occupations.



There were significant differences in mean cotinine levels pre and post policy implementation among both male and female self-reported current smokers. Among men living in non-routine/non-manual households, mean cotinine levels fell from 328.8ng/ml (pre 1st July) to 258.1ng/ml (post 1st July). However, mean cotinine levels among male smokers from routine/manual households did not vary significantly after the introduction of the smokefree legislation. Among women, the opposite pattern was true, with mean cotinine levels among female smokers living in routine/manual households showing the sharpest decrease, falling from 310.8ng/ml (pre 1st July) to 252.5ng/ml (post 1st July), and no significant change among those in non-routine/non-manual households.

Table 6.14 also shows mean cotinine levels among self-reported and cotinine validated



non-smokers by NS-SEC, pre and post 1st July. Among men, mean cotinine levels did not vary significantly between the two NS-SEC groups, pre or post 1st July. Among women, estimates did not vary between the two groups pre-policy implementation, being 0.5 and 0.6ng/ml for non-routine/non-manual households and routine/manual households respectively. However, post 1st July, mean saliva cotinine levels were lower among those from non-routine/non-manual households than routine/manual households, 0.3ng/ml and 0.6ng/ml respectively.

Table 6.14, Figure 6F

#### 6.4.5 Self-reported hours of exposure to other people's smoke, pre and post 1st July

All participants aged 16 and over were asked to estimate their total hours of exposure to other people's tobacco smoke. The mean number of hours reported was significantly lower after the introduction of the smokefree legislation, falling from 7.2 hours (pre 1st July) to 3.8 hours (post 1st July) among men and from 5.2 hours (pre 1st July) to 3.1 hours (post 1st July) among women.

Table 6.15

## 6.5 Discussion

### 6.5.1 Overview

The implementation of smokefree legislation on 1st July 2007 was hailed as one of the most important steps in public health policy for many years.<sup>20</sup> Its primary objective was to prevent occupational exposure to the multiple toxins in tobacco smoke and in particular, to protect the health and wellbeing of people working within the leisure and recreation industries by providing safe and healthy working environments in relation to secondhand smoke. A secondary objective was to protect the general public from exposure to tobacco smoke in public places. As observed in other countries, a by-product of these objectives was the potential encouragement that smokefree environments might give to current smokers to stop smoking altogether, or at least to smoke fewer cigarettes, and also to discourage young adults from taking up a behaviour that is known to persist into adulthood. Since then numerous studies have been published assessing the impact of this legislation in England.

The Department of Health study *Smokefree England: One year on*<sup>20</sup> noted that preliminary findings from a study of bar workers showed that their cotinine levels had fallen by 76% following the implementation of the smokefree legislation, and concluded that bar workers had experienced marked improvement in the indoor air quality of their working environment. Similar findings were noted in Ireland<sup>21</sup> and Scotland.<sup>22</sup>

The focus of this chapter has been to assess the preliminary impact of the smokefree legislation in relation to those potential 'by-product' benefits of reductions in smoking prevalence and cigarette consumption. In addition to this, a key area of concern has been the potential displacement of smoking behaviour from public to private areas, thus potentially increasing secondhand exposure to smoke within the home.

### 6.5.2 Impact on smokers

The findings from the Health Survey for England 2007 point to some promising results, although overall smoking prevalence did not fall in the six months after the implementation of the smokefree legislation, remaining at 24% for men and 21% for women. Other countries, such as Scotland and Ireland, have noted initial falls in smoking prevalence as a result of smokefree legislation. However, smoking prevalence in these countries was higher than in England, which has seen a gradual but steady decline in smoking prevalence in the last ten years.<sup>23</sup> Given this lower starting point, it perhaps is not surprising that less dramatic results have been observed within the first six months of a smokefree England.

What is promising is the observed decline in cigarette consumption, which is most notable when looking at the cotinine data. Mean cotinine levels among male and female current smokers were significantly lower in the six months after 1st July than before 1st July. This



reduction was too large to be due solely to reduced exposure to others' smoke and points to an overall reduction in cigarette consumption. It is supported by a reduction in the mean number of cigarettes consumed per day reported by male smokers, and the fact that around two in five smokers reported that the smokefree legislation had actually encouraged them to reduce the number of cigarettes they smoked.

These findings can be placed in context by results from a Smoking Toolkit Study, which estimated that 40% of smokers tried to quit smoking in 2007, with many making several attempts to quit smoking.<sup>24</sup> In addition, The NHS Information Centre has shown that between April 2007 and March 2008, the number of smokers setting a date to quit smoking through NHS stop smoking services increased by 13% compared with the previous year, with half of these people successfully quitting.<sup>25</sup> HSE did not collect information about the number of quit attempts that smokers may have made, but lower cigarette consumption in the six months after the introduction of the smokefree legislation may provide some corroborating evidence that more smokers may be trying to quit in this period.

When looking at the HSE 2007 data by sub-groups of smokers, it appears that the impact of the smokefree legislation may be affecting different sub-groups in different ways. Among men, the most notable decreases in mean cotinine levels post 1st July were observed among smokers aged 55 and over and those living in non-manual/non-routine households. There was no evidence of change in mean cotinine levels pre and post 1st July in the groups that might be regarded as the main targets for reduction - younger men and those in routine and manual households. The latter group were identified as being of particular importance in the government's PSA target on smoking, originally set in 2004 and confirmed in 2007, with the aim of 'reducing adult smoking rates to 21% or less by 2010, with a reduction in prevalence among routine and manual groups to 26% or less'.<sup>8</sup> The HSE 2007 findings point to the potentially limited impact of this policy upon a key target sub-group so far, and suggest that as yet little has been achieved in tackling the persistent inequalities in smoking prevalence among men. However, there was a different picture among women, with largest decreases in mean cotinine levels being observed among smokers aged 16-34 and those residing in routine/manual households. The apparent differential impact of the legislation upon men and women should be considered in future assessments of the smokefree legislation and further implementation strategies.

### **6.5.3 Impact on non-smokers**

A further positive result is the slight decline in mean cotinine levels among female non-smokers pre and post 1st July and also the observed similarity in mean cotinine levels among male non-smokers pre and post 1st July. This is reassuring as a major concern about the potential impact of the smokefree legislation was that it might displace smoking from public to private places, and hence increase some people's exposure to secondhand smoke. Based on the cotinine data, this does not appear to be the case, and these findings are supported by cotinine results for children presented in Chapter 11, which found that post 1st July, children living with smokers were not more exposed to secondhand smoke at home than previously. However, a more concerning finding is that around one third of smokers post 1st July reported that the smokefree legislation had encouraged them to stay at home where they could smoke. If these people, whilst at home, were smoking directly around other, non-smoking members of the household, an increase in mean cotinine levels among non-smokers might be expected. Whilst this does not currently appear to be the case, this is an area that should be reviewed in the future when assessing the longer term impact of this legislation.

### **6.5.4 Use of cotinine to validate estimates of smoking prevalence**

A final and important consideration arises, not from the data relating to the impact of the smokefree legislation, but from the overall smoking prevalence figures. Cotinine data, included for adults for the first time since 2003, have shown that a low but persistent level of under-reporting of smoking prevalence is evident from survey data. It is important therefore to recognise that cotinine-measured smoking prevalence is actually slightly higher than self-reported prevalence, being 1 percentage point higher for women and 2 percentage

points higher for men in HSE 2007. Under-reporting of self-reported smoking behaviour is a concern that the authors of the General Household Survey, which monitors the government's progress towards their smoking targets, have raised. HSE 2007 cotinine data has provided evidence showing the level of this under-reporting and this should be taken into account when assessing progress towards PSA targets as measured by self-report data.

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- 15 The Household Reference Person (HRP) is defined as the person in whose name the accommodation is held; if more than one, the person with the highest income; and if more than one, the oldest.
- 16 For a full explanation of NS-SEC and its derivation see the Glossary in Methodolgy Volume 2 of this report and *The National Statistics Socio-economic Classification User Manual 2002*. ONS 2002.
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- 6.1 Cigarette smoking status, by age and sex
- 6.2 Number of cigarettes smoked by current smokers, by age and sex
- 6.3 Cigarette smoking status (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex
- 6.4 Cigarette smoking status (age-standardised), by equivalised household income and sex
- 6.5 Trends in cigarette smoking status, 1993-2007, by sex
- 6.6 Prevalence of saliva cotinine levels of 15ng/ml or more, by age and sex
- 6.7 Saliva cotinine levels among self-reported current cigarette smokers and self-reported and cotinine validated non-smokers, by age and sex
- 6.8 Cigarette smoking status, pre and post 1st July, by age and sex
- 6.9 Numbers of cigarettes smoked by current smokers, pre and post 1st July, by age and sex
- 6.10 Self-reported impact of the smokefree legislation on the number of cigarettes smoked, pre and post 1st July, by age and sex
- 6.11 Self-reported impact of the smokefree legislation upon smoking at home, pre and post 1st July, by age and sex
- 6.12 Prevalence of saliva cotinine levels of 15ng/ml or more, pre and post 1st July, by age and sex
- 6.13 Saliva cotinine levels, pre and post 1st July, by age and sex
- 6.14 Saliva cotinine levels, pre and post 1st July, by NS-SEC of household reference person and sex
- 6.15 Self-reported mean hours of exposure to other people's smoke, pre and post 1st July, by age and sex

Table 6.1

<b>Cigarette smoking status, by age and sex</b>								
<i>Aged 16 and over</i>								2007
Cigarette smoking status	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Current cigarette smoker	25	34	27	25	20	14	10	24
Used to smoke cigarettes regularly	4	16	20	28	40	56	59	28
Never regularly smoked cigarettes	71	50	53	47	40	30	31	48
<b>Women</b>								
Current cigarette smoker	26	25	26	22	18	13	8	21
Used to smoke cigarettes regularly	7	16	19	23	29	28	32	21
Never regularly smoked cigarettes	67	59	55	55	53	59	60	58
<i>Bases (unweighted)</i>								
Men	334	422	565	504	493	421	300	3039
Women	363	575	704	636	603	494	407	3782
<i>Bases (weighted)</i>								
Men	481	552	659	559	505	337	247	3339
Women	454	568	669	564	520	373	366	3513

Table 6.2

<b>Number of cigarettes smoked by current smokers, by age and sex</b>								
<i>Current smokers aged 16 and over</i>								2007
Cigarettes smoked per day	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<b>Men</b>								
% under 10 cigarettes per day	41	37	27	24	25	21	*	30
% 10 to under 20 cigarettes per day	41	44	40	34	36	34	*	40
% 20 or more cigarettes per day	18	19	33	41	40	45	*	30
Median number of cigarettes smoked per day	10.0	10.0	15.0	15.0	15.0	15.0	*	12.9
Mean number of cigarettes smoked per day	11.9	11.7	14.8	15.9	16.1	16.1	*	14.0
Standard error of the mean	1.09	0.63	0.71	0.80	0.90	1.17	*	0.38
<b>Women</b>								
% under 10 cigarettes per day	43	43	29	27	22	27	[45]	33
% 10 to under 20 cigarettes per day	43	44	49	46	51	40	[42]	46
% 20 or more cigarettes per day	14	13	22	27	26	33	[13]	21
Median number of cigarettes smoked per day	10.0	10.0	11.4	14.5	13.6	14.8	[10.0]	11.4
Mean number of cigarettes smoked per day	10.9	10.4	12.7	14.0	14.4	13.4	[10.6]	12.4
Standard error of the mean	0.58	0.43	0.52	0.61	0.81	0.84	[1.24]	0.26
<i>Bases (unweighted)</i>								
Men	80	141	150	124	100	58	29	682
Women	98	154	184	139	111	65	32	783
<i>Bases (weighted)</i>								
Men	115	187	178	140	99	46	24	790
Women	114	144	173	123	95	49	29	727

\* The unweighted base for this group is less than 30 therefore estimates are not shown.

Table 6.3

**Cigarette smoking status (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Cigarette smoking status	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
Men											
Observed											
Current cigarette smoker	30	23	23	23	25	22	25	25	22	24	20
Used to smoke cigarettes regularly	25	32	30	25	32	31	19	31	27	31	23
Never regularly smoked cigarettes	45	44	47	52	43	47	56	45	51	45	57
Standardised											
Current cigarette smoker	30	24	24	23	26	23	24	25	22	25	19
Used to smoke cigarettes regularly	26	32	27	24	30	29	21	29	27	30	25
Never regularly smoked cigarettes	44	44	48	53	44	48	55	46	51	46	56
Women											
Observed											
Current cigarette smoker	32	22	27	22	21	19	17	22	16	18	13
Used to smoke cigarettes regularly	25	22	21	21	23	19	15	24	24	24	23
Never regularly smoked cigarettes	43	56	52	57	56	62	68	54	61	57	64
Standardised											
Current cigarette smoker	33	22	26	22	22	19	17	23	16	19	13
Used to smoke cigarettes regularly	24	21	21	20	22	18	17	23	23	24	22
Never regularly smoked cigarettes	43	56	52	58	56	63	66	54	61	57	65
Bases (unweighted)											
Men	187	446	327	290	292	345	336	314	502	249	253
Women	224	561	413	361	382	410	423	376	632	322	310
Bases (weighted)											
Men	191	448	338	287	357	382	463	341	532	264	268
Women	183	504	378	300	368	390	470	356	565	288	277

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 6.4

**Cigarette smoking status (age-standardised),  
by equivalised household income and sex**
*Aged 16 and over* *2007*

Cigarette smoking status	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
Current cigarette smoker	15	22	23	31	40
Used to smoke cigarettes regularly	26	33	28	26	21
Never regularly smoked cigarettes	58	46	49	43	39
<b>Women</b>					
Current cigarette smoker	13	12	22	30	32
Used to smoke cigarettes regularly	23	22	23	21	19
Never regularly smoked cigarettes	65	66	55	49	49
<i>Bases (unweighted)</i>					
<i>Men</i>	622	515	459	459	342
<i>Women</i>	623	562	542	655	527
<i>Bases (weighted)</i>					
<i>Men</i>	684	587	500	459	387
<i>Women</i>	587	543	498	565	493

Table 6.5

**Trends in cigarette smoking status, 1993-2007, by sex**
*Aged 16 and over* *1993-2007*

Current smoking status	Survey year															
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>a</sup>	2003 <sup>a</sup>	2004	2005	2006	2007
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>																
Current cigarette smoker	28	28	29	30	29	28	27	28	26	27	25	27	24	27	24	24
Used to smoke cigarettes regularly	33	32	31	30	31	31	30	30	31	29	31	28	29	28	27	28
Never regularly smoked cigarettes	39	39	40	40	40	40	42	42	43	44	44	45	47	45	49	48
<b>Women</b>																
Current cigarette smoker	26	27	27	27	27	27	26	25	25	26	24	24	23	24	21	21
Used to smoke cigarettes regularly	22	22	21	21	21	21	21	19	22	20	21	20	22	20	22	21
Never regularly smoked cigarettes	52	51	52	52	52	52	52	56	53	54	55	56	56	56	57	58
<i>Bases</i>																
<i>Men</i>	7678	7159	7321	7479	3891	7163	3543	3639	6919	3303	6563	7148	3225	3659	6791	3339
<i>Women</i>	8873	8609	8706	8939	4676	8694	4224	4315	8642	4056	8201	7599	3416	3899	7258	3513

<sup>a</sup> Data from 2003-2007 have been weighted for non-response (shaded columns); for 2003 both weighted and unweighted data are shown.  
Bases are unweighted from 1993-2003, and weighted from 2003-2007.

Table 6.6

**Prevalence of saliva cotinine levels of 15ng/ml or more, by age and sex***Aged 16 and over with valid cotinine assay*

2007

Saliva cotinine (ng/ml)	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
% with cotinine15 ng/ml or more	23	35	29	27	21	19	12	26
Women								
% with cotinine 15ng/ml or more	27	28	27	23	20	14	6	22
Bases (unweighted)								
Men	200	256	361	340	316	270	182	1925
Women	218	329	443	400	361	303	191	2245
Bases (weighted)								
Men	309	334	400	336	302	202	149	2031
Women	291	341	402	338	315	224	212	2123



Table 6.7

**Saliva cotinine levels among self-reported current cigarette smokers and self-reported and cotinine validated non-smokers<sup>a</sup>, by age and sex**

Aged 16 and over with valid cotinine assay

2007

Saliva cotinine (ng/ml)	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
Self-reported cigarette smokers								
50th percentile <sup>b</sup>	[161.0]	246.8	331.0	331.6	344.3	[374.4]	c	276.4
75th percentile	[257.9]	394.4	484.4	466.2	495.8	[540.4]	c	437.6
90th percentile	[409.4]	469.4	548.1	539.8	615.3	[753.8]	c	545.1
Mean saliva cotinine	[197.2]	260.3	325.7	338.3	360.2	[390.2]	c	299.9
Standard error of the mean	[26.44]	16.07	16.24	14.67	21.55	[38.17]	c	8.76
Self-reported and cotinine validated non-smokers								
50th percentile	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1
75th percentile	0.9	0.4	0.3	0.3	0.3	0.5	0.2	0.4
90th percentile	2.2	1.1	1.1	0.9	0.9	1.1	0.7	1.1
Mean saliva cotinine	0.7	0.5	0.4	0.5	0.4	0.5	0.2	0.5
Standard error of the mean	0.12	0.10	0.06	0.08	0.08	0.09	0.04	0.03
Women								
Self-reported cigarette smokers								
50th percentile	111.5	200.2	290.5	274.3	285.0	[268.6]	c	242.9
75th percentile	273.2	331.4	393.5	404.2	426.7	[364.6]	c	366.2
90th percentile	341.3	485.0	521.0	576.5	527.5	[429.8]	c	500.2
Mean saliva cotinine	159.9	224.1	297.4	297.4	313.3	[269.4]	c	257.7
Standard error of the mean	14.80	13.52	11.08	15.77	16.51	[21.14]	c	5.87
Self-reported and cotinine validated non-smokers								
50th percentile	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75th percentile	0.7	0.3	0.3	0.3	0.3	0.3	0.4	0.3
90th percentile	2.1	0.7	0.9	1.2	1.0	1.3	1.0	1.1
Mean saliva cotinine	0.7	0.3	0.3	0.5	0.4	0.5	0.5	0.5
Standard error of the mean	0.10	0.05	0.05	0.10	0.07	0.05	0.13	0.03
Bases (unweighted)								
Men								
Cigarette smokers	40	74	88	82	55	36	16	391
Non-smokers	136	170	257	250	249	220	162	1444
Women								
Cigarette smokers	56	88	108	79	59	34	10	434
Non-smokers	150	227	321	313	293	262	179	1745
Bases (weighted)								
Men								
Cigarette smokers	63	111	107	87	55	29	15	467
Non-smokers	209	210	278	241	236	162	130	1467
Women								
Cigarette smokers	74	93	104	73	57	27	12	439
Non-smokers	202	235	288	260	250	192	198	1624

<sup>a</sup> To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine level lower than 15ng/ml.

<sup>b</sup> Percentiles have been presented in this table for reference only. The percentiles show a set of points within a scale from 1-100 which is divided into groups based on order of magnitude. For example, those with a cotinine value that is equal or greater than the value of 90% of those who gave a cotinine measurement is expressed as the 90th percentile.

<sup>c</sup> Data not shown because of small bases.

Table 6.8

**Cigarette smoking status, pre and post 1st July, by age and sex***Aged 16 and over*

2007

Cigarette smoking status	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
<i>Pre 1st July</i>								
Current cigarette smoker	25	32	27	28	18	12	7	23
Used to smoke cigarettes regularly	5	17	20	27	39	53	59	28
Never regularly smoked cigarettes	70	51	52	45	43	34	34	49
<i>Post 1st July</i>								
Current cigarette smoker	25	36	27	22	21	15	12	24
Used to smoke cigarettes regularly	4	15	19	29	41	59	59	28
Never regularly smoked cigarettes	71	49	54	49	38	26	29	48
<b>Women</b>								
<i>Pre 1st July</i>								
Current cigarette smoker	23	23	26	25	19	13	6	21
Used to smoke cigarettes regularly	9	18	20	17	31	28	34	22
Never regularly smoked cigarettes	68	59	54	58	50	58	60	58
<i>Post 1st July</i>								
Current cigarette smoker	28	28	26	19	18	13	10	21
Used to smoke cigarettes regularly	6	13	17	29	27	28	30	21
Never regularly smoked cigarettes	66	59	57	52	55	59	60	58
<i>Bases (unweighted)</i>								
<i>Pre 1st July:</i>								
Men	165	193	272	246	229	215	145	1465
Women	188	285	355	307	270	232	196	1833
<i>Post 1st July:</i>								
Men	169	229	293	258	264	206	155	1574
Women	175	290	349	329	333	262	211	1949
<i>Bases (weighted)</i>								
<i>Pre 1st July:</i>								
Men	240	252	315	269	235	171	118	1600
Women	235	282	340	270	233	175	175	1710
<i>Post 1st July:</i>								
Men	241	300	343	290	270	166	129	1740
Women	219	286	329	294	287	198	191	1804

Table 6.9

### Number of cigarettes smoked by current smokers, pre and post 1st July, by age and sex

Current smokers aged 16 and over

2007

Cigarettes smoked per day	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
% under 10 cigarettes per day	36	26	17	28	40	26	30	33
% 10 to under 20 cigarettes per day	48	31	39	39	39	44	37	40
% 20 or more cigarettes per day	16	43	44	33	21	30	33	27
Mean number of cigarettes smoked per day	10.9	16.1	17.2	14.4	12.5	14.5	14.4	13.7
Standard error of the mean	0.55	0.56	0.74	0.40	0.79	0.66	0.87	0.49
Women								
% under 10 cigarettes per day	44	27	26	33	42	30	29	34
% 10 to under 20 cigarettes per day	39	49	44	45	46	46	48	47
% 20 or more cigarettes per day	16	24	30	23	11	25	23	19
Mean number of cigarettes smoked per day	11.0	13.1	14.3	12.7	10.3	13.4	12.8	12.1
Standard error of the mean	0.48	0.53	0.75	0.32	0.40	0.56	0.67	0.34
Bases (unweighted)								
Men	100	140	80	320	121	134	107	362
Women	120	156	77	353	138	140	97	374
Bases (weighted)								
Men	139	162	71	371	164	157	98	419
Women	119	168	93	380	133	155	115	403

Table 6.10

### Self-reported impact of the smokefree legislation on the number of cigarettes smoked, pre and post 1st July, by age and sex

Current smokers aged 16 and over

2007

Self-reported impact on the number of cigarettes smoked	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
Smoking ban will make/has made me reduce number of cigarettes smoked	61	43	39	49	45	38	33	40
Smoking ban will not make/has not made me reduce number of cigarettes smoked	39	57	61	51	55	62	67	60
Women								
Smoking ban will make/has made me reduce number of cigarettes smoked	60	54	40	53	45	42	32	41
Smoking ban will not make/has not made me reduce number of cigarettes smoked	40	46	60	47	55	58	68	59
Bases (unweighted)								
Men	90	119	69	278	104	123	88	315
Women	108	156	80	344	124	138	92	354
Bases (weighted)								
Men	122	137	61	320	140	144	80	364
Women	108	145	66	319	129	124	76	329

Table 6.11

**Self-reported impact of the smokefree legislation upon smoking at home, pre and post 1st July, by age and sex**

Current smokers aged 16 and over

2007

Self reported impact of legislation	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
Smoking ban will make/has made me stay at home where I can smoke	23	41	43	34	33	38	41	37
Smoking ban will not make/has not made me stay at home where I can smoke	77	59	57	66	67	62	59	63
Women								
Smoking ban will make/has made me stay at home where I can smoke	33	36	33	34	25	38	33	32
Smoking ban will not make/has not made me stay at home where I can smoke	67	64	67	66	75	62	67	68
Bases (unweighted)								
Men	92	122	75	289	103	125	92	320
Women	110	155	86	351	126	139	103	368
Bases (weighted)								
Men	124	140	66	331	138	146	83	367
Women	110	144	71	325	130	125	85	341

Table 6.12

**Prevalence of saliva cotinine levels of 15ng/ml or more, pre and post 1st July, by age and sex**

Aged 16 and over with valid cotinine assay

2007

Saliva cotinine (ng/ml)	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
% with cotinine 15ng/ml or more	30	28	19	26	29	29	19	25
Women								
% with cotinine 15ng/ml or more	27	26	14	22	28	25	15	22
Bases (unweighted)								
Men	233	346	380	959	223	355	388	966
Women	273	421	402	1096	274	422	453	1149
Bases (weighted)								
Men	330	358	321	1009	313	377	332	1022
Women	314	369	354	1037	318	371	397	1086

Table 6.13

**Saliva cotinine levels, pre and post 1st July, by age and sex***Aged 16 and over with valid cotinine assay**2007*

Saliva cotinine (ng/ml)	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
Mean saliva cotinine among self-reported cigarette smokers	258.0	331.8	403.7	316.6	213.3	331.0	295.6	283.3
Standard error of the mean	18.27	13.51	19.31	9.33	10.14	12.57	20.30	8.37
Mean saliva cotinine among self-reported and cotinine validated non-smokers <sup>a</sup>	0.7	0.6	0.4	0.5	0.6	0.3	0.4	0.4
Standard error of the mean	0.11	0.07	0.04	0.04	0.10	0.07	0.08	0.05
Women								
Mean saliva cotinine among self-reported cigarette smokers	231.7	310.8	[291.8]	277.7	165.1	283.4	293.6	239.7
Standard error of the mean	13.18	9.97	[13.58]	6.52	8.59	11.94	16.28	7.15
Mean saliva cotinine among self-reported and cotinine validated non-smokers <sup>a</sup>	0.7	0.6	0.5	0.6	0.3	0.3	0.5	0.4
Standard error of the mean	0.08	0.08	0.06	0.04	0.05	0.08	0.08	0.05
Bases (unweighted)								
Men								
Cigarette smokers	62	81	53	196	52	89	54	195
Non-smokers	154	249	312	715	152	258	319	729
Women								
Cigarette smokers	70	96	45	211	74	91	58	223
Non-smokers	188	315	348	851	189	319	386	894
Bases (weighted)								
Men								
Cigarette smokers	94	90	48	232	80	104	51	235
Non-smokers	211	253	260	725	207	266	269	742
Women								
Cigarette smokers	77	90	41	208	90	86	55	232
Non-smokers	222	272	305	798	215	275	335	826

<sup>a</sup> To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine level lower than 15ng/ml.

Table 6.14

**Saliva cotinine levels, pre and post 1st July, by NS-SEC of household reference person and sex***Aged 16 and over with valid cotinine assay**2007*

Saliva cotinine (ng/ml)	Pre 1st July		Post 1st July	
	Non-routine/ non-manual	Routine and manual	Non-routine/ non-manual	Routine and manual
<b>Men</b>				
Mean saliva cotinine among self-reported cigarette smokers	328.8	296.8	258.1	306.5
Standard error of the mean	11.41	16.20	10.61	12.34
Mean saliva cotinine among self-reported and cotinine validated non-smokers <sup>a</sup>	0.5	0.6	0.4	0.4
Standard error of the mean	0.05	0.07	0.06	0.05
<b>Women</b>				
Mean saliva cotinine among self-reported cigarette smokers	232.7	310.8	229.1	252.5
Standard error of the mean	9.97	9.97	10.91	10.97
Mean saliva cotinine among self-reported and cotinine validated non-smokers <sup>a</sup>	0.5	0.6	0.3	0.6
Standard error of the mean	0.05	0.07	0.03	0.13
<i>Bases (unweighted)</i>				
<i>Men</i>				
<i>Cigarette smokers</i>	<i>101</i>	<i>88</i>	<i>96</i>	<i>99</i>
<i>Non-smokers</i>	<i>468</i>	<i>236</i>	<i>512</i>	<i>211</i>
<i>Women</i>				
<i>Cigarette smokers</i>	<i>84</i>	<i>120</i>	<i>109</i>	<i>113</i>
<i>Non-smokers</i>	<i>556</i>	<i>267</i>	<i>613</i>	<i>268</i>
<i>Bases (weighted)</i>				
<i>Men</i>				
<i>Cigarette smokers</i>	<i>115</i>	<i>108</i>	<i>118</i>	<i>115</i>
<i>Non-smokers</i>	<i>452</i>	<i>256</i>	<i>517</i>	<i>215</i>
<i>Women</i>				
<i>Cigarette smokers</i>	<i>81</i>	<i>119</i>	<i>112</i>	<i>117</i>
<i>Non-smokers</i>	<i>499</i>	<i>268</i>	<i>552</i>	<i>259</i>

<sup>a</sup> To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine level lower than 15ng/ml.

Table 6.15

# **Self-reported mean hours of exposure to other people's smoke, pre and post 1st July, by age and sex**

Aged 16 and over

2007

Self-reported exposure to other people's smoke	Pre 1st July			Total	Post 1st July			Total
	16-34	35-54	55+		16-34	35-54	55+	
Men								
Mean number of hours exposed to other people's smoke	10.4	7.5	3.9	7.2	6.0	3.0	2.6	3.8
Standard error of the mean	1.07	0.71	0.46	0.50	0.69	0.39	0.47	0.33
Women								
Mean number of hours exposed to other people's smoke	7.5	5.1	3.1	5.2	5.0	2.7	2.0	3.1
Standard error of the mean	0.72	0.46	0.46	0.32	0.64	0.39	0.31	0.28
Bases (unweighted)								
Men	353	515	587	1455	394	549	624	1567
Women	468	661	696	1825	462	677	806	1945
Bases (weighted)								
Men	486	580	523	1589	535	630	564	1730
Women	510	609	581	1700	500	622	676	1798

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# Adult alcohol consumption

## 7

Elizabeth Fuller

### Summary

- This chapter covers alcohol consumption by men and women aged 16 and over. It measures drinking in the last week, including the number of drinking days and the maximum amount drunk on a single day. Knowledge of the recommended maximum daily intake of alcohol and of what constitutes a unit of alcohol are examined, and attitudes to drinking are explored.
- 90% of men and 84% of women said they drank alcohol at least occasionally.
- The majority of adults had drunk alcohol in the last week; 73% of men, 57% of women. This includes 22% of men and 13% of women who had drunk alcohol on five or more days in the last week. Frequent drinking was most common among men and women aged 45 and over and in higher income households.
- The current recommendations for daily alcohol intake are that it should not regularly exceed three to four units for men and two to three units for women. In the last week, 42% of men and 31% of women had drunk more than the recommended maximum on at least one day.
- Among those adults who drank in the last week, the majority exceeded recommendations on at least one day; 59% of men and 55% of women had done so. This was more likely in adults of normal working age than those aged 65 or over.
- 35% of men and 27% of women had drunk more than twice the recommended levels on at least one day in the last week. This was most common among the youngest age group (56% of men and 52% of women aged between 16 and 24), and declined with age.
- On average, among those who drank in the last week, men consumed 8.5 units on the day they drank most in the last week, and women consumed 5.5 units. Average consumption was highest among young adults and declined with age.
- When asked about measuring their intake of alcohol, most adults (92% of men and 89% of women) had heard of units. However, there was less knowledge of the recommended maximum daily intake; 35% of men and 47% of women had heard of units but said they didn't know what the recommendations were for men, and 39% of men and 43% of women similarly knew about units but said they did not know the recommendations for women. Those who attempted to define the recommendations were more likely to be wrong than right.
- The alcoholic content of wine and beer varies considerably, although there is little variation for spirits. When asked about the alcoholic content of different drinks:
  - 125ml glass of wine: 44% of men and 45% of women said one unit, and 21% of men and 15% of women said two units.
  - Pint of 'normal strength' beer: 49% of men and 37% of women said two units, and 5% of men and 4% of women said three units.

- Single pub measure of spirits: 27% of both men and women said one unit, and 26% of men and 20% of women said two units.
- The majority of adults believed that 'drinking is a major part of the British way of life'. Only a minority agreed that 'there is nothing wrong with people getting drunk regularly'. Similarly, only a minority agreed that 'the government should tax alcohol more heavily to encourage people to drink less', one possible approach to reducing excessive drinking.

## 7.1 Introduction

Most adults in Britain drink alcohol, at least occasionally. However, in recent years, concern has arisen among policy makers and the general public about the damaging effects of excessive drinking on individuals, communities and society as a whole. Following a wide-ranging review of the current extent and nature of alcohol-related harms in Britain, the government published its *Alcohol Harm Reduction Strategy for England* in 2004, with a further report, *Safe. Sensible. Social. The next steps in the National Alcohol Strategy* in 2007.<sup>1,2,3</sup>

Alcohol has been identified as a causal factor in more than 60 medical conditions, including mouth, throat, stomach, liver and breast cancers; hypertensive disease, cirrhosis and depression.<sup>4,5</sup> Additionally, alcohol is implicated in many road traffic accidents and violent assaults.<sup>6,7</sup> Both hospital admissions for conditions specifically related to alcohol and deaths attributed to alcohol increased substantially between 1991 and 2006.<sup>8</sup> The annual cost to the NHS of alcohol misuse has been estimated as £2.7 billion.<sup>9</sup>

Per capita alcohol consumption in the UK rose over the second half of the twentieth century.<sup>10</sup> In recent years, as households' disposable income has risen, alcohol has become more affordable; taking 1980 as a baseline, in 2007, the affordability of alcohol had increased by 69%.<sup>8</sup> While the average amount drunk each year increased over this period from 9.4 litres of pure alcohol per head to 11.2 litres, the proportion of household expenditure spent on alcohol fell from 9.6% to 5.2%.<sup>11</sup> What people drink has also changed. Since the 1960s, there has been a fall in the proportion of alcohol drunk in the form of beer and a corresponding rise in the proportion drunk in other forms, particularly wine. Between 1980 and 2006, the proportion of alcohol drunk as beer changed from 60% to 43% of total consumption. In the same period, the proportion of wine increased from 14% to 30% of total consumption.<sup>11</sup>

In the 1980s, the concept of 'sensible drinking' was developed by government and health educators.<sup>12</sup> In 1987, this was linked in official guidance to the amount of alcohol consumed; specifically 'units' of alcohol, previously a term used in clinical practice, was introduced as a means of monitoring the alcohol content of specific drinks. The recommended limits, 21 units per week for men, 14 units per week for women, were endorsed by three of the Royal Colleges: General Practitioners, Psychiatrists and Physicians.<sup>13</sup> This guidance was revised in 1995 and linked to daily rather than weekly consumption. The Department of Health now advises that men should not regularly drink more than three to four units of alcohol per day, and women should not regularly drink more than two to three units of alcohol per day. Pregnant women are advised to avoid alcohol altogether.<sup>14</sup> Men who regularly drink more than eight units a day (or 50 units a week) and women who regularly drink more than six units a day (or 35 units a week) are considered to be at particular risk of harm.<sup>15</sup>

In the 1980s and 1990s, the sensible drinking message was coupled with the advice that one unit was equivalent to a half pint of ordinary beer or lager, a small (125ml) glass of wine or a single measure of spirits.<sup>4</sup> However, the 2004 *Alcohol Harm Reduction Strategy* acknowledged that these equivalents were no longer valid. Two changes were identified as being particularly significant. Over time, the alcoholic strength of beers and wines had increased; for example, the average strength of wine was around 12.5% alcohol by volume (ABV), rather than the 9% assumed earlier. In addition, a standard glass of wine sold in a pub or bar was likely to be 175ml or even 250 ml. As a consequence, advice on the alcoholic content of drinks has become more specific; for example, the NHS 'Know your units' website defines the content in units of drinks not just by type, but also by volume and ABV.<sup>16</sup>

'Making the sensible drinking message easier to understand and apply' was one of the actions identified in the 2004 *Alcohol Harm Reduction Strategy* under the heading 'Better education and communication'.<sup>2</sup> Other actions included targeting messages at those most at risk, providing better information for consumers, and improving alcohol education in

schools. The 2007 strategy update claimed some success for the actions identified in 2004, but acknowledged that more needed to be done. Among new initiatives proposed were the development of informal sources of support for people who wanted to drink less, the provision of authoritative guidance about what is safe for young people to drink, local alcohol strategies and a public consultation on alcohol pricing and promotion.<sup>17</sup> The consultation starts to address two measures that evidence suggests would make an important contribution to curbing excessive drinking; raising the price of alcohol and regulating supply.<sup>10</sup>

This chapter describes alcohol consumption by men and women aged 16 and over, including the number of drinking days in the last week and the maximum amount of alcohol consumed on any day in the last week. It also looks at individuals' knowledge of the sensible drinking message, including recommended daily limits and the alcohol content of specified drinks. It also considers attitudes to drinking, including individuals' views of their own drinking levels and wider views of drinking in Britain today.

This chapter focuses on results for 2007. Trend data for adult alcohol consumption and other key variables are available in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>18</sup>

## 7.2 Methods and definitions

### 7.2.1 Methods

The Health Survey for England has asked about drinking alcohol since its inception in 1991. Information on drinking alcohol is generally collected from adults as part of the main survey interview. In 2007, as in previous years, there were two exceptions to this, designed to provide greater privacy for younger informants. Teenagers aged 16 and 17 – below the legal age for buying alcohol – were asked to fill in a self-completion questionnaire covering smoking and drinking; young adults aged between 18 and 24 were offered this questionnaire as an alternative to the interview.<sup>19</sup>

The questionnaire was revised between 1998 and 2003 to reflect changes in government guidelines, specifically the move from recommended limits for weekly consumption to those based on daily consumption.<sup>20</sup> In 2007, the HSE questionnaire covered the following areas:

- Frequency of drinking in the last 12 months (including those who never drink)
- Number of drinking days in the last week
- For those who drank in the last week, the amounts of different types of alcohol drunk on the day they drank most.

The 2007 questionnaire also included for the first time questions about knowledge of units of alcohol, and some attitude statements about drinking (see Section 7.4).

### 7.2.2 Measuring alcohol intake

Alcohol consumption is reported in terms of units of alcohol; one unit of alcohol is 10ml by volume of pure alcohol. Daily consumption is calculated by recording the amounts drunk using the day in the past week when the participant drank most. Those who drank bottled or canned beer, lager, stout or cider were asked in detail about what they drank, and this information was used to estimate the amount in pints.<sup>21</sup>

The method used by the HSE to convert drinks to units remained essentially unchanged from 1991 until 2005. The assumptions were similar to those which have been used by other major surveys since they were introduced by the General Household Survey (GHS) in 1990.<sup>22</sup> However, in the same way that the original health promotion advice about the content of alcoholic drinks had become out of date as the drinking environment changed (see Section 7.1), it became clear that these assumptions about the strength of drinks and

standard glass sizes were no longer valid. In response, from 2006 changes were made to the way HSE and other surveys estimated alcohol consumption.<sup>23,24,25</sup>

In 2007, the questions about the quantities of wine drunk were revised from the previous format, which measured consumption by the number of glasses drunk, with no definition of glass size. The new format asked separately about large (250ml), medium (175ml) and small (125ml) glasses, and also included the option of specifying the quantity of wine drunk in bottles or fractions of a bottle; a bottle was treated as the equivalent of six small (125ml) glasses.

Table 7A below shows the conversion factors used in this report; drinks other than wine are the same as the revised unit measures used in 2006.<sup>23</sup> In 2006 the unit conversion for a glass of wine (size unspecified) was two units (revised from one unit in previous years).

Table 7A		
Type of drink	Measure	Revised equivalent units of alcohol
Normal strength beer, lager, stout, cider, shandy (less than 6% ABV)	Pint	2
	Can or bottle	amount in pints multiplied by 2.5
	Small cans (size unknown)	1.5
	Large cans or bottles (size unknown)	2
Strong beer, lager, stout, cider (6% ABV or more)	Pint	4
	Can or bottle	amount in pints multiplied by 4
	Small cans (size unknown)	2
	Large cans or bottles (size unknown)	3
Spirits and liqueurs	Glass (single measure)	1
Sherry, martini and other fortified wines	Glass	1
Wine	Small glass (125ml)	1.5
	Medium glass (175ml)	2.0
	Large glass (250ml)	3.0
	Bottle	9.0
Alcopops	Small can or bottle	1.5

The effect of the change in the way wine is converted into units is discussed in Section 7.5.

### 7.2.3 Measuring alcohol consumption in surveys

Survey measures of alcohol consumption are generally acknowledged to underestimate consumption. There are several reasons why this is so; the most significant are believed to be the under-representation of heavy drinkers in survey samples and the difficulty of accurately recalling amounts drunk, particularly where drinking is in informal settings. Comparisons of survey measures with HM Revenue and Customs data on alcohol taxed for sale suggest that survey estimates of consumption represent between 55% and 60% of the true figure.<sup>26</sup> However, survey data provide a reliable means of comparing drinking between different groups and of measuring trends in drinking over time.

## 7.3 Drinking behaviour

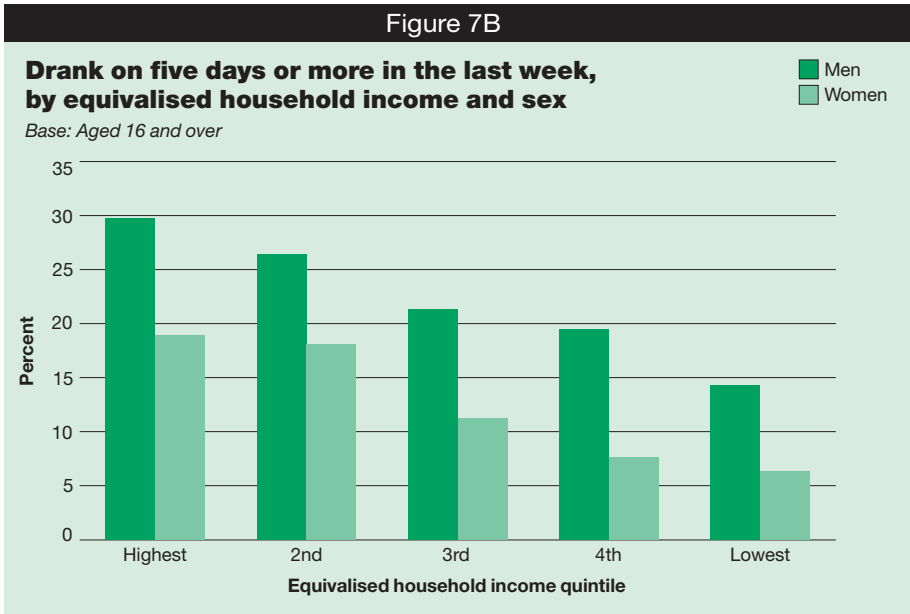
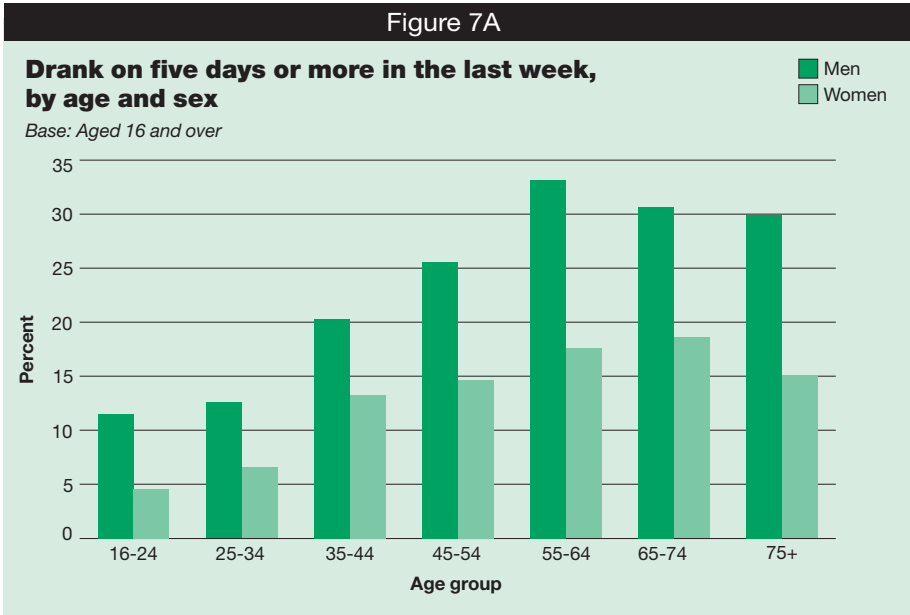
### 7.3.1 Usual frequency of drinking alcohol

Most adults drink alcohol, at least occasionally; 90% of men and 84% of women said they had drunk alcohol in the last year.

The majority had drunk alcohol in the last week; 73% of men, 57% of women, including 22% of men and 13% of women who had drunk alcohol on five or more days in the last

week. Frequent drinking was most common among men and women aged 45 and over and in higher income households. Figure 7A shows the proportion of adults drinking on five or more days per week by age, and Figure 7B shows it by quintile of equivalised household income.

Tables 7.1-7.4, Figures 7A, 7B



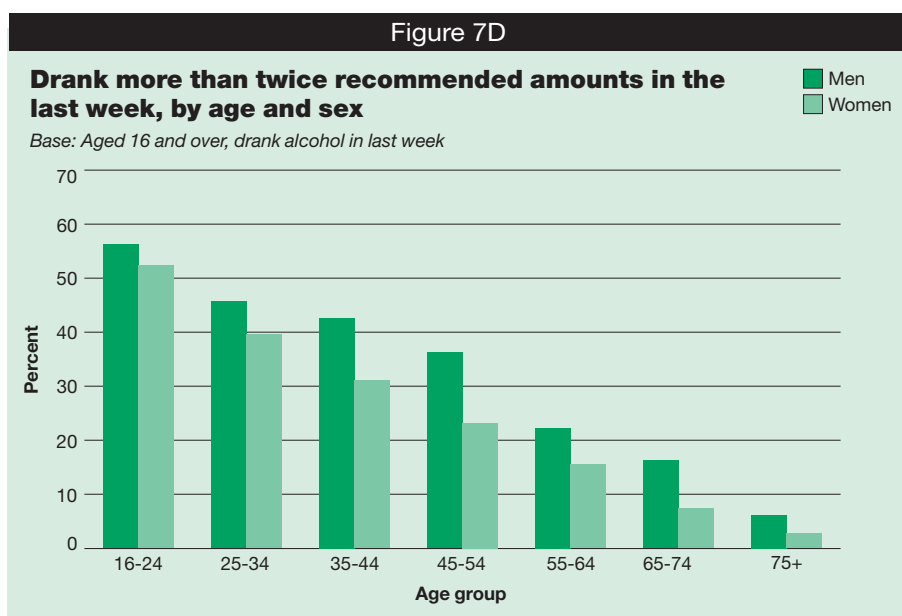
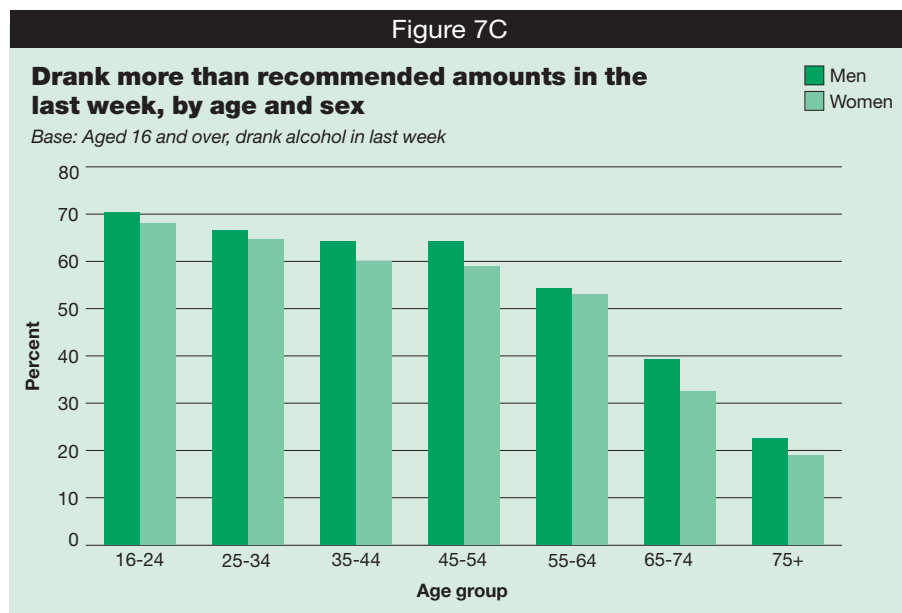
7.3.2 Maximum daily consumption in the last week

The current recommendations for daily alcohol intake are that it should not regularly exceed three to four units for men and two to three units for women.<sup>14</sup> In the last week, 58% of men and 69% of women had either drunk no alcohol or had drunk within recommendations on any day they did drink. Conversely, 42% of men and 31% of women had drunk more than the recommended maximum on at least one day.

Table 7.5

The majority of adults who drank in the last week exceeded recommendations on at least one day; 59% of men and 55% of women had done so. This was more likely in adults of working age than those aged 65 or over, as Figure 7C shows.

Among adults who drank in the last week, 35% of men and 27% of women had drunk more than twice the recommended levels on at least one day in the last week. As Figure 7D illustrates, this was most common among the youngest age group (56% of men and 52% of women aged between 16 and 24), and declined with age to 6% of men and 3% of women aged 75 and over.



On average, among those who drank in the last week, men consumed 8.5 units on the day they drank most and women consumed 5.5 units. Average (mean) consumption was highest among young adults and declined with age. It was higher than the recommended levels for all age groups except the oldest, and more than twice recommendations for men aged between 16 and 44 and women aged between 16 and 34. **Table 7.6, Figures 7C, 7D**

There were no significant differences by region or income in the proportions of men and women drinking above recommendations, nor in the average amounts they drank on a single day in the last week. **Tables 7.7, 7.8**

## 7.4 Knowledge and attitudes

### 7.4.1 Knowledge of recommended maximum daily alcohol intake

For recommendations about sensible drinking to be effective, adults who drink alcohol need to know what they are, and also to be able to relate their consumption of actual drinks to the equivalent in units of alcohol, the terms in which current recommendations are expressed.



Most adults (92% of men and 89% of women) had heard of units; this was most common among adults aged between 35 and 64. There was less knowledge of the recommended maximum daily intake; 35% of men and 47% of women had heard of units but said they didn't know what the recommendations were for men, and 39% of men and 43% of women similarly knew about units but said they did not know the recommendations for women.

Those who attempted to define the recommendations were more likely to be wrong than right. Overall, 14% of men and 9% of women correctly defined the recommended daily maximum for men (four units) and 11% of men and 6% of women knew the recommended maximum for women (three units). Men and women aged below 55 were more likely to know these limits than older adults. 42% of men and 33% of women gave incorrect answers about recommendations for men, and 41% of men and 40% of women gave incorrect answers about recommendations for women. There was a greater tendency to under-estimate than to over-estimate the recommended maximum consumption; in particular, 23% of both men and women thought that the maximum recommended intake for women was two units a day.

**Tables 7.9, 7.10**

Accurate awareness of the recommendations varied between regions although no individual regions stood out. It was higher among adults in higher income households; this was possibly related to differences in alcohol consumption.

**Tables 7.11-7.14**

General awareness of units was higher among men and women who had drunk alcohol in the last week. Men's awareness that four units was the recommended daily maximum for men increased in line with the maximum amount drunk on any day. But even among men who drank the most, less than one in five (19%) thought that the daily maximum was four units, and men were as likely to think that the maximum was three units, regardless of how much they drank. Among women, relatively small proportions knew that three units was the recommended daily maximum for women (6% of women who had drunk between three and six units on a single day, 9% of those who had drunk more than six units). Around a third of these women thought the recommended daily maximum was two units (30% of women who had drunk between three and six units on a single day, 35% of those who had drunk more than six units). Nevertheless, most adults who drank more than the recommended amounts either did not know what these limits were or could not identify them correctly, as shown in Figures 7E and 7F.

**Tables 7.15, 7.16, Figures 7E, 7F**

## **7.4.2 Knowledge of the alcoholic content of different drinks**

The alcoholic content of wine on sale in shops, pubs and bars varies considerably. The content of a 125ml glass of wine may range from one unit (8% ABV) to 1.8 units (14.5% ABV), although it is likely to be in the range 1.25 to 1.75 units.<sup>27</sup> 44% of men and 45% of women identified the content of a 125ml glass of wine as one unit, and 21% of men and 15% of women said two units.

**Table 7.17**

The strength of beers and lagers also varies; normal strength is here assumed to be below 6% ABV, and a pint may contain up to 3.4 units; for example a pint of beer with 4% ABV is equivalent to 2.3 units. 49% of men and 37% of women identified a pint of normal strength beer as equivalent to two units, and 5% of men and 4% of women said it was equivalent to three units.

There is little variation in the ABV of spirits, and a standard pub single measure of 25ml contains one unit (assuming an ABV of 40%). But in some pubs and bars a single measure contains 35ml, in which case it would be equivalent to 1.4 units. 27% of both men and women said that a single pub measure of spirits contained one unit, and 26% of men and 20% of women said it contained two units.

Accurate knowledge of the content of different drinks in units varied with age, being highest among 25 to 54 year olds. It was also related to what people actually drank. 77% of men and 73% of women who had drunk wine on the day they drank most in the last week said that a 125ml glass of wine contained one or two units, compared with 65% of men and 60% of women who had not drunk wine on the day they drank most in the last week (though they may have drunk wine on other days). A similar, though less marked pattern was seen for beer and spirits.

**Tables 7.17-7.20**



Figure 7E

**Men's estimate of the recommended maximum amount of alcohol that men should drink in a day, by the maximum drunk on any day in the last week**

Base: Men aged 16 and over

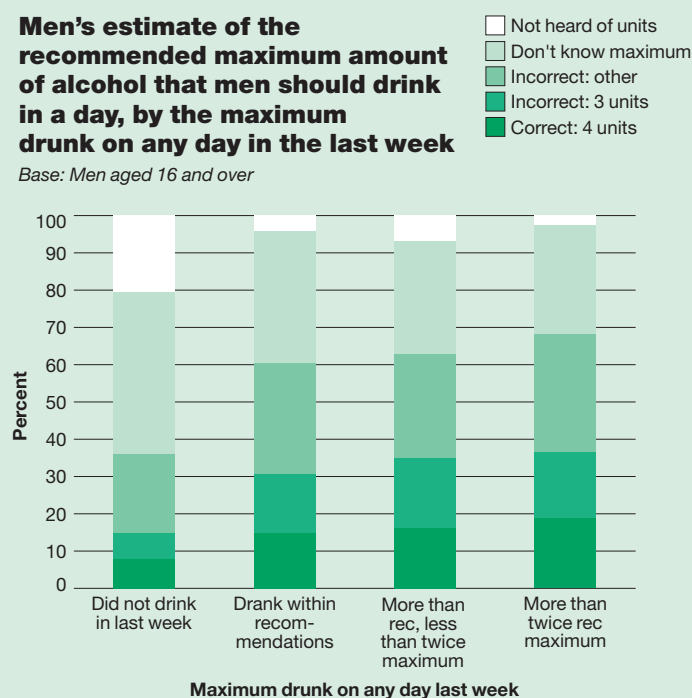
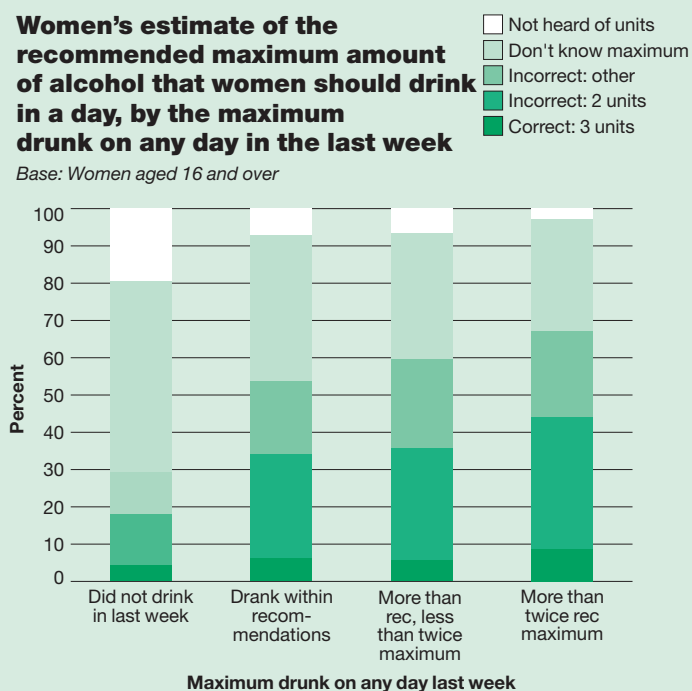


Figure 7F

**Women's estimate of the recommended maximum amount of alcohol that women should drink in a day, by the maximum drunk on any day in the last week**

Base: Women aged 16 and over



### 7.4.3 Attitude to own drinking

Among adults who had drunk alcohol in the last year, 16% of men and 14% of women said they would like to drink less. This was most common among men and women aged below 55, less common among older adults.

Table 7.21

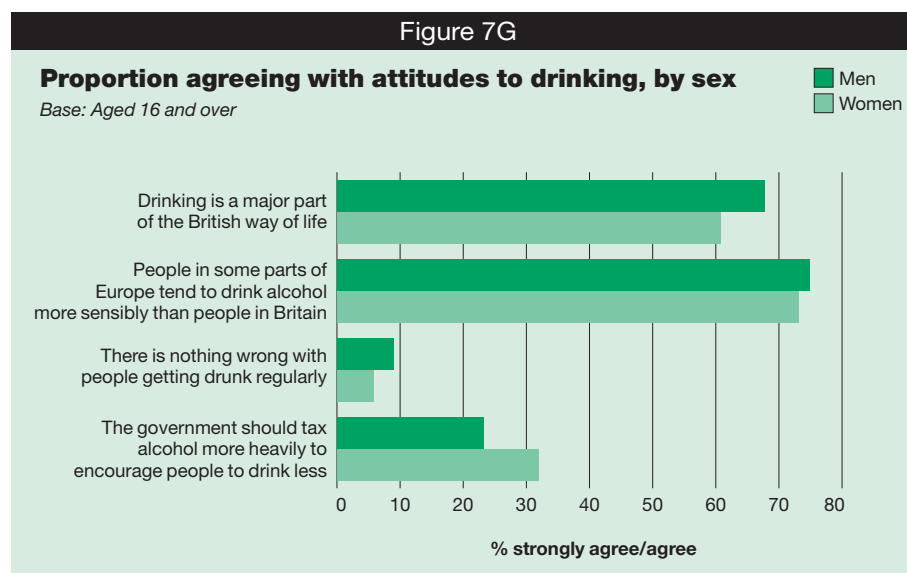
Adults who had drunk more than twice the recommended daily maximum intake were more likely than other drinkers to want to drink less (24% of men and 25% of women who drank at this level).

Table 7.22

## 7.4.4 Attitudes to drinking in general

The majority of adults believed that ‘drinking is a major part of the British way of life’. However, there was also agreement that ‘people in some other parts of Europe tend to drink more sensibly than people in Britain’. Only a minority of adults agreed that ‘there is nothing wrong with people getting drunk regularly’. Similarly, only a minority agreed with one possible remedy, that ‘the government should tax alcohol more heavily to encourage people to drink less’. Figure 7G shows the proportion of adults that agreed or strongly agreed with these statements.

Table 7.23, Figure 7G



Men were more likely than women to agree that ‘drinking is part of the British way of life’ (68% of men, 61% of women). Levels of agreement differed between age groups, and also between regions, with no clear pattern. Men and women in the top two income quintiles were more likely to think this than adults in lower income households. Among those who had drunk alcohol in the last year, agreement was highest among adults who had drunk more than twice the recommended maximum on at least one day; 74% of men and 68% of women in this group agreed that ‘drinking is part of the British way of life’.

75% of men and 73% of women agreed that ‘people in some other parts of Europe tend to drink more sensibly than people in Britain’. There were differences between age groups, with 16 to 24 year olds least likely to agree (67% of men, 57% of women), and 65 to 74 year olds most likely to agree (81% of men, 80% of women). There was no significant variation between regions. The proportion agreeing increased in line with income. Men and women who had not drunk in the last week were less likely than those who had to agree that ‘people in some other parts of Europe tend to drink more sensibly than people in Britain’; the amount drunk was not significant.

Relatively few adults agreed that ‘there is nothing wrong with people getting drunk regularly’ (9% of men and 6% of women). Young adults were most likely to think this (24% of men and 13% of women aged 16 to 24), and the proportions agreeing broadly declined with age. Adults in the North East were more likely to agree than were those elsewhere. There was no difference between income groups. Men who had drunk more than twice the recommended daily maximum were more likely than other adults to agree that ‘there is nothing wrong with people getting drunk regularly’ (14%).

There is strong evidence that increasing the price of alcohol would be an effective way to moderate excessive drinking.<sup>10,28</sup> Nevertheless, only a minority, 23% of men and 32% of women, thought that ‘the government should tax alcohol more heavily to encourage people to drink less’. Adults aged 65 or over were more likely than younger men and women to agree with this statement. The proportions who agreed varied between regions, and agreement was higher in London than anywhere else. Agreement was highest among men and women in the lowest income quintile (33% and 46%). The proportions who thought that

‘the government should tax alcohol more heavily to encourage people to drink less’ varied with the amount drunk on the heaviest drinking day; it was highest among men and women who had not drunk alcohol in the last week (34% of men, 41% of women) and lowest among those who had drunk more than twice the daily maximum on at least one day (8% of men, 11% of women).

Tables 7.24-7.27

## 7.5 Discussion

### 7.5.1 Estimates of consumption

In 2006, the revisions in the way alcohol intake was calculated had a significant impact on the estimates of alcohol consumption and consequently on the proportions of men and women reported as drinking over the recommended daily limits.<sup>23</sup> A further change was implemented in the 2007 HSE, specifying wine glass size (see Section 7.2.2). Tables 7B to 7D show estimates for 2007 using the 2006 and 2007 methods of calculation (the difference being the unit conversion factor for wine), and it can be seen in Table 7B that the 2007 method had a marginal effect on consumption estimates.

Table 7B								
Mean consumption of alcohol by those who drank in the last week on the day they drank most: 2006 and 2007 methods of calculation								
	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<b>Men</b>								
2006 method	15.2	10.3	8.9	8.0	6.5	5.0	3.4	8.6
2007 method	15.2	10.1	8.8	7.8	6.4	4.9	3.3	8.5
<b>Women</b>								
2006 method	8.9	7.4	6.0	5.2	4.5	3.3	2.4	5.7
2007 method	8.9	7.3	5.7	5.1	4.4	3.1	2.3	5.5

Using the 2007 method rather than the 2006 method there was an apparent decrease; this was a measurement effect, not an indication of real change.

The proportion of women exceeding recommended daily limits also decreased as a result of the revision. However, counter-intuitively, the proportions of men drinking more than the recommended daily limits and the proportions of women drinking more than twice the recommended daily maximum increased slightly (see Tables 7C and 7D).

Table 7C								
Proportion who drank more than the maximum recommended daily intake in the last week: 2006 and 2007 methods of calculation (based on those who drank in the last week)								
	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<b>Men</b>								
2006 method	70	65	63	63	52	38	21	57
2007 method	70	66	64	64	54	39	22	59
<b>Women</b>								
2006 method	69	67	64	61	59	36	22	58
2007 method	68	65	60	59	53	32	19	55

This is also a measurement effect; the previous method of converting wine glasses to units treated all glass sizes the same, and therefore overestimated the intake of those who drank less (who were more likely to drink wine in small glasses) and underestimated the intake of those who drank more (who were more likely to drink wine in large glasses).<sup>29</sup>

Table 7D

**Proportion who drank more than twice the maximum recommended daily intake in the last week: 2006 and 2007 methods of calculation (based on those who drank in the last week)**

	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
2006 method	56	45	42	35	23	15	7	35
2007 method	56	46	43	36	22	16	6	35
Women								
2006 method	50	39	30	22	15	7	4	26
2007 method	52	40	31	23	16	7	3	27

### 7.5.2 The sensible drinking recommendations

The 2007 strategy update identified the need to raise awareness of the sensible drinking message, and also to promote labelling of the unit content of drinks, on containers and also at the point of sale.<sup>3</sup> This is intended to encourage more informed drinking choices by individuals. Currently, the sensible drinking message has failed to reach significant proportions of adults. Nearly half of men and just over half of women either had not heard of units of alcohol or did not know what the sensible drinking recommendations were. Moreover, most of those who did attempt to define the maximum recommended amounts for men and women got them wrong. Adults who had exceeded the guidelines were most likely to know what they were. However, in this group there were still 31% of men and 34% of women who had drunk twice the recommended daily maximum and either had not heard of units of alcohol or did not know what the recommendations were.

Nevertheless, evidence suggests that increased awareness is unlikely to have a significant impact on the levels of problematic drinking.<sup>10,28</sup> Individuals' drinking choices are as much influenced by past experiences, context and their own judgment of their capacity for alcohol.<sup>10</sup> These findings indicate that a significant proportion of adults had drunk above what they knew (or believed) to be the recommended maximum. It may be worth noting that this is not hard to do. For men, drinking two pints of a 4% ABV beer or two 175ml glasses of a 12% ABV wine exceeds their recommended daily intake; women will exceed the recommended maximum by drinking less than that. Finally, only a quarter of men and women who had drunk more than twice the recommended daily maximum at least once in the last week reported that they would like to drink less than they actually do.

### 7.5.3 Attitudes to drinking in Britain today

The overall aim of the government's alcohol strategy has been to reduce the harm caused by alcohol use, rather than to discourage drinking per se. The 2004 *Alcohol Harm Reduction Strategy* stated that 'there are both benefits and costs to alcohol use, and, therefore [the strategy] does not aim to cut alcohol consumption by the whole population'.<sup>2</sup>

These findings suggest that the strategy is in tune with public opinion. A majority of adults thought that drinking is a major part of the British way of life. Similar levels of agreement that people elsewhere in Europe tend to drink more sensibly than the British do indicate a level of concern at the pattern of drinking in Britain. The 2007 strategy update identified the need for a change in the public tolerance of drunkenness and alcohol-fuelled disorder, and suggested that this was already taking place.<sup>3</sup> This survey found that the majority of adults disapproved of someone getting drunk regularly; overall, less than one in ten thought it acceptable. However, it may be of concern that acceptance of regular drunkenness was highest among young adults (24% of men and 13% of women aged between 16 and 24), since this is the group most likely to drink large quantities of alcohol within a short space of time with the explicit intention of getting drunk, thereby placing themselves at risk of harm from accidents, assaults and alcohol poisoning.<sup>2</sup>

There is a strong body of evidence suggesting that increasing the price of alcohol would discourage excessive drinking.<sup>10,28</sup> A rise in the cost of drinking would have a disproportionate impact on young drinkers and those who drank most, both groups at risk. Groups including Alcohol Concern and the British Medical Association have urged the government to raise excise duty on alcohol above the rate of inflation.<sup>10,30</sup> But these findings suggested that such a price rise would be unpopular with the general public. Disapproval was highest among young people and those who drank most, and there was no group within which this proposal gained majority support.

## References and notes

- 1 Strategy Unit Alcohol Harm Reduction project *Interim analytical report*, London, 2003  
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- 2 Strategy Unit *Alcohol Harm Reduction Strategy for England*. Cabinet Office, London, 2004.  
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- 3 Department of Health, Home Office et al. *Safe. Sensible. Social. The next steps in the national alcohol strategy*. <http://www.homeoffice.gov.uk/documents/Alcohol-strategy.pdf?view=Binary>
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- 5 Rehm J, Room R, Graham K et al. *The relationship of average volume of consumption and patterns of drinking to burden of disease: an overview*. *Addiction*, 2003; **98**:1209-1228.
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- 7 Kershaw C, Nicholas S, Walker A. *Crime in England and Wales 2007/08*. Home Office, London, 2008.  
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- 8 The NHS Information Centre. *Statistics on Alcohol: England 2008*. <http://www.ic.nhs.uk/pubs/alcohol08>
- 9 Department of Health. *Safe, Sensible, Social – consultation on further action*. London, 2008.  
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- 10 BMA Board of Science. *Alcohol misuse: tackling the UK epidemic*. British Medical Association, London, 2008.  
<http://www.bma.org.uk/ap.nsf/Content/tacklingalcoholmisuse?OpenDocument&Highlight=2,alcohol,misuse>
- 11 British Beer and Pub Association. *Statistical Handbook*. Brewing publications, London, 2008.
- 12 This paragraph is based on *Annex E: History of the Sensible Drinking Message* in Department of Health (1995) cited above.
- 13 For the Royal College of Psychiatrists, a significant revision from their previous recommendation that sensible drinking indicated an intake of up to 56 units per week for men and women; see Department of Health (1995), cited above.
- 14 [http://www.dh.gov.uk/en/Publichealth/Healthimprovement/Alcoholmisuse/DH\\_085385](http://www.dh.gov.uk/en/Publichealth/Healthimprovement/Alcoholmisuse/DH_085385)
- 15 Department of Health et al (2007), cited above. Drinking at this level has been described in surveys, including the HSE, as 'binge drinking'. 'Binge drinking' is also used to define a pattern of drinking a large quantity of alcohol in a short period of time with the aim of getting drunk. In practice, this may involve considerably more than twice the recommended daily limits. To avoid confusion, the term 'binge drinking' is not used in this report.
- 16 <http://units.nhs.uk/howMany.html>
- 17 See Strategy Unit (2004), cited above. For details of the progress so far see [http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH\\_086412](http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_086412)
- 18 [www.ic.nhs.uk/pubs/hse07trends](http://www.ic.nhs.uk/pubs/hse07trends)
- 19 In 2007, 27% of this age group chose to complete the questionnaire rather than be interviewed about their drinking. They were most likely to be at the young end of the age range; for example, 48% of 18 year olds requested the booklet, compared with 17% of 24 year olds.
- 20 See Department of Health (1995), cited above. Questions about average daily consumption, which enabled the estimation of weekly consumption, were last asked by the Health Survey for England in 2002.
- 21 One pint is equivalent to 0.568 litres.
- 22 Smyth M, Browne F. *General Household Survey 1990*. HMSO, London, 1992.

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- 26 Goddard E. *Obtaining information about drinking through surveys of the general population*, ONS, London, 2001
- 27 See <http://units.nhs.uk/howMany.html>. These findings assume that a 125ml glass of wine is equivalent to 1.5 units (see Section 7.2).
- 28 Room R, Babor T, Rehm J. *Alcohol and public health*. The Lancet, 2005; **365**:519-30.
- 29 As the table below shows, there is not a simple correspondence between the amount individuals drank and how it was recorded. While there is a relationship between glass size and the amount drunk, it is confounded by measures of consumption recorded in bottles or fractions of bottles, which were converted into the equivalent in 125ml glasses.

**Proportions of wine drinkers who recorded consumption in different glass sizes, by the maximum drunk on one day in the last week and sex**

Glass sizes	Drank within recommendations	Drank more than recommended maximum, but less than twice	Drank more than than twice recommended maximum	Total
	%	%	%	%
<b>Men</b>				
Bottles (converted into 6x125ml glasses)	5	23	37	21
125ml	24	19	14	20
175ml	67	60	52	61
250ml	9	22	34	19
<b>Women</b>				
Bottles (converted into 6x125ml glasses)	6	16	28	16
125ml	41	16	11	26
175ml	50	70	59	59
250ml	9	14	31	16

Note: Columns total more than 100% because consumption could be recorded using a mixture of measures.

- 30 Alcohol Concern. *2008 Budget submission*. London, 2008. <http://www.alcoholconcern.org.uk/servlets/doc/1288>

- |  |   |
|--|---|
| 7.1 Usual frequency of drinking alcohol in last year, by age and sex   | 7.14 Estimation of recommended maximum alcohol intake in units per day for women (age-standardised), by equivalised household income and sex                          |
| 7.2 Number of days on which drank alcohol in the last week, by age and sex   | 7.15 Estimation of recommended maximum alcohol intake in units per day for men (age-standardised), by maximum drunk on any day in the last week and sex               |
| 7.3 Number of days on which drank alcohol in the last week (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex                       | 7.16 Estimation of recommended maximum alcohol intake in units per day for women (age-standardised), by maximum drunk on any day in the last week and sex             |
| 7.4 Number of days on which drank alcohol in the last week (age-standardised), by equivalised household income and sex   | 7.17 Estimation of the alcoholic content of specific drinks, by age and sex   |
| 7.5 Summary of maximum alcohol consumption on any day in the last week, by age and sex   | 7.18 Estimation of the alcoholic content of a 125ml glass of wine (age-standardised), by whether drank wine on heaviest drinking day and sex                          |
| 7.6 Maximum alcohol consumption on any day in the last week, by age and sex  | 7.19 Estimation of the alcoholic content of a pint of normal strength beer (age-standardised), by whether drank normal strength beer on heaviest drinking day and sex |
| 7.7 Maximum alcohol consumption on any day in the last week (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex                      | 7.20 Estimation of the alcoholic content of a single pub measure of spirits (age-standardised), by whether drank spirits on heaviest drinking day and sex             |
| 7.8 Maximum alcohol consumption on any day in the last week (age-standardised), by equivalised household income and sex  | 7.21 Attitude to own drinking, by age and sex   |
| 7.9 Estimation of recommended maximum alcohol intake in units per day for men, by age and sex  | 7.22 Attitude to own drinking (age-standardised), by maximum drunk on any day in the last week and sex  |
| 7.10 Estimation of recommended maximum alcohol intake in units per day for women, by age and sex   | 7.23 Attitudes to drinking: summary of agreement and disagreement, by sex   |
| 7.11 Estimation of recommended maximum alcohol intake in units per day for men (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex   | 7.24 Proportion agreeing with statements about drinking, by age and sex   |
| 7.12 Estimation of recommended maximum alcohol intake in units per day for women (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex | 7.25 Proportion agreeing with statements about drinking (observed and age-standardised), by Government Office Region/Strategic Health Authority and sex               |
| 7.13 Estimation of recommended maximum alcohol intake in units per day for men (age-standardised), by equivalised household income and sex                                       | 7.26 Proportion agreeing with statements about drinking (age-standardised), by equivalised household income and sex   |
|  | 7.27 Attitudes to drinking (age-standardised), by maximum drunk on any day in the last week and sex   |



Table 7.1

**Usual frequency of drinking alcohol in last year, by age and sex***Aged 16 and over*

2007

Usual frequency of drinking	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Almost every day	6	6	11	16	23	24	29	15
Five or six days a week	8	4	7	8	7	4	3	6
Three or four days a week	21	21	21	20	18	16	9	19
Once or twice a week	35	32	32	27	24	24	19	28
Once or twice a month	18	14	12	10	10	10	10	12
Once every couple of months	4	5	5	5	4	4	7	5
Once or twice a year	2	5	3	6	4	6	8	5
Not at all in the last 12 months/Non-drinker	7	14	9	8	9	12	16	10
<b>Women</b>								
Almost every day	2	3	7	9	12	15	15	9
Five or six days a week	1	2	4	6	6	3	1	4
Three or four days a week	9	15	16	16	15	8	3	13
Once or twice a week	34	26	31	30	23	19	12	25
Once or twice a month	22	16	13	11	12	13	12	14
Once every couple of months	8	9	8	7	9	9	11	9
Once or twice a year	5	9	7	9	9	16	20	10
Not at all in the last 12 months/Non-drinker	18	20	13	11	14	17	26	16
<i>Bases (unweighted)</i>								
Men	177	422	565	504	492	421	300	2881
Women	226	574	703	636	603	494	407	3643
<i>Bases (weighted)</i>								
Men	251	552	659	559	504	337	247	3108
Women	278	567	668	564	520	373	366	3336



Table 7.2

# Number of days on which drank alcohol in the last week, by age and sex

Aged 16 and over

2007

Number of days	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Did not drink in last week	33	33	22	22	24	27	39	27
One	23	15	19	16	13	18	15	17
Two	16	17	18	16	15	10	8	15
Three	11	14	14	12	8	9	5	11
Four	6	9	7	9	7	5	3	7
Five	3	5	7	7	8	5	3	6
Six	3	2	3	4	5	6	3	4
Seven	5	5	11	14	21	20	24	13
<i>Drank on five or more days in last week</i>	12	13	20	26	33	31	30	22
Mean number of days	1.8	2.0	2.5	2.8	3.1	2.8	2.6	2.5
Standard error of mean	0.14	0.11	0.10	0.11	0.12	0.13	0.17	0.05
<b>Women</b>								
Did not drink in last week	43	47	36	35	39	50	64	43
One	22	18	18	19	16	16	12	18
Two	15	15	17	13	13	8	5	13
Three	10	8	11	10	9	5	2	8
Four	6	6	5	8	6	3	2	5
Five	2	3	5	4	4	4	1	4
Six	2	1	2	2	3	3	1	2
Seven	1	2	6	8	11	12	13	7
<i>Drank on five or more days in last week</i>	5	7	13	15	18	19	15	13
Mean number of days	1.3	1.3	1.9	2.0	2.0	1.8	1.4	1.7
Standard error of mean	0.11	0.07	0.08	0.09	0.10	0.12	0.12	0.04
<b>Bases (unweighted)</b>								
Men	324	422	565	504	492	421	300	3028
Women	354	574	703	636	603	494	407	3771
<b>Bases (weighted)</b>								
Men	463	552	659	559	504	337	247	3321
Women	443	567	668	564	520	373	366	3501

Table 7.3

**Number of days on which drank alcohol in the last week (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Number of days	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
Men											
Observed											
Did not drink in last week	22	26	23	21	25	29	42	25	26	26	27
One	25	15	17	19	18	14	13	23	16	14	18
Two	18	16	17	17	15	15	11	13	17	18	16
Three	10	11	10	14	11	13	10	9	12	12	12
Four	7	8	7	4	8	6	6	9	7	8	6
Five	6	5	8	5	4	6	5	6	5	7	4
Six	3	5	5	4	4	3	4	2	3	3	4
Seven	10	15	13	16	16	14	9	12	12	12	13
Drank on five or more days in last week	19	24	26	25	24	24	19	20	21	22	21
Mean number of days	2.3	2.7	2.7	2.7	2.7	2.6	2.0	2.4	2.5	2.5	2.4
Standard error of mean	0.23	0.15	0.14	0.14	0.14	0.16	0.16	0.15	0.12	0.16	0.17
Standardised											
Did not drink in last week	22	26	23	21	25	29	42	25	27	26	28
One	25	15	17	19	18	14	13	24	16	15	17
Two	17	16	18	17	15	15	10	13	17	19	16
Three	9	11	10	14	11	13	9	9	12	12	11
Four	7	8	7	4	8	6	6	9	7	8	6
Five	6	5	8	4	4	6	5	6	5	6	4
Six	3	4	5	4	4	2	4	2	3	3	4
Seven	11	14	12	16	15	14	10	11	12	11	14
Drank on five or more days in last week	19	24	25	25	24	23	20	19	21	20	22
Mean number of days	2.3	2.6	2.7	2.7	2.7	2.5	2.1	2.3	2.5	2.5	2.5
Standard error of mean	0.23	0.15	0.14	0.15	0.14	0.17	0.16	0.14	0.12	0.16	0.18

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Continued...

Table 7.3 continued

Aged 16 and over

2007

Number of days	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Observed</b>											
Did not drink in last week	34	42	39	46	46	43	56	38	40	40	41
One	26	16	18	18	16	18	14	19	18	18	17
Two	14	14	17	13	12	12	9	13	14	15	12
Three	12	10	8	7	7	8	9	7	8	8	8
Four	4	6	5	4	4	5	5	7	5	6	5
Five	4	2	4	3	3	3	2	5	5	4	6
Six	1	2	2	2	3	3	1	2	2	2	2
Seven	5	8	7	7	8	7	4	9	8	7	9
<i>Drank on five or more days in last week</i>	10	12	12	12	14	13	8	16	15	13	17
Mean number of days	1.6	1.8	1.8	1.6	1.7	1.7	1.3	1.9	1.8	1.8	1.9
Standard error of mean	0.14	0.09	0.10	0.11	0.15	0.12	0.13	0.13	0.09	0.13	0.13
<b>Standardised</b>											
Did not drink in last week	33	41	39	47	45	43	55	38	40	40	40
One	27	17	18	18	17	19	14	19	18	18	18
Two	15	14	17	13	12	12	9	13	14	15	14
Three	13	10	8	7	7	8	8	7	8	8	8
Four	4	6	5	4	5	5	5	7	5	6	5
Five	3	2	4	2	4	3	2	5	5	4	6
Six	2	2	2	2	3	3	1	2	2	2	2
Seven	5	8	7	7	8	7	5	9	8	6	9
<i>Drank on five or more days in last week</i>	9	12	12	12	14	13	8	16	15	12	17
Mean number of days	1.7	1.8	1.7	1.6	1.7	1.7	1.3	1.9	1.8	1.7	1.9
Standard error of mean	0.14	0.09	0.10	0.11	0.15	0.12	0.14	0.13	0.09	0.13	0.13
<b>Bases (unweighted)</b>											
<i>Men</i>	187	444	325	289	292	346	333	313	499	246	253
<i>Women</i>	223	559	412	361	381	408	423	375	629	320	309
<b>Bases (weighted)</b>											
<i>Men</i>	191	446	336	286	357	384	456	339	526	258	268
<i>Women</i>	182	503	377	300	366	387	470	355	561	285	276

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 7.4

**Number of days on which drank alcohol in the last week (age-standardised), by equivalised household income and sex**

Aged 16 and over

2007

Number of days	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Men</b>					
Did not drink in last week	15	19	30	39	46
One	14	20	17	15	18
Two	17	18	15	11	11
Three	13	11	11	9	6
Four	11	6	5	6	5
Five	9	7	5	5	2
Six	5	6	2	4	2
Seven	16	14	14	10	11
<i>Drank on five or more days in last week</i>	<i>30</i>	<i>26</i>	<i>21</i>	<i>19</i>	<i>14</i>
Mean number of days	3.2	2.8	2.4	2.1	1.7
Standard error of mean	0.12	0.12	0.13	0.16	0.13
<b>Women</b>					
Did not drink in last week	26	35	40	50	59
One	16	16	22	20	18
Two	16	16	13	13	9
Three	15	8	9	6	4
Four	8	7	5	3	3
Five	6	6	2	2	1
Six	3	4	3	1	1
Seven	10	8	6	5	5
<i>Drank on five or more days in last week</i>	<i>19</i>	<i>18</i>	<i>11</i>	<i>8</i>	<i>6</i>
Mean number of days	2.4	2.1	1.7	1.3	1.0
Standard error of mean	0.11	0.12	0.09	0.08	0.08
<i>Bases (unweighted)</i>					
<i>Men</i>	<i>622</i>	<i>514</i>	<i>458</i>	<i>458</i>	<i>338</i>
<i>Women</i>	<i>622</i>	<i>562</i>	<i>542</i>	<i>651</i>	<i>523</i>
<i>Bases (weighted)</i>					
<i>Men</i>	<i>684</i>	<i>585</i>	<i>499</i>	<i>458</i>	<i>380</i>
<i>Women</i>	<i>586</i>	<i>543</i>	<i>498</i>	<i>561</i>	<i>487</i>

Table 7.5

**Summary of maximum alcohol consumption on any day in the last week, by age and sex**

Aged 16 and over

2007

Maximum daily consumption	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Did not drink in last week	34	33	22	22	24	27	39	27
Up to and including 4 units	20	23	28	28	35	44	48	30
More than 4, up to and including 8 units	9	14	17	22	24	17	10	17
More than 8 units	37	31	33	28	17	12	4	26
<b>Women</b>								
Did not drink in last week	44	47	36	35	39	50	64	43
Up to and including 3 units	18	19	26	27	29	34	29	25
More than 3, up to and including 6 units	9	13	18	23	23	13	6	16
More than 6 units	29	21	20	15	10	4	1	15
<i>Bases (unweighted)</i>								
Men	322	421	564	504	492	420	300	3023
Women	348	575	703	636	602	494	407	3765
<i>Bases (weighted)</i>								
Men	458	550	658	559	504	337	247	3313
Women	437	568	668	564	519	373	366	3495

Table 7.6

**Maximum alcohol consumption on any day in the last week, by age and sex**

Aged 16 and over, drank alcohol in last week

2007

Maximum daily consumption	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
2 units or less	17	16	19	22	26	33	53	24
More than 2, up to and including 3 units	4	8	7	6	7	9	12	7
More than 3, up to and including 4 units	8	10	10	8	12	19	12	11
More than 4, up to and including 5 units	1	4	5	6	6	5	7	5
More than 5, up to and including 6 units	4	8	9	13	13	10	6	10
More than 6, up to and including 8 units	8	9	7	9	13	7	3	9
More than 8 units	56	46	43	36	22	16	6	35
<i>More than 4 units</i>	70	66	64	64	54	39	22	59
<i>More than 8 units</i>	56	46	43	36	22	16	6	35
Mean number of units	15.2	10.1	8.8	7.8	6.4	4.9	3.3	8.5
Standard error of mean	1.22	0.56	0.38	0.37	0.34	0.21	0.21	0.23
<b>Women</b>								
2 units or less	25	27	30	29	33	54	69	34
More than 2, up to and including 3 units	7	9	10	12	14	14	12	11
More than 3, up to and including 4 units	4	6	12	15	15	14	9	11
More than 4, up to and including 5 units	4	10	7	9	10	4	4	7
More than 5, up to and including 6 units	7	9	10	13	13	7	3	10
More than 6, up to and including 8 units	12	8	7	8	5	4	1	7
More than 8 units	41	32	24	16	11	3	1	20
<i>More than 3 units</i>	68	65	60	59	53	32	19	55
<i>More than 6 units</i>	52	40	31	23	16	7	3	27
Mean number of units	8.9	7.3	5.7	5.1	4.4	3.1	2.3	5.5
Standard error of mean	0.51	0.44	0.23	0.21	0.18	0.15	0.14	0.13
<i>Bases (unweighted)</i>								
<i>Men</i>	213	286	442	401	380	308	184	2214
<i>Women</i>	193	308	454	413	369	254	146	2137
<i>Bases (weighted)</i>								
<i>Men</i>	304	370	511	436	385	245	151	2402
<i>Women</i>	246	302	429	365	317	188	131	1979

Table 7.7

**Maximum alcohol consumption on any day in the last week (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over, drank alcohol in last week

2007

Maximum daily consumption	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
2 units or less	20	20	22	28	20	24	20	28	28	31	25
More than 2, up to and including 3 units	5	9	5	8	9	7	8	8	5	5	5
More than 3, up to and including 4 units	10	10	12	12	13	12	10	9	11	8	14
More than 4, up to and including 5 units	1	6	4	3	4	7	7	3	6	5	6
More than 5, up to and including 6 units	8	8	10	9	11	10	13	11	9	11	7
More than 6, up to and including 8 units	8	6	7	7	12	9	11	7	9	9	10
More than 8 units	48	40	41	33	31	32	33	34	32	30	34
<i>More than 4 units</i>	65	61	61	53	58	57	63	56	56	55	57
<i>More than 8 units</i>	48	40	41	33	31	32	33	34	32	30	34
Mean number of units	11.6	8.9	9.3	8.0	7.7	8.9	7.6	7.7	7.9	7.3	8.5
Standard error of mean	1.48	0.45	0.67	0.61	0.53	1.16	0.45	0.52	0.49	0.49	0.85
<b>Standardised</b>											
2 units or less	22	21	21	28	20	24	20	28	29	32	25
More than 2, up to and including 3 units	5	9	5	8	8	8	8	8	5	5	5
More than 3, up to and including 4 units	9	10	11	12	13	11	10	9	11	8	15
More than 4, up to and including 5 units	1	7	4	3	4	6	7	3	6	5	7
More than 5, up to and including 6 units	7	8	9	9	10	9	11	10	8	10	6
More than 6, up to and including 8 units	7	6	6	7	12	10	11	8	9	9	10
More than 8 units	47	40	44	33	33	32	33	34	32	31	33
<i>More than 4 units</i>	64	60	63	52	59	58	62	55	55	55	55
<i>More than 8 units</i>	47	40	44	33	33	32	33	34	32	31	33
Mean number of units	11.2	8.9	9.9	8.1	8.1	9.4	7.7	8.0	8.1	7.5	8.7
Standard error of mean	1.35	0.46	0.75	0.67	0.61	1.39	0.50	0.62	0.70	0.57	1.28

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Continued...

Table 7.7 continued

Aged 16 and over, drank alcohol in last week

2007

Maximum daily consumption	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Observed</b>											
2 units or less	24	32	31	38	39	38	34	32	35	34	37
More than 2, up to and including 3 units	12	12	10	8	10	11	12	12	10	10	10
More than 3, up to and including 4 units	12	10	13	10	10	11	12	8	12	12	13
More than 4, up to and including 5 units	8	9	7	5	8	6	10	6	7	9	5
More than 5, up to and including 6 units	9	8	8	12	8	11	11	9	11	10	12
More than 6, up to and including 8 units	8	7	7	9	3	6	5	11	7	4	10
More than 8 units	28	22	24	18	21	17	17	21	17	21	13
More than 3 units	64	56	59	54	50	52	54	56	54	55	53
More than 6 units	36	28	31	26	24	24	22	32	24	25	23
Mean number of units	6.4	5.7	5.8	5.3	5.2	5.2	5.1	6.3	5.2	5.5	4.8
Standard error of mean	0.50	0.35	0.37	0.35	0.42	0.35	0.35	0.53	0.27	0.45	0.27
<b>Standardised</b>											
2 units or less	28	34	35	37	40	40	36	33	36	37	37
More than 2, up to and including 3 units	11	12	10	7	10	10	13	12	10	10	11
More than 3, up to and including 4 units	10	10	12	11	10	10	13	8	12	10	13
More than 4, up to and including 5 units	7	9	7	5	8	5	9	6	7	8	5
More than 5, up to and including 6 units	8	8	7	12	8	10	9	9	11	9	12
More than 6, up to and including 8 units	8	6	7	8	3	7	4	11	7	4	10
More than 8 units	28	21	22	19	21	17	15	21	18	22	14
More than 3 units	61	54	55	55	50	49	51	55	53	54	52
More than 6 units	36	27	29	27	24	24	20	32	25	26	23
Mean number of units	6.4	5.5	5.5	5.4	5.2	5.1	4.9	6.4	5.3	5.7	4.9
Standard error of mean	0.56	0.34	0.40	0.41	0.40	0.35	0.32	0.57	0.29	0.49	0.29
<b>Bases (unweighted)</b>											
Men	147	325	251	228	215	244	198	233	373	186	187
Women	148	321	255	194	204	228	185	225	377	195	182
<b>Bases (weighted)</b>											
Men	149	330	259	226	262	269	262	252	393	198	195
Women	120	290	233	161	198	218	208	216	335	173	163

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.



Table 7.8

**Maximum alcohol consumption on any day in the last week (age-standardised), by equivalised household income and sex**

Aged 16 and over, drank alcohol in last week

2007

Maximum daily consumption	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
2 units or less	18	23	25	28	27
More than 2, up to and including 3 units	8	5	8	8	7
More than 3, up to and including 4 units	9	11	9	13	9
More than 4, up to and including 5 units	4	5	5	1	3
More than 5, up to and including 6 units	9	10	7	10	7
More than 6, up to and including 8 units	11	7	11	3	10
More than 8 units	42	39	35	36	37
<i>More than 4 units</i>	<i>65</i>	<i>61</i>	<i>58</i>	<i>51</i>	<i>57</i>
<i>More than 8 units</i>	<i>42</i>	<i>39</i>	<i>35</i>	<i>36</i>	<i>37</i>
Mean number of units	8.8	9.0	9.0	9.7	9.3
Standard error of mean	0.41	0.52	0.84	1.52	0.87
<b>Women</b>					
2 units or less	35	33	33	36	41
More than 2, up to and including 3 units	10	11	11	11	9
More than 3, up to and including 4 units	10	11	13	9	8
More than 4, up to and including 5 units	8	7	6	7	3
More than 5, up to and including 6 units	11	10	8	8	10
More than 6, up to and including 8 units	7	10	5	7	6
More than 8 units	19	19	24	21	23
<i>More than 3 units</i>	<i>55</i>	<i>56</i>	<i>56</i>	<i>53</i>	<i>50</i>
<i>More than 6 units</i>	<i>26</i>	<i>29</i>	<i>29</i>	<i>28</i>	<i>29</i>
Mean number of units	5.6	5.6	5.7	5.7	5.9
Standard error of mean	0.37	0.32	0.33	0.36	0.41
<i>Bases (unweighted)</i>					
<i>Men</i>	<i>539</i>	<i>423</i>	<i>328</i>	<i>284</i>	<i>192</i>
<i>Women</i>	<i>473</i>	<i>370</i>	<i>323</i>	<i>316</i>	<i>222</i>
<i>Bases (weighted)</i>					
<i>Men</i>	<i>592</i>	<i>475</i>	<i>347</i>	<i>281</i>	<i>208</i>
<i>Women</i>	<i>444</i>	<i>351</i>	<i>298</i>	<i>270</i>	<i>203</i>

Table 7.9

**Estimation of recommended maximum alcohol intake in units per day for men, by age and sex**

Aged 16 and over

2007

Recommended daily maximum for men in units	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
One	1	0	1	2	1	1	1	1
Two	10	15	14	13	14	10	9	13
Three	14	15	16	14	17	15	10	15
Four	18	13	17	15	12	12	4	14
Five or more	14	15	17	16	11	10	4	13
Don't know	32	30	29	36	41	42	55	35
Not heard of units	11	11	6	4	5	10	17	8
<b>Women</b>								
One	1	1	1	0	1	0	-	1
Two	5	12	11	12	10	6	3	9
Three	8	13	13	15	14	9	6	12
Four	9	9	11	12	9	4	3	9
Five or more	16	12	13	14	8	8	4	11
Don't know	47	40	44	41	51	60	56	47
Not heard of units	14	13	7	5	8	12	29	12
<i>Bases (unweighted)</i>								
Men	312	384	519	456	453	390	261	2775
Women	341	536	647	599	551	449	354	3477
<i>Bases (weighted)</i>								
Men	445	502	604	508	463	312	214	3047
Women	426	530	612	531	474	339	318	3230

Table 7.10

**Estimation of recommended maximum alcohol intake in units per day for women, by age and sex**

Aged 16 and over

2007

Recommended daily maximum for women in units	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
One	8	8	9	8	8	7	3	8
Two	21	25	27	24	23	20	17	23
Three	13	12	14	10	10	7	2	11
Four or more	13	10	13	14	7	8	3	10
Don't know	34	34	32	40	45	47	58	39
Not heard of units	11	11	6	4	5	10	17	8
<b>Women</b>								
One	3	11	9	8	7	3	3	7
Two	16	25	26	30	28	18	10	23
Three	10	5	7	7	5	4	2	6
Four or more	12	11	12	12	7	9	5	10
Don't know	45	36	40	38	45	55	52	43
Not heard of units	14	13	7	5	8	12	29	11
<i>Bases (unweighted)</i>								
Men	312	383	515	456	452	386	256	2760
Women	341	536	646	599	559	454	355	3490
<i>Bases (weighted)</i>								
Men	445	500	600	508	462	308	209	3034
Women	426	530	612	531	481	343	319	3241

Table 7.11

**Estimation of recommended maximum alcohol intake in units per day for men (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Recommended daily maximum for men in units	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
One	1	2	1	1	1	1	1	1	1	1	1
Two	10	11	13	16	13	16	12	12	12	12	13
Three	12	12	13	17	12	17	14	21	15	19	11
Four	17	18	17	16	14	13	10	11	13	12	14
Five or more	16	13	14	13	16	11	13	11	14	13	15
Don't know	33	36	38	31	37	34	31	40	38	38	38
Not heard of units	9	9	4	7	7	8	19	4	7	6	8
<b>Standardised</b>											
One	1	2	1	1	1	1	1	1	1	1	1
Two	10	11	13	15	12	17	12	13	12	12	12
Three	12	13	13	16	12	16	15	22	15	19	11
Four	17	18	17	16	15	13	10	11	13	12	13
Five or more	16	14	14	13	16	12	13	11	14	13	15
Don't know	34	35	37	31	37	33	32	39	38	37	39
Not heard of units	9	8	4	7	7	9	18	4	8	6	9
<b>Women</b>											
<b>Observed</b>											
One	0	0	1	0	1	1	1	0	0	0	1
Two	7	8	8	9	10	12	7	9	10	10	10
Three	14	11	12	12	11	11	10	13	12	12	13
Four	8	9	12	8	7	10	6	9	10	9	10
Five or more	12	12	11	9	11	10	11	11	11	12	10
Don't know	51	47	45	51	47	44	41	50	50	51	49
Not heard of units	6	12	11	10	13	11	23	8	7	7	7
<b>Standardised</b>											
One	1	0	1	0	1	1	1	0	0	0	1
Two	7	9	8	9	9	11	7	9	10	9	10
Three	14	12	12	11	12	11	11	13	12	12	13
Four	8	10	11	8	8	10	6	9	9	9	10
Five or more	13	12	11	9	13	11	11	12	11	12	10
Don't know	51	46	45	52	45	44	43	50	51	51	50
Not heard of units	6	11	11	11	12	12	22	8	7	7	7
<b>Bases (unweighted)</b>											
Men	177	396	303	272	272	319	284	284	468	231	237
Women	207	499	389	344	358	377	360	348	595	304	291
<b>Bases (weighted)</b>											
Men	181	397	315	271	334	350	390	311	498	245	253
Women	167	448	358	285	344	359	404	331	533	272	261

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 7.12

**Estimation of recommended maximum alcohol intake in units per day for women (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Recommended daily maximum for women in units	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
One	8	8	8	9	9	10	6	7	6	6	6
Two	23	22	23	27	20	26	20	31	22	25	18
Three	7	13	13	8	10	10	11	7	13	11	15
Four or more	14	10	11	12	12	8	10	10	11	9	12
Don't know	38	39	41	37	42	38	34	42	41	42	41
Not heard of units	9	9	4	7	7	8	19	4	7	6	8
<b>Standardised</b>											
One	8	8	8	9	9	10	6	7	6	7	6
Two	22	22	23	25	20	26	20	32	22	26	18
Three	7	13	14	8	10	10	10	7	13	11	14
Four or more	14	10	11	12	12	8	10	10	11	10	12
Don't know	39	38	40	38	42	38	36	41	41	40	42
Not heard of units	9	9	4	7	7	9	19	4	8	6	9
<b>Women</b>											
<b>Observed</b>											
One	8	5	6	6	7	10	5	5	8	7	9
Two	25	24	23	22	21	22	19	25	26	26	25
Three	6	7	7	5	6	5	5	7	5	3	7
Four or more	9	11	11	9	9	9	9	11	10	13	8
Don't know	46	42	42	46	44	42	39	44	45	45	44
Not heard of units	6	11	11	10	13	11	23	8	7	7	7
<b>Standardised</b>											
One	7	5	6	6	7	9	5	5	8	7	8
Two	25	25	23	22	22	22	19	24	25	25	25
Three	6	7	6	5	6	6	4	7	5	3	7
Four or more	10	11	11	9	10	9	9	11	10	13	7
Don't know	46	41	42	47	43	42	40	44	46	46	46
Not heard of units	6	11	11	11	12	12	22	8	7	7	7
<b>Bases (unweighted)</b>											
Men	177	392	300	271	270	318	283	282	467	231	236
Women	207	502	392	344	360	379	360	350	596	304	292
<b>Bases (weighted)</b>											
Men	181	394	312	270	332	349	389	309	497	245	252
Women	167	450	361	285	346	360	404	333	534	272	262

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 7.13

**Estimation of recommended maximum alcohol intake in units per day for men (age-standardised), by equivalised household income and sex**

Aged 16 and over

2007

Recommended daily maximum for men in units	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Men</b>					
One	2	1	1	1	1
Two	14	14	12	11	8
Three	19	20	14	12	6
Four	20	15	13	11	8
Five or more	16	15	10	13	13
Don't know	27	32	40	39	46
Not heard of units	3	3	10	13	17
<b>Women</b>					
One	1	1	0	0	1
Two	10	10	10	7	8
Three	15	15	11	10	7
Four	10	10	10	9	6
Five or more	17	14	10	6	7
Don't know	41	42	50	55	53
Not heard of units	5	7	9	13	18
<i>Bases (unweighted)</i>					
Men	588	488	423	424	299
Women	593	534	516	600	471
<i>Bases (weighted)</i>					
Men	649	558	462	421	340
Women	560	516	478	517	439

Table 7.14

**Estimation of recommended maximum alcohol intake in units per day for women (age-standardised), by equivalised household income and sex**

*Aged 16 and over*

*2007*

Recommended daily maximum for women in units	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Men</b>					
One	9	9	9	5	5
Two	29	29	20	20	12
Three	15	13	9	10	6
Four or more	14	12	9	8	9
Don't know	31	35	44	43	51
Not heard of units	3	3	10	13	18
<b>Women</b>					
One	8	8	8	4	5
Two	28	28	22	21	16
Three	7	7	6	4	5
Four or more	17	12	10	7	6
Don't know	35	39	45	51	49
Not heard of units	5	7	9	13	18
<i>Bases (unweighted)</i>					
<i>Men</i>	<i>588</i>	<i>486</i>	<i>424</i>	<i>421</i>	<i>296</i>
<i>Women</i>	<i>594</i>	<i>537</i>	<i>517</i>	<i>603</i>	<i>472</i>
<i>Bases (weighted)</i>					
<i>Men</i>	<i>649</i>	<i>556</i>	<i>463</i>	<i>419</i>	<i>337</i>
<i>Women</i>	<i>560</i>	<i>519</i>	<i>478</i>	<i>519</i>	<i>440</i>

Table 7.15

**Estimation of recommended maximum alcohol intake in units per day for men (age-standardised), by maximum drunk on any day in the last week and sex**

Aged 16 and over

2007

Recommended daily maximum for men in units	Maximum drunk on any day in the last week			
	None	Drank within recommendations	Drank more than recommended maximum, but less than twice	Drank more than twice recommended maximum
	%	%	%	%
<b>Men</b>				
One	1	2	1	1
Two	9	17	12	14
Three	7	16	19	18
Four	8	15	16	19
Five or more	11	11	15	17
Don't know	43	36	30	29
Not heard of units	21	4	7	2
<b>Women</b>				
One	0	1	1	1
Two	7	11	12	10
Three	7	15	17	20
Four	6	9	8	14
Five or more	7	12	13	17
Don't know	53	44	42	35
Not heard of units	19	7	7	3
<i>Bases (unweighted)</i>				
<i>Men</i>	713	880	476	685
<i>Women</i>	1439	919	574	524
<i>Bases (weighted)</i>				
<i>Men</i>	803	903	511	798
<i>Women</i>	1337	826	528	514



Table 7.16

**Estimation of recommended maximum alcohol intake in units per day for women (age-standardised), by maximum drunk on any day in the last week and sex**

Aged 16 and over

2007

Recommended daily maximum for women in units	Maximum drunk on any day in the last week			
	None	Drank within recommendations	Drank more than recommended maximum, but less than twice	Drank more than than twice recommended maximum
	%	%	%	%
<b>Men</b>				
One	4	11	8	8
Two	13	27	27	28
Three	6	10	15	14
Four or more	8	8	12	14
Don't know	47	40	31	34
Not heard of units	21	4	7	2
<b>Women</b>				
One	5	8	9	8
Two	14	28	30	35
Three	4	6	6	9
Four or more	6	11	15	15
Don't know	51	39	34	30
Not heard of units	19	7	6	3
<i>Bases (unweighted)</i>				
<i>Men</i>	708	875	474	682
<i>Women</i>	1440	927	577	525
<i>Bases (weighted)</i>				
<i>Men</i>	799	898	509	795
<i>Women</i>	1338	832	530	515

Table 7.17

# **Estimation of the alcoholic content of specific drinks, by age and sex**

Aged 16 and over, aware of units

2007

Number of units in drink	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
<b>125ml glass of wine</b>								
One	32	42	54	48	47	38	24	44
Two	30	29	20	21	15	16	10	21
Three or more	8	3	3	4	2	3	4	4
Don't know	30	26	22	28	36	44	63	32
<b>Pint of normal strength beer<sup>a</sup></b>								
One	17	13	16	15	12	8	11	14
Two	49	58	56	54	47	39	20	49
Three	7	5	6	4	4	4	3	5
Four or more	4	1	3	2	2	2	4	3
Don't know	24	24	20	26	35	46	62	30
<b>Single pub measure of spirits</b>								
One	22	26	30	32	27	24	23	27
Two	23	31	33	28	24	20	10	26
Three or more	21	13	11	11	9	5	4	11
Don't know	34	30	26	29	40	51	64	36
<b>Women</b>								
<b>125ml glass of wine</b>								
One	36	51	54	53	48	33	21	45
Two	23	21	15	17	9	10	4	15
Three or more	7	3	4	3	2	3	4	3
Don't know	34	26	26	28	41	55	72	36
<b>Pint of normal strength beer<sup>a</sup></b>								
One	17	18	17	15	10	6	4	14
Two	37	49	44	44	34	22	6	37
Three	7	3	5	3	3	4	2	4
Four or more	5	2	3	2	2	1	1	2
Don't know	34	28	31	36	52	67	87	43
<b>Single pub measure of spirits</b>								
One	24	31	33	30	24	21	13	27
Two	18	28	25	25	17	10	4	20
Three or more	16	9	8	5	7	5	2	8
Don't know	42	33	34	39	53	64	81	46
<b>Bases (unweighted)<sup>b</sup></b>								
Men	278	344	489	437	430	351	217	2546
Women	295	467	609	569	514	399	253	3106
<b>Bases (weighted)<sup>b</sup></b>								
Men	392	443	567	485	438	280	177	2782
Women	366	458	571	504	440	300	226	2865

<sup>a</sup> Earlier in the questionnaire participants were asked about 'normal strength' beer which was defined on a show card as 'less than 6% alcohol'.

<sup>b</sup> Bases may vary but are of similar size; those shown are for the question about the content of a glass of wine.

Table 7.18

**Estimation of the alcoholic content of a 125ml glass of wine (age-standardised), by whether drank wine on heaviest drinking day and sex**

*Aged 16 and over, drank in the last week and aware of units* 2007

Number of units in drink	Whether drank wine on heaviest drinking day	
	No	Yes
	%	%
<b>Men</b>		
One	41	57
Two	24	20
Three or more	3	4
Don't know	32	18
<b>Women</b>		
One	44	57
Two	16	16
Three or more	2	4
Don't know	37	23
<i>Bases (unweighted)</i>		
Men	1233	732
Women	706	1229
<i>Bases (weighted)</i>		
Men	1371	764
Women	659	1128

Table 7.19

**Estimation of the alcoholic content of a pint of normal strength beer<sup>a</sup> (age-standardised), by whether drank normal strength beer<sup>a</sup> on heaviest drinking day and sex**

*Aged 16 and over, drank in the last week and aware of units* 2007

Number of units in drink	Whether drank normal strength beer <sup>a</sup> on heaviest drinking day	
	No	Yes
	%	%
<b>Men</b>		
One	18	13
Two	49	56
Three	4	4
Four or more	2	2
Don't know	26	24
<b>Women</b>		
One	16	14
Two	41	48
Three	3	4
Four or more	2	2
Don't know	37	33
<i>Bases (unweighted)</i>		
Men	787	1179
Women	1615	322
<i>Bases (weighted)</i>		
Men	812	1324
Women	1480	309

<sup>a</sup> Earlier in the questionnaire participants were asked about 'normal strength' beer which was defined on a show card as 'less than 6% alcohol'.

Table 7.20

**Estimation of the alcoholic content of a single pub measure of spirits (age-standardised), by whether drank spirits on heaviest drinking day and sex**

*Aged 16 and over, drank in the last week and aware of units* 2007

Number of units in drink	Whether drank spirits on heaviest drinking day	
	No	Yes
	%	%
<b>Men</b>		
One	30	35
Two	28	27
Three or more	11	11
Don't know	32	27
<b>Women</b>		
One	31	36
Two	22	24
Three or more	8	6
Don't know	39	34
<i>Bases (unweighted)</i>		
Men	1573	397
Women	1431	503
<i>Bases (weighted)</i>		
Men	1698	441
Women	1296	491

Table 7.21

**Attitude to own drinking, by age and sex**

Aged 16 and over, drank in the last year

2007

Attitude to own drinking	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
<b>Men</b>								
Would like to drink less	21	20	18	18	14	10	7	16
Does not want to drink less	79	80	82	82	86	90	93	84
<b>Women</b>								
Would like to drink less	19	19	18	17	11	8	3	14
Does not want to drink less	81	81	82	83	89	92	97	86
<i>Bases (unweighted)</i>								
Men	146	346	482	438	432	355	235	2434
Women	175	448	582	540	497	391	269	2902
<i>Bases (weighted)</i>								
Men	207	449	558	483	440	282	192	2612
Women	212	440	549	477	426	293	242	2640

Table 7.22

**Attitude to own drinking (age-standardised), by maximum drunk on any day in the last week and sex**

Aged 16 and over, drank in the last year

2007

Attitude to own drinking	Maximum drunk on any day in the last week			
	Did not drink in last week	Drank within recommendations	Drank more than recommended maximum, but less than twice	Drank more than twice recommended maximum
	%	%	%	%
<b>Men</b>				
Would like to drink less	13	10	20	24
Does not want to drink less	87	90	80	76
<b>Women</b>				
Would like to drink less	9	10	17	25
Does not want to drink less	91	90	83	75
<i>Bases (unweighted)</i>				
Men	411	884	474	661
Women	904	918	580	498
<i>Bases (weighted)</i>				
Men	447	894	505	762
Women	819	815	527	477

Table 7.23

**Attitudes to drinking: summary of agreement and disagreement, by sex**

Aged 16 and over

2007

Attitudes to drinking <sup>b</sup>	Agree strongly %	Agree %	Neither <sup>a</sup> %	Disagree %	Disagree strongly %	Total agree %	Total disagree %
<b>Men</b>							
Drinking is a major part of the British way of life	12	56	20	10	2	68	13
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	19	55	17	7	1	75	8
There is nothing wrong with people getting drunk regularly	2	7	15	42	34	9	76
The government should tax alcohol more heavily to encourage people to drink less	7	16	19	35	23	23	58
<b>Women</b>							
Drinking is a major part of the British way of life	10	51	22	14	3	61	17
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	17	56	20	6	1	73	7
There is nothing wrong with people getting drunk regularly	2	4	14	40	40	6	80
The government should tax alcohol more heavily to encourage people to drink less	10	22	23	33	11	32	45

<sup>a</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

<sup>b</sup> Bases for the first statement are:

Unweighted: Men 2783 Women 3440

Weighted: Men 3056 Women 3197.

Bases for other statements vary but are of similar size.

Table 7.24

**Proportion agreeing with statements about drinking, by age and sex***Aged 16 and over**2007*

Attitudes to drinking: % strongly agree/ agree	Age group							Total  %
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	
Men								
Drinking is a major part of the British way of life	62	74	68	66	70	71	60	68
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	67	75	76	76	77	81	70	75
There is nothing wrong with people getting drunk regularly	24	12	8	5	4	6	3	9
The government should tax alcohol more heavily to encourage people to drink less	17	26	19	21	25	30	32	23
Women								
Drinking is a major part of the British way of life	57	63	60	59	61	68	59	61
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	57	70	75	76	77	80	77	73
There is nothing wrong with people getting drunk regularly	13	7	4	6	3	3	3	6
The government should tax alcohol more heavily to encourage people to drink less	24	27	28	31	35	42	45	32
Bases (unweighted) <sup>a</sup>								
Men	309	384	519	465	454	391	261	2783
Women	340	526	656	595	556	443	324	3440
Bases (weighted) <sup>a</sup>								
Men	443	503	604	515	464	313	214	3056
Women	426	520	622	526	478	335	291	3197

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.

Table 7.25

**Proportion agreeing with statements about drinking (observed and age-standardised), by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 16 and over

2007

Attitudes to drinking: % strongly agree/agree	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Men</b>											
<b>Observed</b>											
Drinking is a major part of the British way of life	67	69	68	68	69	64	70	68	68	70	66
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	70	77	73	74	72	73	78	79	75	74	75
There is nothing wrong with people getting drunk regularly	17	10	13	7	9	9	10	6	5	4	6
The government should tax alcohol more heavily to encourage people to drink less	20	23	15	16	21	26	35	23	23	21	26
<b>Standardised</b>											
Drinking is a major part of the British way of life	66	69	70	68	68	64	69	67	67	70	66
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	70	77	72	74	72	73	78	79	74	74	75
There is nothing wrong with people getting drunk regularly	16	10	13	7	9	10	9	6	5	4	6
The government should tax alcohol more heavily to encourage people to drink less	21	23	15	15	20	25	36	23	23	21	25

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Bases vary but are of similar sizes; those shown are for the first statement.

Continued...

Table 7.25 continued

Aged 16 and over

2007

Attitudes to drinking: % strongly agree/agree	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Women</b>											
<b>Observed</b>											
Drinking is a major part of the British way of life	58	64	64	56	57	58	70	57	59	58	60
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	74	76	74	72	67	73	71	72	76	74	77
There is nothing wrong with people getting drunk regularly	8	6	6	6	5	5	6	4	5	6	5
The government should tax alcohol more heavily to encourage people to drink less	28	34	27	28	37	33	41	27	29	32	27
<b>Standardised</b>											
Drinking is a major part of the British way of life	58	64	64	56	57	57	69	57	59	58	60
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	74	77	75	71	66	72	72	71	75	74	76
There is nothing wrong with people getting drunk regularly	9	6	6	6	6	5	6	4	5	6	4
The government should tax alcohol more heavily to encourage people to drink less	28	34	27	29	37	32	41	27	29	33	26
<i>Bases (unweighted)<sup>b</sup></i>											
Men	174	400	300	275	273	321	286	287	467	230	237
Women	206	493	388	337	353	370	356	346	591	304	287
<i>Bases (weighted)<sup>b</sup></i>											
Men	177	401	312	272	335	354	394	314	495	243	252
Women	167	443	358	280	341	352	398	328	530	272	258

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Bases vary but are of similar sizes; those shown are for the first statement.



Table 7.26

**Proportion agreeing with statements about drinking (age-standardised), by equivalised household income and sex**

Aged 16 and over

2007

Attitudes to drinking: % strongly agree/ agree	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Men</b>					
Drinking is a major part of the British way of life	71	71	66	63	66
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	80	75	73	70	68
There is nothing wrong with people getting drunk regularly	10	10	9	6	12
The government should tax alcohol more heavily to encourage people to drink less	19	20	25	23	33
<b>Women</b>					
Drinking is a major part of the British way of life	64	62	58	58	58
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	80	78	73	67	65
There is nothing wrong with people getting drunk regularly	4	5	4	6	9
The government should tax alcohol more heavily to encourage people to drink less	28	28	28	35	46
<i>Bases (unweighted)<sup>a</sup></i>					
Men	600	496	428	411	298
Women	603	535	517	584	455
<i>Bases (weighted)<sup>a</sup></i>					
Men	663	567	468	409	339
Women	569	517	478	501	425

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.

Table 7.27

**Attitudes to drinking (age-standardised), by maximum drunk on any day in the last week and sex**

Aged 16 and over

2007

Attitudes to drinking: % strongly agree/ agree	Maximum drunk on any day in the last week			
	Did not drink in last week	Drank within recommendations	Drank more than recommended maximum, but less than twice	Drank more than than twice recommended maximum
	%	%	%	%
<b>Men</b>				
Drinking is a major part of the British way of life	62	68	70	74
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	71	79	75	74
There is nothing wrong with people getting drunk regularly	5	7	9	14
The government should tax alcohol more heavily to encourage people to drink less	34	22	16	8
<b>Women</b>				
Drinking is a major part of the British way of life	59	57	62	68
People in some other parts of Europe tend to drink alcohol more sensibly than people in Britain	68	78	77	74
There is nothing wrong with people getting drunk regularly	6	5	7	6
The government should tax alcohol more heavily to encourage people to drink less	41	27	22	11
<i>Bases (unweighted)<sup>a</sup></i>				
Men	406	872	465	656
Women	888	894	575	493
<i>Bases (weighted)<sup>a</sup></i>				
Men	441	881	496	758
Women	805	797	523	473

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.

# Children's BMI, overweight and obesity

## 8

Shaun Scholes

### Summary

- There is increasing evidence that childhood overweight and obesity can be linked with numerous long-term and immediate health risks. This chapter examines patterns of overweight and obesity among children aged 2-15 and their relationship with a number of socio-economic and demographic variables. Among children aged 11-15 this chapter also examines whether normal weight, overweight and obese children have different attitudes to physical activity.

#### Body Mass Index (BMI)

- Mean BMI was higher among girls than boys aged 2-15 (a difference of 0.3 kg/m<sup>2</sup>). Girls had a higher mean BMI at ages 11, 13, 14 and 15 (differences from about 0.8 to 1.2 kg/m<sup>2</sup>).

#### Overweight and obesity prevalence

- According to the UK National BMI percentiles classification, around three in ten boys and girls aged 2-15 were classed as either overweight or obese (31% and 30% respectively). The difference between the sexes was not statistically significant.
- Among girls aged 2-15, the rates of prevalence of overweight including obese were higher in the lowest income group. The proportions that were overweight including obese in the highest and lowest income quintiles respectively were 24% and 35%. The same pattern was not apparent among boys.
- Obesity prevalence rates were higher in households where both natural parents or the lone natural parent were classed as either overweight or obese. 24% of boys aged 2-15 living in overweight/obese households were classed as obese compared with 11% in normal/underweight households. Equivalent figures for girls classed as obese were 21% and 10%.

#### Obesity and physical activity

- Among girls, obesity prevalence rates varied by overall physical activity levels. 21% of girls aged 2-15 in the low physical activity group were classed as obese, compared with 15% of the high group. Equivalent figures for girls aged 11-15 were 24% and 17%. The same pattern was not apparent among boys.
- When asked about awareness of the recommendations for physical activity among children, 73% of boys aged 11-15 who were classed as obese stated that children should spend a minimum of five days a week doing physical activity; this compared with 62% of the normal weight group. No significant differences were found amongst girls.
- 64% of boys aged 11-15 in the normal weight group stated that children should spend at least 60 minutes a day doing physical activity compared with 53% of the overweight group. Among girls of similar age, the proportion believing that children should spend at least 60 minutes a day doing physical activity were 62% among those classed as overweight and 50% in the normal weight group.

- Among boys and girls aged 11-15, the proportion believing that they were very physically active relative to their peers was higher in the normal weight group. The proportion believing that they were very physically active in the normal weight and obese groups respectively were 46% and 27% for boys, 32% and 21% for girls.
- Among boys and girls aged 11-15, the proportion stating that they would like to do more physical activity than at present was higher in the obese group. The proportion stating that they would like to do more physical activity than at present in the obese and normal weight groups respectively were 71% and 57% for boys, 84% and 71% for girls.

### **BMI, overweight and obesity prevalence trends 1995-2007**

- While trends show yearly fluctuations between 1995 and 2007, obesity prevalence increased by 6 percentage points (pp) among boys aged 2-15 (from 11% to 17%), and 4 pp among girls (from 12% to 16%). There have been increases over the period among boys and girls aged 2-10 and boys aged 11-15. Whilst marked increases have occurred in the prevalence of obesity, the prevalence of overweight for children aged 2-15 has remained largely unchanged.
- The Public Service Agreement (PSA) target is to reduce the proportion of overweight and obese children to 2000 levels by 2020. Between 2000 and 2007 the percentage of boys aged 2-15 classed as either overweight or obese increased overall by 4 percentage points (pp) from 27% to 31%. This overall increase reflected an increase in obesity among boys aged 2-10, and an increase in overweight among boys aged 11-15. While there was no significant change among girls aged 2-15 overall, there was an increase in overweight including obesity among girls aged 2-10.
- There was no significant change in mean BMI or overweight/obesity prevalence between 2006 and 2007, and there are indications that the trend in obesity prevalence may have begun to flatten out over the last two to three years.

## 8.1 Introduction

The government's health white paper, *Choosing Health: making healthier choices easier*, sets out government commitments for action on obesity, including stemming the rise in obesity among children aged under 11.<sup>1</sup> This reflects the Public Service Agreement (PSA) shared by the Department of Health, Department for Children, Schools and Families and Department of Culture, Media and Sport to 'Reduce the proportion of overweight and obese children to 2000 levels by 2020 in the context of tackling obesity across the population'.<sup>2</sup>

Overweight and obesity are terms that refer to an excess of body fat and they usually relate to increased weight-for-height. The two terms denote different degrees of excess adiposity, and overweight can be thought of as a stage where an individual is at risk of developing obesity.<sup>3</sup> The adverse health consequences associated with obesity are mostly related to an increased adiposity rather than increased weight per se<sup>4</sup> and it is therefore important that any indicator of obesity reflects this increased adiposity. Body Mass Index (BMI), calculated as weight (kg) divided by height squared (m<sup>2</sup>), has been shown to correlate strongly with adiposity in adults<sup>5,6</sup> and children.<sup>4,7,8</sup> It is the key measure of overweight and obesity in this chapter. The decision to use BMI is supported by recommendations made by the International Obesity Task Force, which concluded that BMI is a reasonable measure of body adiposity in children.<sup>9</sup>

In this chapter overweight and obesity prevalence and trends have been produced using the 85th and 95th BMI percentiles of the UK reference curves as cut-offs respectively for overweight and obesity.<sup>10</sup> The UK National BMI percentiles classification has been used in the past to describe childhood overweight and obesity prevalence trends in the UK<sup>11</sup> and was used to produce obesity trend estimates in the Chief Medical Officer's (CMO) 2002 Annual Report.<sup>12</sup>

The importance of studying early overweight and obesity is highlighted by the increasing body of evidence that links obesity with numerous long-term and immediate health risks. Childhood and adolescent obesity can persist into adulthood, where the direct health risks of obesity are severe and well established. It has been estimated that up to 50% of obese adolescents remain obese in adulthood.<sup>13</sup> Other studies have linked childhood and adolescent overweight/obesity directly to middle-age mortality and morbidity.<sup>14,15,16,17,18</sup> In addition to the increased risk for health problems in later life, children face immediate health consequences of obesity including increased risks for an abnormal lipids profile and elevated blood pressure.<sup>19</sup> Associations between childhood obesity and increased asthma prevalence<sup>20</sup> or the incidence of type 2 diabetes mellitus<sup>21</sup> have also been reported.

Lack of physical activity is often cited as a contributing factor to the 'obesity epidemic in children and youth'.<sup>22</sup> Obese children are more likely to have lower levels of physical fitness,<sup>23</sup> decreased participation in sports<sup>24</sup> and reduced physical activity levels. The degree to which inactivity is responsible for the rising levels of obesity in children has not been established. However, there are indications that less active children are more likely to have excess fat even as early as late infancy.<sup>25</sup> There is also evidence that children who spend more time in sedentary pursuits are more likely to have excess fat, although the strength of this association has recently been questioned.<sup>26,27</sup>

The Chief Medical Officer (CMO) of England has recommended that children and young people should achieve a total of at least 60 minutes of at least moderate intensity physical activity each day. He also recommended that at least twice a week this should include activities to improve bone health, muscle strength and flexibility. However, it should be borne in mind that this level of activity, although commonly accepted as the level required to confer health benefits, has a limited scientific base. Given that levels of overweight and obesity in children are rising, it may be that the 60 minutes per day recommendation is insufficient to prevent weight gain in some children.

This chapter examines patterns of overweight and obesity among children aged 2-15, and their relationship with a number of socio-economic and demographic variables. For children aged 11-15 this chapter also examines whether normal weight, overweight and

obese children have different attitudes to physical activity. The childhood overweight and obesity trends presented at both national and regional levels in HSE 2006<sup>11</sup> are updated to include this year's data. Trend tables for children's obesity and other key variables are also available in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>28</sup>

## 8.2 Methods and Definitions

### 8.2.1 Methods

For children aged 2-15, height and weight were measured and BMI was calculated from these. BMI and overweight/obesity prevalence are presented by individual years of age. For the overweight and obesity prevalence estimates the exact age was used (extracted from the date of interview minus the date of birth). Presentation of the results is based, however, on the *age at last birthday*, which is the HSE standard. Also in line with the HSE standard for children, the results for different regions, income groups and social classes have not been aged-standardised.

BMI, overweight and obesity prevalence trends for children aged 2-15 were calculated for HSE years 1995 to 2007. Since 1995 when children were first included in the HSE, weighting was necessary to compensate for limiting the number of children interviewed in a household to two, and the weighting is used to adjust the data to ensure that the age/sex distribution matched that of all children in co-operating households. Non-response weighting was also introduced in 2003. The child selection weighted estimates are shown for 1995-2002 and the non-response weighted estimates (including adjustment for child selection) for 2003-2007. In light of the PSA target for children under 11, national trend data are presented separately for three age groups: 2-10, 11-15 and 2-15.

Prevalence trends have also been produced by socio-economic group and at the regional level (Government Office Region/Strategic Health Authority). To achieve sufficient sample sizes at the regional level, HSE datasets were combined in order to produce three-year averages.

### 8.2.2 Definitions

#### *Defining overweight and obesity*

Overweight and obesity prevalence for children aged 2-15 was estimated using the age and sex-specific UK National BMI percentiles classification.<sup>29,30</sup> Different growth patterns among boys and girls at each age mean that a universal categorisation cannot be used to define childhood overweight/obesity. The UK National BMI percentiles classification gives the BMI threshold for each age above which a child is considered overweight or obese. The classification estimates were produced by calculating the percentage of boys and girls who were over the 85th (overweight) or 95th (obese) BMI percentiles of the 1990 reference population.

The terms 'overweight' and 'obese' in this chapter are mutually exclusive, 'overweight' excluding those who are obese. Where a statement is made about the aggregate of these two categories, terms such as 'either overweight or obese' or 'overweight including obese' are used.

#### *Parental BMI*

Parental behaviour is recognised as one of the potential myriad environmental factors that can influence the diet and exercise regimes of children. Earlier analyses of Health Survey for England data found a clear relationship between parental BMI status and rates of obesity among children.<sup>11,31</sup> The specific definitions of the parental BMI status groups analysed in this chapter are:

- 'Normal/underweight household': this group refers to those children who lived in a

household where both natural parents, or the lone natural parent had either normal BMI or was underweight (BMI less than 25 kg/m<sup>2</sup>).

- ‘Mother overweight/obese, father normal/underweight’: represents those children who lived in a household where the natural mother was either overweight or obese (BMI 25 kg/m<sup>2</sup> or above) and the father had normal BMI or was underweight.
- ‘Father overweight/obese, mother normal/underweight’: represents those children who lived in a household where the natural father was either overweight or obese (BMI 25 kg/m<sup>2</sup> or above) and the mother had normal BMI or was underweight.
- ‘Overweight/obese’: represents those children who lived in a household where both natural parents, or the lone natural parent, were either overweight or obese.

All analyses between parental BMI status and obesity were restricted to children in the core (general population) sample. Children from the boost sample were excluded, as parental BMI was not measured.

### Physical activity

Mean BMI and overweight/obesity prevalence were compared across children’s overall physical activity levels. The specific definitions of the three physical activity groups are:

- High: active for 60 minutes on 7 days in the last week.
- Medium: active for 30-59 minutes on 7 days in the last week.
- Low: active at a lower level or not active at all.

The definition assumes that all reported activities were of at least moderate intensity. On this basis, the high category represents the recommended level of physical activity.<sup>32</sup>

All analyses relating to children’s physical activity levels were restricted to children in the boost sample. Children from the core were excluded as questions about levels of physical activity were only included for children in the boost sample.<sup>33</sup>

### Social class

Trends in childhood obesity by social class were presented in HSE 2006<sup>11</sup>, updating an analysis presented in HSE 2002.<sup>30</sup> An analysis of childhood overweight and obesity prevalence trends by socio-economic group is limited by the fact that the National Statistics Socio-economic Classification (NS-SEC) was not used before 2001, Registrar General’s social class having been used in earlier years. Social class was assigned on the basis of the occupation of the head of household using the Registrar General’s Standard Occupational Classification. Occupations are assigned to six social class categories, which can be grouped into manual and non-manual occupations (as used in this chapter). Table 8A below shows which occupation and social class category forms part of the manual and non-manual groupings:<sup>34</sup>

Table 8A		
	Social class code	Occupation description
Non-manual	I	Professional occupations
	II	Managerial and technical occupations
	IIINM	Skilled occupations (non-manual)
Manual	IIIM	Skilled occupations (manual)
	IV	Partly skilled occupations
	V	Unskilled occupations

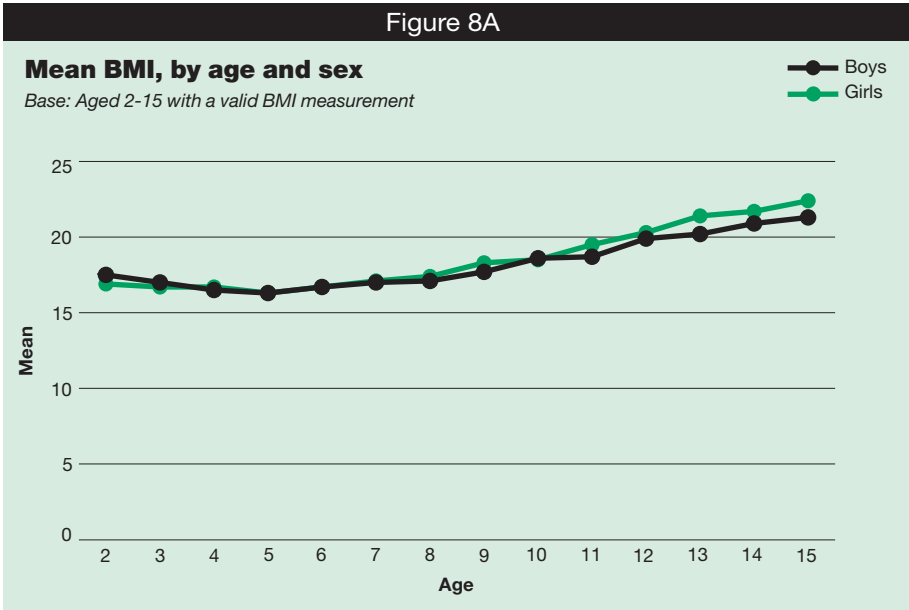
Trends in childhood obesity by the NS-SEC classification are shown separately for the HSE years 2001-2007. NS-SEC is a social classification system that attempts to classify groups on the basis of employment relations, based on characteristics such as career prospects, autonomy, mode of payment and period of notice.<sup>35</sup> It was introduced in 2001. It has

similarities to Registrar General's Social Class. Participants are assigned to an NS-SEC category based on the current or former occupation of the household reference person.<sup>36</sup> The five categories presented in this chapter are managerial and professional, intermediate (e.g. clerical, administrative, sales), small employers and own account workers, lower supervisory and technical, and semi-routine and routine occupations.

### 8.3 BMI and prevalence of overweight and obesity

#### 8.3.1 BMI, overweight and obesity, by age and sex

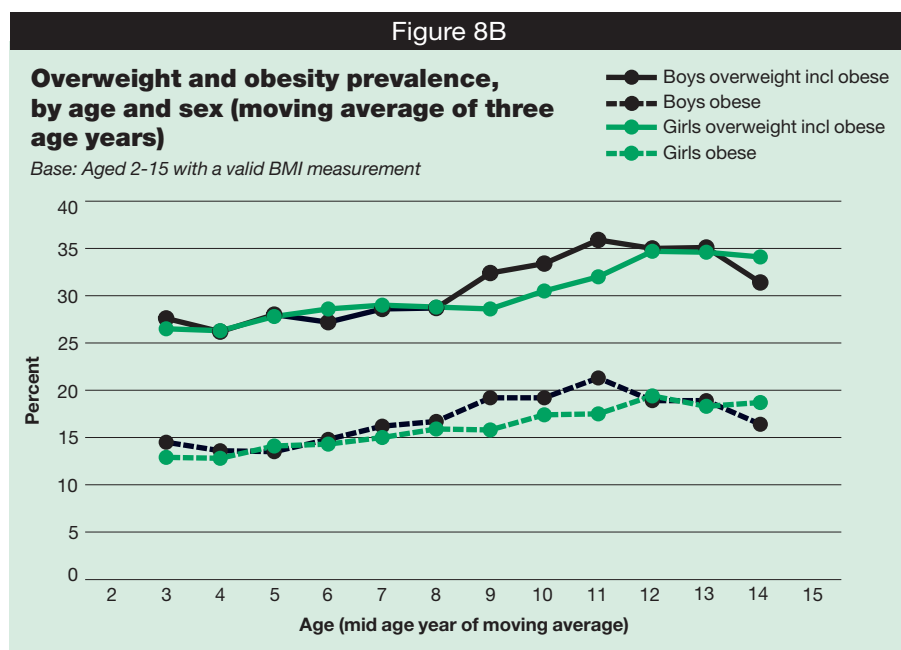
Mean BMI was higher among girls aged 2-15 (a difference of 0.3 kg/m<sup>2</sup>). Mean BMI varied little between the sexes for most ages. The most marked difference occurred at ages 11, 13, 14 and 15 when girls had a higher BMI (differences from about 0.8 to 1.2 kg/m<sup>2</sup>). Boys had a higher BMI than girls at age 2 (a difference of 0.6 kg/m<sup>2</sup>). **Table 8.1, Figure 8A**



Around three in ten boys and girls aged 2-15 were classed as either overweight or obese (31% and 30% respectively). In contrast to HSE 2006,<sup>11</sup> no significant differences in overweight/obesity prevalence were found between the sexes. Figure 8B shows the proportions obese and overweight including obese, by age with moving averages of three age year groups. **Table 8.2, Figure 8B**

Table 8B			
Overweight and obesity prevalence, by age and sex			
	Age		
	2-10	11-15	2-15
	%	%	%
Boys			
Overweight	13	15	14
Obese	16	18	17
Overweight including obese	29	33	31
Girls			
Overweight	14	15	14
Obese	14	19	16
Overweight including obese	28	34	30





### 8.3.2 BMI, overweight and obesity by Government Office Region

Among children aged 2-15 no significant regional differences were found by Government Office Region in mean BMI or overweight/obesity prevalence.

Table 8.3

### 8.3.3 BMI, overweight and obesity by equivalised household income

Among girls aged 2-15, differences in overweight/obesity prevalence were apparent between the highest and lowest income groups. 22% of girls aged 2-15 in the lowest income group were classed as obese compared with 9% of the highest group, and 35% and 24% respectively were classed as overweight including obese. The pattern was similar both for girls aged 2-10 and 11-15 (results not shown). No significant differences were found amongst boys of any age.

Table 8.4, Figure 8C

### 8.3.4 BMI, overweight and obesity by parental BMI

Table 8.5 shows how mean BMI, overweight and obesity prevalence varied by parental BMI status. Obesity prevalence rates were higher in households where both natural parents or the lone natural parent were classed as either overweight or obese. 24% of boys aged 2-15 living in overweight/obese households were classed as obese compared with 11% in normal/underweight households. Equivalent figures for girls classed as obese were 21% and 10%.

Table 8.5

## 8.4 BMI, overweight, obesity and physical activity

### 8.4.1 BMI, overweight and obesity by levels of physical activity

Table 8.6 shows how mean BMI, overweight and obesity prevalence (using the UK National BMI percentiles classification) varied by overall self-reported physical activity levels in 2007. Table 8C shows overweight and obesity by the high and low activity groups for children aged 2-10, 11-15 and 2-15.

Figure 8C

### Overweight and obesity prevalence, by equivalised household income and sex

Base: Aged 2-15 with a valid BMI measurement

Overweight  
Obese

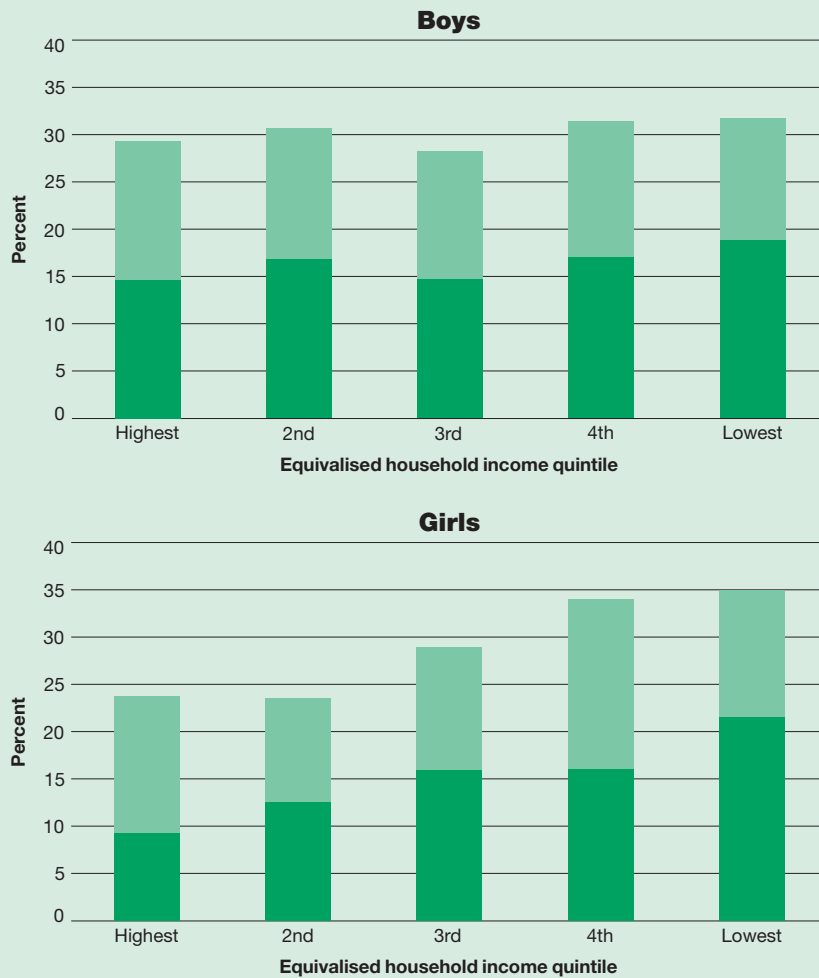


Table 8C

### Overweight and obesity prevalence, by physical activity, age and sex

	Age					
	2-10		11-15		2-15	
	High <sup>a</sup>	Low <sup>b</sup>	High <sup>a</sup>	Low <sup>b</sup>	High <sup>a</sup>	Low <sup>b</sup>
	%	%	%	%	%	%
<b>Boys</b>						
Overweight	14	11	16	13	15	11
Obese	16	16	17	21	16	18
Overweight including obese	29	27	33	34	31	30
<b>Girls</b>						
Overweight	13	15	17	12	14	13
Obese	13	17	17	24	15	21
Overweight including obese	27	31	33	36	29	34

<sup>a</sup> High activity level: active for at least 60 minutes on seven days in the last week

<sup>b</sup> Low activity level: active for less than 30 minutes on seven days in the last week.

Among girls aged 2-15, obesity prevalence rates were higher in the low physical activity group. 21% of girls aged 2-15 in the low physical activity group were classed as obese compared with 15% of the high group. Equivalent figures for those aged 11-15 were 24% and 17%. No significant differences were found amongst boys of any age or girls aged 2-10.

**Table 8.6**

### 8.4.2 Attitudes to physical activity by BMI status

In order to assess awareness of the recommended guidelines for physical activity for their age group, children aged 11-15 were asked how many days a week and how many minutes a day young people should spend doing physical activity.

Table 8.7 shows how children's views on the number of days a week and minutes a day that should be spent doing physical activity varied by BMI status. 73% of boys aged 11-15 who were classed as obese, compared with 62% of the normal weight group, stated that children should spend a minimum of five days a week doing physical activity. No significant differences were found amongst girls.

64% of boys in the normal weight group stated that children should spend at least 60 minutes a day doing physical activity, compared with 53% of the overweight group. Among girls, the proportion believing that children should spend at least 60 minutes a day doing physical activity was higher in the overweight group: 62% among those classed as overweight and 50% in the normal weight group.

Children aged 11-15 were asked how they perceived their own level of physical activity compared with other children of their own age, and to state whether they would like to do more physical activity than at present.

Table 8.8 and Figure 8D show how children's perceptions of their level of physical activity relative to their peers varied by BMI status. 46% of boys aged 11-15 in the normal weight group believed that they were very physically active, compared with 37% and 27% in the overweight and obese groups respectively. 32% of girls aged 11-15 in the normal weight group believed that they were very physically active compared with 21% in the obese group.

Among boys and girls aged 11-15, the proportion stating that they would like to do more physical activity than at present was higher in the obese group than the normal weight group: 71% and 57% respectively for boys, 84% and 71% for girls.

Children who stated that they would like to do more physical activity than at present were asked to indicate which of a list of physical activities they would like to do in the future. Boys aged 11-15 in the obese group were more likely than those in the normal weight group to indicate walking, riding a bike and playing outside. Girls aged 11-15 in the obese group were more likely than those in the normal weight group to indicate riding a bike and swimming. Girls in the normal weight group were more likely than those classed as obese to indicate 'other sports'.

**Tables 8.7-8.9, Figure 8D**

## 8.5 Trends in BMI, overweight and obesity

### 8.5.1 Trends in BMI, overweight and obesity, by sex and age

Tables 8.10-8.12 show the results of the BMI and overweight/obesity national trends by sex for children aged 2-15, and then for the age groups 2-10 and 11-15 separately. Figures 8E-8G show three-year moving averages over the period for obesity, and overweight including obesity, for each age group. As well as the longer time series, trends since the start of the period covered by the PSA target, and the most recent three years, are also examined.

#### Mean BMI

Among children aged 2-15, mean BMI for both sexes increased by 0.6 kg/m<sup>2</sup> between 1995 and 2007. With fluctuations from year to year, overall increases in mean BMI were evident for both age groups during this time period.

Figure 8D

### Perception of own physical activity, by BMI status

Base: Aged 11-15 with a valid BMI measurement

■ Not very/not at all physically active  
■ Fairly physically active  
■ Very physically active



Between 2000 (the 'baseline' year for the PSA target) and 2007, mean BMI among boys aged 2-15 increased by 0.4 kg/m<sup>2</sup>. This increase resulted primarily from an increase of 0.3 kg/m<sup>2</sup> among boys aged 2-10, with no significant change among boys aged 11-15. There was no significant change in mean BMI among girls during this period.

### Overweight and obesity

It has been well documented that childhood obesity in the UK has increased significantly since 1995. While the trends show yearly fluctuations between 1995 and 2007, obesity prevalence among boys aged 2-15 increased by 6 percentage points (pp) (from 11% to 17%).<sup>37</sup> The equivalent increase for girls was 4 pp (from 12% to 16%). Whilst marked increases have occurred in the prevalence of obesity, the prevalence of overweight for children aged 2-15 has remained largely unchanged.

Looking at the two age groups between 1995 and 2007, obesity prevalence among boys aged 2-10 increased overall by 7 pp (from 10% to 16%), and the equivalent increase for girls aged 2-10 was 4 pp (from 10% to 14%). Among boys aged 11-15, the proportion who were obese increased 4 pp between 1995 and 2007, from 14% in 1995 to 18% in 2007, while there was no significant increase in obesity among girls aged 11-15.

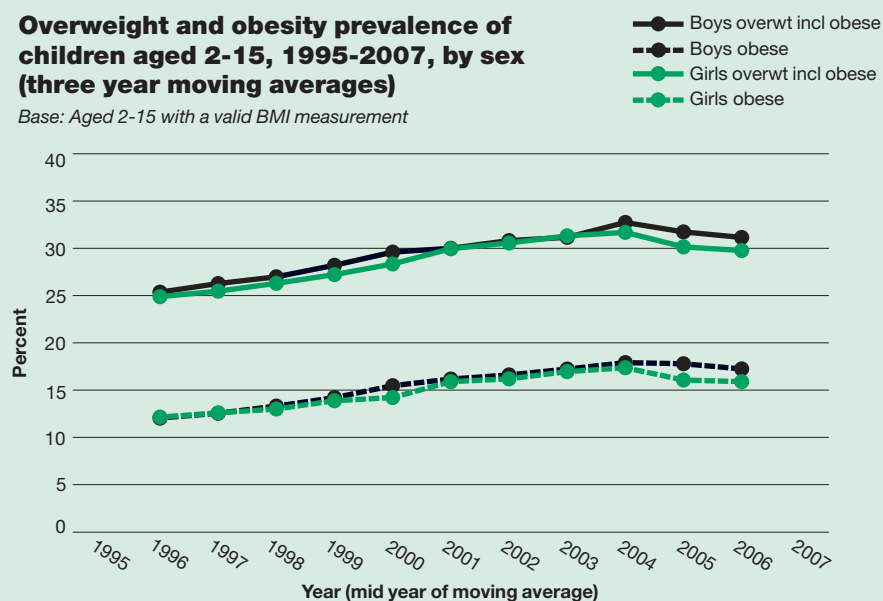
### Trends since 2000

For the period between 2000 (the PSA target baseline) and 2007, the proportion of boys aged 2-15 classed as either overweight or obese increased significantly overall by 4 pp (from 27% to 31%). This increase was made up from small increases in obesity and

Figure 8E

### Overweight and obesity prevalence of children aged 2-15, 1995-2007, by sex (three year moving averages)

Base: Aged 2-15 with a valid BMI measurement



Note: Data from 1995 to 2002 have selection weights only. Data from 2003 onwards are also weighted for non-response. In these moving averages, some points combine estimates with and without non-response weighting.

overweight which were not individually significant over the period. There were no significant changes among girls aged 2-15 over the period.

Looking at the older and younger age groups between 2000 and 2007, among children aged 2-10, the prevalence of obesity among boys increased overall by 4 pp (from 12% to 16%), and the prevalence of either overweight or obese among girls increased overall by 5 pp (from 23% to 28%; again the increase for girls reflected smaller non-significant increases in both overweight and obesity). Among boys aged 11-15 the prevalence of overweight increased by 5 pp (from 10% to 15%), while there was no significant change in obesity, nor in overweight or obesity among girls aged 11-15.

The moving averages shown in Figures 8F and 8G suggest that the trend in obesity may be flattening out, and the next couple of years' data will be important in confirming whether this is a continuing pattern, or whether the longer term trend continues upward. In the most recent three years generally there has been no statistically significant change in the prevalence of obesity year on year between 2005 and 2006, or between 2006 and 2007. The only exception to this is a statistically significant decrease between 2005 and 2006 among girls aged 2-15.<sup>38</sup>

Tables 8.10-8.12, Figures 8E-8G

## 8.5.2 Trends in obesity by social class

Table 8.13 shows the obesity trends (1995-2007) by social class using the Registrar General's Standard Occupational Classification. Among boys aged 2-15, obesity prevalence significantly increased from 9% in 1995 to 15% in 2007 (7 pp) for the aggregated non-manual social classes and from 13% in 1995 to 18% in 2007 (5 pp) for the aggregated manual social class categories. Among girls aged 2-15, obesity prevalence increased significantly from 13% in 1995 to 19% in 2007 (6 pp) for the aggregated manual social class categories.

No significant changes in obesity prevalence by social class were found between 2000-2007 or 2006-2007.

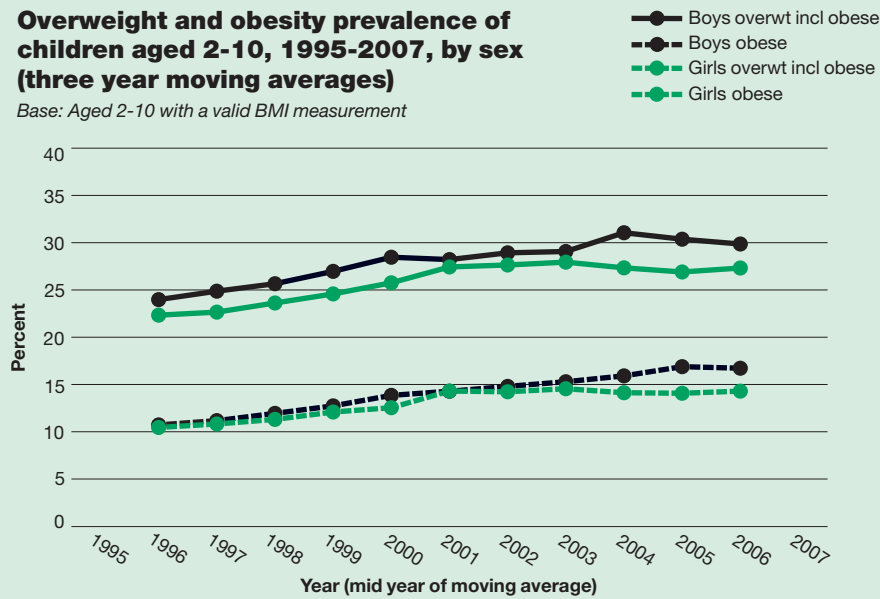
Table 8.13

Table 8.14 shows the obesity trends (2001-2007) by the National Statistics Socio-economic Classification. Obesity prevalence (marginally) significantly increased from 2001 to 2007 in semi-routine or routine households. Among boys aged 2-15, obesity prevalence increased from 16% in 2001 to 21% in 2007 (5 pp). The equivalent figures for girls were 17% and 21% (5 pp).

Figure 8F

### Overweight and obesity prevalence of children aged 2-10, 1995-2007, by sex (three year moving averages)

Base: Aged 2-10 with a valid BMI measurement

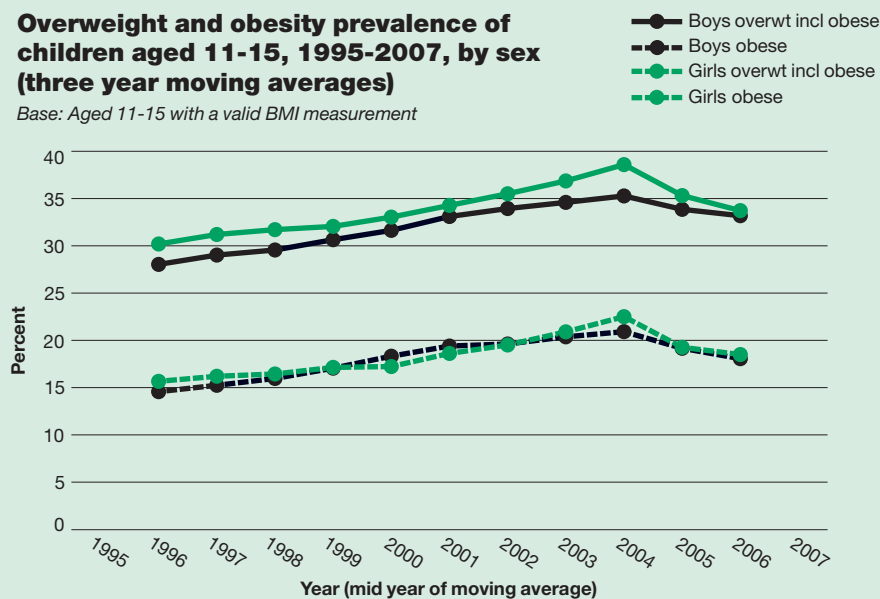


Note: Data from 1995 to 2002 have selection weights only. Data from 2003 onwards are also weighted for non-response. In these moving averages, some points combine estimates with and without non-response weighting.

Figure 8G

### Overweight and obesity prevalence of children aged 11-15, 1995-2007, by sex (three year moving averages)

Base: Aged 11-15 with a valid BMI measurement



Note: Data from 1995 to 2002 have selection weights only. Data from 2003 onwards are also weighted for non-response. In these moving averages, some points combine estimates with and without non-response weighting.

Among boys aged 2-15 in intermediate households, obesity prevalence increased from 15% in 2006 to 23% in 2007 (8 pp). Obesity prevalence decreased from 20% in 2006 to 14% in 2007 (6 pp) for boys in lower supervisory and technical households. Future years' data will show whether these are part of upward/downward trends. Among girls of similar age there was no significant change in obesity prevalence by NS-SEC over that period.

Table 8.14

### 8.5.3 Trends in obesity by Government Office Region

Table 8.15 shows trends in overweight, obesity and overweight including obesity by Government Office Region. To provide robust base sizes for the regional analysis, years have been grouped together. No significant regional variations were apparent in earlier years, as in 2005-2007.

Table 8.15

## 8.6 Discussion

Increases in the prevalence of childhood obesity could potentially result in increasing numbers of obese adults in the long term, with serious implications both for individual health and the costs of providing health services.

The trend tables presented in this chapter clearly show an overall upward trend in the prevalence of obesity between 1995 and 2007 for boys and girls. The PSA target is to reduce the proportion of overweight and obese children to 2000 levels by 2020 in the context of tackling obesity across the population. This chapter has shown a significant increase between 2000 and 2007 in the percentage classed as either overweight or obese among boys aged 2-15 and girls aged 2-10 (4 pp and 5 pp respectively). However, there is perhaps evidence that there may be a halt in the year-to-year rise, with the 2007 overweight and obesity rates at the same level as 2006.

As in HSE 2006,<sup>11</sup> this chapter also examined variations in overweight and obesity prevalence by age, sex, equivalised household income quintiles, and parental BMI. The risk of being overweight or obese is distributed somewhat unevenly across socio-economic groups. Among girls aged 2-15, obesity prevalence rates were higher in the lowest income group. Obesity prevalence rates were higher in households where both natural parents or the lone natural parent were classed as either overweight or obese.

Analyses in this chapter explored the relationship between physical activity and childhood obesity in a number of ways. Among girls aged 2-15, obesity prevalence rates were higher in those with low levels of self-reported physical activity. No evidence was found to suggest that obese children have lower expectations regarding the number of days in a week that should be spent doing physical activity. The proportion of boys aged 11-15 who believed that children should spend a minimum of five days a week doing physical activity was highest among those classed as obese.

Estimates of the number of minutes a day that children should spend doing physical activity varied by BMI status and sex. Among boys aged 11-15, those classed as being normal weight were more likely than the obese to believe that children should spend at least 60 minutes a day doing physical activity (the recommended level by the CMO). Girls of similar age classed as being overweight were more likely than those in the normal weight group to believe that children should spend at least 60 minutes a day doing physical activity.

Children's perceptions of their level of physical activity compared with their peers systematically varied by BMI status in the expected pattern. Boys and girls aged 11-15 of normal weight were more likely than those classed as obese to believe that they were very physically active compared with other children of their own age. Children aged 11-15 classed as obese were significantly more likely than those in the normal weight group to state that they would like to do more physical activity than at present.

The promotion and adoption of physically active lifestyles is seen as a crucial element in the attempt to reduce the prevalence of childhood obesity.<sup>23</sup> As described in the HSE 2006,<sup>39</sup> however, an important limitation of the HSE child physical activity module is that no validation of the questions has been undertaken using objective measures of activity and fitness. Children's activity patterns are characterised by short and sporadic (rather than sustained) bouts of activity.<sup>40</sup> They are also less likely to involve clearly defined periods of specific activities. This makes the collection of data by structured questionnaire a difficult and complex task. The introduction of objective measures such as the actigraph, included in HSE 2008, provides an excellent opportunity to provide more in-depth information on the links between the intensity and amount of physical activity and obesity both for adults and children.



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- 33 The module of questions on children's physical activity was only included in the child boost sample, where only up to two children and no adults were interviewed. In core households, where all adults and up to two children were interviewed, with parents answering on behalf of their children up to the age of 12 as well as on their own behalf, the addition of the child physical activity module would have constituted an excessive burden on the respondents.
- 34 In households where the head of household was not interviewed the social class of the head of household was derived from information obtained from their spouse or partner. Heads of households who were in the armed forces, whose occupation was not adequately described or who were full-time students were not allocated a social class and are not shown separately in the table.
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- 37 To examine the statistical significance of change the difference between 1995 and 2007 was compared.
- 38 The estimate for obesity for girls aged 11-15 in 2004, based on a small sample, was higher than other years. The long term trends suggest that 2004's estimate may have been an outlier in the series (due to random variation), and otherwise the trend appears to be flattening out for this and other age groups over the most recent years.
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- 8.1 BMI, by age and sex
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- 8.4 BMI, overweight and obesity prevalence, by equivalised household income and sex
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Table 8.1

**BMI, by age and sex***Aged 2-15 with a valid BMI measurement*

2007

BMI (kg/m <sup>2</sup> )	Age														Total
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Boys															
Mean	17.5	17.0	16.5	16.3	16.7	17.0	17.1	17.7	18.6	18.7	19.9	20.2	20.9	21.3	18.4
Standard error of the mean	0.21	0.16	0.14	0.11	0.19	0.18	0.15	0.20	0.21	0.21	0.22	0.23	0.22	0.23	0.06
5th percentile	14.8	14.5	14.0	14.1	13.7	14.0	14.3	14.3	14.8	14.7	15.3	15.6	16.5	17.0	14.5
10th percentile	15.2	15.1	14.7	14.5	14.2	14.6	14.5	14.9	15.2	15.1	16.0	16.4	17.0	17.8	15.1
15th percentile	15.6	15.4	14.9	14.7	14.6	15.0	15.0	15.4	15.5	15.6	16.3	17.1	17.7	18.3	15.4
Median	17.2	16.6	16.4	16.1	16.1	16.4	16.7	17.0	17.6	18.1	19.0	19.7	20.2	20.4	17.5
85th percentile	18.9	18.6	17.9	17.6	18.3	19.3	19.4	20.5	22.4	21.7	24.1	23.5	24.0	25.2	21.6
90th percentile	19.1	19.3	18.4	18.2	19.4	20.4	20.5	21.6	23.4	23.2	25.4	24.5	25.0	26.4	22.8
95th percentile	20.1	20.9	19.6	20.2	21.5	22.7	22.0	23.5	25.4	24.9	26.9	27.8	28.3	28.1	25.1
Girls															
Mean	16.9	16.7	16.7	16.3	16.7	17.1	17.4	18.3	18.5	19.5	20.3	21.4	21.7	22.4	18.7
Standard error of the mean	0.17	0.14	0.15	0.19	0.18	0.18	0.21	0.24	0.20	0.28	0.23	0.24	0.31	0.30	0.08
5th percentile	13.7	14.1	14.3	13.4	13.8	14.1	13.9	14.3	14.9	14.8	15.6	16.5	16.3	17.2	14.3
10th percentile	14.7	14.5	14.8	14.0	14.1	14.6	14.5	15.1	15.4	15.2	16.1	17.2	17.0	18.0	15.0
15th percentile	15.2	15.2	15.0	14.3	14.6	15.0	14.9	15.4	15.6	15.7	16.7	17.7	17.6	18.4	15.4
Median	16.9	16.6	16.4	15.9	16.2	16.4	16.8	17.6	17.8	18.8	19.8	20.8	20.8	21.8	17.7
85th percentile	18.7	18.2	18.2	18.3	18.7	19.3	20.2	21.3	21.5	23.9	23.8	25.5	26.2	26.9	22.4
90th percentile	19.1	18.7	18.7	19.2	19.7	20.0	21.5	23.2	22.4	25.2	24.9	26.7	28.0	27.8	23.8
95th percentile	19.8	19.5	20.9	22.2	22.2	21.6	23.4	25.1	24.6	27.7	27.5	28.8	30.4	31.2	26.3
Bases (unweighted)															
Boys	195	213	214	214	234	206	250	221	259	248	242	273	256	230	3255
Girls	179	206	203	210	223	212	224	228	236	210	253	268	230	208	3090
Bases (weighted)															
Boys	164	184	184	195	214	187	225	199	214	205	208	236	249	221	2885
Girls	160	191	178	190	199	198	205	206	219	195	206	219	224	204	2793

Table 8.2

**Overweight and obesity prevalence, by age and sex***Aged 2-15 with a valid BMI measurement*

2007

BMI status	Age														Total
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>															
Overweight <sup>a,b</sup>	15	9	15	13	15	9	13	14	12	16	15	17	16	12	14
Obese <sup>a,b</sup>	14	16	13	11	16	17	16	17	25	16	23	18	16	16	17
Overweight including obese	29	26	28	25	31	26	29	31	37	32	39	35	32	28	31
<b>Girls</b>															
Overweight <sup>a,b</sup>	11	15	15	11	16	17	10	12	16	11	17	19	14	14	14
Obese <sup>a,b</sup>	14	12	13	13	16	14	16	18	13	20	19	19	17	20	16
Overweight including obese	25	27	28	24	31	30	25	31	30	31	35	38	31	34	30
<i>Bases (unweighted)</i>															
Boys	195	213	214	214	234	206	250	221	259	248	242	273	256	230	3255
Girls	179	206	203	210	223	212	224	228	236	210	253	268	230	208	3090
<i>Bases (weighted)</i>															
Boys	164	184	184	195	214	187	225	199	214	205	208	236	249	221	2885
Girls	160	191	178	190	199	198	205	206	219	195	206	219	224	204	2793

<sup>a</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.<sup>b</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.3

**BMI, overweight and obesity prevalence, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex***Aged 2-15 with a valid BMI measurement*

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
<b>Boys</b>											
Mean	18.1	18.4	18.6	18.4	18.1	18.7	18.2	18.2	18.2	18.3	18.1
Standard error of the mean	0.27	0.16	0.18	0.23	0.17	0.20	0.22	0.19	0.16	0.21	0.22
Median	17.0	17.5	17.8	17.5	17.5	17.8	17.3	17.2	17.3	17.2	17.4
% Overweight <sup>b,c</sup>	15	13	14	15	15	13	14	12	14	13	15
% Obese <sup>b,c</sup>	15	15	17	17	19	20	18	14	15	15	15
% Overweight including obese	30	28	31	32	34	33	32	26	29	28	30
<b>Girls</b>											
Mean	19.1	18.8	19.0	18.9	18.8	18.5	18.2	18.6	18.6	18.7	18.6
Standard error of the mean	0.30	0.22	0.27	0.26	0.27	0.18	0.21	0.25	0.18	0.24	0.26
Median	18.0	17.8	18.0	17.7	17.7	17.7	17.4	17.3	17.6	17.8	17.6
% Overweight <sup>b,c</sup>	17	12	16	15	16	13	11	11	18	16	19
% Obese <sup>b,c</sup>	20	18	17	16	18	15	16	16	13	15	12
% Overweight including obese	37	30	33	30	34	27	27	27	31	31	31
<i>Bases (unweighted)</i>											
Boys	156	439	351	347	355	353	349	307	598	304	294
Girls	155	411	338	312	338	338	379	322	497	227	270
<i>Bases (weighted)</i>											
Boys	134	400	309	265	320	318	363	280	496	252	244
Girls	133	377	300	248	303	309	413	293	417	190	227

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.4

**BMI, overweight and obesity prevalence, by  
equivalised household income and sex***Aged 2-15 with a valid BMI measurement**2007*

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
<b>Boys</b>					
Mean	18.2	18.3	18.2	18.6	18.3
Standard error of the mean	0.13	0.16	0.14	0.16	0.17
Median	17.5	17.2	17.5	17.7	17.3
% Overweight <sup>a,b</sup>	15	14	13	14	13
% Obese <sup>a,b</sup>	15	17	15	17	19
% Overweight including obese	29	31	28	31	32
<b>Girls</b>					
Mean	17.9	18.2	18.5	19.0	19.3
Standard error of the mean	0.16	0.15	0.20	0.19	0.20
Median	17.2	17.4	17.4	18.3	17.9
% Overweight <sup>a,b</sup>	14	11	13	18	13
% Obese <sup>a,b</sup>	9	13	16	16	22
% Overweight including obese	24	24	29	34	35
<i>Bases (unweighted)</i>					
Boys	471	549	633	519	594
Girls	484	516	506	477	637
<i>Bases (weighted)</i>					
Boys	400	459	553	470	559
Girls	416	443	448	435	617

<sup>a</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>b</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.5

**BMI, overweight and obesity prevalence, by parental BMI status<sup>a</sup> and sex**

Aged 2-15 in core sample with a valid BMI measurement

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Parental BMI status			
	Underweight/normal BMI household	Mother overweight/obese, father underwt/normal	Father overweight/obese, mother underwt/normal	Overweight/obese household
<b>Boys</b>				
Mean	17.8	18.3	17.2	19.2
Standard error of the mean	0.30	0.47	0.21	0.24
Median	16.9	17.6	17.1	18.4
% Overweight <sup>b,c</sup>	13	13	14	14
% Obese <sup>b,c</sup>	11	15	8	24
% Overweight including obese	23	28	22	38
<b>Girls</b>				
Mean	17.7	[17.9]	17.7	19.6
Standard error of the mean	0.28	[0.51]	0.27	0.31
Median	16.9	[16.9]	17.0	18.3
% Overweight <sup>b,c</sup>	8	[14]	13	17
% Obese <sup>b,c</sup>	10	[11]	6	21
% Overweight including obese	18	[25]	19	38
<b>Bases (unweighted)</b>				
Boys	161	57	97	280
Girls	145	38	107	275
<b>Bases (weighted)</b>				
Boys	143	53	85	254
Girls	131	36	93	250

<sup>a</sup> BMI only recorded for adults selected as part of the general population sample, so children from the boost sample are excluded from this table.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.6

**BMI, overweight and obesity prevalence, by physical activity levels and sex**

Aged 2-15 in the boost sample with a valid BMI measurement

2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Activity level <sup>a</sup> in the last week		
	High	Medium	Low
<b>Boys</b>			
Mean	18.3	18.2	18.5
Standard error of the mean	0.08	0.20	0.19
Median	17.4	17.2	17.6
% Overweight <sup>b,c</sup>	15	13	11
% Obese <sup>b,c</sup>	16	16	18
% Overweight including obese	31	29	30
<b>Girls</b>			
Mean	18.4	18.8	19.5
Standard error of the mean	0.11	0.20	0.20
Median	17.4	17.8	18.6
% Overweight <sup>b,c</sup>	14	15	13
% Obese <sup>b,c</sup>	15	19	21
% Overweight including obese	29	34	34
<b>Bases (unweighted)</b>			
Boys	1845	323	390
Girls	1568	431	452
<b>Bases (weighted)</b>			
Boys	1835	326	384
Girls	1570	434	452

<sup>a</sup> The three physical activity levels are defined as:

High: active for 60 minutes on 7 days, at least moderate intensity activity, in the last week

Medium: active for 30-59 minutes on 7 days, at least moderate intensity activity, in the last week

Low: active at a lower level or not active at all.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.7

### Knowledge of number of days and minutes a day children should do physical activity, by BMI status and sex

Aged 11-15 with a valid BMI measurement

2007

Attitudes to amount of physical activity	BMI status			All
	Normal weight	Overweight	Obese <sup>a,b</sup>	
	%	%	%	
Boys				
Number of days should do physical activity				
1	1	1	0	1
2	5	3	4	4
3	14	11	11	13
4	18	15	13	17
5	19	22	29	21
6	10	11	10	10
7	33	37	34	34
How many minutes a day should do physical activity				
< 30 minutes per day	12	18	14	13
30-59 minutes per day	24	28	28	25
60-119 minutes per day	48	41	46	47
≥ 120 minutes per day	16	12	12	15
Girls				
Number of days should do physical activity				
1	1	0	0	1
2	7	7	3	6
3	17	12	17	16
4	18	18	17	18
5	19	21	23	20
6	9	8	8	9
7	28	33	31	30
How many minutes a day should do physical activity				
<30 minutes per day	15	12	14	14
30-59 minutes per day	35	26	29	33
60-119 minutes per day	41	53	49	44
≥120 minutes per day	9	9	7	9
Bases (unweighted) <sup>c</sup>				
Boys	730	159	189	1078
Girls	647	160	195	1002
Bases (weighted) <sup>c</sup>				
Boys	655	141	166	961
Girls	583	140	172	894

<sup>a</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>b</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

<sup>c</sup> Bases vary but are of similar size; those shown are for the first statement.



Table 8.8

### Attitudes to own level of physical activity, by BMI status and sex

Aged 11-15 with a valid BMI measurement

2007

Attitudes to amount of physical activity	BMI status			All
	Normal weight	Overweight	Obese <sup>a,b</sup>	
	%	%	%	%
<b>Boys</b>				
<b>Compared with other people of own age</b>				
Very physically active	46	37	27	42
Fairly physically active	45	52	57	49
Not very/not at all physically active	8	11	15	10
<b>Would like to do more physical activity than at present</b>				
Yes	57	68	71	61
No	43	32	29	39
<b>Girls</b>				
<b>Compared with other people of own age</b>				
Very physically active	32	30	21	30
Fairly physically active	52	54	59	54
Not very/not at all physically active	16	15	19	16
<b>Would like to do more physical activity than at present</b>				
Yes	71	73	84	74
No	29	27	16	26
<i>Bases (unweighted)<sup>c</sup></i>				
Boys	801	180	214	1195
Girls	737	173	214	1124
<i>Bases (weighted)<sup>c</sup></i>				
Boys	720	162	187	1069
Girls	669	150	190	1008

<sup>a</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>b</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

<sup>c</sup> Bases vary but are of similar size; those shown are for the first statement.

Table 8.9

### Physical activities would like to do in the future, by BMI status and sex

Aged 11-15 with a valid BMI measurement and who would like to do more physical activity than at present

2007

Physical activities would like to do in the future	BMI status			All
	Normal weight	Overweight	Obese <sup>a,b</sup>	
	%	%	%	%
<b>Boys</b>				
Ball sports	62	64	67	64
Swimming	53	65	62	57
Riding a bike	52	61	64	56
Running or jogging	42	39	45	42
Walking	31	36	45	35
Other sports	38	41	32	37
Skate boarding, roller/ice skating	34	36	33	34
Playing outside	27	30	37	29
Horse riding	7	6	9	7
Dancing	5	12	6	6
Something else	20	23	26	21
<b>Girls</b>				
Ball sports	51	49	57	52
Swimming	61	62	72	64
Riding a bike	42	40	53	44
Running or jogging	44	38	41	43
Walking	38	24	41	36
Other sports	55	45	41	51
Skate boarding, roller/ice skating	46	43	41	45
Playing outside	23	17	26	23
Horse riding	34	31	35	34
Dancing	49	49	43	48
Something else	12	18	9	12
<i>Bases (unweighted)</i>				
Boys	460	122	156	738
Girls	515	129	180	824
<i>Bases (weighted)</i>				
Boys	412	109	133	655
Girls	474	111	161	746

<sup>a</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>b</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.10

### Trends in BMI, overweight and obesity prevalence among children aged 2-15, 1995-2007, by sex

Aged 2-15 with a valid BMI measurement

1995-2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Survey year														
	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>a</sup>	2003 <sup>a</sup>	2004	2005	2006	2007	
Boys															
Mean	17.7	17.7	17.8	17.9	18.2	18.0	18.2	18.3	18.5	18.5	18.6	18.6	18.4	18.4	
Standard error of the mean	0.08	0.07	0.06	0.08	0.15	0.14	0.08	0.07	0.11	0.12	0.15	0.13	0.07	0.06	
Median	17.0	17.1	17.0	17.1	17.3	17.0	17.4	17.4	17.5	17.5	17.5	17.7	17.5	17.5	
% Overweight <sup>b,c</sup>	13	14	13	15	14	12	15	14	15	15	14	16	13	14	
% Obese <sup>b,c</sup>	11	12	13	13	16	14	15	17	17	17	19	18	17	17	
% Overweight including obese	24	26	26	28	31	27	31	31	32	32	33	34	31	31	
Girls															
Mean	18.1	18.1	18.1	18.4	18.2	18.5	18.6	18.8	18.8	18.8	19.3	18.9	18.7	18.7	
Standard error of the mean	0.09	0.10	0.07	0.10	0.15	0.14	0.10	0.07	0.11	0.12	0.20	0.14	0.08	0.08	
Median	17.3	17.2	17.3	17.4	17.3	17.4	17.6	17.8	17.8	17.8	18.1	17.8	17.6	17.7	
% Overweight <sup>b,c</sup>	13	12	13	14	14	13	15	14	14	15	17	13	14	14	
% Obese <sup>b,c</sup>	12	12	12	14	14	14	14	17	16	16	18	18	15	16	
% Overweight including obese	25	24	26	27	27	27	30	31	30	31	35	31	29	30	
Bases (unweighted)															
Boys	1697	1874	3275	1754	857	864	1490	3250	1417	1417	635	1166	3029	3255	
Girls	1672	1758	3288	1657	789	846	1532	3140	1416	1416	578	1191	2950	3090	
Bases (weighted)															
Boys	1918	2132	3063	1981	977	877	1653	3745	1410	1452	624	1102	2822	2885	
Girls	1901	2014	3069	1872	950	841	1699	3636	1444	1393	581	1091	2670	2793	

<sup>a</sup> Data for all years have been weighted to correct for the probability of selection. For 2003-2007, data have also been weighted for non-response (shaded columns). Two columns of data are shown for 2003, one with selection weighting only, and one with selection and non-response weighting.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.11

### Trends in BMI, overweight and obesity prevalence among children aged 2-10, 1995-2007, by sex

Aged 2-10 with a valid BMI measurement

1995-2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Survey year													
	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>a</sup>	2003 <sup>a</sup>	2004	2005	2006	2007
<b>Boys</b>														
Mean	16.7	16.7	16.7	16.9	17.2	16.9	17.0	17.1	17.2	17.2	17.2	17.3	17.1	17.2
Standard error of the mean	0.06	0.06	0.05	0.08	0.15	0.10	0.08	0.06	0.11	0.12	0.13	0.12	0.07	0.06
Median	16.4	16.4	16.4	16.5	16.6	16.4	16.6	16.6	16.5	16.5	16.6	16.7	16.6	16.7
% Overweight <sup>b,c</sup>	13	14	13	15	14	14	16	13	15	15	15	16	12	13
% Obese <sup>b,c</sup>	10	11	11	11	16	12	14	15	15	15	16	17	17	16
% Overweight including obese	22	25	24	26	30	26	29	29	30	30	30	33	29	29
<b>Girls</b>														
Mean	16.9	16.8	16.9	17.0	17.0	17.0	17.1	17.3	17.2	17.2	17.3	17.4	17.1	17.2
Standard error of the mean	0.08	0.08	0.05	0.07	0.13	0.12	0.09	0.07	0.10	0.11	0.14	0.13	0.07	0.07
Median	16.4	16.4	16.5	16.5	16.6	16.4	16.6	16.7	16.6	16.6	16.8	16.7	16.5	16.7
% Overweight <sup>b,c</sup>	13	11	12	12	13	12	14	13	13	13	15	12	13	14
% Obese <sup>b,c</sup>	10	10	11	12	13	12	13	16	13	12	13	17	13	14
% Overweight including obese	23	21	23	24	26	23	27	29	26	26	28	29	26	28
<i>Bases (unweighted)</i>														
Boys	1113	1234	2159	1185	563	582	913	2036	864	864	404	707	1875	2006
Girls	1114	1178	2222	1082	535	537	980	1948	869	869	338	731	1845	1921
<i>Bases (weighted)</i>														
Boys	1261	1418	2007	1336	633	570	1035	2364	876	878	379	664	1737	1766
Girls	1266	1365	2082	1216	628	523	1094	2290	897	858	346	674	1635	1746

<sup>a</sup> Data for all years have been weighted to correct for the probability of selection. For 2003-2007, data have also been weighted for non-response (shaded columns). Two columns of data are shown for 2003, one with selection weighting only, and one with selection and non-response weighting.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.12

### Trends in BMI, overweight and obesity prevalence among children aged 11-15, 1995-2007, by sex

Aged 11-15 with a valid BMI measurement

1995-2007

BMI (kg/m <sup>2</sup> ) and BMI status (%)	Survey year														
	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>a</sup>	2003 <sup>a</sup>	2004	2005	2006	2007	
Boys															
Mean	19.7	19.7	19.7	19.9	20.1	19.9	20.1	20.3	20.5	20.5	20.8	20.5	20.3	20.2	
Standard error of the mean	0.15	0.16	0.11	0.15	0.24	0.24	0.16	0.12	0.18	0.19	0.27	0.23	0.12	0.11	
Median	19.1	19.2	19.1	19.1	19.2	19.2	19.4	19.7	19.7	19.7	20.2	19.4	19.7	19.6	
% Overweight <sup>b,c</sup>	13	15	13	15	15	10	14	14	14	14	13	15	15	15	
% Obese <sup>b,c</sup>	14	14	16	16	17	19	19	20	20	20	24	20	18	18	
% Overweight including obese	27	29	28	31	32	29	33	34	35	35	37	35	33	33	
Girls															
Mean	20.6	20.8	20.7	21.0	20.5	21.0	21.2	21.2	21.4	21.5	22.2	21.4	21.1	21.1	
Standard error of the mean	0.16	0.18	0.13	0.17	0.28	0.24	0.19	0.13	0.19	0.20	0.33	0.21	0.13	0.13	
Median	19.9	20.2	20.1	20.4	20.1	20.6	20.6	20.6	20.8	20.8	21.3	20.8	20.5	20.4	
% Overweight <sup>b,c</sup>	14	14	15	16	14	14	18	15	16	16	19	14	16	15	
% Obese <sup>b,c</sup>	15	15	16	17	15	18	18	19	22	22	27	21	17	19	
% Overweight including obese	29	29	32	33	29	33	35	34	38	38	46	35	33	34	
Bases (unweighted)															
Boys	584	640	1116	569	294	282	577	1214	553	553	231	459	1154	1249	
Girls	558	580	1066	575	254	309	552	1192	547	547	240	460	1105	1169	
Bases (weighted)															
Boys	658	714	1056	645	343	306	618	1381	533	574	245	438	1085	1119	
Girls	635	649	987	656	322	318	605	1346	547	535	235	417	1035	1047	

<sup>a</sup> Data for all years have been weighted to correct for the probability of selection. For 2003-2007, data have also been weighted for non-response (shaded columns). Two columns of data are shown for 2003, one with selection weighting only, and one with selection and non-response weighting.

<sup>b</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>c</sup> Overweight was defined as ≥85th<95th UK National BMI percentile; obese was defined as ≥95th UK National BMI percentile.

Table 8.13

### Trends in obesity prevalence, 1995-2007, by sex and social class (Registrar General's classification)<sup>a</sup>

Aged 2-15 with a valid BMI measurement

1995-2007

Obese <sup>b</sup>	Survey year													
	1995	1996	1997	1998	1999	2000	2001	2002	2003 <sup>c</sup>	2003 <sup>c</sup>	2004	2005	2006	2007
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Boys														
Non-manual	9	12	12	13	18	15	15	16	16	16	18	18	15	15
Manual	13	11	13	13	15	14	16	18	18	18	20	19	21	18
Girls														
Non-manual	11	13	12	13	13	13	12	16	14	14	15	18	13	14
Manual	13	12	13	15	15	17	17	19	19	19	22	19	17	19
Bases (unweighted)														
Boys (non-manual)	780	893	1439	870	389	442	758	1755	747	747	372	655	1717	1815
Boys (manual)	797	871	1705	828	440	371	676	1364	600	600	246	455	1175	1276
Girls (non-manual)	787	852	1553	784	391	449	797	1692	788	788	317	645	1676	1779
Girls (manual)	764	780	1595	825	377	341	673	1311	577	577	244	481	1134	1158
Bases (weighted)														
Boys (non-manual)	875	986	1299	970	440	427	831	1996	727	731	354	600	1578	1579
Boys (manual)	908	1018	1628	946	507	395	756	1586	607	641	253	453	1101	1139
Girls (non-manual)	858	956	1410	869	461	434	867	1915	783	743	302	572	1478	1573
Girls (manual)	903	910	1514	944	464	347	750	1548	604	595	262	449	1047	1061

<sup>a</sup> Registrar General's Social Class, based on the occupation of the head of household, divides occupations into six groups shown below. These can be further grouped into two categories, non-manual (classes I-III NM) and manual (classes III M-V), as used in this table. This classification was replaced on government surveys by the National Statistics Socio-economic Classification (NS-SEC) in 2001.

Class Occupation description

I Professional occupations

II Managerial and technical occupations

III NM Skilled occupations (non-manual)

IIIM Skilled occupations (manual)

IV Partly skilled occupations

Unskilled occupations

<sup>b</sup> Obese was defined as ≥95th UK National BMI percentile.

<sup>c</sup> Data for all years have been weighted to correct for the probability of selection. For 2003-2007, data have also been weighted for non-response (shaded columns). Two columns of data are shown for 2003, one with selection weighting only, and one with selection and non-response weighting.

Table 8.14

**Trends in obesity prevalence, 2001-2007, by sex and socio-economic group (NS-SEC)<sup>a</sup>**

Aged 2-15 with a valid BMI measurement

2001-2007

Obese <sup>b</sup>	Survey year							
	2001	2002	2003 <sup>c</sup>	2003 <sup>c</sup>	2004	2005	2006	2007
	%	%	%	%	%	%	%	%
<b>Boys</b>								
Managerial & professional	14	14	16	16	18	17	14	13
Intermediate	16	18	14	13	[24]	20	15	23
Small employers & own account workers	20	17	21	22	29	17	17	17
Lower supervisory & technical	17	18	19	18	17	14	20	14
Semi-routine & routine	16	19	15	16	17	21	22	21
<b>Girls</b>								
Managerial & professional	11	15	13	13	15	20	11	12
Intermediate	16	20	15	15	[11]	16	18	21
Small employers & own account workers	14	14	17	17	20	12	13	15
Lower supervisory & technical	21	17	11	12	22	18	15	16
Semi-routine & routine	17	21	21	22	23	20	18	21

Continued...

Table 8.14 continued

Aged 2-15 with a valid BMI measurement

2001-2007

	Survey year							
	2001	2002	2003 <sup>c</sup>	2003 <sup>c</sup>	2004	2005	2006	2007
	%	%	%	%	%	%	%	%
<i>Bases (unweighted)</i>								
Boys (managerial & professional)	553	1250	545	545	275	480	1238	1348
Boys (intermediate)	98	306	106	106	48	77	233	236
Boys (small employers & own account workers)	167	361	142	142	74	139	379	427
Boys (lower supervisory & technical)	171	361	152	152	58	122	295	287
Boys (semi-routine & routine)	459	869	413	413	167	302	768	816
Girls (managerial & professional)	551	1254	568	568	257	461	1203	1275
Girls (intermediate)	128	258	110	110	31	111	249	213
Girls (small employers & own account workers)	185	334	163	163	72	126	326	404
Girls (lower supervisory & technical)	192	351	137	137	50	111	283	255
Girls (semi-routine & routine)	428	832	396	396	154	329	767	807
<i>Bases (weighted)</i>								
Boys (managerial & professional)	602	1412	529	535	268	435	1129	1171
Boys (intermediate)	101	353	102	101	45	68	215	202
Boys (small employers & own account workers)	185	420	145	159	72	133	359	384
Boys (lower supervisory & technical)	184	407	145	152	61	122	273	246
Boys (semi-routine & routine)	532	1021	423	436	165	302	724	735
Girls (managerial & professional)	598	1425	554	525	250	412	1052	1135
Girls (intermediate)	132	289	111	105	29	103	217	180
Girls (small employers & own account workers)	209	382	176	184	75	108	308	363
Girls (lower supervisory & technical)	210	408	135	130	53	104	252	227
Girls (semi-routine & routine)	484	986	419	402	159	303	714	745

<sup>a</sup> The National Statistics Socio-economic Classification (NS-SEC) was introduced to replace the Registrar General's Social Class in government surveys in 2001. NS-SEC is a social classification system that attempts to classify groups on the basis of employment relations. There are fourteen operational categories representing different groups of occupations, and three residual categories for those not working or not classified. The fourteen categories can be grouped into different classifications, including the five category classification used in this table.

<sup>b</sup> Obese was defined as ≥95th UK National BMI percentile.

<sup>c</sup> Data for all years have been weighted to correct for the probability of selection. For 2003-2007, data have also been weighted for non-response (shaded columns). Two columns of data are shown for 2003, one with selection weighting only, and one with selection and non-response weighting. NS-SEC information only available from HSE 2001 onwards.



Table 8.15

**Trends in BMI status, 1996-2007, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 2-15 with a valid BMI measurement

1996-2007

BMI status and survey year	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
Boys											
1996-1998 <sup>b</sup>											
Overweight <sup>c,d</sup>	16	12	15	14	13	15	14	12	14	14	14
Obese <sup>c,d</sup>	12	14	11	12	14	11	14	14	12	11	13
Overweight including obese	28	26	26	25	27	26	28	26	26	25	27
1999-2001 <sup>b</sup>											
Overweight <sup>c,d</sup>	14	12	14	17	15	14	16	11	13	13	14
Obese <sup>c,d</sup>	17	19	14	14	13	14	21	15	14	15	13
Overweight including obese	31	31	28	31	28	28	37	26	28	29	27
2002-2004 <sup>b</sup>											
Overweight <sup>c,d</sup>	13	15	15	13	12	13	14	15	14	15	13
Obese <sup>c,d</sup>	21	15	14	18	19	17	21	16	16	17	15
Overweight including obese	34	30	29	31	32	29	36	30	30	33	27
2005-2007 <sup>b</sup>											
Overweight <sup>c,d</sup>	16	15	12	13	14	14	13	14	15	14	15
Obese <sup>c,d</sup>	17	15	18	18	20	16	21	16	16	16	15
Overweight including obese	33	30	30	31	34	30	34	29	30	31	29
Girls											
1996-1998 <sup>b</sup>											
Overweight <sup>c,d</sup>	9	15	11	12	11	14	13	15	13	14	13
Obese <sup>c,d</sup>	14	12	11	12	12	13	14	11	14	15	13
Overweight including obese	23	27	22	24	23	27	26	26	27	28	25
1999-2001 <sup>b</sup>											
Overweight <sup>c,d</sup>	17	16	13	17	14	14	17	11	11	11	11
Obese <sup>c,d</sup>	12	18	9	14	18	14	13	17	12	12	12
Overweight including obese	29	34	22	30	33	28	30	28	23	23	23
2002-2004 <sup>b</sup>											
Overweight <sup>c,d</sup>	14	12	16	16	15	14	14	13	15	14	16
Obese <sup>c,d</sup>	18	18	18	16	21	14	19	14	15	16	14
Overweight including obese	32	30	34	32	36	28	33	28	29	29	30
2005-2007 <sup>b</sup>											
Overweight <sup>c,d</sup>	13	15	15	14	14	12	14	12	15	15	15
Obese <sup>c,d</sup>	18	18	16	17	18	13	16	17	14	14	14
Overweight including obese	32	32	31	30	31	25	30	29	29	29	29

Continued...

Table 8.15 continued

Aged 2-15 with a valid BMI measurement

1996-2007

	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
<i>Bases (unweighted)</i>											
Boys (1996-1998)	375	995	739	659	675	776	920	655	1105	550	555
Boys (1999-2001)	237	436	347	293	366	389	326	317	444	218	226
Boys (2002-2004)	308	761	566	508	542	593	643	553	828	432	396
Boys (2005-2007)	384	1082	859	770	794	807	812	691	1251	623	628
Girls (1996-1998)	332	988	752	604	635	847	882	666	992	507	485
Girls (1999-2001)	189	424	320	314	391	353	352	323	439	223	216
Girls (2002-2004)	314	714	540	446	557	586	618	510	849	436	413
Girls (2005-2007)	393	1058	793	727	773	752	851	703	1181	557	624
<i>Bases (weighted)</i>											
Boys (1996-1998)	368	999	740	651	691	761	934	657	1096	543	554
Boys (1999-2001)	225	425	345	288	386	398	321	315	443	217	225
Boys (2002-2004)	305	766	559	500	544	581	657	549	821	428	393
Boys (2005-2007)	368	1068	813	674	810	858	953	718	1216	597	619
Girls (1996-1998)	329	990	751	602	644	842	900	655	989	500	488
Girls (1999-2001)	176	416	330	312	406	357	356	325	437	226	211
Girls (2002-2004)	307	740	534	446	571	576	613	513	855	441	414
Girls (2005-2007)	364	1037	751	641	773	770	1029	701	1134	523	611

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> The HSE years are grouped together because of the smaller sample sizes at regional level. The child selection weight was used for 1996-1998, 1999-2001, and 2002-2004; the non-response weight was used for 2005-2007 (shaded rows).

<sup>c</sup> Categories are mutually exclusive, i.e. overweight does not include those who are obese.

<sup>d</sup> Overweight was defined as  $\geq 85^{\text{th}}$  <  $95^{\text{th}}$  UK National BMI percentile; obese was defined as  $\geq 95^{\text{th}}$  UK National BMI percentile.

# Children's physical activity: behaviour, knowledge and attitudes

## 9

Marilyn Roth

### Summary

- This chapter examines physical activity among children aged 2-15 as well as knowledge and attitudes to physical activity among children aged 11-15. Topics include summary levels of activity, children's knowledge of how much physical activity they should do related to recommended physical activity targets, perception of their own physical activity levels, and desire to do more physical activity.
- 99% of boys and girls aged 2-15 had participated in at least some form of physical activity in the last week. The most common types of activity were active play and walking (93% and 91% for boys, 88% and 91% for girls). Housework/gardening was the least common activity for both boys and girls aged 8-15 (32% and 39% respectively).
- More boys (72%) than girls (63%) met the government recommended targets by participating in physical activity for at least 60 minutes on all seven days per week. The proportion of boys meeting the target was fairly consistent across age groups, but the proportion of girls meeting the recommendations steadily declined after the age of 9.
- When asked how much physical activity children should do, only one in 10 children aged 11-15 suggested that it should be 60 minutes on all seven days per week, i.e. at the minimum level recommended by the government. A further 8% of boys and 3% of girls overestimated the minimum recommendations.
- There was some association between thinking that children should be active for at least 60 minutes per day and actually achieving the recommended targets. 12% of boys and 13% of girls who thought children should do physical activity at the recommended level also achieved this.
- Most boys and girls perceived themselves to be either very or fairly physically active compared with other people their age (90% and 84% respectively). The proportion of boys who perceived themselves to be very physically active was similar from age 11 to 15 (47% and 42% respectively) compared with a significant decline in girls between ages 11 and 15 (38% and 19% respectively).
- For the most part, children who achieved a high level of activity accurately perceived themselves as being either very or fairly physically active compared with others (94% of boys and 92% of girls). However, 68% of boys and 67% of girls in the lowest activity group thought they were very or fairly physically active compared with others.
- Girls were more likely than boys to want to do more physical activity (74% and 61% respectively), regardless of age. The proportion who wanted to do more physical activity declined with age among boys, but not among girls. The most frequently mentioned sports and activities boys would like to do more were ball sports (39%), riding a bike and swimming (both 35%), whereas among girls the most frequently mentioned was swimming (47%). For both boys and girls, there was a pattern of declining interest in some activities with age.

## 9.1 Introduction

This chapter examines participation in physical activity among children aged 2-15 as well as knowledge and attitudes to physical activity among children aged 11-15. The chapter concludes with a discussion of selected results within the context of policy development and cultivating accurate knowledge about, and positive attitudes to, physical activity.

The most commonly accepted definition of physical activity is 'any bodily movement produced by the muscles resulting in energy expenditure above the basal level'.<sup>1</sup> This chapter focuses on specific types of activities that are believed to account for the majority of children's total activity.

The importance of physical activity for the health of children and young people is a key public health issue in light of the rising levels of overweight/obesity.<sup>2</sup> Obesity in children is associated with lower levels of physical activity and physical fitness.<sup>3</sup> Children benefit from a physically active lifestyle in a wide range of ways, including reduced overweight/obesity, increased psychological well-being, increased social interaction, improved self-esteem, skeletal health and growth, and reduction in other health-related risk factors.<sup>4,5</sup> Conversely, children who are overweight/obese are more susceptible to adverse health risks and conditions, such as cardiovascular risk factors,<sup>6</sup> premature atherosclerosis,<sup>7</sup> and diabetes.<sup>8</sup> Establishing a physically active lifestyle in childhood can lead to a more active lifestyle as an adult,<sup>9</sup> thus paving the way to continue experiencing the benefits of exercise into adulthood.

In 2007 the government responded to the increasingly widespread prevalence of overweight/obesity in England by announcing a revised target 'to reverse the rising tide of obesity and overweight in the population by ensuring that all individuals are able to maintain a healthy weight. Our initial focus is on children: by 2020 we will have reduced the proportion of overweight and obese children to 2000 levels'.<sup>10</sup> In 2008 in order to achieve this target, the government focused on five key policy areas, one of which was to 'build physical activities into our lives.' More specifically, among other strategies, the government planned to implement numerous initiatives geared toward physical activity, including the development of programmes to increase participation in PE and sports among children who are overweight or obese; investment in evidence-based programmes that encourage parents to make changes to their children's diet and levels of physical activity; the development of cycling skills and infrastructure in areas with higher levels of childhood overweight/obesity; the promotion of physical activity within a whole-town approach, as is being encouraged across Europe<sup>11</sup> and developed in France;<sup>12</sup> and the development of a new physical activity strategy.<sup>13</sup>

The Chief Medical Officer (CMO) of England has recommended that children and young people should do a minimum of 60 minutes of at least moderate intensity physical activity each day. Children should also participate in activities that improve bone health, muscle strength and flexibility at least twice a week.<sup>14</sup> Despite the common acceptance that this level of activity is adequate (the World Health Organization's recommendations for children are the same as England's),<sup>15</sup> there is now some question as to whether the recommended amount is sufficient to prevent weight gain in all children, as is explored in a report from the European Union. The report highlights the importance of considering the impact of not only sex, age, and socio-economic status on behaviour patterns regarding diet and physical activity, but also local and regional traditions associated with dietary habits and physical activity behaviour.<sup>16</sup> Moreover, regional differences in environment, culture and infrastructure may serve to support or hinder an adequate amount of physical exercise.<sup>17</sup>

The influence of culture on exercise is clearly seen in the UK's South Asian community. South Asians consistently report substantially lower levels of physical activity compared with the general population.<sup>18,19</sup> Recent British research found that ethnic and socio-economic factors can impact on adolescents' propensity to participate in physical activity. Asians and black girls were less likely to participate in physical activity than those from white backgrounds.<sup>20</sup> The impact of socio-economic status, ethnicity and culture, and

socialisation is evident in the development of knowledge and attitudes to, and ultimately patterns of, physical activity.

It is important to establish how and when children develop knowledge and attitudes about physical activity. This is key to developing and implementing the most effective policy to help reach the government's ambition of reversing the rise of obesity. There is some evidence that suggests young people's attitudes towards and perceived ability in sport and exercise are largely developed by the time they complete secondary school, and this is highly predictive of whether they become physically active adults.<sup>21</sup>

Socialisation has been defined as 'the inter- and intra-generational transfer of attitudes, beliefs, and behaviours'. Socialisation plays a key role in explaining social inequalities in health, and the underlying factors and behaviours associated with poorer health, including a lack of physical activity. Families (particularly parents), peers, and teachers are the primary people involved in the socialisation of children and young people. It has been argued that socio-cultural context shapes individual attitudes and behaviours related to health and physical activity.<sup>22</sup> This is consistent with other research that illustrates the impact of physical, social, economic, and domestic environment on increasing children's physical activity levels, and the role of early socialisation in adult obesity.<sup>23,24,25</sup> Factors including parental physical activity and education, family income, positive school physical activity policies, and school attendance all facilitate higher levels of activity in children.<sup>23</sup> Encouragement and instrumental behaviours, such as providing transport to and payment of fees for activities, are also pivotal in facilitating physical activity in children.<sup>26</sup>

There is a learned component associated with both positive and negative health behaviours, which is rooted in the process of socialisation. Parents influence children in many health-enhancing and health-impairing behaviours, including physical activity.<sup>27</sup> This is why it is necessary to instil the importance of healthy behaviour, including physical activity, in children from a young age so that they can reap the benefits throughout their lives.<sup>24</sup> It is also important to ensure that parents are provided with relevant information so that they can provide guidance and encouragement to their children.

This chapter provides results for 2007. Trend data on the summary levels of physical activity, and on other key measures, can be found in *Health Survey for England 2007 Latest Trends* on The Information Centre's website.<sup>28</sup>

## 9.2 Methods and definitions

### 9.2.1 Measurements

The HSE included questions related to physical activity in children in 1997, 1998, 2002, 2006, and 2007; the questions were asked only of people (adults and children) in minority ethnic groups in 1999 and 2004. Consistent with previous years, information was collected on out-of-school physical activity. Additionally, for the first time, the 2007 questionnaire also included questions on knowledge of and attitudes to physical activity.

The physical activity questionnaire for adults was based on a major national study of activity from 1990, which included objective measurements of health and fitness.<sup>21</sup> These measurements were used to validate the physical activity interview questions. No such study existed for children's activity, however, so the development of questions for the HSE was based on other small research studies. Extensive development and piloting of the questions was carried out in 1996 and 1997. The structure of the physical activity questionnaires was further changed in 2002. For example, only activities lasting at least 15 minutes were included in 1997 but this was the case only for housework/gardening in 2002. To establish whether the changes had affected the key measures, a comparison of overall activity levels between 1997 and 2002 was undertaken: no difference was found in the proportion of boys and girls meeting physical activity recommendations, in all age groups, between the two years.<sup>29</sup>

The new module on knowledge of and attitudes to physical activity for 2007 was developed using the adult version of the survey because no previous questionnaires that were found focused on children. Potential topic areas and questions were generated through a literature review on knowledge of and attitudes to physical activity, which was completed in 2006. The adult version of the questionnaire on knowledge of and attitudes to physical activity was drawn from numerous existing surveys that included questions relating to knowledge and attitudes, social influences, self-efficacy and barriers to physical activity.<sup>21,30,31,32</sup> The new instrument underwent cognitive testing in summer 2006 before being piloted in the HSE 2007 dress rehearsal in autumn 2006.

The HSE 2007 questions collected information about the out-of-school activity of children aged 2-15 based on three main categories: sports and exercise, active play, and walking. In addition, children aged eight and over were asked about their participation in housework/gardening. Children aged 11-15 were also asked about their knowledge of and attitudes to physical activity in a self-completion booklet (see below).

Details of the following activities over the previous seven days were collected:

### **Walking**

- Whether the child had done any continuous walks of at least 5 minutes.
- On how many days the child had done any continuous walks of at least 5 minutes, and the total duration of walking on each of these days.

### **Housework/gardening (aged 8 and over only)**

- Whether the child had done any housework or gardening that involved pulling or pushing, like vacuuming, cleaning a car, mowing grass or sweeping up leaves for at least 15 minutes.
- On how many days the child had done any housework or gardening lasting at least 15 minutes; and the total duration of housework/gardening on each of these days.

### **Sports and exercise**

This category included activities such as swimming, football, tennis, gymnastics. It was intended to include more organised or structured sporting activities.

- Whether the child had done any sports/exercise and if so, the number of days at the weekend; duration at the weekend: number of weekdays; and duration each weekday.

### **Active play**

Defined as 'active things like ride a bike, kick a ball around, run about, play active games, jump around'.

- Whether the child had done any active play; if so, number of days at the weekend; duration at the weekend; number of weekdays; duration each weekday.

Data for sports and exercise and active play were collected separately for weekend and weekdays. There was no lower limit of duration for the inclusion of sports and exercise and active play. In common with the 2002 and 2006 questionnaires, no information was collected on intensity; it is assumed therefore that all reported activities were of at least moderate intensity.

School activities were excluded for three main reasons. First, it was assumed that, generally speaking, the amount of activity in which children participate during school lessons would be similar (according to their age) and would only serve to add a 'standard' additional amount of activity for each child. Secondly, activities that are part of school curriculum are generally compulsory, and the HSE was more concerned with what children would do of their own choice. Thirdly, since a large proportion of data would be collected by proxy from a parent, it was felt that information about activities during school lessons would be less accurate than information about leisure time activities. It should be noted that any activities carried out on school premises but not as part of school lessons (e.g. after school clubs)



were covered by the questions asked. For pre-school children, activities done at any nursery or playgroup the child attended were included.

The following details about knowledge of and attitudes to physical activity were collected:

- Whether children were aware of the number of days per week and the number of minutes per day a child should do physical activity to meet the current recommended targets.
- Whether children believed themselves to be very, fairly, not very or not at all physically active compared to other people their own age.
- Whether children would like to do more physical activity than at the moment and if so, which types of sport or physical activity they would like to do more of.

### 9.2.2 Weighting

In addition to the 1,727 children interviewed as part of the core sample, information was collected from 5,777 additional interviews with children as part of the child boost sample in 2007. Only children from the boost sample were asked the physical activity module of questions. Children aged 11-15 from both the core and boost samples were asked the knowledge and attitudes to physical activity questionnaire. The weighting used in the analyses in this chapter takes this into account (see Volume 2, Methodology and documentation, for further details of weighting).

### 9.2.3 Definitions of physical activity levels

The definitions of overall physical activity levels used in the 2007 HSE report are:

- High: active for at least 60 minutes on all seven days
- Medium: active for 30-59 minutes on all seven days
- Low: lower level of activity than that described above

These categories were based on the Chief Medical Officer's recommendations for physical activity for children and young people.<sup>14</sup>

## 9.3 Physical activity: behaviour

### 9.3.1 Participation in physical activities

Overall, 99% of girls and boys aged 2-15 had participated in at least some form of physical activity in the past week. The most common types of activity for both boys and girls were active play and walking (93% and 91% for boys, 88% and 91% for girls). Just over two thirds of boys had taken part in sports and exercise, with a similar but slightly lower proportion of girls doing this (69% and 64%). Housework or gardening was the least common activity for both boys and girls (32% and 39% respectively).

Among boys, participation in sports and exercise increased considerably at age 6 and remained fairly stable, while active play decreased slightly after age 9. Among girls there were similar high proportions in active play up to the age of 8, but for both active play and sports and exercise there was decreasing participation from around the age of 11 or 12. There was little variation by age for walking among either boys or girls.

**Table 9.1**

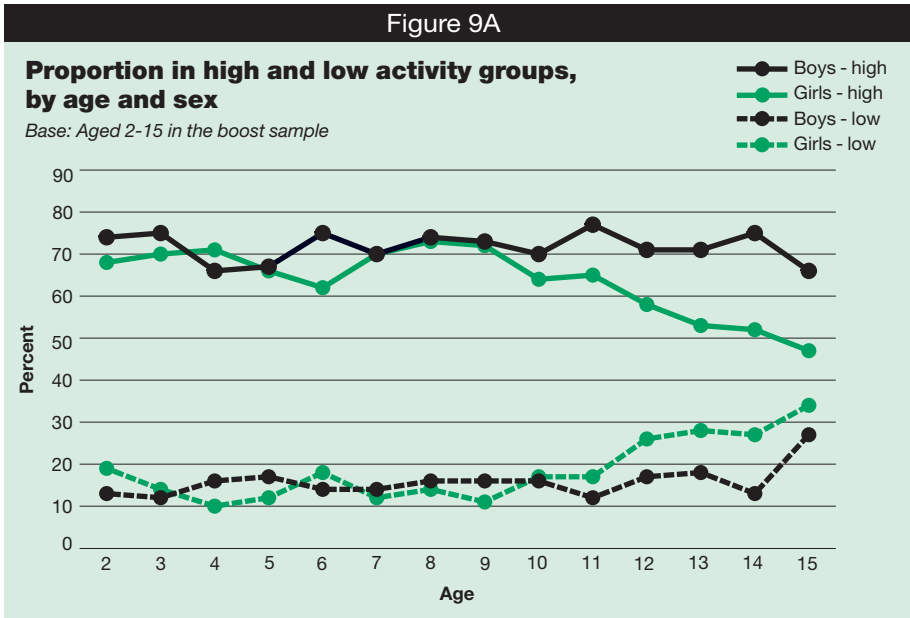
### 9.3.2 Summary levels of physical activity

Questions were asked about the amount of time children had spent on each type of activity, and from this, summary levels of activity were derived. Based on the assumption that all the activity was of at least moderate intensity, those in the 'high' activity category were counted as meeting the government's recommended level of physical activity. More boys than girls met the weekly recommended target, with 72% of boys and 63% of girls aged 2-15 participating in physical activity for at least 60 minutes on all seven days. The proportion of boys who met the recommended amount of physical activity was fairly consistent across

age groups, whereas for girls, there was a steady decline after the age of 9, with increasing proportions in the low category from age 12.

The proportion of children meeting the national recommendations also varied by region. Children in London had the lowest levels of physical activity: only 63% of boys and 50% of girls met the physical activity target in the previous week. The proportions meeting the target were the highest in the South West for both boys and girls (81% of boys and 75% of girls). By contrast, there was far less variation in physical activity levels by equivalised household income for both boys and girls.

Tables 9.2-9.4, Figure 9A



9.4 Knowledge and attitudes

9.4.1 Children’s knowledge of how much physical activity they should do, by sex and age

Children aged 11-15 were asked about the amount of physical activity they thought they should do; for children aged 11-12 the question asked about ‘children your age’, and for children aged 13-15 they were asked about what ‘young people’ should do. Their responses have been compared here with the CMO’s recommendation that children aged up to 15 should be involved in at least moderate intensity activity for at least 60 minutes, seven days per week. Only a small proportion of children aged 11-15 said that they thought they should be doing physical activity at the level of the current minimum recommended physical activity targets. 10% of both boys and girls said that children should be active for 60 minutes on all seven days per week. Many children mentioned either 60 minutes a day or seven days as a target, but not both. 34% of boys and 35% of girls said children should exercise for 60 minutes, and 30% of boys and 26% of girls said they should participate in physical activity every day.

Table 9.5

9.4.2 Children’s knowledge of how much physical activity they should do, by own physical activity level

Children’s knowledge of how much physical activity they should do (related in analysis to the government’s recommended physical activity targets) was analysed by summary levels of their own physical activity. There was some relationship between children believing that they should exercise for at least 60 minutes every day (i.e. at the level recommended by the government) and actually meeting the government recommendations. Boys and girls aged 11-15 who met the target (high level of physical activity) in the last week were more likely to suggest that they should be doing this amount of physical activity than those achieving only medium or low levels of activity, although it is important to note that there were relatively



few boys and girls in the medium and low activity levels compared with the high level. 12% of boys and 13% girls in the high category (and therefore achieving the targets) said that they thought children should be doing physical activity at that level.

Table 9.6

### 9.4.3 Children's perception of their own physical activity levels

Children were asked about their perception of their own physical activity levels compared with other people their own age. Perceptions reflected the differences in actual physical activity reported earlier between boys and girls: 42% of boys and 29% of girls aged 11-15 perceived themselves as very physically active compared with others. In contrast, only 10% of boys and 16% of girls considered themselves not very or not at all physically active. The proportion of boys who perceived themselves to be very physically active was similar from age 11 to 15 (47% and 42% respectively) but there was a significant decline in girls between ages 11 and 15 (38% and 19% respectively).

Table 9.7, Figure 9B



There were no significant regional variations in perceptions of own physical activity, nor was there any clear pattern of self-perceived physical activity level by equivalised household income.

Tables 9.8, 9.9

### 9.4.4 Children's perception of their own physical activity levels, by actual physical activity levels

Almost all boys and girls aged 11-15 who had a high level of activity correctly perceived themselves as being either very or fairly physically active compared with others (94% and 92% respectively). However a high proportion of both boys and girls who had a low level of

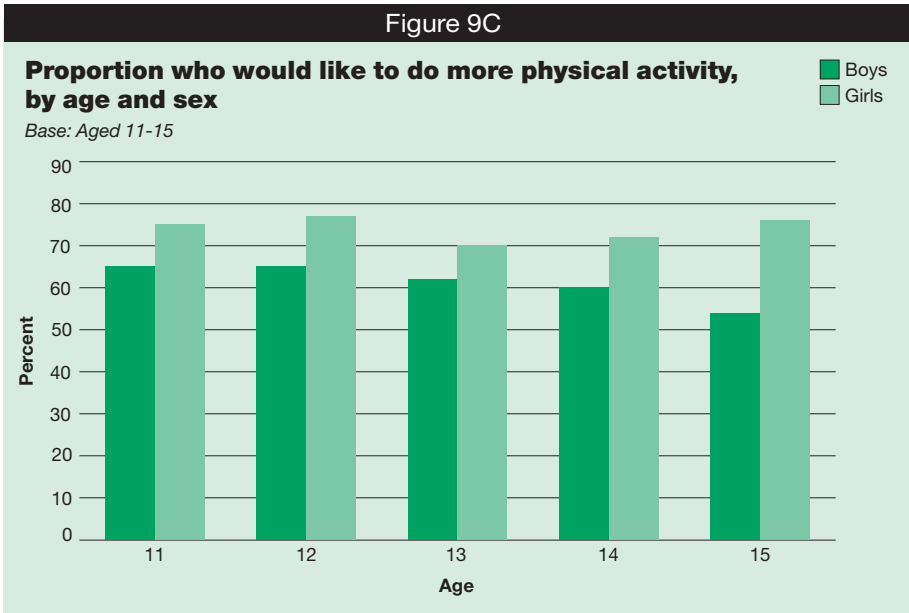
activity also perceived themselves as being very or fairly active compared with others (68% and 67% respectively). Boys and girls in the medium and low activity groups were more likely to perceive they were not very active and less likely to perceive they were very active than boys and girls in the high activity group. Overall, patterns of perception were fairly consistent across age for those at the high activity level, with the exception of girls aged 15; numbers were low in the other two groups.

Table 9.10

### 9.4.5 Preferences for future physical activity

Children were asked whether they would like to do more physical activity than they did at the moment, and if so, which types of sport or physical activity they would like to do more of in the future. Girls were more likely than boys to want to do more physical activity regardless of age. Overall, 74% of girls and 61 % of boys aged 11-15 wanted to do more physical activity.

Table 9.11, Figure 9C



The proportion of children who wanted to do more physical activity also varied significantly by region. Similarly, while there was significant variation across quintiles of equivalised household income, there was no clear pattern between higher and lower income groups.

Tables 9.12-9.13

When asked from a list which type of sport or activity they would like to do more of in the future, there were some very different preferences between boys and girls. The most common responses for boys were ball sports such as football, netball, tennis or golf (39%), riding a bike and swimming (both 35%); the two least common were horse riding (5%) and dancing (4%). The most frequently mentioned sports that girls wanted to do more were swimming (47%) and ball sports (38%). As well as swimming, girls were considerably more likely than boys to say that they would like to do more dancing (35% and 4%). The least popular choice for girls was playing outside, although a similar proportion of both boys and girls mentioned this (18% of boys, 16% of girls).

For both boys and girls, there was generally a pattern of declining interest in most activities with age. The exceptions were running or jogging and walking, where there was little variation by age. The decline with age was steepest among both sexes for wanting to play outside.

Table 9.14

## 9.5 Discussion

### 9.5.1 Limitations of collecting physical activity data by questionnaire

Despite their limitations, questionnaires are a practical and cost effective way of measuring physical activity in large scale epidemiological research.<sup>33</sup> An important limitation of the HSE child physical activity module is that no validation of these questions has been undertaken using objective measures of activity and fitness (e.g. heart rate monitoring, use of motion sensors or physiological analysis). Although little is known about the specific cognitive skills required for children to complete self-reported measures accurately, it is acknowledged that recalling physical activity is a highly complex cognitive task. It has been estimated that children under 10 cannot recall more than 50% of the last week's activities.<sup>34</sup> The HSE module attempts to limit the effect of inadequate recall not only by confining questions to activity in the seven days preceding the interview, but also by addressing questions to the parent rather than the child for children aged under 13. Children will generally have been present during the interview, and had the opportunity to contribute to the answers, but this was not always the case. In some cases parental knowledge of their children's physical activity levels may not be complete but, by aiming to interview parent and child together, the most accurate and complete information can be gathered.

A similar concern exists for the 'knowledge and attitudes about physical activity' component in the children's self-completion questionnaire. Answering questions related to perceived physical activity is another complex cognitive task that may prove difficult for younger children. This requires that children know how much physical activity others their age are generally doing and be able to assess their own level in comparison. Therefore, it is important to recognise that there may be some imprecision in these measures.

Children's physical activity is far more diverse than that of adults and therefore more difficult to quantify. Children's activity patterns are characterised by short and sporadic (rather than sustained) bouts of activity.<sup>35</sup> They are also less likely to involve clearly defined periods of specific activities. This makes the collection of data by structured questionnaire a difficult and complex task. It is also important to note that with a questionnaire it is nearly impossible to get accurate measures of intensity of activity. The assumption that all activity is at least moderate must be made, but this may not always be true. This issue will be addressed directly in the 2008 report when objective measures of physical activity will be collected through an actigraph.

Another important limitation of the physical activity module and the knowledge and attitudes component is social desirability, which should be considered when examining the results in this chapter. There may be a tendency among some children/parents to exaggerate levels of activity in the last week by stating what they believe the child should do rather than what they have done. Similarly, children/parents may state their perceived level of physical activity based on what they believe it should be, or they may report a desire to do more physical activity because they believe this is a more socially desirable response. Alternatively there may be a tendency for some children to under-claim activity levels as participation in sports and exercise or active play may be considered unfashionable. For children under 13, it is possible that parents' responses may reflect other stereotypes. For example, parents may be more likely to claim higher levels of activity for boys than girls.<sup>36</sup>

### 9.5.2 Summary levels of participation

Consistent with HSE findings from previous years,<sup>2</sup> more boys than girls met the government recommended physical activity targets regardless of age (72% and 63% respectively). While it is possible that girls may compensate for their relative lack of physical activity with other strategies to control their weight, this raises the possibility that the overweight/obesity epidemic may begin to affect girls disproportionately, especially given the fact the number of girls who met the targets decreased after the age of 9.

Overall, girls' participation in physical activity began its decline at an earlier age than boys', particularly with respect to sports and exercise. Although the difference between boys and

girls in relation to meeting the recommendations can probably be attributed to a number of factors, the simple fact that the proportion of girls participating in sports and exercise decreased after the age of 8 begins to account for the gap, since there is no decline in the proportion of boys participating in sports and exercise.

A Scottish study, which focused on declining physical activity among adolescent girls, highlighted the importance of recognising how biological, psychological, behavioural, environmental, social and cultural factors may influence boys and girls differently in relation to physical activity. They found that girls cited self-consciousness and a lack of time as barriers to participation. Their perception of and confidence in their own capability in sport was associated with whether or not they were likely to participate. Girls were also less likely than boys to join sports clubs, which can, at least in part, be attributed to less enthusiasm for competitive sport and negative perceptions associated with females participating in traditionally male-dominated sports. Parental and sibling participation (or lack thereof) also influenced girls' involvement in sport.<sup>37</sup> Another study about adolescent girls' perceptions of physical activity found similar factors that accounted for lower levels of physical activity. In addition to issues of self-confidence and traditional perceptions of femininity, the study found that shifting priorities and a lack of motivation also contributed to decreased physical activity. Perhaps policy aimed at adolescent girls could incorporate more opportunity for non-competitive sport in a supportive environment; programmes aimed at encouraging young girls to continue participating in sport into adolescence; and positive messages about adolescent female participation in sport. Adolescent girls could also benefit from the media representation of more positive role models who promote realistic and healthy body images and patterns of physical activity.<sup>38</sup>

Unless the gap between the sexes narrows, more girls will continue to miss the health, weight-management, self-esteem, and physical benefits that accompany regular physical activity. Attitudes and patterns of behaviour that are developed through socialisation in childhood and adolescence are usually carried through to adulthood. Girls who do not achieve the physical activity targets may be more vulnerable to certain health problems in adulthood if they are unsuccessful in changing their physical activity patterns and, subsequently, modifying potential risk factors for ill-health.

Moreover, the issue of self-consciousness as a barrier to participation also emphasises the connection between social exclusion and the resulting diminished social capital, which refers to social bonds that 'provide specific benefits that flow from the trust, reciprocity, information and cooperation associated with social networks.' Poor social bonds have been linked to health inequalities.<sup>22</sup> It should be noted that while specific efforts to increase physical activity levels among girls should be made, efforts to increase activity among under-achieving boys are equally important.

Both boys and girls in London were among the least likely to meet the recommended targets for physical activity. This may be at least partially attributed to the greater diversity and higher proportion of minority ethnic groups in London. As has been established, social and cultural as well as ethnic and socioeconomic factors all influence attitudes to and behaviour patterns associated with physical activity; therefore, the higher proportion of ethnic minorities in London may contribute to lower levels of participation in physical activity overall.

### **9.5.3 Knowledge of how much physical activity children should do, and its impact on activity levels**

A relatively small proportion of children aged 11-15 thought that they should be doing physical activity at precisely the government's recommended level of at least 60 minutes on 7 days per week: only 10% of both boys and girls, and relatively thought they should be doing more. While the questionnaire did not include any mention of the government's recommendations, the fact that few children believed that 'young people' (in questions for 13-15 year olds) or 'children their age' (in questions for those aged 11-12) should be doing physical activity at an equivalent level suggests that there is little awareness of these targets. Although awareness of the recommendations may not necessarily translate into

increased participation for all children, it could serve to increase motivation and participation for some. Children who thought they should do physical activity at the level equivalent to the recommendations were most likely to have achieved a high level of activity in the last week. However, this finding was less consistent for older children, with older boys and girls being least likely to think they should be active at that level, and to achieve the targets. Possible reasons for declining participation in physical activity among adolescent girls have already been discussed in section 9.5.2 above. It is also possible that lack of awareness of the target may be a contributing factor to declining activity levels in adolescent girls.

A lack of knowledge regarding the minimum recommended targets may not be the only concern. In a European study, most adolescent girls failed to mention any health benefits associated with physical activity other than weight management, which was cited more for aesthetic reasons.<sup>38</sup> These findings suggest policy could be revisited to ensure that children are informed about the recommended physical activity targets and the health benefits and consequences of achieving or not achieving these targets.

#### **9.5.4 Perception of own activity compared with behaviour**

Children generally perceived themselves to be very or fairly physically active compared with other people their own age. In the light of their actual physical activity levels, however, their optimism is not always justified. While some children had a fairly accurate perception of their level of activity compared with others (namely boys and girls with a high level of activity), most boys and girls who achieved only a low level of activity nevertheless perceived themselves to be very or fairly physically active compared with other people their own age. 68% of boys and 67% of girls who achieved only a low level of physical activity thought of themselves as either very or fairly physically active compared with others. Younger girls seemed to have the least accurate perception of their own activity. In contrast, the proportion of girls who perceived themselves as not very physical active rose with age, suggesting that at least some adolescent girls recognised their decreased level of physical activity.

These findings reinforce the need to educate children about the recommended physical activity targets so that they are more knowledgeable about how they are performing and whether they should be doing more physical activity.

#### **9.5.5 Children's desire to do more physical activity**

While boys were more likely to have achieved the physical activity targets than girls regardless of age, girls were more likely to want to do more physical activity than boys regardless of age. Although girls' participation in physical activity consistently declined with age, the fact that they consistently wanted to do more activity should be viewed as encouraging.

Different types of activities were more popular with boys or girls and with certain ages. This suggests that policy aimed at increasing physical activity among children may be more effective if it is age and sex and activity specific. The literature also suggests that certain ethnic groups have lower levels of activity.<sup>18,19</sup> Further research into whether certain types of activity may be more acceptable to certain ethnic groups should also be considered.

There is evidence to suggest that the most effective way of instilling the importance of and regular participation in physical activity begins with the family. Policy and programmes aimed at increasing physical activity among children and young people may benefit from informing parents about age-appropriate techniques for increasing physical activity, such as encouragement and parental modelling.<sup>26,39</sup>

Parents and children might benefit from being more informed about the recommended physical activity targets and how children might successfully achieve them. Children can meet the government recommendations through normal everyday activities, such as walking, cycling to and from school, and active play, in addition to more organised sports and activities. Ideally, children should also be educated both about the benefits of physical

activity and the possible consequences of too much sedentary time. Policies might provide opportunities for children to take part in physical activity within a supportive environment where they feel confident about participating.

Increasing the physical activity levels of children who do not currently meet the recommended target is a complex task. As has been established, most children develop attitudes and behaviours through the process of socialisation, primarily through family, peers, and teachers.<sup>22</sup> Therefore, health promotion for children should ideally incorporate policy, programmes, and education aimed at families, communities, and schools. Attitudes and behaviours regarding physical activity, diet and nutrition, and their connection to health, are inevitably linked. Physical activity cannot be addressed in isolation; instead, it must be viewed in the context of determinants of health, including diet and nutrition, transport, socio-economic status, and culture, and their inter-relationships. Recognising how these and other factors influence physical activity will help create a more effective means for change.

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- 9.1 Summary of participation in different activities, by age and sex
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Table 9.1

**Summary of participation in different activities, by age and sex***Aged 2-15 in the boost sample<sup>a</sup>*

2007

Participation in each activity type on at least one day in the last week	Age														Total
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>															
Sports and exercise	51	51	53	59	73	79	69	78	78	79	73	77	73	77	69
Active play	96	97	94	96	95	97	93	95	92	93	91	90	88	83	93
Walking <sup>b</sup>	87	93	92	87	89	94	87	91	90	92	93	91	94	97	91
Housework/gardening <sup>c</sup>	n/a	n/a	n/a	n/a	n/a	n/a	22	31	24	31	39	36	39	35	32
All physical activities	100	100	100	100	100	100	99	99	98	98	100	100	99	100	99
<b>Girls</b>															
Sports and exercise	49	56	65	66	63	70	77	76	75	67	66	63	61	50	64
Active play	94	96	93	95	93	99	96	94	91	90	84	79	72	60	88
Walking <sup>b</sup>	90	90	94	89	92	91	91	88	91	92	95	91	94	90	91
Housework/gardening <sup>c</sup>	n/a	n/a	n/a	n/a	n/a	n/a	37	36	39	46	40	42	38	35	39
All physical activities	100	100	100	100	100	100	100	99	98	99	100	99	100	96	99
<b>Bases (unweighted)<sup>d</sup></b>															
Boys	203	217	196	197	200	185	230	195	230	220	223	240	219	206	2961
Girls	201	199	173	183	201	179	200	203	210	187	217	246	214	189	2802
<b>Bases (weighted)</b>															
Boys	195	215	189	200	209	196	229	191	216	208	214	227	241	221	2952
Girls	195	196	177	196	202	184	199	205	218	188	194	224	231	204	2810

<sup>a</sup> Only children from the boost sample were asked the physical activity module. All children were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>b</sup> Activities lasting at least 5 minutes.

<sup>c</sup> Housework/gardening only asked of those aged 8-15, activities lasting at least 15 minutes.

<sup>d</sup> Bases vary but are of similar sizes; those shown are for sports and exercise.

Table 9.2

**Summary of activity levels, by age and sex***Aged 2-15 in the boost sample<sup>a</sup>*

2007

Activity level in the last week <sup>b</sup>	Age															Total
	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Boys																
High	74	75	66	67	75	70	74	73	70	77	71	71	75	66	72	
Medium	13	13	18	16	11	15	9	11	14	12	12	11	12	14	13	
Low	13	12	16	17	14	14	16	16	16	12	17	18	13	20	15	
Girls																
High	68	70	71	66	62	70	73	72	64	65	58	53	52	47	63	
Medium	13	17	19	22	19	18	14	17	20	18	16	19	21	19	18	
Low	19	14	10	12	18	12	14	11	17	17	26	28	27	34	19	
Bases (unweighted)																
Boys	202	213	190	193	199	184	227	191	225	215	221	239	217	205	2921	
Girls	198	197	169	177	198	178	200	199	205	186	216	243	213	181	2760	
Bases (weighted)																
Boys	194	211	183	195	208	195	226	188	211	203	213	226	239	220	2912	
Girls	192	194	172	188	199	184	199	201	213	186	193	222	230	195	2767	

<sup>a</sup> Only children from the boost sample were asked the physical activity module. All children were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>b</sup> High=60 minutes or more on all 7 days, Medium=30-59 minutes on all 7 days, Low=lower level of activity.

Table 9.3

**Summary of activity levels, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex***Aged 2-15 in the boost sample<sup>b</sup>*

2007

Activity level in the last week <sup>c</sup>	Government Office Region										Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East		South East Coast	South Central
	%	%	%	%	%	%	%	%	%		%	%
<b>Boys</b>												
High	64	78	76	75	68	69	63	81	72		72	71
Medium	19	10	12	10	14	16	20	6	11		10	13
Low	18	12	12	15	19	15	17	13	17		18	16
<b>Girls</b>												
High	63	65	68	64	69	56	50	75	66		73	59
Medium	17	15	18	21	15	21	25	12	16		12	19
Low	20	19	14	16	16	23	25	13	18		15	21
<i>Bases (unweighted)</i>												
Boys	149	397	330	287	333	312	337	256	520		256	264
Girls	144	373	285	267	314	320	344	268	445		203	242
<i>Bases (weighted)</i>												
Boys	144	406	305	246	322	311	401	272	504		248	256
Girls	134	377	267	236	299	327	423	275	430		196	234

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Only children from the boost sample were asked the physical activity module. All children were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>c</sup> High=60 minutes or more on all 7 days, Medium=30-59 minutes on all 7 days, Low=lower level of activity.

Table 9.4

**Summary of activity levels, by equivalised household income and sex**
Aged 2-15 in the boost sample<sup>a</sup>

2007

Activity level in the last week <sup>b</sup>	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Boys</b>					
High	74	71	77	70	71
Medium	13	14	12	11	14
Low	13	15	11	19	15
<b>Girls</b>					
High	62	66	63	66	64
Medium	21	15	19	15	17
Low	17	19	18	19	20
<i>Bases (unweighted)</i>					
Boys	403	488	553	475	523
Girls	412	459	446	423	562
<i>Bases (weighted)</i>					
Boys	392	463	542	485	549
Girls	398	439	433	431	599

<sup>a</sup> Only children from the boost sample were asked the physical activity module. All children were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>b</sup> High=60 minutes or more on all 7 days, Medium=30-59 minutes on all 7 days, Low=lower level of activity.

Table 9.5

# **Knowledge of how much physical activity young people should do, by age and sex**

Aged 11-15

2007

Knowledge of physical activity recommendations (days and minutes) <sup>a,b</sup>	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
<b>Boys</b>						
<b>Days</b>						
0-3 days	17	15	17	16	19	17
4 days	11	14	16	17	15	15
5 days	19	19	19	21	17	19
6 days	10	10	9	8	7	9
7 days	32	28	30	29	33	30
Don't know	11	14	9	9	9	10
<b>Minutes per day</b>						
1-19 minutes	20	16	5	4	3	9
20-29 minutes	4	2	4	5	3	4
30 minutes	13	17	14	18	19	16
31-59 minutes	8	8	9	5	7	7
60 minutes	33	37	32	32	36	34
More than 60 minutes	22	19	26	25	25	23
Don't know	-	-	11	11	7	6
<b>Compared with government recommendations:</b>						
Same as current minimum recommendations	11	13	11	7	10	10
More than current minimum recommendations <sup>c</sup>	7	5	8	9	10	8
Less than current minimum recommendations or did not know	82	83	80	83	79	81
<b>Girls</b>						
<b>Days</b>						
0-3 days	16	15	21	25	25	21
4 days	14	16	15	19	15	16
5 days	18	21	20	14	15	17
6 days	12	8	7	7	10	9
7 days	26	27	27	28	23	26
Don't know	15	13	10	8	12	12
<b>Minutes per day</b>						
1-19 minutes	12	14	5	6	6	8
20-29 minutes	5	4	3	6	6	5
30 minutes	27	23	19	22	26	23
31-59 minutes	7	9	10	6	5	7
60 minutes	37	35	36	38	30	35
More than 60 minutes	12	15	17	15	12	14
Don't know	1	-	10	7	16	7
<b>Compared with government recommendations:</b>						
Same as current minimum recommendations	12	12	12	9	7	10
More than current minimum recommendations <sup>c</sup>	2	3	4	3	1	3
Less than current minimum recommendations or did not know	85	85	84	88	91	87
<b>Bases (unweighted)<sup>d</sup></b>						
Boys	255	252	285	261	235	1288
Girls	221	260	283	236	222	1222
<b>Bases (weighted)</b>						
Boys	211	216	245	253	224	1149
Girls	204	210	233	229	218	1095

<sup>a</sup> Children aged 11-12 were asked about the amount of physical activity 'children your age' should take, and children aged 13-15 were asked about 'young people'. Their answers have been compared in this analysis with the CMO's recommendation for physical activity in terms of whether the children suggested the same amount, more or less than the current recommendations, or did not know how much physical activity they thought they should do.

<sup>b</sup> The current recommendation for children is at least 60 minutes of at least moderate intensity activity on all 7 days.

<sup>c</sup> Stated 7 days plus more than 60 minutes each day.

<sup>d</sup> Bases vary but are of similar sizes; those shown are for knowledge of number of days.

Table 9.6

**Knowledge of how much physical activity young people should do, by summary of activity levels, age and sex**
Aged 11-15 in the boost sample<sup>a</sup>

2007

Knowledge of physical activity recommendations (days and minutes) <sup>b,c</sup>	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
Boys						
High (met current recommendations) <sup>d</sup>						
Same as current minimum recommendations	11	15	13	11	9	12
More than current minimum recommendations <sup>e</sup>	8	6	9	10	12	9
Less than current minimum recommendations or did not know	81	79	78	79	79	79
Medium <sup>d</sup>						
Same as current minimum recommendations	f	f	f	f	f	8
More than current minimum recommendations <sup>e</sup>	f	f	f	f	f	2
Less than current minimum recommendations or did not know	f	f	f	f	f	90
Low <sup>d</sup>						
Same as current minimum recommendations	f	[9]	[19]	f	[2]	9
More than current minimum recommendations <sup>e</sup>	f	[-]	[4]	f	[11]	5
Less than current minimum recommendations or did not know	f	[91]	[77]	f	[87]	86
Girls						
High (met current recommendations) <sup>d</sup>						
Same as current minimum recommendations	15	12	16	15	7	13
More than current minimum recommendations <sup>e</sup>	2	4	7	5	1	4
Less than current minimum recommendations or did not know	83	84	77	80	92	83
Medium <sup>d</sup>						
Same as current minimum recommendations	[14]	[8]	[11]	[6]	[9]	9
More than current minimum recommendations <sup>e</sup>	[3]	[7]	[-]	[2]	[4]	3
Less than current minimum recommendations or did not know	[83]	[85]	[89]	[92]	[87]	88
Low <sup>d</sup>						
Same as current minimum recommendations	[-]	8	9	6	6	6
More than current minimum recommendations <sup>e</sup>	[-]	-	1	3	-	1
Less than current minimum recommendations or did not know	[100]	92	89	91	94	93

Continued...

Table 9.6 continued

Aged 11-15 in the boost sample <sup>a</sup>						2007
	Age					Total
	11	12	13	14	15	
Bases (unweighted) <sup>g</sup>						
Boys						
High activity	146	141	153	148	128	716
Medium activity	22	24	26	24	26	122
Low activity	25	36	41	26	36	164
Girls						
High activity	112	118	124	101	77	532
Medium activity	30	35	41	41	30	177
Low activity	31	52	61	52	58	254
Bases (weighted)						
Boys						
High activity	137	137	145	160	136	714
Medium activity	23	24	25	27	28	126
Low activity	22	33	38	28	39	160
Girls						
High activity	114	106	114	108	84	526
Medium activity	29	30	36	45	33	173
Low activity	31	46	57	56	60	251

<sup>a</sup> Only children from the boost sample were asked the physical activity module. All children aged 11-15 were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>b</sup> Children aged 11-12 were asked about the amount of physical activity 'children your age' should take, and children aged 13-15 were asked about 'young people'. Their answers have been compared in this analysis with the CMO's recommendation for physical activity in terms of whether the children suggested the same amount, more or less than the current recommendations, or did not know how much physical activity they thought they should do.

<sup>c</sup> The current recommendation for children is at least 60 minutes of at least moderate level activity on all 7 days.

<sup>d</sup> High=60 minutes or more on all 7 days, Medium=30-59 minutes on all 7 days, Low=lower level of activity.

<sup>e</sup> Stated 7 days plus more than 60 minutes each day.

<sup>f</sup> Results not shown due to small base; results shown in brackets are also on small bases (below 50) and should be treated with caution.

<sup>g</sup> Bases vary but are of similar sizes; those shown are for knowledge of number of days.

Table 9.7

**Perception of own physical activity levels, by age and sex**

<i>Aged 11-15</i>						<i>2007</i>
Perception of own physical activity levels compared with other people of own age	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
<b>Boys</b>						
Very physically active	47	42	40	39	42	42
Fairly physically active	45	46	49	51	49	48
Not very physically active	6	10	10	10	8	9
Not at all physically active	2	1	1	1	1	1
<i>Very or fairly physically active</i>	<i>92</i>	<i>88</i>	<i>90</i>	<i>89</i>	<i>91</i>	<i>90</i>
<i>Not very or at all physically active</i>	<i>8</i>	<i>12</i>	<i>10</i>	<i>11</i>	<i>9</i>	<i>10</i>
<b>Girls</b>						
Very physically active	38	31	30	27	19	29
Fairly physically active	55	59	57	53	50	55
Not very physically active	7	9	11	18	28	15
Not at all physically active	0	1	2	2	2	1
<i>Very or fairly physically active</i>	<i>93</i>	<i>90</i>	<i>87</i>	<i>80</i>	<i>69</i>	<i>84</i>
<i>Not very or at all physically active</i>	<i>7</i>	<i>10</i>	<i>13</i>	<i>20</i>	<i>31</i>	<i>16</i>
<i>Bases (unweighted)</i>						
Boys	254	252	286	263	234	1289
Girls	219	261	282	237	223	1222
<i>Bases (weighted)</i>						
Boys	210	216	246	256	222	1150
Girls	202	211	232	230	219	1095

Table 9.8

# **Perception of own physical activity levels, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 11-15

2007

Perception of own physical activity levels compared with other people of own age	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>											
Very physically active	40	39	41	42	40	47	42	45	41	35	48
Fairly physically active	44	49	49	46	50	48	49	46	48	54	42
Not very physically active	12	12	9	10	7	5	9	7	9	8	10
Not at all physically active	4	-	1	3	3	1	-	1	2	3	-
<i>Very or fairly physically active</i>	<i>84</i>	<i>88</i>	<i>91</i>	<i>88</i>	<i>90</i>	<i>95</i>	<i>91</i>	<i>91</i>	<i>89</i>	<i>89</i>	<i>90</i>
<i>Not very or at all physically active</i>	<i>16</i>	<i>12</i>	<i>9</i>	<i>12</i>	<i>10</i>	<i>5</i>	<i>9</i>	<i>9</i>	<i>11</i>	<i>11</i>	<i>10</i>
<b>Girls</b>											
Very physically active	29	19	32	34	31	34	26	31	28	31	26
Fairly physically active	48	63	55	53	53	52	56	51	55	53	57
Not very physically active	21	17	13	13	13	12	16	16	15	14	16
Not at all physically active	1	1	-	-	3	2	2	2	1	1	1
<i>Very or fairly physically active</i>	<i>78</i>	<i>82</i>	<i>87</i>	<i>87</i>	<i>84</i>	<i>87</i>	<i>82</i>	<i>82</i>	<i>84</i>	<i>85</i>	<i>83</i>
<i>Not very or at all physically active</i>	<i>22</i>	<i>18</i>	<i>13</i>	<i>13</i>	<i>16</i>	<i>13</i>	<i>18</i>	<i>18</i>	<i>16</i>	<i>15</i>	<i>17</i>
<i>Bases (unweighted)</i>											
Boys	55	179	159	134	126	141	134	125	236	121	115
Girls	59	166	142	119	129	149	138	119	201	89	112
<i>Bases (weighted)</i>											
Boys	47	169	142	101	117	128	137	111	198	102	96
Girls	53	148	123	95	113	136	154	107	169	74	94

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.



Table 9.9

# **Perception of own physical activity levels, by equivalised household income and sex**

Aged 11-15

2007

Perception of own physical activity levels compared with other people of own age	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Boys</b>					
Very physically active	49	38	39	41	43
Fairly physically active	41	52	50	46	49
Not very physically active	9	9	9	12	5
Not at all physically active	-	-	2	1	3
<i>Very or fairly physically active</i>	<i>91</i>	<i>91</i>	<i>89</i>	<i>87</i>	<i>92</i>
<i>Not very or at all physically active</i>	<i>9</i>	<i>9</i>	<i>11</i>	<i>13</i>	<i>8</i>
<b>Girls</b>					
Very physically active	26	33	23	31	27
Fairly physically active	58	46	63	54	54
Not very physically active	16	19	13	14	16
Not at all physically active	-	3	-	1	3
<i>Very or fairly physically active</i>	<i>84</i>	<i>79</i>	<i>87</i>	<i>85</i>	<i>81</i>
<i>Not very or at all physically active</i>	<i>16</i>	<i>21</i>	<i>13</i>	<i>15</i>	<i>19</i>
<i>Bases (unweighted)</i>					
<i>Boys</i>	<i>192</i>	<i>211</i>	<i>229</i>	<i>229</i>	<i>220</i>
<i>Girls</i>	<i>166</i>	<i>182</i>	<i>183</i>	<i>210</i>	<i>265</i>
<i>Bases (weighted)</i>					
<i>Boys</i>	<i>164</i>	<i>173</i>	<i>205</i>	<i>207</i>	<i>215</i>
<i>Girls</i>	<i>144</i>	<i>153</i>	<i>161</i>	<i>186</i>	<i>260</i>

Table 9.10

**Perception of own physical activity levels, by summary of physical activity levels, age and sex**
Aged 11-15 in the boost sample<sup>a</sup>

2007

Perception of own physical activity levels compared with other people of own age	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
<b>Boys</b>						
<b>High (met current recommendations)<sup>b,c</sup></b>						
Very physically active	52	49	50	43	51	49
Fairly physically active	42	44	44	51	46	46
Not very physically active	4	7	6	5	2	5
Not at all physically active	2	-	1	2	2	1
<i>Very or fairly physically active</i>	<i>94</i>	<i>93</i>	<i>93</i>	<i>93</i>	<i>97</i>	<i>94</i>
<i>Not very or at all physically active</i>	<i>6</i>	<i>7</i>	<i>7</i>	<i>7</i>	<i>3</i>	<i>6</i>
<b>Medium<sup>c</sup></b>						
Very physically active	d	d	d	d	d	31
Fairly physically active	d	d	d	d	d	58
Not very physically active	d	d	d	d	d	11
Not at all physically active	d	d	d	d	d	0
<i>Very or fairly physically active</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>89</i>
<i>Not very or at all physically active</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>11</i>
<b>Low<sup>c</sup></b>						
Very physically active	d	[14]	[16]	d	[18]	15
Fairly physically active	d	[47]	[54]	d	[47]	53
Not very physically active	d	[31]	[28]	d	[36]	30
Not at all physically active	d	[8]	[2]	d	[-]	2
<i>Very or fairly physically active</i>	<i>d</i>	<i>[61]</i>	<i>[70]</i>	<i>d</i>	<i>[64]</i>	<i>68</i>
<i>Not very or at all physically active</i>	<i>d</i>	<i>[39]</i>	<i>[30]</i>	<i>d</i>	<i>[36]</i>	<i>32</i>
<b>Girls</b>						
<b>High (met current recommendations)<sup>b,c</sup></b>						
Very physically active	36	40	41	43	29	38
Fairly physically active	62	56	54	48	52	54
Not very physically active	2	4	3	10	14	6
Not at all physically active	-	-	1	-	5	1
<i>Very or fairly physically active</i>	<i>98</i>	<i>96</i>	<i>96</i>	<i>90</i>	<i>80</i>	<i>92</i>
<i>Not very or at all physically active</i>	<i>2</i>	<i>4</i>	<i>4</i>	<i>10</i>	<i>20</i>	<i>8</i>
<b>Medium<sup>c</sup></b>						
Very physically active	[39]	[19]	[16]	[13]	[10]	18
Fairly physically active	[53]	[70]	[68]	[77]	[59]	66
Not very physically active	[7]	[10]	[16]	[10]	[31]	15
Not at all physically active	[0]	[0]	[0]	[0]	[0]	0
<i>Very or fairly physically active</i>	<i>[93]</i>	<i>[90]</i>	<i>[84]</i>	<i>[90]</i>	<i>[69]</i>	<i>[85]</i>
<i>Not very or at all physically active</i>	<i>[7]</i>	<i>[10]</i>	<i>[16]</i>	<i>[10]</i>	<i>[31]</i>	<i>[15]</i>
<b>Low<sup>c</sup></b>						
Very physically active	[32]	10	17	12	6	14
Fairly physically active	[46]	73	60	41	49	54
Not very physically active	[20]	17	18	38	45	29
Not at all physically active	[3]	-	5	10	-	4
<i>Very or fairly physically active</i>	<i>[77]</i>	<i>83</i>	<i>77</i>	<i>53</i>	<i>55</i>	<i>67</i>
<i>Not very or at all physically active</i>	<i>[23]</i>	<i>17</i>	<i>23</i>	<i>47</i>	<i>45</i>	<i>33</i>

Continued...

Table 9.10 continued

Aged 11-15 in the boost sample<sup>a</sup> 2007

	Age					Total
	11	12	13	14	15	
Bases (unweighted)						
Boys						
High activity	144	143	157	149	127	720
Medium activity	22	24	26	24	26	122
Low activity	25	36	40	26	35	162
Girls						
High activity	113	119	123	104	78	537
Medium activity	30	34	41	41	32	178
Low activity	30	52	61	52	58	253
Bases (weighted)						
Boys						
High activity	135	139	148	162	135	719
Medium activity	23	24	25	27	28	126
Low activity	22	33	37	28	37	158
Girls						
High activity	115	107	112	112	85	531
Medium activity	29	30	36	45	35	174
Low activity	30	46	57	56	60	250

<sup>a</sup> Only children from the boost sample were asked the physical activity module. All children were asked the physical activity knowledge and attitude questions. The weighting used in the analyses in this chapter takes this into account.

<sup>b</sup> The current recommendation for children is at least 60 minutes on all 7 days.

<sup>c</sup> High=60 minutes or more on all 7 days, Medium=30-59 minutes on all 7 days, Low=lower level of activity.

<sup>d</sup> Results not shown due to small base; results shown in brackets are also on small bases (below 50) and should be treated with caution.

Table 9.11

**Proportion who would like to do more physical activity, by age and sex**
*Aged 11-15* 2007

Would like to do more physical activity	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
<b>Boys</b>						
Yes	65	65	62	60	54	61
<b>Girls</b>						
Yes	75	77	70	72	76	74
<i>Bases (unweighted)</i>						
Boys	255	248	285	261	236	1285
Girls	221	261	283	239	222	1226
<i>Bases (weighted)</i>						
Boys	211	213	245	254	224	1147
Girls	204	211	233	233	218	1100

Table 9.12

**Proportion who would like to do more physical activity, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**
*Aged 11-15* 2007

Would like to do more physical activity	Government Office Region										Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East		South East Coast	South Central
	%	%	%	%	%	%	%	%	%		%	%
<b>Boys</b>												
Yes	70	57	59	64	63	49	72	63	60		64	56
<b>Girls</b>												
Yes	76	76	72	72	75	69	72	75	78		78	78
<i>Bases (unweighted)</i>												
Boys	55	178	158	134	127	139	134	125	235		121	114
Girls	59	167	142	120	129	150	138	121	200		88	112
<i>Bases (weighted)</i>												
Boys	47	168	142	101	117	127	138	111	197		102	95
Girls	53	149	123	96	113	136	154	109	168		74	94

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 9.13

**Proportion who would like to do more physical activity, by equivalised household income and sex***Aged 11-15**2007*

Would like to do more physical activity	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Boys</b>					
Yes	56	58	66	60	64
<b>Girls</b>					
Yes	69	72	77	73	77
<i>Bases (unweighted)</i>					
Boys	190	208	230	229	222
Girls	166	183	185	210	266
<i>Bases (weighted)</i>					
Boys	162	171	206	207	217
Girls	144	154	164	187	261

Table 9.14

**Types of sport or physical activity children would like to do more in the future, by age and sex**

Aged 11-15

2007

Types of sport or physical activity	Age					Total
	11	12	13	14	15	
	%	%	%	%	%	%
<b>Boys</b>						
Swimming	40	43	39	31	23	35
Ball sports	42	47	39	36	31	39
Riding a bike	39	41	33	36	24	35
Other sports	27	29	24	19	17	23
Running/jogging	25	26	28	24	26	26
Skate boarding, roller/ice skating	26	29	23	21	9	21
Walking	23	23	20	21	19	21
Dancing	4	6	2	5	5	4
Playing outside	27	24	19	12	8	18
Horse riding	8	8	4	2	2	5
Something else	12	17	14	12	11	13
Does not want to do more	35	35	38	40	46	39
<b>Girls</b>						
Swimming	53	51	41	46	45	47
Ball sports	48	45	35	31	30	38
Riding a bike	46	34	31	30	21	32
Other sports	46	45	33	33	28	37
Running/jogging	30	32	31	34	27	31
Skate boarding, roller/ice skating	46	44	31	23	19	32
Walking	29	31	19	28	28	27
Dancing	39	37	32	34	33	35
Playing outside	26	26	15	10	7	16
Horse riding	40	34	18	16	17	25
Something else	7	12	8	10	8	9
Does not want to do more	25	23	30	28	24	26
<i>Bases (unweighted)</i>						
Boys	253	248	285	260	236	1282
Girls	220	261	283	239	222	1225
<i>Bases (weighted)</i>						
Boys	210	213	245	253	224	1144
Girls	203	211	233	233	218	1099

# Children's diet and healthy eating

# 10

Deanna Pickup

## Summary

- This chapter presents findings on the consumption of fruit and vegetables among children aged 5-15. The proportion of boys and girls reaching the government's recommended five portions of fruit and vegetables is examined. Findings on the knowledge and attitudes of children aged 11-15 towards healthy eating are also explored, with particular reference to the link between knowledge, attitudes and behaviour.
- Among children aged 5-15, 21% of both boys and girls reached the target of five portions of fruit and vegetables per day. The main source of fruit and vegetables was from fresh fruit, with 68% of boys and 72% of girls having consumed fresh fruit in the previous 24 hours.
- 31% of boys and 27% of girls in the highest quintile of equivalised household income ate the recommended five portions per day. In the lowest quintile, 16% of boys and 18% of girls reached this target. Children in the lowest quintile were more likely than those in the highest quintile to have eaten no fruit and vegetables in the previous 24 hours.
- Around two in three boys and three in four girls accurately reported that five portions of fruit and vegetables should be consumed each day. However only 22% of boys and 21% of girls could correctly identify what a portion was.
- More than four in five children regarded their diet as healthy, with most saying it was 'quite healthy' (70% of boys and 72% of girls) rather than 'very healthy' (13% of both boys and girls). Only 1% thought that their diet was 'very unhealthy'. Younger children were more likely than older children to report that they perceived their diet to be very healthy or quite healthy (85% of boys and 88% of girls aged 11-12, 82% of both boys and girls aged 13-15).
- The majority of children aged 11-15 agreed that 'healthy foods are enjoyable', with more girls than boys agreeing with the statement (72% and 64% respectively). 38% of boys and 34% of girls agreed that 'the tastiest foods are the ones that are bad for you'. For the statements, 'I get confused over what's supposed to be healthy', 'if you do enough exercise you can eat whatever you like' and 'I don't really care what I eat', much larger proportions of children disagreed than agreed.
- Attitudes towards healthy eating were strongly associated with children's perceptions of their diet. Those who judged their diet to be healthy were more likely to agree with the statement 'healthy foods are enjoyable', than those who judged their diet to be unhealthy. The opposite pattern was found for the statement 'the tastiest foods are the ones that are bad for you', with greater agreement among those who felt their diet was unhealthy. Children who judged their diet to be unhealthy were also more likely than those who thought they ate healthily to agree with the statements 'I get confused over what is supposed to be healthy and what isn't' and 'I don't really care what I eat'.

## 10.1 Introduction

The benefits of fruit and vegetable consumption during childhood are well documented. For example there is evidence to suggest that a diet lacking the vitamins and antioxidants provided in a diet rich in fruit and vegetables is linked to poorer lung function in children.<sup>1</sup> Additionally, an increase in fruit consumption in childhood is thought to have a long-term protective effect against cancer risk later in life.<sup>2</sup>

Diet and nutrition research provides clear evidence that children develop their eating habits and attitudes towards diet early in life. For example, if fruit and vegetables are introduced to a child at an early age this may shape their consumption and preference towards fruit and vegetables, and encourage a positive attitude towards healthier food options.<sup>3</sup> Furthermore, these behaviours and attitudes typically extend into adulthood and ultimately have an impact on health over an individual's lifespan.<sup>4</sup>

For this reason many government papers outline the importance of developing positive attitudes and behaviours towards diet in children, particularly through education. For example the (then) Department of Education and Skills' 2004 paper *Starting early: food and nutrition education of young children* states that for positive attitudes to develop, messages about healthy lifestyles, including diet, need to be clear and concise and delivered in such a way that children get involved.<sup>5</sup> Similarly, the 2003 Food Standards Agency paper *Getting to Grips with Grub* outlines key nutritional competencies children should meet prior to leaving school, such as an understanding of fruit and vegetable consumption and portion size.<sup>6</sup>

In recent years, following the 1997 white paper *Excellence in Schools*,<sup>7</sup> and 2003 green paper *Every Child Matters*,<sup>8</sup> in which the government pledged to help all schools to become healthy, there has been a focus on implementing initiatives in schools which aim to educate and provide children with healthy food options, in particular wider access to fruit and vegetables. These include the Healthy School Programme, Wired for Health, National School Fruit Scheme, breakfast clubs and fruit tuck shops, Food Dudes and Food in Schools. The Healthy Schools Programme was implemented in 1998<sup>9</sup> and currently more than 95% of schools are involved in the programme and over 60% have achieved 'Healthy School Status', based on accreditation criteria set by the government.<sup>10</sup>

The '5 A Day' programme was introduced in July 2000 with the aim of increasing the consumption of fruit and vegetables in the population, by raising awareness of the health benefits and improving access to fruit and vegetables through targeted action.<sup>11</sup> The government continues to promote the message of the '5 A DAY' initiative, that people should eat at least five portions (400g) of a variety of fruit and vegetables each day.

This chapter presents results from 2007. Trend data for key measures, including adult and child fruit and vegetable consumption, can be found in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>12</sup>

## 10.2 Methods and definitions

### 10.2.1 Fruit and vegetable consumption

Participants aged 5 and over were asked questions about a range of food items to determine the overall amount of fruit and vegetables, including pulses, salad and fruit juice, consumed in a single day (defined as the 24 hours ending the previous midnight). The questions were asked as part of the face-to-face interview. Parents answered on behalf of children aged 12 and under, and participants aged 13-15 answered the questions themselves. Any seasonal or weekly variation in eating habits is minimised in the aggregate data, as interviewing is carried out throughout the year and on every day of the week. Participants were asked whether they had consumed each food type and, if so, how much had been consumed. Separate questions were asked for fresh, frozen and tinned



vegetables, vegetables in composites (for example vegetable curry), salads, pulses, fresh, frozen, tinned and dried fruit, fruit in composites (such as apple pie), as well as fruit juice. Summary measures were created to look at total consumption of fruit and vegetables (including portions and part portions) and consumption of different groups of food. The summary measures included were total fruit and vegetables, total vegetables (including fresh, raw, frozen and tinned vegetables, vegetables in composites and salads but excluding pulses) and total fruit consumption (including fresh, frozen, tinned and dried fruit and fruit in composites). Measurement of the amount of different food items differed according to the type of food (see section 10.2.2).

### 10.2.2 Portions

Fruit and vegetable consumption is measured using the guidelines specified in the '5 A DAY' programme. Five portions is defined as 400g of fruit and vegetables per day (an average portion is 80g). To make it easier for participants to report their consumption of different types of fruit and vegetables, portion size was converted into every day measures. For example, respondents were asked about tablespoons of vegetables, cereal bowlfuls of salad, pieces of medium sized fruit (such as apples) or handfuls of very small fruit (such as raspberries). Table 10A below illustrates the portion sizes defined for each of the different food items included in the analysis.

Table 10A	
Food item	Portion size
Vegetables (fresh, raw, tinned and frozen)	3 tablespoons
Pulses	3 tablespoons
Salad	1 cereal bowl
Vegetables in composites e.g. vegetable curry	3 tablespoons
Very large fruit e.g. melon	1 average slice
Large fruit e.g. grapefruit	Half a fruit
Medium fruit e.g. apples	1 fruit
Small fruit e.g. plums	2 fruits
Very small fruit and berries	1 average handful
Dried fruit	1 tablespoon
Frozen fruit/tinned fruit	3 tablespoons
Fruit in composites e.g. stewed fruit	3 tablespoons
Fruit juice	1 small glass (150ml)

The '5 A DAY' initiative clearly advises which food items count towards the recommendation, and these guidelines were incorporated into the Health Survey questions. For example, participants were told not to count potatoes, pasta or rice as vegetables. Interviewers were able to record full and half units, such as half a tablespoon; no amounts smaller than this could be recorded. Additionally, the consumption of fruit juice, pulses, and dried fruit were counted as a maximum of one portion, even if more than this was consumed within the previous 24 hours. These restrictions are in line with the '5 A DAY' message, which emphasises that a variety of fruit and vegetables should be consumed. In the absence of defined portion sizes for children, fruit and vegetable consumption was measured using the same definition of portion sizes as those for adults.

### 10.2.3 Interpretation of the data on fruit and vegetable consumption

The data on fruit and vegetable consumption are based on self-reported information for a 24-hour recall period, given by either the child's parent up to the age of 12 or the child him/herself if aged 13-15. Although portions were clearly defined in every day terms, there may be some variations in the way that participants interpreted the definitions, for instance in assessing the amount of fruit contained in an apple pie. The data may be subject to recall error, and evidence suggests that participants may intentionally over-report consumption to indicate socially desirable behaviour.<sup>13</sup> Nevertheless, survey estimates can still provide useful comparisons of consumption patterns of the population.

Within specific groups, mean levels of consumption may be increased by a small number of participants who consumed unusually large amounts of fruit and vegetables. Median consumption is shown, where appropriate, to give an indication of the mid-range value as an alternative measure that is not influenced by extreme values.

#### 10.2.4 Knowledge and attitudes

Children aged 11-15 were asked questions about their knowledge of and attitudes towards a healthy diet. These questions were asked in the form of self completion booklets, one version for those aged 11-12 and one for those aged 13-15. The healthy eating section of the booklets was identical for both age groups except for two extra questions asked of participants aged 13-15 (not analysed here).

To ascertain their knowledge about fruit and vegetable consumption, children aged 11-15 were asked to state how many portions of fruit and vegetables they thought people should eat every day. They were also asked to identify what they thought made up one portion of fruit or vegetables from a list of varying portion sizes of fruit and vegetables.<sup>13</sup> Based on the answers given, they were classified as incorrect (the correct response was not selected), partially correct (the correct answer and other options were selected) or completely correct (only the correct option was selected).

Children aged 11-15 were asked a number of other questions about their diet and healthy eating, including whether they perceived their own diet, in terms of 'what you usually eat', to be healthy, and which factors would prevent or encourage improvements in the way that they eat.

Participants were asked to give their views about healthy eating by indicating how much they agreed or disagreed with five attitude statements.<sup>15</sup> The five point agreement scale included the responses 'agree strongly', 'agree', 'neither agree nor disagree', 'disagree' and 'disagree strongly'. A 'can't choose' option was also provided. In analysis, summary measures have been derived to give the total agreeing or disagreeing with each statement (combining 'agree strongly' with 'agree'; 'disagree strongly' with 'disagree'; 'neither agree or disagree' was combined with 'can't choose').

### 10.3 Fruit and vegetable consumption

#### 10.3.1 Numbers of portions of fruit and vegetables consumed, by age and sex

Among children aged 5-15, 21% of both boys and girls achieved the government's recommended guideline of eating five portions or more of fruit and vegetables per day. Boys consumed a mean of 3.3 portions and girls consumed a mean of 3.4 portions per day. There was no significant difference by age in the proportion achieving the '5 A DAY' target or in the average number of portions consumed. 6% of boys and 4% of girls did not eat any fruit and vegetables.

Table 10.1

#### 10.3.2 Different types of fruit and vegetables consumed

As in previous years, children were asked about their consumption of individual food items in the previous 24 hours, such as vegetables (fresh, raw, tinned and frozen), pulses, salad, vegetables in composites, dried fruit, frozen or tinned fruit and fruit juice. Summary measures were created to look at total consumption of fruit and vegetables (including portions or part portions) and consumption of different groups of food.

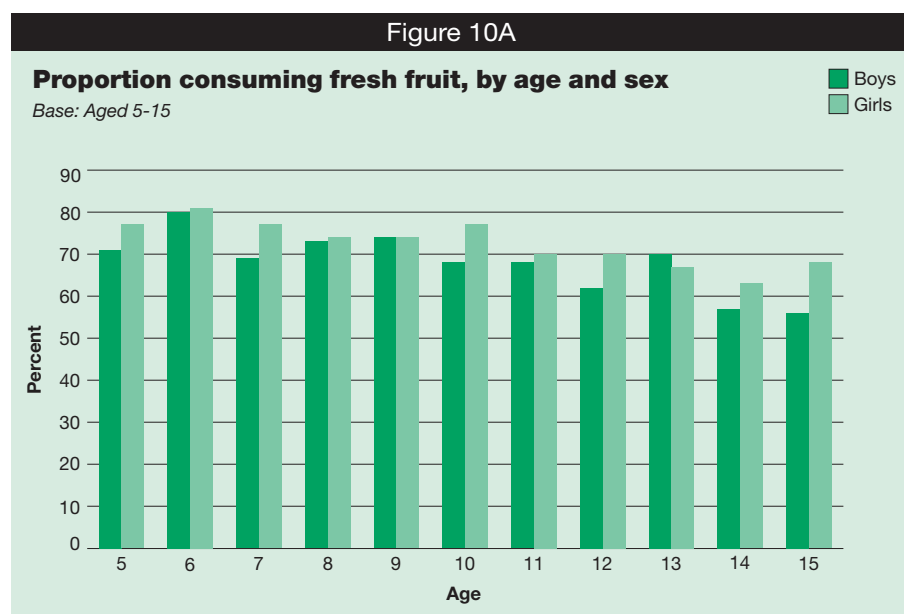
The summary measures included were total fruit and vegetables, total vegetables and salads (including fresh, raw, frozen and tinned vegetables, vegetables in composites and in salads) and total fruit consumption (including fresh, frozen and tinned fruit and fruit in composites). Table 10.2 shows the proportion of children aged 5-15 consuming the different food items and table 10.3 shows the mean number of portions of each food type consumed (refer to 10.2.1 for definitions). Table 10B summarises the proportion of boys and girls who had eaten each food type and the mean number consumed for each.

Table 10B				
	Boys		Girls	
	% consuming food item	Mean no. of portions consumed	% consuming food item	Mean no. of portions consumed
Any fruit and vegetables	94	3.3	96	3.4
Any fruit (excludes fruit juice)	71	1.6	76	1.6
Fresh fruit	68	1.4	72	1.5
Dried fruit	8	0.1	9	0.1
Fruit in composites	6	0.0	6	0.1
Frozen/tinned fruit	3	0.0	4	0.0
Fruit juice	57	0.6	59	0.6
Any vegetables and salads (excludes pulses)	65	0.8	67	0.9
Vegetables	52	0.5	53	0.6
Pulses	36	0.3	36	0.3
Salad	24	0.2	28	0.3
Vegetables in composites	7	0.1	7	0.1

94% of boys and 96% of girls reported consuming any fruit or vegetables in the previous 24 hours. More girls than boys reported eating any fruit (76% and 71% respectively). Younger children were generally more likely to eat any fruit or any vegetables than older children.

The main source of fruit and vegetables for all children was fresh fruit. More girls than boys reported eating fresh fruit in the past 24 hours (72% of girls, 68% of boys), although there was no significant difference in the mean number of portions of fresh fruit being consumed by sex (1.5 girls and 1.4 for boys). As Figure 10A shows, younger children were more likely than older children to consume fresh fruit. They also ate more portions on average.

Tables 10.2, 10.3, 10B, Figure 10A



### 10.3.3 Fruit and vegetable consumption by Government Office Region

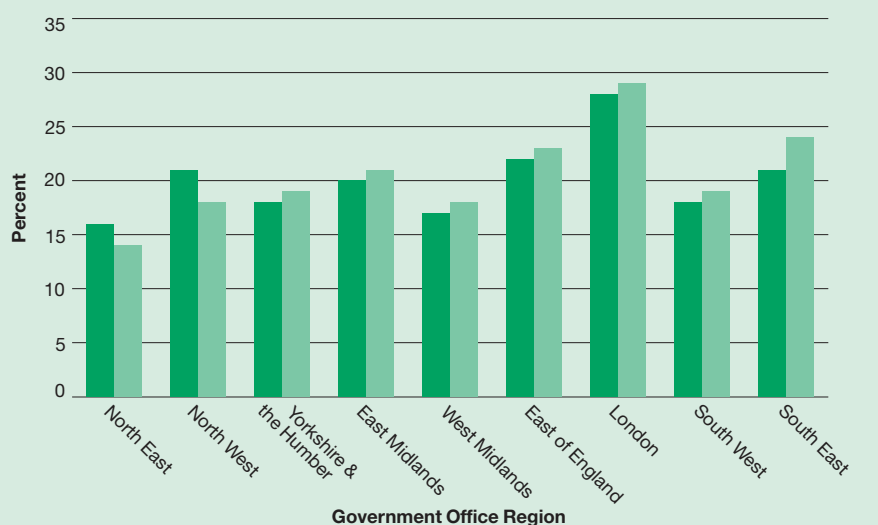
Comparison between Government Office Regions (GORs) showed that more boys and girls living in London reported eating at least five portions of fruit and vegetables (28% and 29% respectively) than children in other regions of the country, and among girls fewer in the North East ate at least five portions. In other regions the proportion ranged from 16% to 22% for boys and 18% to 24% for girls (see Figure 10B).

Table 10.4, Figure 10B

Figure 10B

### Proportion consuming five or more portions of fruit and vegetables per day, by Government Office Region and sex

Base: Aged 5-15



#### 10.3.4 Fruit and vegetable consumption by equivalised household income

There was a strong relationship between equivalised household income and fruit and vegetable consumption. Children in the higher two income quintiles were more likely than those in the lower three quintiles to consume five or more portions of fruit and vegetables per day. 31% of boys in the highest income quintile ate five or more portions per day. This decreased by almost half in the lowest two quintiles (15% and 16%). Among girls, 27% in the highest income quintile reached the target, decreasing to 18% in the lowest three quintiles (see figure 10C).

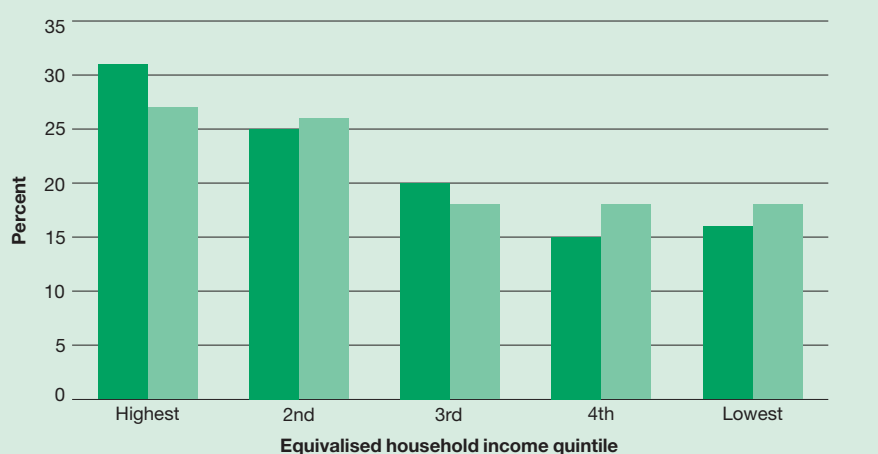
Overall only a small proportion of children ate no fruit and vegetables, but boys and girls in the lowest two income quintiles were more likely to eat no fruit and vegetables than those in the highest income group. Among boys, the proportions were 8%-10% in the lowest income quintiles compared with 2% in the highest. Among girls the equivalent proportions were 5%-6% in the lowest two quintiles and 1% in the highest.

Table 10.5, Figure 10C

Figure 10C

### Proportion consuming five or more portions of fruit and vegetables per day, by equivalised household income and sex

Base: Aged 5-15

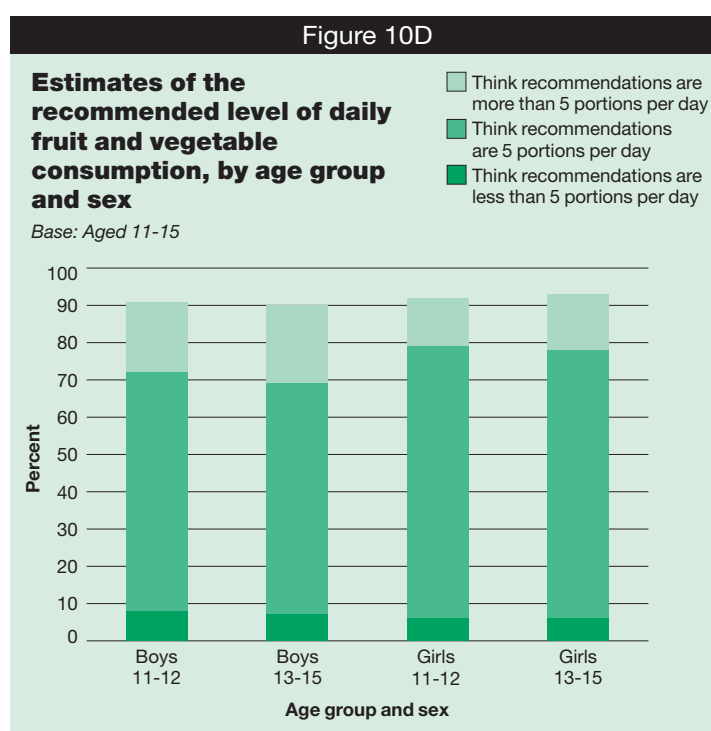


## 10.4 Knowledge and attitudes

### 10.4.1 Knowledge of portion size and recommended fruit and vegetable consumption

In order to establish awareness of the government's guidelines for fruit and vegetable consumption, children aged 11-15 were asked to state the number of portions of fruit and vegetables that they thought people should eat every day. 63% of boys and 73% of girls aged 11-15 accurately reported that five portions of fruit and vegetables should be consumed per day, with girls significantly more likely to give the correct answer. Among those making an incorrect estimate, more thought that people were recommended to eat fewer than five portions a day (20% of boys, 14% of girls) than that they should eat more than five portions per day (8% of boys and 6% of girls). Boys were more likely than girls to state that they didn't know the answer, 10% and 7% respectively. Figure 10D shows children's responses by age and sex.

Table 10.6, Figure 10D



To establish awareness of what constitutes a portion of fruit or vegetables, children were shown a list including one correct and five incorrect answers.<sup>14</sup> 82% of boys and 83% of girls correctly identified an apple as a single portion, and around a fifth of these were completely correct, only mentioning an apple and no other options (22% of boys and 21% of girls). Overall 60% of boys and 62% of girls gave a partially correct answer and only 17% were entirely incorrect.

Table 10.7

### 10.4.2 Perceptions of own diet

Children aged 11-15 were asked to give their perceptions of their own diet on a four point scale ranging from very healthy to very unhealthy. More than four in five children regarded their diet as healthy, with most saying it was 'quite healthy' (70% of boys and 72% of girls) rather than 'very healthy' (13% of both boys and girls). Only 1% thought that their diet was 'very unhealthy'.

Overall there was little difference in the perceptions of their diet between boys and girls. However, younger girls were more likely than older girls to report that they perceived their diet to be very healthy or quite healthy (88% of girls aged 11-12, 82% of girls aged 13-15).

Table 10.8

### 10.4.3 Attitudes towards healthy eating, by age and sex

Children aged 11-15 were presented with five statements about healthy eating, and were asked to say how much they agreed or disagreed with each. A summary of the levels of agreement and disagreement are given in Table 10C.

Table 10C			
	Total agree	Neither <sup>a</sup>	Total disagree
	%	%	%
<b>Boys</b>			
Healthy foods are enjoyable	64	29	8
The tastiest foods are the ones that are bad for you	38	37	25
I get confused over what's supposed to be healthy and what isn't	17	20	62
If you do enough exercise you can eat whatever you like	19	21	60
I don't really care what I eat	16	19	65
<b>Girls</b>			
Healthy foods are enjoyable	72	23	5
The tastiest foods are the ones that are bad for you	34	37	29
I get confused over what's supposed to be healthy and what isn't	20	20	60
If you do enough exercise you can eat whatever you like	12	21	68
I don't really care what I eat	10	17	73

<sup>a</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

The majority of children aged 11-15 agreed that 'healthy foods are enjoyable', with 72% of girls and 64% of boys agreeing with the statement. Most of the remainder were neutral rather than disagreeing (8% of boys and 5% of girls disagreed that 'healthy foods are enjoyable'). There was a more even spread of agreement, disagreement and neutral views about the statement 'the tastiest foods are the ones that are bad for you'. For the remaining statements, 'I get confused over what's supposed to be healthy', 'if you do enough exercise you can eat whatever you like' and 'I don't really care what I eat', more children disagreed than agreed.

There were significant differences in the level of agreement between boys and girls for all statements except 'I get confused over what's supposed to be healthy and what isn't'. More girls than boys agreed that 'healthy foods are enjoyable'; for all of the remaining statements, boys were more likely than girls to agree.

**Tables 10.9, 10C**

There was also some variation in the level of agreement across the age groups. Figure 10E gives a summary of levels of agreement for each of the statements, among boys and girls aged 11-12 and 13-15. Younger children were more likely than older children to agree that 'healthy foods are enjoyable'. For boys, levels of agreement decreased from 68% to 61% and for girls from 76% to 70%. However, the pattern was reversed for 'I don't really care what I eat', with older children being more likely to agree to this than younger children.

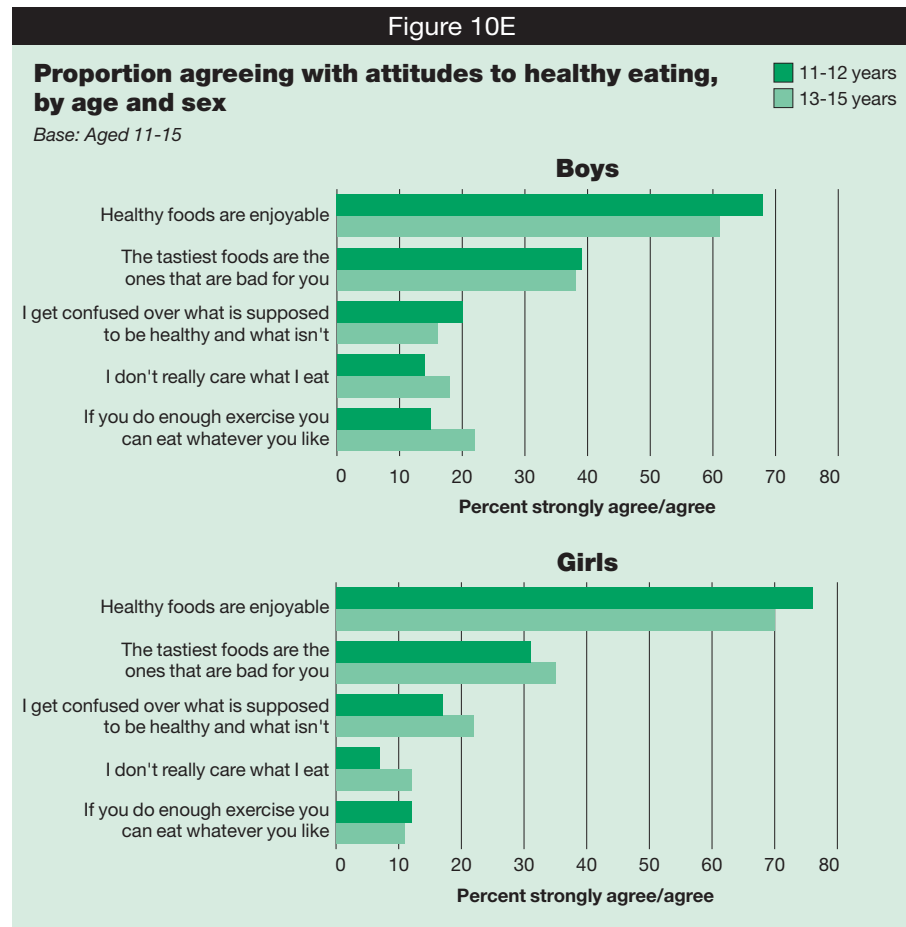
Older boys were more likely than younger ones to agree 'if you do enough exercise you can eat what you like' (22% and 15% respectively), though there was no similar pattern by age among girls.

Among both boys and girls, there was little variation according to age in response to the statement 'the tastiest foods are the ones that are bad for you'. However, for the statement 'I get confused over what's supposed to be healthy and what isn't', there was a different pattern by age for boys and girls. Younger boys were more likely to agree with the statement

than older ones (20% aged 11-12 and 16% aged 13-15), while older boys were more likely to disagree that they get confused about healthy foods. Among girls, levels of agreement were higher in the older group (17% aged 11-12 and 22% aged 13-15), and while levels of disagreement were similar in both age groups, fewer older girls gave a neutral response.

Similarly, there is a different pattern between boys and girls in response to the statement 'if you do enough exercise you can eat whatever you like'. Overall, boys were more likely than girls to agree with this. Agreement was considerably lower among boys aged 11-12 (15%) than among those aged 13-15 (22%), while fewer older boys disagreed with the statement. Conversely, there were similar levels of agreement among girls in each age group, while older girls were less likely than younger girls to disagree with the statement, but more likely to give a neutral answer. These differences in views on the relationship between exercise and eating may reflect the differences between the sexes in levels of physical activity and attitudes towards taking exercise (see Chapter 9 of this report).

Table 10.10, Figure 10E



#### 10.4.4 Attitudes towards healthy eating, by Government Office Region

There was significant variation by Government Office Region for two of the attitude statements. Among boys, levels of agreement that 'healthy foods are enjoyable' ranged from 56% in London and 57% in the East of England, to 70% in the North East and 72% in the North West. There was less variation among girls, with agreement ranging from 67% to 75% across regions.

There were variations for the statement 'the tastiest foods are the ones that are bad for you', although no clear regional pattern emerged.

Table 10.11

#### 10.4.5 Attitudes towards healthy eating, by equivalised household income

Attitudes to health eating varied according to equivalised household income. Significant differences were found for all statements except 'healthy foods are enjoyable'; generally those in the lowest income quintiles were more likely than those in the higher two quintiles to agree with each of the remaining attitude statements.

Table 10.12



#### 10.4.6 Attitudes towards healthy eating by perception of own diet

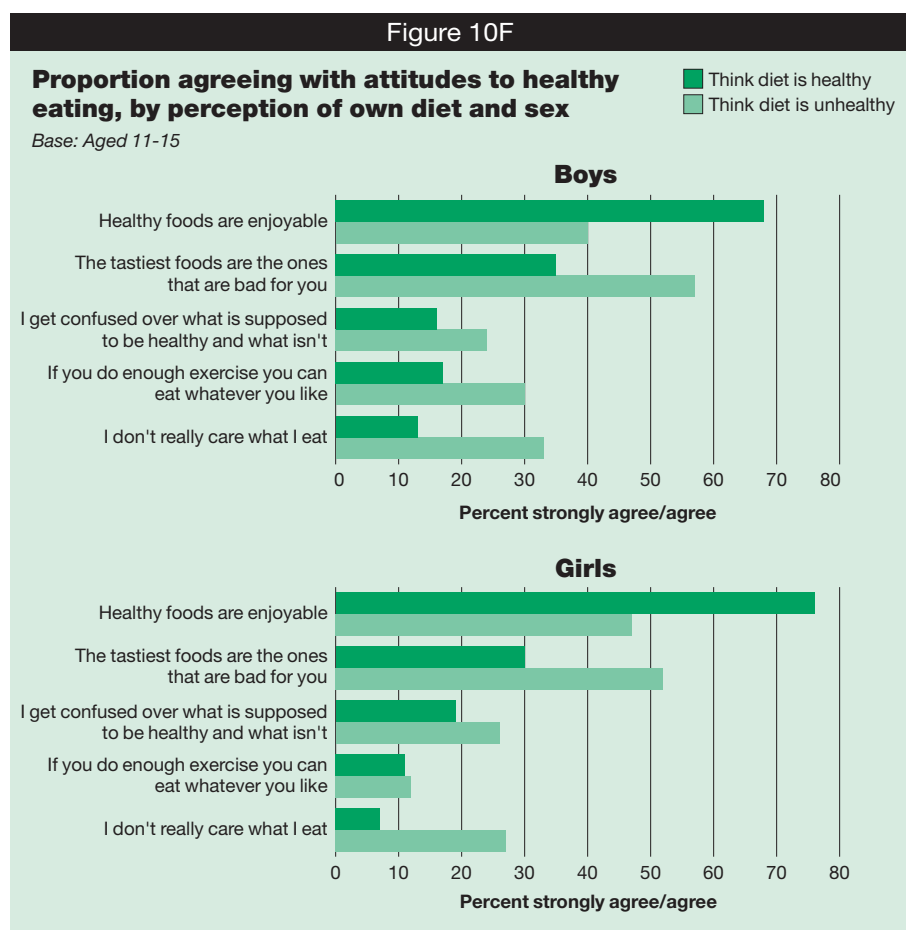
Levels of agreement to the five attitude statements were strongly associated with how healthy children aged 11-15 perceive their diet to be, as shown in Figure 10F. Those who judged their diet to be healthy were more likely to agree with the statement 'healthy foods are enjoyable', than those who judged their diet to be unhealthy. 68% of boys and 77% of girls who said they ate a healthy diet agreed with the statement, compared with 40% of boys and 47% of girls who reported an unhealthy diet'.

Following the same pattern, those who felt that their diet was unhealthy were more likely than those who thought it healthy to agree with the remaining four statements. The contrast was greatest for the statements 'the tastiest foods are the ones that are bad for you' (57% of boys and 52% of girls who said their diet was unhealthy agreed, compared with 35% of boys and 30% of girls who said they ate a healthy diet), and 'I don't really care what I eat' (33% of boys and 27% of girls who said their diet was unhealthy agreed, compared with 13% of boys and 7% of girls who said they ate a healthy diet). Among boys, a higher proportion of those who thought their diet unhealthy agreed with 'the tastiest foods are the ones that are bad for you' than with 'healthy foods are enjoyable'.

Boys and girls who judged their diet to be unhealthy were also more likely than those who thought they ate healthily to agree with the statement 'I get confused over what is supposed to be healthy and what isn't'.

Levels of agreement for the statement 'if you do enough exercise you can eat whatever you like' were similar for girls, regardless of whether they perceived their diet to be healthy or unhealthy (11% and 12% respectively). However for boys, there was a significant difference in levels of agreement, with 17% of those who judged their diet to be healthy agreeing with the statement and 30% who judged their diet to be unhealthy agreeing with it.

Table 10.13, Figure 10F





### 10.4.7 Factors that would prevent and encourage improvements in diet

Children aged 11-15 were asked to identify factors that would prevent them from improving their diet and factors that would encourage them to improve, from lists provided.

The two barriers to improvement mentioned most frequently, by similar proportions of boys and girls, were 'I eat what I'm given' (by 24% of boys and 22% of girls), and that healthy eating does not satisfy hunger (21% of both boys and girls). Overall, boys were more likely than girls to report that they do not like healthy foods (18% of boys, 14% of girls) and do not want to change their eating habits (14% of boys, 10% of girls), a difference of four percentage points for each factor. Girls were more likely than boys to mention lack of motivation (19% of girls, 15% of boys). Only around one in ten mentioned the lack of healthy options at school, and even fewer the lack of healthy options at home, as barriers to healthy eating.

Among both boys and girls, those aged 11-12 were more likely than the older group to say that they ate what they were given and that they did not want to change their eating habits.

Both boys and girls aged 13-15 were more likely than the younger group to feel that healthy foods might not satisfy their hunger (22% of boys and 24% of girls aged 13-15, 18% boys and 17% of girls aged 11-12). Older girls were considerably more likely than younger girls to say that they lacked the motivation to improve their diet (24% and 12% respectively).

**Table 10.14**

In terms of factors that would encourage children aged 11-15 to improve their diet, it would appear that many in this age group were not yet always making active decisions about what they eat. The two factors most frequently mentioned were being given more healthy food, with girls significantly more likely to identify this factor than boys (35% and 31% respectively), and advice from parents (27% of boys and 28% of girls). Self motivation was also a relatively important factor, however, and again slightly more so among girls than boys (23% of boys, 28% of girls). TV advertisements and information leaflets were mentioned slightly more frequently than advice from friends and siblings, school nurses or teachers.

Being motivated to change their diet was a factor mentioned more often by boys and girls aged 13-15 (27% and 33% respectively) than by those aged 11-12 (16% and 21%). There was little difference between age groups in the proportions who said that being given healthier food would improve their diet, but for the factors relating to advertising, information leaflets and advice, children aged 11-12 were more likely than the older group to feel that these would be influential.

Just under a quarter of boys and a fifth of girls (24% and 19% respectively) said that they did not feel they needed to make any changes to their diets. Again, those aged 11-12 were more likely to feel this (28% of boys and 24% of girls) than those aged 13-15 (22% and 16%).

**Table 10.15**

### 10.4.8 Predictors for perception of eating a healthy diet

Multivariate logistic regression was used to explore the factors which influence people's self assessment of the healthiness of their diet. The dependent variable was the perception that their own diet was 'very healthy' or 'healthy'. The independent variables included in the models were: age, the five attitude statements described in section 10.4.3, Body Mass Index (BMI), perception of own weight, equivalised household income, Government Office Region (GOR), mother's and father's BMI, mother's and father's perception of their own diet, fruit and vegetable consumption and perception of own physical activity levels. Separate models were constructed for boys and girls.

The factors indicate associations, not causes. These variations in risk are expressed as odds ratios, the degree to which the probability of the key outcome increases or decreases relative to the reference category. Odds ratios greater than one indicate higher odds of being in the highest risk category, and odds ratios less than one indicate lower odds. The 95% confidence intervals are shown, and where the interval does not include one, this category is significantly different from the reference category.

Table 10.16 presents a model of the factors associated with a healthy perception of own diet; the odds ratios presented are after adjustment for the other factors. Although the model was run separately for boys and girls, factors of significance in the model for one sex were included in both models.

The perception of a healthy diet was significantly associated with fruit and vegetable consumption, perception of own weight, perception of own physical activity levels and certain attitudes towards healthy eating, for both boys and girls. Among girls only, equivalised household income was found to be a significant predictor of how healthy they perceived their diet to be.<sup>16</sup>

### **Income**

Perception of eating a healthy diet was associated with equivalised household income for girls, though not for boys. The odds decreased for girls in the second, third and fourth quintiles, compared with those in the highest income quintile. The odds ratio for girls in the fourth lowest quintile was 2.98, almost three times the odds of the reference category (the highest income quintile).

### **Fruit and vegetable consumption**

Among both boys and girls, children who consumed around the average amount of fruit and vegetables portions (3-4 portions) had lower odds of perceiving their own diet to be healthy, compared with those who ate five or more portions daily. The odds for boys and girls who ate less than three portions had lower odds still.

### **Perception of weight**

Children's perception of their own diet was also associated with how they perceived their weight. Among both boys and girls, the odds of perceiving their diet to be healthy were reduced among those who thought they were 'too heavy', compared with children who thought they were the 'right weight'. The same effect was not found for children who thought they were 'too light'.

### **Physical activity**

Children's perception of their physical activity levels was associated with how they perceived their own diet. Those who perceive themselves to be physically inactive had significantly lower odds of stating they perceive their diet to be healthy, than those who believed that they were very physically active (the reference category). Boys and girls who perceived themselves to be fairly physically active had similar odds to children who perceived themselves as being very physically active of stating that they had a healthy diet.

### **Attitudes towards healthy eating**

Children's attitudes to healthy eating were strongly associated with their perceptions of their diets. Odds of perceiving their diet to be healthy were much lower among those who disagreed or had neutral views on the statement 'healthy foods are enjoyable' than among those who agreed. Suggesting a similar pattern, odds of perceiving their diet to be healthy were considerably higher among those who disagreed than agreed that 'the tastiest foods are the ones that are bad for you' and 'I don't really care what I eat'.

**Table 10.16**

## **10.5 Discussion**

Results show that just over one in five of children aged 5-15 achieve the government's recommended target of eating five or more portions of fruit and vegetables per day, with no difference between boys or girls and no consistent patterns based on age. The majority of children were consuming some fruit and vegetables, with fresh fruit being the main source for both boys and girls. The government's scheme to provide fresh fruit and vegetables to all children aged five to seven in state schools may help to establish and reinforce patterns of eating which include plenty of fresh fruit, though early evidence suggests that this has only a very short term effect<sup>17</sup> and further reinforcement may be needed.

Around two in three boys and three in four girls aged 11-15 accurately reported that five portions of fruit and vegetables should be consumed every day. However there were 27% of boys and 32% of girls who either thought that the recommendation was to eat less than five portions, or did not know the number of portions recommended. Furthermore, results show that even though the majority of children were aware of the number of portions people should eat, most children aged 11-15 could not accurately identify what a portion of fruit or vegetables is. This suggests a need for strategies which increase awareness about fruit and vegetable portion sizes.

Attitudes to healthy eating showed some encouraging patterns: more than four out of five children aged 11-15 thought that they usually ate healthily, the majority agreed that healthy foods are enjoyable, while few agreed that they did not care what they ate. Around three in five disagreed that they were confused about what is healthy and what is not. Girls were more likely than boys to agree that healthy foods were enjoyable, while boys were more likely to agree with the rest of the attitude statements presented.

Overall boys were more likely than girls to agree 'if you do enough exercise you can eat what you like', and among boys those aged 13-15 were more likely to agree than those aged 11-12. This may reflect the fact that boys in these age groups are typically more physically active than girls.

Attitudes to healthy eating were strongly associated with children's perceptions of how healthy or unhealthy their own diet was, with those who regarded their diet as healthy having more positive views. The logistic regression analysis further indicates that, in conjunction with attitudes to a healthy diet, children's perception of their own diet is significantly associated with other views on their own health and lifestyle (perception of their weight and physical activity levels), as well as behaviour (fruit and vegetable consumption). This suggests that children may be viewing their diet not just in terms of what they eat but also in terms of other health and lifestyle factors. This may prove useful in the development of strategies aimed at improving people's diet.

In terms of barriers to and factors that would encourage improvements to diet, it was clear that significant proportions of children were not always making their own decisions about what they ate. Thus among barriers to healthy eating around a quarter of children mentioned that they ate what they were given, and conversely among important factors that would improve their diet more than three in ten cited being given healthier food, and more than a quarter mentioned advice from parents.

It is important to provide information directly to children to build up their awareness of the benefits of healthy eating, to counter any confusion about what is healthy, and to build up their motivation to adopt healthy diets and lifestyles. It is clear, however, that the role of parents and schools also continues to be of paramount importance in providing information and advice, and reinforcing positive messages about healthy eating.

## References and notes

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- 12 [www.ic.nhs.uk/pubs/hse07trends](http://www.ic.nhs.uk/pubs/hse07trends)
- 13 Herbert JR, Clemow I, Pbert L et al. *Social desirability bias in dietary self report may compromise the validity of dietary intake measures*. Int J Epidemiol. 1995; 24:389-398.
- 14 The list of fruit and vegetables comprised 2 cherry tomatoes, 1 apple, 1 melon, 4 grapes, 1 jacket potato and 2 tablespoons of carrots. The correct answer is 1 apple.
- 15 These statements were:  
     Healthy foods are enjoyable  
     The tastiest foods are the ones that are bad for you  
     I get confused over what's supposed to be healthy and what isn't  
     If you do enough exercise you can eat whatever you like  
     I don't really care what I eat.
- 16 Exploratory analysis indicated that there may be associations between a child's perception of how healthy they perceive their diet to be and how healthy their parents perceive their own diet to be. This has not been included in the final model as numbers of parent and child pairs in the data are too small to produce reliable conclusions.
- 17 Ransley J K, Greenwood D C, Cade J E et al. *Does the school fruit and vegetable scheme improve children's diet? A non-randomised controlled trial*. Journal of Epidemiology and Community Health, 2007; 61: 699-703; doi:10.1136/jech.2006.052696. <http://jech.bmj.com/cgi/content/short/61/8/699>.

- 10.1 Daily fruit and vegetable consumption, by age and sex
- 10.2 Types of fruit and vegetables consumed daily, by age and sex
- 10.3 Daily mean fruit and vegetable consumption, by food item, age and sex
- 10.4 Daily fruit and vegetable consumption, by Government Office Region/Strategic Health Authority and sex
- 10.5 Daily fruit and vegetable consumption, by equivalised household income and sex
- 10.6 Knowledge of the recommended daily number of portions of fruit and vegetables, by age and sex
- 10.7 Knowledge of what constitutes one portion of fruit or vegetables, by age and sex
- 10.8 Perception of own diet, by age and sex
- 10.9 Attitudes to healthy eating, summary of agreement and disagreement, by sex
- 10.10 Proportion agreeing with attitudes to healthy eating, by age and sex
- 10.11 Proportion agreeing with attitudes to healthy eating, by Government Office Region/Strategic Health Authority and sex
- 10.12 Proportion agreeing with attitudes to healthy eating, by equivalised household income and sex
- 10.13 Proportion agreeing with attitudes to healthy eating, by perception of own diet, age and sex
- 10.14 Barriers to improving diet, by age and sex
- 10.15 Factors that would encourage improvement in diet, by age and sex
- 10.16 Estimated odds ratios for perception of eating a healthy diet, by associated risk factors and sex

Table 10.1

**Daily fruit and vegetable consumption, by age and sex**

Aged 5-15

2007

Portions per day	Age											Total
	5	6	7	8	9	10	11	12	13	14	15	%
	%	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>												
None	4	3	7	6	4	4	7	6	5	9	8	6
Less than 1 portion	3	2	2	2	3	4	2	3	4	2	3	3
1 portion or more but less than 2	20	17	20	17	16	21	21	20	15	21	24	19
2 portions or more but less than 3	18	18	21	22	23	24	20	20	26	23	17	21
3 portions or more but less than 4	21	19	20	16	14	16	18	21	15	17	16	18
4 portions or more but less than 5	13	15	12	15	13	14	14	10	12	10	12	13
5 portions or more	21	25	17	22	26	18	19	19	23	18	19	21
Mean	3.3	3.7	3.0	3.4	3.5	3.2	3.2	3.1	3.4	3.1	3.0	3.3
Standard error of the mean	0.13	0.19	0.14	0.15	0.15	0.15	0.13	0.15	0.16	0.17	0.15	0.06
Median	3.0	3.3	2.8	3.0	3.0	2.7	3.0	3.0	3.0	2.7	2.6	3.0
<b>Girls</b>												
None	5	3	4	4	5	4	4	5	3	4	6	4
Less than 1 portion	3	3	3	2	5	2	3	3	2	3	4	3
1 portion or more but less than 2	16	12	16	14	16	12	17	12	20	20	17	16
2 portions or more but less than 3	21	24	26	26	20	24	19	24	18	21	20	22
3 portions or more but less than 4	24	21	18	18	22	20	22	22	20	21	18	21
4 portions or more but less than 5	11	17	8	15	13	14	10	15	15	11	15	13
5 portions or more	19	20	25	21	19	23	24	21	21	21	21	21
Mean	3.3	3.5	3.4	3.4	3.3	3.6	3.5	3.5	3.5	3.4	3.2	3.4
Standard error of the mean	0.15	0.13	0.15	0.15	0.15	0.17	0.16	0.16	0.14	0.14	0.14	0.05
Median	3.0	3.0	3.0	3.0	3.0	3.2	3.0	3.0	3.0	3.0	3.0	3.0
<i>Bases (unweighted)</i>												
Boys	242	257	239	281	247	294	288	275	309	287	256	2975
Girls	235	245	233	249	254	254	243	278	303	261	244	2799
<i>Bases (weighted)</i>												
Boys	222	235	221	257	222	244	240	235	266	281	246	2670
Girls	214	218	219	226	232	236	226	225	249	255	241	2541

Table 10.2

**Types of fruit and vegetables consumed daily, by age and sex**

Aged 5-15

2007

Types of fruit and vegetables consumed	Age											Total
	5	6	7	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>												
Any fruit and vegetables	96	97	93	94	96	96	93	94	95	91	92	94
Any vegetables and salads (excludes pulses)	69	71	65	64	65	65	68	62	67	57	60	65
Any fruit (excludes fruit juice)	75	83	71	76	76	73	71	67	74	61	59	71
Vegetables	56	62	52	56	49	53	54	48	53	45	49	52
Pulses	39	35	34	34	44	34	36	35	33	35	35	36
Salad	28	23	21	22	27	22	26	23	25	23	21	24
Vegetables in composites	7	6	8	6	7	8	6	5	10	4	4	7
Fresh fruit	71	80	69	73	74	68	68	62	70	57	56	68
Fruit in composites	4	3	3	5	7	4	5	6	9	8	6	6
Dried fruit	12	10	11	8	11	8	6	6	9	6	7	8
Frozen/tinned fruit	2	5	4	2	2	1	3	3	4	2	4	3
Fruit juice	53	60	48	57	58	56	60	63	55	58	52	57
None	4	3	7	6	4	4	7	6	5	9	8	6
<b>Girls</b>												
Any fruit and vegetables	95	97	96	96	95	96	96	95	97	96	94	96
Any vegetables and salads (excludes pulses)	69	72	73	66	64	64	67	64	67	70	63	67
Any fruit (excludes fruit juice)	80	84	81	78	79	82	75	75	70	68	70	76
Vegetables	60	59	59	57	53	50	53	48	51	50	45	53
Pulses	35	34	39	38	36	39	35	38	31	38	31	36
Salad	23	29	28	27	25	25	31	31	29	31	28	28
Vegetables in composites	8	10	7	5	8	7	8	7	7	7	5	7
Fresh fruit	77	81	77	74	74	77	70	70	67	63	68	72
Fruit in composites	4	5	6	3	7	6	8	8	10	4	6	6
Dried fruit	11	8	15	7	8	10	6	9	8	10	8	9
Frozen/tinned fruit	3	4	2	4	3	5	4	5	5	3	3	4
Fruit juice	53	58	56	61	55	57	58	65	61	65	58	59
None	5	3	4	4	5	4	4	5	3	4	6	4
<i>Bases (unweighted)<sup>a</sup></i>												
Boys	242	257	239	281	247	294	288	275	309	287	256	2975
Girls	235	245	233	249	254	254	243	278	303	261	244	2799
<i>Bases (weighted)</i>												
Boys	222	235	221	257	222	244	240	235	266	281	246	2670
Girls	214	218	219	226	232	236	226	225	249	255	241	2541

<sup>a</sup> Bases given are for 'Any fruit and vegetables'. All other bases vary but are of a similar size.

Table 10.3

**Daily mean fruit and vegetable consumption, by food item, age and sex***Aged 5-15**2007*

Mean portions per day	Age											Total
	5	6	7	8	9	10	11	12	13	14	15	
Boys												
Any fruit and vegetables	3.3	3.7	3.0	3.4	3.5	3.2	3.2	3.1	3.4	3.1	3.0	3.3
Standard error of the mean	0.13	0.19	0.14	0.15	0.15	0.15	0.13	0.15	0.16	0.17	0.15	0.06
Any vegetables and salads (excludes pulses)	0.8	0.9	0.7	0.9	0.8	0.8	0.9	0.8	1.0	0.8	0.9	0.8
Standard error of the mean	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05	0.08	0.06	0.06	0.02
Any fruit (excludes fruit juice)	1.7	1.9	1.5	1.7	1.7	1.6	1.4	1.4	1.6	1.4	1.3	1.6
Standard error of the mean	0.11	0.16	0.11	0.10	0.11	0.13	0.10	0.11	0.10	0.13	0.11	0.04
Vegetables (fresh, raw, tinned and frozen)	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.6	0.5	0.6	0.5
Standard error of the mean	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04	0.05	0.04	0.05	0.01
Pulses	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard error of the mean	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.03	0.03	0.01
Salad	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2
Standard error of the mean	0.02	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.04	0.03	0.04	0.01
Vegetables in composites	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Standard error of the mean	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.01	0.03	0.02	0.02	0.01
Fresh fruit	1.6	1.8	1.4	1.6	1.5	1.5	1.3	1.3	1.3	1.3	1.1	1.4
Standard error of the mean	0.11	0.16	0.10	0.10	0.10	0.13	0.10	0.11	0.08	0.13	0.10	0.04
Fruit in composites	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Standard error of the mean	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.00
Dried fruit	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Standard error of the mean	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.01
Frozen/tinned fruit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Standard error of the mean	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00
Fruit juice	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6
Standard error of the mean	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.01
Bases (unweighted) <sup>a</sup>												
Boys	242	257	239	281	247	294	288	275	309	287	256	2975
Bases (weighted)												
Boys	222	235	221	257	222	244	240	235	266	281	246	2670

Continued...



Table 10.3 continued

Aged 5-15

2007

Mean portions per day	Age											Total
	5	6	7	8	9	10	11	12	13	14	15	
<b>Girls</b>												
Any fruit and vegetables	3.3	3.5	3.4	3.4	3.3	3.6	3.5	3.5	3.5	3.4	3.2	3.4
Standard error of the mean	0.15	0.13	0.15	0.15	0.15	0.17	0.16	0.16	0.14	0.14	0.14	0.05
Any vegetables and salads (excludes pulses)	0.8	0.9	0.8	0.8	0.8	1.0	1.0	1.0	1.1	0.9	0.9	0.9
Standard error of the mean	0.05	0.06	0.05	0.06	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.02
Any fruit (excludes fruit juice)	1.7	1.7	1.8	1.7	1.6	1.8	1.6	1.6	1.6	1.5	1.5	1.6
Standard error of the mean	0.12	0.09	0.12	0.12	0.10	0.13	0.11	0.11	0.11	0.11	0.11	0.04
Vegetables (fresh, raw, tinned and frozen)	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.5	0.6	0.6
Standard error of the mean	0.51	0.53	0.51	0.54	0.52	0.63	0.61	0.57	0.67	0.53	0.57	0.01
Pulses	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3
Standard error of the mean	0.02	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.01
Salad	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Standard error of the mean	0.02	0.03	0.03	0.03	0.04	0.03	0.04	0.03	0.04	0.04	0.04	0.01
Vegetables in composites	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Standard error of the mean	0.02	0.03	0.02	0.01	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.01
Fresh fruit	1.6	1.6	1.5	1.6	1.4	1.6	1.5	1.4	1.3	1.3	1.3	1.5
Standard error of the mean	0.11	0.09	0.11	0.12	0.10	0.12	0.11	0.10	0.10	0.10	0.11	0.04
Fruit in composites	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
Standard error of the mean	0.02	0.01	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.01
Dried fruit	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Standard error of the mean	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Frozen/tinned fruit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Standard error of the mean	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.00
Fruit juice	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6
Standard error of the mean	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.01
<b>Bases (unweighted)<sup>a</sup></b>												
Girls	235	245	233	249	254	254	243	278	303	261	244	2799
<b>Bases (weighted)</b>												
Girls	214	218	219	226	232	236	226	225	249	255	241	2541

<sup>a</sup> Bases given are for 'Any fruit and vegetables'. All other bases vary but are of a similar size.

Table 10.4

# Daily fruit and vegetable consumption, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex

Aged 5-15

2007

Portions per day	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>											
None	15	5	10	5	7	5	3	6	4	4	4
Less than 1 portion	3	4	4	2	3	2	1	3	3	3	3
1 portion or more but less than 2	21	22	17	19	18	22	15	24	18	21	14
2 portions or more but less than 3	16	20	24	24	19	21	23	16	24	19	28
3 portions or more but less than 4	16	17	15	17	19	18	18	19	18	15	21
4 portions or more but less than 5	14	12	11	12	18	10	11	14	13	14	11
5 portions or more	16	21	18	20	17	22	28	18	21	24	19
Mean	2.8	3.2	3.0	3.3	3.2	3.3	3.8	3.1	3.4	3.4	3.3
Standard error of the mean	0.20	0.11	0.16	0.17	0.16	0.14	0.23	0.16	0.12	0.16	0.16
Median	2.3	3.0	2.5	2.7	3.0	2.8	3.0	3.0	3.0	3.0	3.0
<b>Girls</b>											
None	9	3	6	5	6	3	4	3	3	2	4
Less than 1 portion	2	4	4	2	3	3	2	3	3	2	5
1 portion or more but less than 2	19	17	17	14	17	16	13	16	15	16	14
2 portions or more but less than 3	27	21	23	25	22	21	19	24	21	20	22
3 portions or more but less than 4	22	24	19	21	18	19	16	24	22	19	24
4 portions or more but less than 5	7	13	12	13	16	13	16	11	12	10	14
5 portions or more	14	18	19	21	18	23	29	19	24	30	19
Mean	2.8	3.2	3.1	3.4	3.2	3.6	3.9	3.3	3.6	3.9	3.3
Standard error of the mean	0.16	0.14	0.16	0.15	0.16	0.19	0.17	0.14	0.12	0.20	0.12
Median	2.7	3.0	3.0	3.0	3.0	3.0	3.5	3.0	3.3	3.5	3.0
<i>Bases (unweighted)</i>											
Boys	149	415	322	305	331	289	348	273	543	262	281
Girls	146	382	299	280	301	316	353	271	451	206	245
<i>Bases (weighted)</i>											
Boys	132	380	286	235	300	263	372	249	453	219	234
Girls	125	351	266	225	271	289	389	245	381	173	208

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

Table 10.5

**Daily fruit and vegetable consumption, by equivalised household income and sex**

Aged 5-15

2007

Portions per day	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Boys</b>					
None	2	3	5	8	10
Less than 1 portion	1	2	3	3	3
1 portion or more but less than 2	13	18	22	24	20
2 portions or more but less than 3	20	22	22	19	22
3 portions or more but less than 4	17	17	17	18	19
4 portions or more but less than 5	15	13	12	12	10
5 portions or more	31	25	20	15	16
Mean	4.1	3.5	3.2	2.9	2.9
Standard error of the mean	0.14	0.15	0.11	0.10	0.11
Median	3.7	3.0	2.8	2.3	2.7
<b>Girls</b>					
None	1	3	4	6	5
Less than 1 portion	3	3	4	4	2
1 portion or more but less than 2	15	12	17	17	19
2 portions or more but less than 3	19	23	22	22	24
3 portions or more but less than 4	20	21	22	21	19
4 portions or more but less than 5	15	12	12	12	12
5 portions or more	27	26	18	18	18
Mean	3.8	3.8	3.3	3.1	3.1
Standard error of the mean	0.13	0.12	0.13	0.12	0.10
Median	3.5	3.2	3.0	3.0	3.0
<i>Bases (unweighted)</i>					
Boys	390	482	558	509	541
Girls	394	460	432	452	587
<i>Bases (weighted)</i>					
Boys	335	404	492	463	524
Girls	341	395	377	415	572

Table 10.6

**Knowledge of the recommended daily number of portions of fruit and vegetables, by age and sex**
*Aged 11-15* *2007*

Number of portions	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
None	-	0	0
One portion	2	2	2
Two portions	3	4	3
Three portions	8	9	8
Four portions	5	7	6
Five portions	64	62	63
More than five portions	8	7	8
Don't know	9	10	10
Mean <sup>a</sup>	4.9	4.7	4.8
Standard error of the mean	0.08	0.05	0.04
Median	5.0	5.0	5.0
<b>Girls</b>			
None	0	0	0
One portion	1	2	1
Two portions	1	2	2
Three portions	5	7	6
Four portions	5	4	4
Five portions	73	72	73
More than five portions	6	6	6
Don't know	8	7	7
Mean <sup>a</sup>	4.9	4.8	4.8
Standard error of the mean	0.04	0.05	0.03
Median	5.0	5.0	5.0
<i>Bases (unweighted)</i>			
Boys	506	779	1285
Girls	482	738	1220
<i>Bases (weighted)</i>			
Boys	425	719	1145
Girls	415	676	1091

<sup>a</sup> Bases for the mean, standard error of the mean and median are slightly smaller than those shown at the bottom of the table, due to the exclusion of the 'Don't know' category in their calculation.

Table 10.7

**Knowledge of what constitutes one portion of fruit or vegetables, by age and sex**
*Aged 11-15* *2007*

Knowledge of portion size <sup>a</sup>	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
Incorrect	20	16	17
Partially correct	61	60	60
Completely correct	20	24	22
<b>Girls</b>			
Incorrect	18	16	17
Partially correct	63	61	62
Completely correct	19	22	21
<i>Bases (unweighted)</i>			
Boys	496	779	1275
Girls	478	735	1213
<i>Bases (weighted)</i>			
Boys	418	720	1138
Girls	412	676	1088

<sup>a</sup> The list of fruit and vegetables comprised:

- 2 cherry tomatoes
- 1 apple
- 1 melon
- 4 grapes
- 1 jacket potato and
- 2 tablespoons of carrots.

The correct answer is 1 apple. Participants were classified as 'incorrect' if they did not specify the correct answer; 'partially correct' if they specified the correct answer and other answers; and 'completely correct' if they only specified the correct answer.

Table 10.8

**Perception of own diet,  
by age and sex***Aged 11-15**2007*

What you usually eat is...	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
Very healthy	12	13	13
Quite healthy	73	69	70
Not very healthy	14	17	16
Very unhealthy	1	1	1
<i>Very healthy/ quite healthy</i>	85	82	83
<i>Not very healthy/ very unhealthy</i>	15	18	17
<b>Girls</b>			
Very healthy	15	11	13
Quite healthy	73	71	72
Not very healthy	12	17	15
Very unhealthy	0	1	1
<i>Very healthy/ quite healthy</i>	88	82	84
<i>Not very healthy/ very unhealthy</i>	12	18	16
<i>Bases (unweighted)</i>			
<i>Boys</i>	508	788	1296
<i>Girls</i>	482	744	1226
<i>Bases (weighted)</i>			
<i>Boys</i>	428	729	1157
<i>Girls</i>	415	684	1099

Table 10.9

**Attitudes to healthy eating, summary of agreement and disagreement, by sex***Aged 11-15<sup>a</sup>**2007*

Attitudes to healthy eating <sup>b</sup>	Strongly agree	Agree	Neither <sup>c</sup>	Disagree	Strongly disagree	Total agree	Total disagree
	%	%	%	%	%	%	%
<b>Boys</b>							
Healthy foods are enjoyable	17	47	29	6	2	64	8
The tastiest foods are the ones that are bad for you	9	29	37	20	6	38	25
I get confused over what's supposed to be healthy and what isn't	3	14	20	35	27	17	62
If you do enough exercise you can eat whatever you like	6	13	21	41	19	19	60
I don't really care what I eat	5	11	19	37	28	16	65
<b>Girls</b>							
Healthy foods are enjoyable	20	52	23	4	1	72	5
The tastiest foods are the ones that are bad for you	10	24	37	22	7	34	29
I get confused over what's supposed to be healthy and what isn't	4	16	20	39	21	20	60
If you do enough exercise you can eat whatever you like	3	9	21	46	21	12	68
I don't really care what I eat	2	8	17	40	32	10	73

<sup>a</sup> Bases for the first statement are:

Unweighted: Boys 1291 Girls 1223

Weighted: Boys 1152 Girls 1095

<sup>b</sup> Bases for other statements vary but are of similar size.<sup>c</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

Table 10.10

**Proportion agreeing with attitudes to healthy eating, by age and sex***Aged 11-15**2007*

Attitudes to healthy eating: % strongly agree/agree	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
Healthy foods are enjoyable	68	61	64
The tastiest foods are the ones that are bad for you	39	38	38
I get confused over what's supposed to be healthy and what isn't	20	16	17
If you do enough exercise you can eat whatever you like	15	22	19
I don't really care what I eat	14	18	16
<b>Girls</b>			
Healthy foods are enjoyable	76	70	72
The tastiest foods are the ones that are bad for you	31	35	34
I get confused over what's supposed to be healthy and what isn't	17	22	20
If you do enough exercise you can eat whatever you like	12	11	12
I don't really care what I eat	7	12	10
<i>Bases (unweighted)<sup>a</sup></i>			
Boys	507	784	1291
Girls	483	740	1223
<i>Bases (weighted)<sup>a</sup></i>			
Boys	427	725	1152
Girls	416	679	1095

<sup>a</sup> Bases shown are for the first statement. Bases for other statements vary but are similar of size.

Table 10.11

**Proportion agreeing with attitudes to healthy eating, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 11-15

2007

Attitudes to healthy eating: % strongly agree/agree	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>											
Healthy foods are enjoyable	70	72	62	65	62	57	56	62	66	71	61
The tastiest foods are the ones that are bad for you	37	44	37	46	41	30	42	32	35	33	37
I get confused over what's supposed to be healthy and what isn't	22	24	16	20	14	14	14	15	18	15	21
If you do enough exercise you can eat whatever you like	23	19	18	19	21	19	27	15	15	15	16
I don't really care what I eat	13	14	19	15	20	17	18	12	17	13	21
<b>Girls</b>											
Healthy foods are enjoyable	72	67	75	75	73	74	72	75	69	77	63
The tastiest foods are the ones that are bad for you	44	35	40	35	26	28	30	33	36	34	38
I get confused over what's supposed to be healthy and what isn't	30	20	20	21	19	19	19	21	18	21	16
If you do enough exercise you can eat whatever you like	7	13	13	11	11	12	15	8	10	7	13
I don't really care what I eat	9	13	8	8	11	12	8	12	10	14	7
<i>Bases (unweighted)<sup>b</sup></i>											
Boys	56	181	157	132	128	141	135	126	235	120	115
Girls	59	169	140	120	128	148	137	121	201	88	113
<i>Bases (weighted)<sup>b</sup></i>											
Boys	48	170	141	99	118	128	139	111	197	101	96
Girls	53	150	121	96	113	135	151	109	169	74	95

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the new configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Bases shown are for the first statement. Bases for other statements vary but are similar of size.



Table 10.12

**Proportion agreeing with attitudes to healthy eating, by  
equivalised household income and sex**

Aged 11-15

2007

Attitudes to healthy eating: % strongly agree/agree	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Boys</b>					
Healthy foods are enjoyable	64	66	59	63	68
The tastiest foods are the ones that are bad for you	30	29	37	44	39
I get confused over what's supposed to be healthy and what isn't	15	13	15	24	20
If you do enough exercise you can eat whatever you like	13	16	18	24	21
I don't really care what I eat	9	14	16	16	23
<b>Girls</b>					
Healthy foods are enjoyable	76	69	77	74	73
The tastiest foods are the ones that are bad for you	22	30	38	35	35
I get confused over what's supposed to be healthy and what isn't	11	16	17	19	25
If you do enough exercise you can eat whatever you like	6	11	7	13	13
I don't really care what I eat	6	10	14	8	10
<i>Bases (unweighted)<sup>a</sup></i>					
Boys	192	210	227	228	226
Girls	167	181	183	210	265
<i>Bases (weighted)</i>					
Boys	164	172	203	207	221
Girls	145	152	162	187	258

<sup>a</sup> Bases shown are for the first statement. Bases for the other statements vary but are similar of size.

Table 10.13

**Proportion agreeing with attitudes to healthy eating, by perception of own diet, age and sex**

Aged 11-15

2007

Attitudes to healthy eating: % strongly agree/agree	Age				Total	
	11-12		13-15			
	Healthy	Unhealthy	Healthy	Unhealthy	Healthy	Unhealthy
	%	%	%	%	%	%
<b>Boys</b>						
Healthy foods are enjoyable	71	50	67	35	68	40
The tastiest foods are the ones that are bad for you	38	47	33	61	35	57
I get confused over what's supposed to be healthy and what isn't	19	26	14	24	16	24
If you do enough exercise you can eat whatever you like	14	23	19	34	17	30
I don't really care what I eat	11	31	14	34	13	33
<b>Girls</b>						
Healthy foods are enjoyable	78	56	76	42	77	47
The tastiest foods are the ones that are bad for you	28	50	32	53	30	52
I get confused over what's supposed to be healthy and what isn't	16	23	21	27	19	26
If you do enough exercise you can eat whatever you like	11	17	12	10	11	12
I don't really care what I eat	6	18	8	31	7	27
<i>Bases (unweighted)<sup>a</sup></i>						
Boys	431	74	636	145	1067	219
Girls	419	62	613	126	1032	188
<i>Bases (weighted)<sup>a</sup></i>						
Boys	363	62	592	130	955	193
Girls	363	51	559	119	922	170

<sup>a</sup> Bases shown are for the first statement. Bases for the other statements vary but are similar of size.

Table 10.14

<b>Barriers to improving diet, by age and sex</b>			
<i>Aged 11-15</i>		<i>2007</i>	
Barriers to improving diet	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
I eat what I'm given	28	22	24
Doesn't satisfy hunger	18	22	21
Don't like healthy foods	20	17	18
Lack of motivation	13	16	15
Don't want to change eating habits	16	12	14
No healthy options at school	10	8	9
No healthy options at home	4	2	3
<b>Girls</b>			
I eat what I'm given	22	21	22
Doesn't satisfy hunger	17	24	21
Don't like healthy foods	12	15	14
Lack of motivation	12	24	19
Don't want to change eating habits	11	9	10
No healthy options at school	12	10	11
No healthy options at home	5	4	5
<i>Bases (unweighted)</i>			
Boys	504	771	1275
Girls	476	741	1217
<i>Bases (weighted)</i>			
Boys	425	713	1137
Girls	410	679	1089

Table 10.15

<b>Factors that would encourage improvement in diet, by age and sex</b>			
<i>Aged 11-15</i>		<i>2007</i>	
Encouraging factors	Age		Total
	11-12	13-15	
	%	%	%
<b>Boys</b>			
Being given healthier food	32	30	31
Advice from parent	36	22	27
Being motivated to	16	27	23
TV adverts	23	17	19
Information leaflets	16	12	13
Advice from friend or brother or sister	12	12	12
Advice from school nurse	16	9	12
Advice from teacher	15	9	11
No changes needed	28	22	24
<b>Girls</b>			
Being given healthier food	36	35	35
Advice from parent	35	23	28
Being motivated to	21	33	28
TV adverts	26	18	21
Information leaflets	24	13	17
Advice from friend or brother or sister	16	13	14
Advice from school nurse	17	9	12
Advice from teacher	18	6	11
No changes needed	24	16	19
<i>Bases (unweighted)</i>			
Boys	492	747	1239
Girls	465	721	1186
<i>Bases (weighted)</i>			
Boys	413	692	1106
Girls	399	663	1062

Table 10.16

**Estimated odds ratios for perception of eating a healthy diet, by associated risk factors and sex**

Aged 11-15 with valid response on how healthy they perceive their diet to be

2007

Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>	Perceive own diet as healthy	N	Odds ratio	95% C.I. <sup>a</sup>
<b>Boys</b> Base (weighted) 1157				<b>Girls</b> Base (weighted) 1099			
<b>Equivalised income quintiles (p=0.928)</b>				<b>Equivalised income quintiles (p=0.005)</b>			
Highest	223	1		Highest	260	1	
2nd	207	0.98	(0.58-1.66)	2nd	186	1.81	(1.03-3.19)
3rd	205	1.04	(0.60-1.81)	3rd	163	2.68	(1.45-4.96)
4th	173	1.16	(0.66-2.02)	4th	154	2.98	(1.47-6.05)
Lowest	164	1.25	(0.68-2.29)	Lowest	145	1.20	(0.66-2.18)
Not known	185	1.17	(0.67-2.07)	Not known	191	2.35	(1.34-4.13)
<b>Consumption of fruit and vegetables (p&lt;0.001)</b>				<b>Consumption of fruit and vegetables (p&lt;0.001)</b>			
5 portions or more	230	1		5 portions or more	233	1	
3-4 portions	328	0.43	(0.21-0.89)	3-4 portions	366	0.39	(0.18-0.83)
Less than 3 portions	599	0.20	(0.10-0.40)	Less than 3 portions	500	0.18	(0.09-0.36)
<b>Perception of weight (p&lt;0.001)</b>				<b>Perception of weight (p&lt;0.001)</b>			
Right weight	690	1		Right weight	530	1	
Too heavy	131	0.32	(0.20-0.51)	Too heavy	191	0.29	(0.17-0.48)
Too light	120	0.82	(0.47-1.43)	Too light	68	0.59	(0.30-1.16)
Not known	215	0.73	(0.48-1.11)	Not known	310	0.91	(0.55-1.50)
<b>Perception of levels of own physical activity (p&lt;0.001)</b>				<b>Perception of levels of own physical activity (p&lt;0.001)</b>			
Very physically active	477	1		Very physically active	316	1	
Fairly physically active	554	0.91	(0.62-1.34)	Fairly physically active	596	0.71	(0.44-1.14)
Not physically active	114	0.33	(0.20-0.54)	Not physically active	177	0.32	(0.19-0.57)
Not known	12	b		Not known	9	b	
<b>Healthy foods are enjoyable (p&lt;0.001)</b>				<b>Healthy foods are enjoyable (p&lt;0.001)</b>			
Agree	729	1		Agree	789	1	
Disagree	89	0.30	(0.17-0.52)	Disagree	56	0.20	(0.10-0.39)
Neither	330	0.50	(0.34-0.74)	Neither	247	0.41	(0.28-0.62)
Not known	9	b		Not known	7	b	
<b>The tastiest foods are the ones that are bad for you (p=0.004)</b>				<b>The tastiest foods are the ones that are bad for you (p=0.049)</b>			
Agree	440	1		Agree	367	1	
Disagree	288	2.08	(1.28-3.38)	Disagree	320	1.83	(1.12-2.99)
Neither	420	1.58	(1.08-2.30)	Neither	402	1.32	(0.88-1.99)
Not known	9	b		Not known	10	b	
<b>I don't really care what I eat (p&lt;0.001)</b>				<b>I don't really care what I eat (p&lt;0.001)</b>			
Agree	188	1		Agree	111	1	
Disagree	748	2.87	(1.95-4.22)	Disagree	793	5.08	(3.07-8.44)
Neither	213	1.82	(1.14-2.90)	Neither	188	2.77	(1.54-4.96)
Not known	9	b		Not known	8	b	

<sup>a</sup> Confidence interval.<sup>b</sup> Results not shown due to small bases.

# Children's smoking and exposure to others' smoke



Soazig Nicholson and Jennifer Mindell

## Summary

- This chapter presents findings on the prevalence of smoking among children aged 8-15 and of exposure to other people's smoke (secondhand smoke) among those aged 0-15. Smoking prevalence is measured using self-reported behaviour and salivary cotinine, a metabolite of nicotine and indicator of current smoking. Salivary cotinine has also been used to assess recent exposure to tobacco smoke.
- A small proportion (2%) of children aged 8-15 reported that they were regular smokers (at least one cigarette a week). This was higher for older children, with 8% of boys aged 15 and 10% of girls aged 15 reporting that they smoked regularly.
- Salivary cotinine is likely to be a more accurate indicator of children's smoking status than self-report, and is a strength of the HSE methodology. The proportion of children aged 8-15 with a cotinine level of 15ng/ml or more (indicative of smoking) was higher than the proportion of children that reported regular smoking. This was particularly true of older children, with 20% of those aged 15 having a cotinine level of 15ng/ml or more, but only 9% reporting that they were regular smokers.
- Overall, the proportion of children aged 4-15 who had a cotinine level indicative of smoking (15ng/ml) was small: 3% of children.
- Mean cotinine levels were significantly higher for children living in a household where one or more adults smoked regularly than where no adults smoked regularly (11.5ng/ml compared with 1.5ng/ml), as was the percentage of children with cotinine levels indicative of actual smoking (7% compared with 1%).
- For girls, mean cotinine levels decreased as income quintile increased. The mean level for girls in the lowest income quintile was 9.5ng/ml, compared with 0.6ng/ml in the highest quintile. The pattern was less clear for boys.
- No differences were found in self-reported smoking behaviour or cotinine levels before and after the introduction of the smokefree legislation in England on 1st July 2007.
- No significant differences were found in the exposure to smoke of children before and after the introduction of the smokefree legislation. However, the proportion of children aged 0-12 who were exposed to smoke for two or more hours by a carer was lower than in 2006. When asked whether they minded being exposed to other people's smoke, 59% of boys and 60% of girls who reported exposure said that they did.
- Nearly all children aged 13-15 thought that breathing in other people's smoke had some effect on young people (97%). When these children were asked what the health effects were, the most commonly identified effects were coughing (identified by 78% of boys, 81% of girls), asthma or the worsening of asthma (identified by 68% of boys, 77% of girls) and cancer (identified by 67% of boys, 64% of girls).

## 11.1 Introduction

This chapter examines the prevalence of smoking among children aged 8-15, and the exposure to other people's smoke of children aged 0-15. Self-reported and biological measures of smoking and exposure to smoke are analysed with reference to the new smokefree legislation in England. This provides early data on the impact of the legislation on children's smoking and exposure to secondhand smoke in England. Results are also presented by age, sex, region and household income, and comparisons are made with results from previous years of the survey.

### 11.1.1 Exposure to other people's smoke

Exposure to secondhand tobacco smoke, also known as passive smoking, environmental tobacco smoke, or tobacco smoke pollution, is widely accepted to have a negative impact on health. A recent report investigating these health consequences concluded that there is no risk-free level of exposure to secondhand smoke.<sup>1</sup> Children are particularly at risk from the effects of this exposure.<sup>2</sup> They have more rapid respiratory rates, which means that they take proportionately more secondhand smoke into their lungs than adults. Their developing organs are also at greater risk from exposure to toxins. A recent British Medical Association (BMA) Scientific Board report summarised the evidence that exposure to secondhand smoke causes illnesses including cot death, respiratory illnesses, impaired lung function, middle-ear disease and asthma. There is also evidence suggesting that exposure to secondhand smoke can cause childhood cancers, cancer in adulthood, meningitis, and the initiation of cardiovascular disease.<sup>3</sup>

The BMA report built on previous work looking at secondhand smoke, including the work of the government's independent Scientific Committee on Tobacco and Health (SCOTH), whose 1998 report highlighted the adverse consequences of secondhand smoke for both children and adults. It concluded that 'Restrictions on smoking in public places and work places are necessary to protect non smokers. Parents need to be informed about the effects of secondhand smoke on their children.'<sup>4</sup>

On 1st July 2007 a new law came into force in England to make virtually all enclosed public places and workplaces in England smokefree.<sup>5</sup> The legislation was introduced with the recognition that individuals have a right to be protected from the harm of secondhand smoke. The aim of the legislation was to reduce ill-health and the number of deaths from medical conditions caused or exacerbated by secondhand smoke. This followed the earlier implementation of similar comprehensive smokefree legislation in Ireland (March 2004), Scotland (March 2006), and Wales (April 2007). Although the long-term impact of the smokefree legislation in these countries is not yet known, early evidence from Scotland has shown that exposure to secondhand smoke has reduced among young people.<sup>6</sup>

One concern about the implementation of smokefree legislation was that it might lead to increased smoking by adults in the home, and therefore increased exposure of children to secondhand smoke. Evidence from other countries suggests that this concern is unfounded, and in fact that smokefree laws have actually reduced smoking in the home, particularly around young children.<sup>6,7,8</sup>

### 11.1.2 Smoking

As well as the risks children face from exposure to secondhand smoke, many children suffer ill-health from smoking themselves. Impacts of childhood smoking include respiratory illness and increased risk of cancer and cardiovascular disease.<sup>3</sup> There is also evidence of an association between children smoking and other risky behaviours such as using alcohol or drugs.<sup>2,9</sup> There is evidence that nicotine dependence in adolescents can occur within weeks of beginning occasional tobacco use.<sup>10</sup> Those who start smoking during childhood are more likely to continue smoking as adults, and less likely to give up than those who start smoking in later life. They are also likely to consume more cigarettes and suffer from a greater addiction to tobacco.<sup>9,11</sup> These, combined with a greater susceptibility of immature organs, result in increased risk from illnesses associated with smoking such as cancers and cardiovascular disease.<sup>3</sup>

In addition to targets to reduce overall smoking prevalence among adults that have been set out in Department of Health publications over the last decade, the 1998 White Paper *Smoking Kills*<sup>12</sup> set a target to reduce smoking prevalence among 11-15 year olds to nine percent by 2010.

This chapter focuses primarily on data from 2007, with some trend data presented on smoking frequency and cotinine levels. Trend data on smoking and other key variables are also available in *Health Survey for England 2007 Latest Trends* on The NHS Information Centre's website.<sup>13</sup>

## 11.2 Methodology

### 11.2.1 Questions about cigarette smoking

Questions on children's smoking have been included in the Health Survey for England (HSE) every year since 1995. As with the 1997, 2002 and 2006 Health Surveys, in 2007 the HSE sample was designed to boost the number of children surveyed. Most of the analysis in this chapter is based on a single year's data, because the sample provided a sufficiently large number of children. However, cotinine results are available only for children in the core sample who had a nurse visit. Therefore for some cotinine analyses, 2006 and 2007 data have been aggregated to increase sample sizes.

To ensure greater privacy for those who do not want their parents to hear their responses and to encourage more honest answers, questions about cigarette smoking were collected by self-completion questionnaire. Children aged 8-15 were asked whether they had ever tried a cigarette, and if so how often they smoked cigarettes (if at all) and how many cigarettes they had smoked in the last week (if any).

### 11.2.2 Exposure to other people's smoke

A question about exposure to other people's smoke was asked of parents/guardians to establish whether those aged 0-12 were looked after for at least two hours a week by someone who smoked whilst looking after them, and for how many hours a week they were exposed to other people's smoke. Those aged 13-15 were asked how many hours a week they were exposed to other people's smoke. In addition, a question to establish how many people smoked inside the home on most days was asked of a responsible adult.

The self completion booklets for those aged 8-15 also contained two questions about whether participants were often near people who were smoking in different locations (such as home, buses or trains, other people's homes), and if so, whether this bothered them.

A new question introduced in HSE 2007 assessed knowledge about the health risks to young people of exposure to other people's smoke. This question was asked of those aged 13-15.

### 11.2.3 Cotinine measurements

Saliva samples were taken from children aged 4-15 in the core sample during the nurse visit and were analysed for cotinine. This is a metabolite of nicotine which provides an indicator of recent exposure to tobacco smoke. Cotinine is generally considered the most useful of the various biological markers that are indicators of smoking.<sup>14</sup> As with the 1997, 2002 and 2006 reports, data from different years have been aggregated in order to provide a sufficient number of children for the analysis; the 2007 report aggregates the 2006 and 2007 cotinine data.

A saliva cotinine level of 15 or more nanograms per millilitre (ng/ml) has generally been regarded as indicative of smoking, and in most cases is unlikely to be due to anything other than direct inhalation or other personal use of tobacco.<sup>15,16</sup> Cotinine has a half-life in the body of between 16-20 hours, which means that it will detect regular smoking but may not detect occasional smoking if the last occasion was several days ago.<sup>16</sup> Sources of cotinine other than tobacco can for practical purposes be ignored.<sup>17</sup>

While inhalation of second-hand smoke can produce measurable levels of cotinine in non-smokers, it is only rarely likely to produce readings as high as 15ng/ml. The measurement of cotinine in HSE provides an objective check on self-reported smoking behaviour. This is particularly useful in the case of children who may wish to conceal their behaviour from other household members who may be present during the interview.

Cotinine levels for this survey are measured using a very sensitive gas chromatography method (see Section 9, Volume 2, Methodology and Documentation). The limit of detection is 0.1ng/ml.<sup>18</sup> Levels below this indicate no exposure at all to tobacco smoke.<sup>19</sup> Saliva cotinine levels of 0.1ng/ml to 15ng/ml indicate exposure to secondhand smoke.<sup>15,16</sup>

#### 11.2.4 Smokefree legislation

On 1st July 2007 new legislation was introduced in England which made virtually all enclosed public places smokefree.<sup>5</sup> Where relevant and numbers permit, analyses have been separated into responses or saliva samples collected before 1st July 2007 and those on or after that date. Some detailed analyses are not possible at this stage because of small base sizes when separating the sample into pre and post 1st July. These will be possible in the future when more than one year's data can be combined.

#### 11.2.5 Weighting the data

Weights were applied to all 2007 data to correct for non-response to the interview. Weights were also applied specifically to the cotinine data to correct for non-response to the nurse visit and saliva sample.

### 11.3 Smoking and exposure to others' smoke

#### 11.3.1 Children's self-reported smoking behaviour

The proportion of children reporting that they had ever tried a cigarette increased with age, as would be expected. At age eight, 1% of boys and less than 0.5% of girls reported that they had ever smoked a cigarette. However, among those aged 15, 38% of boys and 37% of girls reported ever having smoked. As with previous years, the increase was most marked after the age of 11.

There was a similar pattern by age in the number of children reporting that they smoked regularly (one or more cigarettes a week). No children aged 8-11 were classed as regular smokers but by age 15, 8% of boys and 10% of girls fell into this category. Among those aged 13-15 who had ever smoked, 26% of boys and 28% of girls reported having smoked in the last week.

A comparison of the self-reported smoking prevalence in 2007 with that presented in previous HSE reports indicates that overall children's smoking status has remained relatively stable over the period examined. However, there has been an increase in the proportion of older children who do not smoke cigarettes since 2001-2002. For example in 2001-2002, 80% of girls and 82% of boys aged 15 did not smoke, compared with 87% of girls and 89% of boys aged 15 in 2007.

Tables 11.1, 11.2, 11.3

#### 11.3.2 Children's exposure to other people's smoke

Children's exposure to other people's smoke was analysed with reference to the introduction of smokefree legislation in England on 1st July 2007. There was no significant difference in the proportion of children aged 0-12 whose parents reported that they were exposed to smoke for two or more hours by a carer before and after the legislation was introduced.

Overall, the proportion of children aged 0-12 who were exposed to smoke for two or more hours by a carer was lower than in 2006. 7% of both boys and girls were exposed to smoke by a carer, compared with 18% in 2006.

Table 11.4



Parents of children aged 0-12 were asked how many hours per week their child was exposed to other people's smoke. This question was asked directly of children aged 13-15 in the self-completion booklet. Overall, no significant difference was seen in the relatively small proportion of children being exposed to smoke for 15 hours or more per week when comparing before and after the 1st July 2007. However, fewer children were exposed to smoke for 1-14 hours per week after the smoke free legislation was introduced (25% compared with 32% before for boys, 25% compared with 29% for girls). This resulted in a greater proportion of children not being exposed to smoke at all after the smoke free legislation (70% compared with 62% before for boys, 69% compared with 64% for girls). This shift was particularly notable in the younger age groups and was not significant among those aged 13-15.

In spite of the change the proportion of children who were not exposed to smoke after the 1st July, there was no significant difference in the mean number of hours children were exposed to smoke. The mean for boys was 3.5 hours before the 1st July, 3 hours after. For girls the mean was 4.2 hours before the 1st July, 3.5 hours after.

**Table 11.5**

Children aged 8-15 were asked about the locations in which they were exposed to smoke. The most common locations were in other people's homes (28% of boys, 30% of girls) and at their own home (27% of boys, 25% of girls). There were highly significant falls before and after 1st July 2007 in reported exposure on public transport (from 15% in boys and 16% in girls to 9% and 10% respectively) but no other significant changes in exposure were noted. When asked whether they minded being exposed to other people's smoke, 59% of boys and 60% of girls who reported exposure said that they did, with no variation pre and post ban.

**Table 11.6**

### 11.3.3 Cotinine analysis

Valid cotinine samples were obtained from 80% of eligible participants aged 4-15. Table 11.7 examines the characteristics of those cases, and compares them with the total interviewed sample for age and cigarette smoking status. As in previous years, the sample aged 4-15 with a valid cotinine assay included fewer younger children and slightly over-represented older children, compared with the total sample aged 4-15 who were interviewed. This slight imbalance has been corrected with weighting (see 11.2.5 and Volume 2, Methodology and Documentation, Chapter 7.2.8).

**Table 11.7**

Mean cotinine levels were low among younger children (aged 4-12) and increased among those aged 13-15. The overall mean cotinine level was 3.9ng/ml and this did not change significantly before and after 1st July. The median level was 0.1ng/ml. This is considerably lower than the mean since many children were not smoking or exposed to others' smoke, while small numbers of children had very high cotinine levels because of their own smoking, and these high values have skewed the mean.<sup>20</sup> Few children had a cotinine level of 15ng/ml or above, indicative of active smoking (3%, no significant difference before and after 1st July). 40% of children had no detectable cotinine in their saliva, indicating that they had not been exposed to smoke at all. Again, there was no significant change in this proportion before and after 1st July.

**Tables 11.8, 11.9**

Cotinine levels were significantly higher for children living in a household where one or more adults smoked regularly than where no adults smoked regularly. Not only were mean cotinine levels higher in these households (11.5ng/ml compared with 1.5ng/ml), but so was the percentage of children with cotinine levels indicative of actual smoking (7% compared with 1%). Furthermore, children from these households were much less likely to have no detectable cotinine in their saliva (7% compared with 50%).

**Table 11.10**

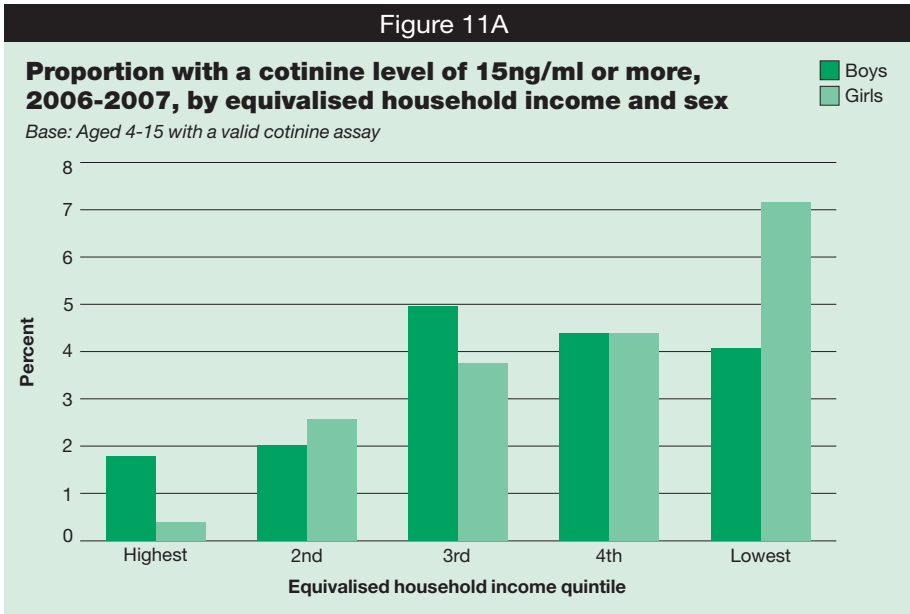
Mean cotinine levels varied significantly by region. However, it should be noted that the base sizes for each region were small and, overall, no region stood out.

**Table 11.11**

Cotinine levels also varied significantly by equivalised household income. Mean cotinine levels decreased as income quintile increased. The mean level for girls in the lowest income quintile was 9.5ng/ml, compared with 0.6ng/ml in the highest quintile. The pattern was less clear for boys. As Figure 11A shows, the proportion of children with a cotinine level indicative of actual smoking also decreased as income quintile increased. The proportion of children

with no detectable cotinine was highest in the highest income quintile (54% of boys, 57% of girls) and lowest in the lowest quintiles (22% in the 4th and lowest quintiles for boys and 22% in the lowest quintile for girls).

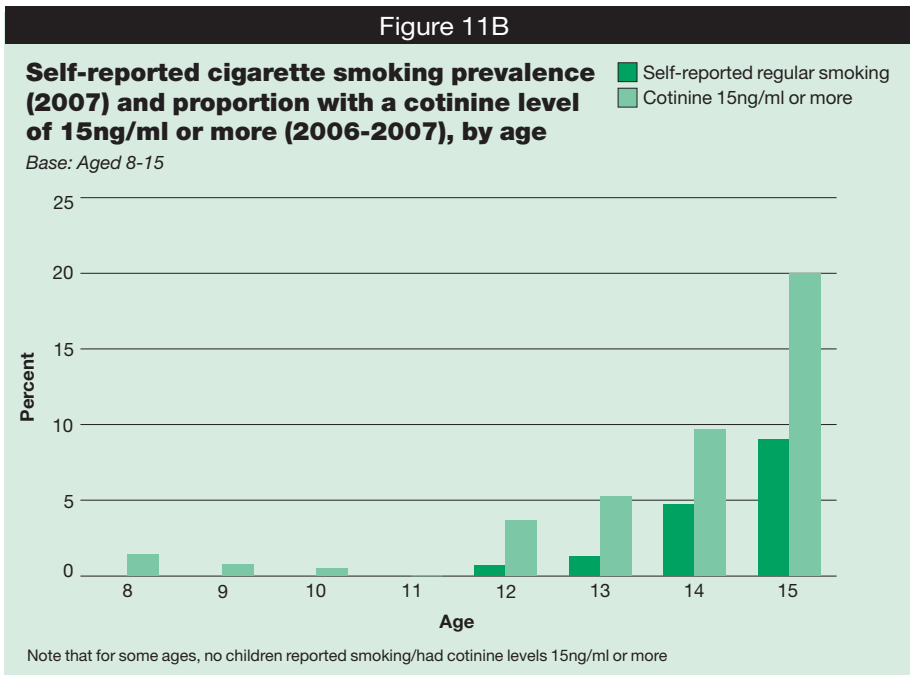
Table 11.12, Figure 11A



### 11.3.4 Cotinine levels and self-reported smoking

Previous Health Survey reports have shown that in general, children who report that they are smokers have a saliva cotinine level of 15ng/ml or more. However, comparison of self-reports with cotinine results has suggested that a small proportion of children smoke but do not admit to doing so. These patterns hold for the 2007 data, where the proportion of children aged 8-15 with a cotinine result of 15ng/ml or more (2006-2007 data combined) was higher than the proportion who reported regular smoking (2007 data). Of those aged 15, high cotinine prevalence was 21% for boys and 19% for girls, whereas only 8% of boys and 10% of girls reported regular smoking.

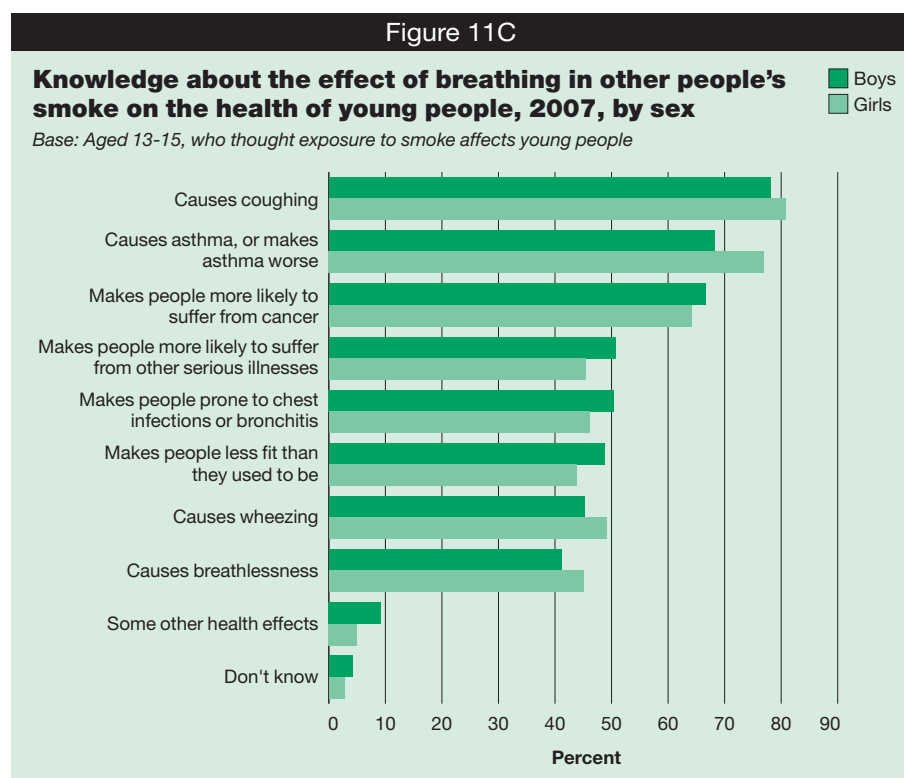
Tables 11.1, 11.13, Figure 11B



### 11.3.5 Knowledge about the health risks of exposure to smoke

Children aged 13-15 were asked about the effect of breathing in other people's smoke on the health of young people. In total, 97% of children thought that this had some effect on young people, including 40% of children who thought that it affected young people a great deal. Those children who thought that exposure to smoke affects young people were asked to identify from a list in what ways health was affected. As shown in Figure 11C, the most commonly identified health effects were coughing (identified by 78% of boys, 81% of girls), asthma or the worsening of asthma (identified by 68% of boys, 77% of girls) and cancer (identified by 67% of boys, 64% of girls).

Table 11.14 Figure 11C



## 11.4 Discussion

As in 2006, the 2007 results show no significant differences between girls and boys in self-reported smoking behaviour or cotinine levels. The prevalence of smoking increased with age, with very few children under the age of 12 saying that they had ever smoked. This result was consistent with analysis of cotinine results, which showed that few young children had a cotinine level of 15ng/ml or more.

As in previous years, the proportion of children reporting that they were regular smokers was lower than the proportion of children with a cotinine level indicative of smoking. The self-reported smoking prevalence presented here is also lower than that found in the survey of Drug Use, Smoking and Drinking among Young People (SDD 2007).<sup>21</sup> For example, in SDD 12% of boys and 19% of girls aged 15 reported that they were regular smokers, compared with 8% of boys and 10% of girls in HSE. These findings suggest that the HSE self-reported data may give an underestimate of smoking prevalence. This may be because children are reluctant to report smoking behaviours when parents are present, even when the questions are administered in a self-completion booklet, whereas for SDD children complete the self-completion booklets at school. This should be borne in mind when interpreting the self-reported data presented in this chapter.

Children's cotinine levels varied by whether there were any adults smoking in the household or not. This was true both for levels indicative of passive smoking, and also for active smoking. Cotinine levels also varied by equivalised household income, reflecting known

differences in adult smoking prevalence (see Chapter 6 of this report, Adults' smoking and tobacco exposure). This emphasises the importance of reducing adult smoking prevalence as the key to reducing both initiation of smoking in children and children's exposure to tobacco smoke.

Analyses were carried out with reference to the new smokefree legislation which was implemented in England on 1st July 2007. However, no significant differences were found in any of the measures (children's self-reported smoking, exposure, and cotinine results). A number of explanations can be suggested for this. First, these analyses are based on small numbers, so real changes may not show as being significant. It will be possible to look into this further when more data become available for HSE 2008. Secondly, there have been gradual increases in the number and type of premises that have become smokefree over the past few years, so the impact across the whole population of the implementation of the legislation may be less dramatic. Thirdly, it may take time for people to change their behaviour where the legislation does not apply.

The most important finding is that this survey has not found that children living with smokers are more exposed at home than previously, confirming findings from elsewhere.<sup>6,7,8</sup> It will be important to continue to monitor this, and to reanalyse the data with greater power when more samples are available.

In 2007, children were asked for the first time about their knowledge of the effect of passive smoking on young people. Nearly all children knew that there were some health effects, of which coughing and asthma or the worsening of asthma were the best known. However, only two-thirds of children knew cancer was a possible effect, and half or fewer knew about other health effects, so there is scope for further health education to increase general understanding of the importance of protecting children from other people's tobacco smoke.

## References and notes

- 1 US Department of Health and Human Services. *The Health Consequences of involuntary Exposure to Tobacco Smoke: A report of the Surgeon General*. National Centre for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Atlanta, 2006.
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- 11.1 Self-reported cigarette smoking status, by age and sex
- 11.2 Self-reported cigarette smoking in the last week, by age and sex
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Table 11.1

**Self-reported cigarette smoking status, by age and sex**Aged 8-15 2007

Self-reported smoking status	Age								Total
	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%
<b>Boys</b>									
Have ever smoked	1	3	1	5	11	12	20	38	12
Never smoked	99	97	99	95	89	88	80	62	88
Only smoked once or twice	1	3	1	4	8	8	11	20	7
Used to smoke, but don't now	0	-	-	1	1	1	3	8	2
Smoke sometimes, not every week	-	-	-	0	-	2	2	2	1
Smoke 1-6 cigarettes per week	-	-	-	-	-	0	1	1	0
Smoke more than 6 cigarettes per week	-	-	-	-	1	1	4	7	2
<i>All regular smokers (one or more cigarettes a week)</i>	-	-	-	-	1	1	5	8	2
<b>Girls</b>									
Have ever smoked	0	1	2	2	7	16	22	37	11
Never smoked	100	99	98	98	93	84	78	63	89
Only smoked once or twice	0	1	2	2	5	10	12	17	6
Used to smoke sometimes	-	-	0	-	2	4	3	7	2
Smoke sometimes, not every week	-	-	-	-	0	0	2	3	1
Smoke 1-6 cigarettes per week	-	-	-	-	-	0	1	1	0
Smoke more than 6 cigarettes per week	-	-	-	-	-	1	3	9	2
<i>All regular smokers (one or more cigarettes a week)</i>	-	-	-	-	-	2	5	10	2
<i>Bases (unweighted)</i>									
Boys	244	217	271	257	253	288	267	236	2033
Girls	225	230	236	222	264	283	240	225	1925
<i>Bases (weighted)</i>									
Boys	222	193	225	212	216	247	261	224	1800
Girls	204	207	217	205	214	233	234	221	1734

Table 11.2

**Self-reported cigarette smoking in the last week, by age and sex***Aged 13-15 who have ever smoked<sup>a</sup>*

2007

Whether smoked in the last week	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
Yes	[23]	26	27	26
No	[77]	74	73	74
<b>Girls</b>				
Yes	[15]	31	32	28
No	[85]	69	68	72
<i>Bases (unweighted)</i>				
Boys	35	52	89	176
Girls	46	55	78	179
<i>Bases (weighted)</i>				
Boys	30	53	86	169
Girls	37	50	80	167

<sup>a</sup> Fewer than 0.5% of children aged 8-12 have smoked in the last week, and this age group has therefore not been included in the table.



Table 11.3

**Self-reported cigarette smoking in the last week, 1995-1997, 2001-2002, 2006 and 2007, by age and sex**

Aged 8-15

1995-1997, 2001-2002, 2006, 2007

Whether smoked in the last week	Age								Total
	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%
<b>Boys</b>									
<b>1995-1997</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	99	99	96	91	83	96
Smoke cigarettes, less than once a week	-	0	-	1	1	2	4	4	1
Smoke cigarettes, once a week or more often	-	-	-	1	0	2	5	13	3
<b>2001-2002</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	100	98	96	93	82	96
Smoke cigarettes, less than once a week	0	0	-	0	1	2	3	4	1
Smoke cigarettes, once a week or more often	-	-	-	-	1	3	4	13	2
<b>2006</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	100	99	97	95	88	97
Smoke cigarettes, less than once a week	-	-	-	0	-	0	1	3	1
Smoke cigarettes, once a week or more often	-	-	-	-	1	3	4	10	2
<b>2007</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	100	99	97	93	89	97
Smoke cigarettes, less than once a week	-	-	-	0	-	2	2	2	1
Smoke cigarettes, once a week or more often	-	-	-	-	1	1	5	8	2
<b>Bases (unweighted)</b>									
Boys 1995-1997	542	471	507	483	506	456	469	455	3889
Boys 2001-2002	349	346	356	385	365	368	364	354	2887
Boys 2006	182	249	244	209	254	256	239	226	1859
Boys 2007	244	217	271	257	253	288	267	236	2033
<b>Bases (weighted)<sup>b</sup></b>									
Boys 1995-1997	519	446	477	441	462	443	425	419	3631
Boys 2001-2002	406	405	415	435	429	411	408	388	3298
Boys 2006	174	244	225	196	230	228	234	217	1747
Boys 2007	222	193	225	212	216	247	261	224	1800

<sup>a</sup> 'Don't smoke cigarettes' includes those who have never smoked, only smoked once or twice, or used to smoke sometimes.

<sup>b</sup> Data from before 2003 were weighted to correct for probabilities of selection; from 2003 selection and non-response weighting was applied.

Continued...

Table 11.3 continued

Aged 8-15

1995-1997, 2001-2002, 2006, 2007

Whether smoked in the last week	Age								Total
	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%
<b>Girls</b>									
<b>1995-1997</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	99	99	96	85	79	95
Smoke cigarettes, less than once a week	0	-	0	1	1	2	5	8	2
Smoke cigarettes, once a week or more often	-	-	-	-	1	2	10	14	3
<b>2001-2002</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	99	100	95	92	80	96
Smoke cigarettes, less than once a week	-	-	-	0	0	2	2	5	1
Smoke cigarettes, once a week or more often	-	-	-	0	0	3	6	15	3
<b>2006</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	100	99	97	91	85	96
Smoke cigarettes, less than once a week	-	-	-	-	1	3	2	3	1
Smoke cigarettes, once a week or more often	-	-	-	-	0	0	7	12	2
<b>2007</b>									
Don't smoke cigarettes <sup>a</sup>	100	100	100	100	100	98	93	87	97
Smoke cigarettes, less than once a week	-	-	-	-	0	0	2	3	1
Smoke cigarettes, once a week or more often	-	-	-	-	-	2	5	10	2
<b>Bases (unweighted)</b>									
Girls 1995-1997	534	469	525	473	461	446	484	423	3815
Girls 2001-2002	335	353	353	381	357	376	338	366	2859
Girls 2006	234	227	222	242	220	247	231	233	1856
Girls 2007	225	230	236	222	264	283	240	225	1925
<b>Bases (weighted)<sup>b</sup></b>									
Girls 1995-1997	519	437	489	452	433	411	428	374	3543
Girls 2001-2002	411	415	408	439	415	415	385	394	3282
Girls 2006	196	201	196	210	204	232	221	228	1687
Girls 2007	204	207	217	205	214	233	234	221	1734

<sup>a</sup> 'Don't smoke cigarettes' includes those who have never smoked, only smoked once or twice, or used to smoke sometimes.

<sup>b</sup> Data from before 2003 were weighted to correct for probabilities of selection; from 2003 selection and non-response weighting was applied.

Table 11.4

**Exposure to smoke, pre and post 1st July 2007, by age and sex***Aged 0-12**2007*

Exposure to smoke from carers	Aged 0-4		Aged 5-12		Total	
	Pre-1st July	Post-1st July	Pre-1st July	Post-1st July	Pre-1st July	Post-1st July
	%	%	%	%	%	%
<b>Boys</b>						
Looked after by a smoker for more than 2 hours a week	4	6	13	10	8	7
Not looked after by a smoker for more than 2 hours a week	96	94	87	90	92	93
<b>Girls</b>						
Looked after by a smoker for more than 2 hours a week	10	4	17	12	13	7
Not looked after by a smoker for more than 2 hours a week	90	96	83	88	87	93
<i>Bases (unweighted)</i>						
Boys	116	159	221	216	337	375
Girls	136	123	207	205	343	328
<i>Bases (weighted)</i>						
Boys	319	328	198	195	517	523
Girls	318	282	188	182	507	464

Table 11.5

**Reported weekly hours of exposure to other people's smoke, pre and post 1st July 2007, by age and sex**

Aged 0-15

2007

Hours per week exposed to smoke	Aged 0-4		Aged 5-12		Aged 13-15 <sup>b</sup>		Total	
	Pre-1st July 2007	Post-1st July 2007	Pre-1st July 2007	Post-1st July 2007	Pre-1st July 2007	Post-1st July 2007	Pre-1st July 2007	Post-1st July 2007
	%	%	%	%	%	%	%	%
<b>Boys</b>								
Not exposed	82	92	72	78	37	43	62	70
1-14 hours a week	15	7	24	19	52	46	32	25
15-28 hours a week	0	0	2	2	5	6	3	3
Over 28 hours a week	2	1	2	1	6	5	4	2
Mean number of hours exposed to others' smoke per week <sup>a</sup>	1.3	0.7	1.9	1.5	6.5	6.3	3.5	3.0
Standard error of mean	0.54	0.25	0.47	0.34	1.08	0.87	0.50	0.46
<b>Girls</b>								
Not exposed	85	93	70	80	39	41	64	69
1-14 hours a week	14	6	24	17	46	46	29	25
15-28 hours a week	1	0	3	1	6	6	3	3
Over 28 hours a week	0	0	3	2	9	7	4	3
Mean number of hours exposed to others' smoke per week <sup>a</sup>	1.2	0.4	2.6	2.1	8.1	7.2	4.2	3.5
Standard error of mean	0.33	0.18	0.43	0.45	1.03	0.93	0.49	0.46
<i>Bases (unweighted)</i>								
Boys	116	158	220	214	350	357	686	729
Girls	136	123	206	204	346	340	688	667
<i>Bases (weighted)</i>								
Boys	319	327	197	192	334	318	849	838
Girls	318	282	187	181	317	305	822	768

<sup>a</sup> 16 children said that they were exposed to smoke for more than 112 hours a week (i.e. more than 16 hours a day). These responses were capped at 112 hours before calculating the means.

<sup>b</sup> Children aged 13-15 answered these questions for themselves in a self-completion booklet, whereas parents of children aged 0-12 answered on their behalf during the CAPI interview.

Table 11.6

<b>Locations exposed to other people's smoke, pre and post 1st July, by sex</b>			
<i>Aged 8-15</i>		<i>2007</i>	
<b>Location of exposure<sup>a</sup></b>	<b>Pre-1st July</b>	<b>Post-1st July</b>	<b>Total</b>
	%	%	%
<b>Boys</b>			
At home	26	28	27
In other people's homes	30	27	28
On buses or trains	15	9	12
In pubs	-	-	-
In other places	48	42	45
Not exposed to other people's smoke	25	28	27
Whether bothered by exposure to other people's smoke <sup>b</sup>			
Yes	60	59	59
No	40	41	41
<b>Girls</b>			
At home	25	25	25
In other people's homes	30	29	30
On buses or trains	16	10	13
In pubs	-	-	-
In other places	47	42	45
Not exposed to other people's smoke	26	29	27
Whether bothered by exposure to other people's smoke <sup>b</sup>			
Yes	56	59	60
No	44	41	40
<b>Bases (unweighted)</b>			
<i>Location of exposure</i>			
Boys	1000	1031	2031
Girls	973	937	1910
<i>Whether bothered</i>			
Boys	729	721	1450
Girls	713	656	1369
<b>Bases (weighted)</b>			
<i>Location of exposure</i>			
Boys	897	903	1800
Girls	888	831	1719
<i>Whether bothered</i>			
Boys	654	634	1288
Girls	653	582	1235

<sup>a</sup> Children could select more than one answer.

<sup>b</sup> Among those reporting exposure to others' smoke.

Table 11.7

<b>Comparison of those for whom salivary cotinine was measured with the total sample, by sex, age and smoking status</b>				
<i>Aged 4-15 and eligible for cotinine measurement (core sample)<sup>a,b</sup></i>			<i>2007</i>	
<b>Age and smoking status</b>	<b>Boys</b>		<b>Girls</b>	
	Sample with cotinine assay	Total sample	Sample with cotinine assay	Total sample
	%	%	%	%
<b>Age (4-15)</b>				
4-6	21	26	21	26
7-9	22	22	24	26
10-12	28	25	26	22
13-15	29	27	29	25
<i>All</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
<b>Smoking status<sup>c</sup></b>				
Never smoked	88	89	85	86
Only smoked once or twice	8	8	10	9
Used to smoke, but don't now	2	2	3	2
Smoke sometimes, not every week	2	1	1	1
Smoke 1-6 cigarettes per week	-	0	-	1
Smoke 6+ cigarettes per week	0	0	2	2
<i>All regular smokers (one or more cigarettes a week)</i>	<i>0</i>	<i>0</i>	<i>2</i>	<i>2</i>
<b>Bases (unweighted)</b>				
<i>Aged 4-15</i>	<i>368</i>	<i>457</i>	<i>377</i>	<i>479</i>
<i>Aged 8-15 (with valid smoking status)</i>	<i>254</i>	<i>290</i>	<i>509</i>	<i>290</i>
<b>Bases (weighted)</b>				
<i>Aged 4-15</i>	<i>325</i>	<i>406</i>	<i>336</i>	<i>435</i>
<i>Aged 8-15 (with valid smoking status)</i>	<i>219</i>	<i>252</i>	<i>446</i>	<i>261</i>

<sup>a</sup> Cotinine is only measured in the core sample as part of the nurse visit.

<sup>b</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means in later tables.

<sup>c</sup> Smoking status questions are only asked of those aged 8-15.

Table 11.8

**Cotinine levels, by age<sup>a</sup>***Aged 4-15 with a valid cotinine assay<sup>b</sup> 2007*

Cotinine (ng/ml)	Age		Total
	4-12	13-15	
	%	%	%
Mean	1.3	10.9	3.9
Standard error of mean	0.34	2.32	0.70
75th percentile <sup>c</sup>	0.9	1.2	0.9
90th percentile	2.8	7.6	3.4
95th percentile	4.7	79.3	7.1
Median	0.1	0.1	0.1
% with cotinine 15ng/ml or more	1	8	3
% with no detectable cotinine	38	43	40
<i>Bases (unweighted)</i>	<i>537</i>	<i>208</i>	<i>745</i>
<i>Bases (weighted)<sup>d</sup></i>	<i>544</i>	<i>201</i>	<i>745</i>

<sup>a</sup> Boys and girls have been combined in this table to give sufficient base sizes; there was little variation by sex.

<sup>b</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.

<sup>c</sup> Percentiles have been presented in this table for reference only. The percentiles show a set of points within a scale from 1-100 which is divided into groups based on order of magnitude. For example, those with a cotinine value that is equal to or greater than the value of 90% of those who gave a cotinine measurement is expressed as the 90th percentile.

<sup>d</sup> Data have been weighted to correct for non-response to the saliva sample.

Table 11.9

**Cotinine levels, pre and post 1st July 2007, by age<sup>a</sup>***Aged 4-15 with a valid cotinine assay<sup>b</sup>**2007*

Cotinine (ng/ml)	Age				Total	
	4-12		13-15			
	Pre-1st July	Post-1st July	Pre-1st July	Post-1st July	Pre-1st July	Post-1st July
Mean	1.8	0.9	11.7	10.0	4.6	3.2
Standard error of mean	0.67	0.13	3.12	3.62	0.98	0.97
75th percentile <sup>c</sup>	1.1	0.8	1.2	1.2	1.2	0.8
90th percentile	3.3	2.6	8.8	7.2	4.1	3.0
95th percentile	5.6	4.4	160.4	73.4	8.1	5.8
Median	0.1	0.1	0.1	0.1	0.1	0.1
% with cotinine 15ng/ml or more	1	0	8	7	3	2
% with no detectable cotinine	38	39	42	44	39	40
<i>Bases (unweighted)</i>	<i>263</i>	<i>274</i>	<i>107</i>	<i>101</i>	<i>208</i>	<i>370</i>
<i>Bases (weighted)<sup>d</sup></i>	<i>268</i>	<i>276</i>	<i>107</i>	<i>95</i>	<i>201</i>	<i>375</i>

<sup>a</sup> Boys and girls have been combined in this table to give sufficient base sizes; there was little variation by sex.

<sup>b</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.

<sup>c</sup> Percentiles have been presented in this table for reference only. The percentiles show a set of points within a scale from 1-100 which is divided into groups based on order of magnitude. For example, those with a cotinine value that is equal to or greater than the value of 90% of those who gave a cotinine measurement is expressed as the 90th percentile.

<sup>d</sup> Data have been weighted to correct for non-response to the saliva sample.

Table 11.10

**Cotinine levels, pre and post 1st July 2007, by number of adults smoking regularly in the home<sup>a</sup>***Aged 4-15 with a valid cotinine assay<sup>b</sup>*

2007

Cotinine (ng/ml)	Adults smoking in household					
	No adult smoking in the home			One or more adults smoking in the home		
	Pre-1st July	Post-1st July	Total	Post-1st July	Pre-1st July	Total
Mean	1.9	1.1	1.5	13.3	9.7	11.5
Standard error of mean	0.22	0.09	0.12	4.04	3.80	2.76
75th percentile <sup>c</sup>	0.2	0.2	0.2	4.6	3.4	4.2
90th percentile	0.9	0.8	0.8	10.0	8.9	9.6
95th percentile	1.4	1.7	1.4	148.7	64.6	62.3
Median	0.0	0.0	0.1	1.9	1.9	2.1
% with cotinine 15ng/ml or more	2	1	1	7	7	7
% with no detectable cotinine	49	51	50	8	7	7
<i>Bases (unweighted)</i>	283	287	570	87	88	175
<i>Bases (weighted)<sup>d</sup></i>	286	280	566	89	90	179

<sup>a</sup> Boys and girls have been combined in this table to give sufficient base sizes; there was little variation by sex.

<sup>b</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.

<sup>c</sup> Percentiles have been presented in this table for reference only. The percentiles show a set of points within a scale from 1-100 which is divided into groups based on order of magnitude. For example, those with a cotinine value that is equal to or greater than the value of 90% of those who gave a cotinine measurement is expressed as the 90th percentile.

<sup>d</sup> Data have been weighted to correct for non-response to the saliva sample.

Table 11.11

**Cotinine levels, 2006-2007, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**Aged 4-15 with a valid cotinine assay<sup>b</sup>

2006-2007

Cotinine (ng/ml)	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
Boys											
Mean	6.2	12.6	6.5	8.9	3.4	1.1	3.4	4.8	5.5	6.7	4.1
Standard error of mean	3.91	4.57	2.25	4.65	2.50	0.44	0.72	1.70	2.26	3.40	2.95
Median	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2
% with cotinine 15ng/ml or more	5	6	4	6	1	1	2	4	3	4	2
% with no detectable cotinine	20	29	37	34	37	38	32	34	36	30	42
Girls											
Mean	13.2	7.8	6.8	6.9	4.2	5.8	3.6	5.3	3.9	6.8	1.2
Standard error of mean	6.06	2.00	1.60	3.43	2.05	3.32	0.80	3.13	2.04	1.64	0.34
Median	0.9	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2
% with cotinine 15ng/ml or more	11	5	5	6	3	3	3	3	2	3	1
% with no detectable cotinine	23	33	28	30	34	37	46	29	31	31	31
Bases (unweighted)											
Boys	54	183	128	116	106	123	98	102	229	123	106
Girls	51	185	130	135	123	119	129	108	205	101	104
Bases (weighted)											
Boys	54	173	115	100	113	136	154	115	213	113	100
Girls	50	163	109	107	123	111	207	108	174	85	89

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.



Table 11.12

**Cotinine levels, 2006-2007, by equivalised household income and sex***Aged 4-15 with a valid cotinine assay<sup>a</sup>**2006-2007*

Cotinine (ng/ml)	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
<b>Boys</b>					
Mean	3.3	1.3	8.1	4.6	7.8
Standard error of mean	2.02	0.49	2.39	1.60	2.46
75th percentile <sup>b</sup>	0.2	0.3	0.7	1.5	2.2
90th percentile	0.8	1.3	3.1	5.7	5.4
95th percentile	3.6	3.2	29.0	11.4	11.1
Median	0.0	0.1	0.1	0.4	0.4
% with cotinine 15ng/ml or more	2	2	5	4	4
% with no detectable cotinine	54	48	32	22	22
<b>Girls</b>					
Mean	0.6	2.7	4.1	7.3	9.5
Standard error of mean	0.37	0.87	1.38	2.21	2.18
75th percentile <sup>b</sup>	0.2	0.6	1.0	1.7	2.9
90th percentile	0.6	2.1	4.2	4.3	8.9
95th percentile	1.3	4.8	10.5	13.4	44.2
Median	0.0	0.1	0.1	0.4	0.5
% with cotinine 15ng/ml or more	0	3	4	4	7
% with no detectable cotinine	57	39	32	28	22
<i>Bases (unweighted)</i>					
Boys	179	204	215	197	216
Girls	173	209	191	210	248
<i>Bases (weighted)</i>					
Boys	164	189	225	200	252
Girls	157	178	180	199	263

<sup>a</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.

<sup>b</sup> Percentiles have been presented in this table for reference only. The percentiles show a set of points within a scale from 1-100 which is divided into groups based on order of magnitude. For example, those with a cotinine value that is equal to or greater than the value of 90% of those who gave a cotinine measurement is expressed as the 90th percentile.

Table 11.13

**Cotinine levels, 1996-1997, 2001-2002, and 2006-2007, by age and sex**Aged 4-15 with a valid cotinine assay<sup>a</sup>

1996-1997, 2001-2002, 2006-2007

Cotinine (ng/ml)	Age												Total
	4	5	6	7	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>													
<b>1996-1997</b>													
Mean	2.2	2.1	1.9	1.5	1.8	1.4	2.6	1.8	3.7	5.9	22.4	43.0	5.9
Standard error of mean	0.25	0.39	0.18	0.12	0.51	0.13	0.96	0.27	1.11	1.67	4.03	6.09	0.99
% with cotinine 15ng/ml or more	2	1	1	-	0	0	1	2	2	6	14	23	4
<b>2001-2002</b>													
Mean	3.6	1.4	1.8	2.4	0.9	1.4	1.5	1.8	2.8	11.2	14.1	29.8	6.0
Standard error of mean	1.42	0.16	0.60	1.02	0.08	0.12	0.30	0.30	0.89	2.15	2.74	4.73	0.52
% with cotinine 15ng/ml or more	2	1	-	-	-	-	1	1	2	9	11	20	4
<b>2006-2007</b>													
Mean	[0.8]	1.4	0.9	1.3	1.3	0.9	0.7	0.5	10.0	6.6	9.7	34.8	6.2
Standard error of mean	[0.23]	0.34	0.29	0.35	0.42	0.21	0.13	0.08	3.40	2.26	4.75	8.45	1.07
% with cotinine 15ng/ml or more	[-]	-	1	1	2	1	-	-	5	5	7	21	4
<b>Girls</b>													
<b>1996-1997</b>													
Mean	3.8	2.7	2.0	2.1	1.9	1.6	2.5	2.0	3.9	11.3	27.2	38.4	7.4
Standard error of mean	0.66	0.48	0.20	0.67	0.22	0.12	1.04	0.59	1.02	2.60	4.42	5.50	0.60
% with cotinine 15ng/ml or more	5	3	1	1	1	-	0	1	4	9	18	24	5
<b>2001-2002</b>													
Mean	2.0	4.9	1.7	2.5	1.5	1.4	1.4	1.4	3.6	8.7	17.1	30.7	6.4
Standard error of mean	0.37	2.18	0.17	1.07	0.18	0.23	0.11	0.17	1.27	2.06	2.94	4.63	0.55
% with cotinine 15ng/ml or more	1	2	1	-	1	-	-	1	3	7	13	19	4
<b>2006-2007</b>													
Mean	2.1	1.1	1.0	0.8	3.1	1.0	1.1	1.0	6.4	6.0	15.5	28.2	5.7
Standard error of mean	0.50	0.31	0.21	0.13	1.92	0.21	0.26	0.13	3.91	1.65	4.75	5.18	0.74
% with cotinine 15ng/ml or more	4	1	-	-	1	1	1	-	2	6	13	19	4
<b>Bases (unweighted)</b>													
Boys 1996-1997	283	320	349	352	365	329	338	321	332	282	319	300	3890
Boys 2001-2002	170	228	260	286	281	283	307	320	289	302	286	272	3284
Boys 2006-2007	46	69	88	90	89	103	111	115	103	113	116	96	1139
Girls 1996-1997	300	304	321	363	371	326	362	315	312	287	319	273	3853
Girls 2001-2002	179	235	243	270	273	293	294	300	176	294	257	288	3202
Girls 2006-2007	54	78	81	106	102	104	96	125	108	127	91	113	1185
<b>Bases (weighted)<sup>b</sup></b>													
Boys 1996-1997	235	267	305	303	315	276	295	268	275	249	259	255	3302
Boys 2001-2002	193	270	301	336	329	329	355	361	344	339	320	299	3775
Boys 2006-2007	61	113	97	93	90	91	103	105	97	110	116	96	1174
Girls 1996-1997	246	251	274	310	332	277	307	275	265	240	260	214	3252
Girls 2001-2002	199	276	294	322	336	345	335	350	317	329	293	310	3705
Girls 2006-2007	72	116	86	106	91	92	84	108	95	108	89	103	1150

<sup>a</sup> One case has been excluded from the analysis due to an atypical cotinine result; while this very high reading may be valid, if it were included it would have a disproportionate effect on the means.

<sup>b</sup> Data before 2003 were weighted to correct for probabilities of selection; from 2003 selection and non-response weighting was applied

[-] Results in brackets should be treated with caution because of the small base (below 50).

Table 11.14

**Knowledge about the effect of breathing in other people's smoke on the health of young people, by age and sex**

*Aged 13-15, who thought exposure to smoke affects young people*

2007

Health effects of breathing in other people's smoke	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
Causes coughing	78	81	75	78
Causes asthma, or makes asthma worse	73	67	64	68
Makes people more likely to suffer from cancer	67	67	65	67
Makes people more likely to suffer from other serious illnesses	53	50	49	51
Makes people prone to chest infections or bronchitis	49	53	49	50
Makes people less fit than they used to be	49	47	51	49
Causes wheezing	47	46	42	45
Causes breathlessness	39	45	40	41
Some other health effects	10	8	9	9
Don't know	3	3	7	4
<b>Girls</b>				
Causes coughing	80	82	80	81
Causes asthma, or makes asthma worse	78	82	71	77
Makes people more likely to suffer from cancer	63	67	62	64
Makes people more likely to suffer from other serious illnesses	49	44	42	45
Makes people prone to chest infections or bronchitis	49	49	40	46
Makes people less fit than they used to be	46	47	39	44
Causes wheezing	52	51	44	49
Causes breathlessness	44	47	44	45
Some other health effects	5	6	3	5
Don't know	3	3	3	3
<i>Bases (unweighted)</i>				
Boys	255	240	205	700
Girls	259	228	207	694
<i>Bases (weighted)</i>				
Boys	220	236	193	649
Girls	213	221	204	638

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# Children's experience of alcohol: behaviour and attitudes

# 12

Helen Mackenzie

## Summary

- This chapter presents findings on the prevalence and frequency of alcohol consumption among children aged 8-15. Comparisons are made with the 2007 survey of Drug Use, Smoking and Drinking Among Young People (SDD). In addition, the chapter looks at the types of drinks and amount of alcohol consumed by those aged 13-15, as well as their attitudes to drinking.
- Children are likely to under-report their alcohol consumption in home-based surveys because they may be worried about parents seeing their answers. This should be borne in mind when interpreting the findings presented below.
- The proportion who reported ever having had a proper alcoholic drink increased with age, from 7% of boys aged 8 to 79% of boys aged 15, and from 8% of girls aged 8 to 74% of girls aged 15. Overall, 35% of boys and 34% of girls aged 8-15 reported having experience of drinking alcohol.
- 4% of boys and 3% of girls aged 8-15 reported usually drinking once a week or more. Frequency of drinking was clearly related to age. The proportion who reported drinking at least once a week increased from less than 1% of both boys and girls aged 8 to 21% of boys and 13% of girls aged 15 (the difference between boys and girls not being statistically significant).
- 15% of both boys and girls aged 13-15 reported drinking alcohol in the last 7 days. Consumption of each type of alcoholic drink increased with age, except for consumption of fortified wines.
- There were some differences in the types of drinks consumed by boys and girls. Boys were more likely than girls to have drunk beer, lager, cider or shandy (12% compared with 7%), whereas girls were more likely than boys to have drunk wine (6% compared with 4%) and alcopops (8% compared with 5%).
- 40% of boys and 41% of girls aged 13-15 said that they had been drunk in the last 12 months. In most cases they reported that their parents had been aware that they had been drunk.
- Girls aged 13-15 were more likely than boys of the same age to agree with the statements:
  - ‘People of my age drink to be sociable with friends’ (73% compared with 66%).
  - ‘People of my age drink because it makes them more confident’ (52% compared with 36%).
  - ‘People of my age drink because they are bored’ (43% compared with 37%).

## 12.1 Introduction

The Home Office report *Safe. Sensible. Social. The next steps in the Alcohol Harm Reduction Strategy* (June 2007) reviewed progress since the Government's Alcohol Harm Reduction Strategy was launched in 2004, and outlined renewed proposals to tackle the problems associated with alcohol misuse.<sup>1</sup> The report emphasised the need to focus attention on the minority of drinkers who cause the most harm to themselves and others, and identified underage drinkers as one of three problem groups to be specifically targeted. The objectives for young people focused on educating them about making responsible choices about alcohol, and restricting the supply of alcohol to underage drinkers, with proposed measures including tougher law enforcement to prevent underage sales and clearer guidelines to young people and parents about the effects of youth alcohol use.

The 2003 British Medical Association report *Adolescent Health* noted that regular heavy alcohol consumption and binge drinking among young people are associated with other risky behaviours such as unprotected sex, and can have adverse effects on school performance. It warned that alcohol misuse is associated with a range of mental health disorders and an increased risk of physical health problems such as liver damage. Unhealthy drinking patterns in adolescence may also be linked to dependence in adulthood.<sup>2</sup> The way in which young people drink, and where they drink, add to the potential for short-term harm. Binge drinking in the teenage years has been shown to correlate very highly to problems of alcoholism, drug use, low educational attainment and criminal behaviour later in life.<sup>3</sup>

England has been identified as having one of the highest rates of regular drinking and drunkenness among young people in Europe.<sup>4,5</sup> Although there has been no clear trend in the prevalence of drinking among under-16s in recent years, consumption levels appear to be on the rise among those who do drink. Particular concern has been raised about increasing levels of consumption within the 11-13 age group and among adolescent girls.<sup>1,6</sup>

The ambiguous role of alcohol in society is reflected in the official health education advice. For adults, there are guidelines on 'safe' drinking levels, the amount of alcohol that can be drunk without risking health.<sup>1</sup> There are no such guidelines for children or adolescents. The Royal College of Physicians has claimed that risk-free drinking does not exist for this age-group,<sup>7</sup> and the charity Alcohol Concern has recommended that the government's alcohol strategy should aim not just to reduce alcohol consumption among children aged 15 and under, but to stop this age group from drinking alcohol at all.<sup>8</sup>

In taking the alcohol strategy forward, the government plans to provide authoritative age-based guidelines on safe, sensible drinking, designed to help young people and parents make better informed decisions about when and how much they drink.<sup>1</sup> The Department of Children, Schools and Families published the Youth Alcohol Action Plan<sup>9</sup> in 2008, which sets out the government's five priorities:

1. Stepping up enforcement activity to address young people drinking in public places.
2. Taking action with industry on young people and alcohol.
3. Developing a national consensus on young people and drinking.
4. Establishing a new partnership with parents on teenage drinking.
5. Supporting young people to make sensible decisions about alcohol.

The 2007 survey of Drug Use, Smoking and Drinking Among Young People (SDD) found that the proportion of children aged 11-15 who had ever had an alcoholic drink had decreased since 2005 (from 58% to 54%), having fluctuated around 60% since 1998. Among children who had drunk alcohol in the last 7 days, the mean number of units consumed was 12.7 (using a revised method of calculating units in 2007). Comparing the amount consumed using the original method of calculating units, consumption was lower in 2007 than in 2006.<sup>10</sup>

Findings on alcohol consumption among children have previously been included in the 1997, 2002 and 2006 Health Survey reports.<sup>11,12,13</sup> Comparisons with previous years suggests that the usual frequency of drinking alcohol has remained relatively stable. There has been a decrease between 2002 and 2007 in the proportion of children aged 13-15 who reported having drunk alcohol in the last 7 days; however, there were no significant differences in the mean number of alcohol units consumed between 2002 and 2006 (changes to the method of calculating units in 2007 mean that comparable data are not available). This chapter provides results for 2007, and trend data on children's drinking and other key measures are published separately by The NHS Information Centre, *Health Survey for England 2007 Latest Trends*.<sup>14</sup>

## 12.2 Methods and definitions

### 12.2.1 Methods

As children may be reluctant to reveal details about their drinking behaviour in the presence of their parents, questions about alcohol consumption were asked as part of a self-completion questionnaire in order to encourage honesty. Nevertheless, there is still a risk that children will under-report alcohol use because they are worried that parents might see their answers. Comparisons with the survey of Smoking, Drinking and Drug Use Among Young People (SDD) indicate that both smoking and alcohol use are under-reported on home-based interview surveys vis-à-vis surveys carried out in schools<sup>10</sup> (see sections 12.3.1 and 12.3.2, and Chapter 11 on smoking).

All children aged 8 and above were asked about alcohol consumption. Children aged 8-12 were asked whether they had ever had a proper alcoholic drink (a whole drink, not just a sip), how old they were when they first did so, their usual frequency of drinking, and when they last had an alcoholic drink. Children aged 13-15 were asked, in addition to these questions, to provide details of the types and quantities of alcoholic drinks they had consumed in the last 7 days. Children aged 13-15 were also asked about their attitudes towards drinking: their perceptions of parents' views on drinking alcohol and being drunk, as well as their agreement or disagreement with statements about why people their age might drink alcohol.

Questions have been asked about children's alcohol consumption since 1995. Changes to the questionnaire were introduced in 1998 and again in 1999. Prior to 1998, children were asked to tick one of three categories to indicate their experience of alcohol: (1) never tasted alcohol, (2) tasted alcohol once or twice but never had a whole drink, or (3) had a whole proper drink of alcohol. In 1998, children were simply asked 'Have you ever had a proper alcoholic drink – a whole drink, not just a sip?' and asked to tick 'yes' or 'no'. This is the same question as that used on the SDD survey. From 1999 onwards, children who answered 'no' when asked to state whether they had ever had an alcoholic drink were asked a follow-up question about whether they had ever drunk alcopops. Children are regarded as having had experience of drinking alcohol if they answer yes to either question.

A question about when the child last had an alcoholic drink and some subtle changes to the question about usual frequency of drinking were also introduced in 1998.<sup>15</sup>

### 12.2.2 Definitions

A unit of alcohol is 10ml of pure alcohol, and is taken to be approximately the amount contained in half a pint of ordinary strength beer or lager, a single pub measure (50ml) of fortified wine such as sherry or port, or a single pub measure (25ml) of spirits. The method used by the HSE to convert drinks to units remained essentially unchanged from 1991 for adults, and from 1995 for children, until 2005. The assumptions were similar to those which have been used by other major surveys since they were introduced by the General Household Survey (GHS) in 1990.<sup>16</sup> In recent years, it has become clear that these assumptions were no longer valid. The average strengths of beers and wines have

increased in the intervening years, and pubs, bars and restaurants now serve drinks in a broader range of measures; specifically, standard glasses of wine, formerly 125ml, are likely to be 175ml or even 250ml.<sup>17</sup> From 2006, changes have been made in the way HSE and other surveys estimate alcohol consumption for adults, and equivalent changes have been introduced for children for 2007.

Most of these changes affect the conversion to units rather than the questions asked of participants, but for wine the questions were changed and participants in the HSE in 2007 were asked to specify how much wine they had drunk, in terms of different sized glasses and bottles. Participants could record a combination of bottles, or part bottles, and different sized glasses – 250ml, 175ml and 125ml. The unit equivalent of wine has therefore been revised to 3.0 units for a 250ml glass, 2.0 units for a 175ml glass, 1.5 units for a 125ml glass and 9.0 units for a bottle. The conversion from drinks to units for small cans of beer and small cans/ bottles of alcopops has also been revised for children in 2007, in line with revisions for adults introduced in 2006. Table 12A below shows the original conversion factors used by the HSE for children until 2006 as well as the revised conversion factors used in this report.

Type of drink	Measure	Original equivalent units of alcohol	Revised equivalent units of alcohol
Beer, lager, cider or shandy	Pint	2 units	2 units
	Large can/bottle	2 units	2 units
	Small can/bottle	1 unit	1.5 units
Spirits or liqueurs	Glass	1 unit <sup>a</sup>	1 unit <sup>a</sup>
Sherry or martini	Glass	1 unit <sup>a</sup>	1 unit <sup>a</sup>
Wine	Bottle	6.0 units	9.0 units
	Large glass (250ml)	N/A	3.0 units
	Standard glass (175ml)	N/A	2.0 units
	Small glass (125ml)	N/A	1.5 units
	Glass (unspecified)	1 unit	N/A
Alcopops	Large can/bottle	2 units	2 units
	Small can/bottle	1 unit	1.5 units

<sup>a</sup> Participants are asked to count doubles as two glasses.

Although the adjustment outlined above has helped to improve the accuracy of alcohol consumption data, it is still not feasible in a survey of this nature to collect information about the exact strength or volume measure of some drinks consumed (for example, no distinction is made between beer and lager of different strengths, and children often do not drink spirits and fortified wines in standard pub measures), and so the total number of alcohol units is an estimate which involves some degree of approximation.

## 12.3 Experience of drinking alcohol

### 12.3.1 Experience of drinking alcohol among children aged 8-15

Table 12.1 and Figure 12A show the proportion of boys and girls who said they had ever had a whole proper alcoholic drink by age. The results shown are those obtained by the ‘double-question’ method outlined in section 12.2.1, that is, children are regarded as having experience of drinking alcohol if they answered ‘yes’ either to the question about whether they have ever had a proper alcoholic drink or to the question about alcopops. Overall, 35% of boys and 34% of girls aged 8-15 reported having experience of drinking alcohol. The proportion who have had experience of drinking alcohol increased with age, with 7% of boys and 8% of girls aged 8 having done so, compared with 79% of boys and 74% of girls aged 15.

Table 12.1, Figure 12A



Figure 12A

### Proportion who have had experience of drinking alcohol, by age and sex

Base: Aged 8-15



### 12.3.2 Comparison with the survey of Drug Use, Smoking and Drinking among Young People

Table 12B below shows a comparison with results from the 2007 survey of Drug Use, Smoking and Drinking among Young People (SDD), which is carried out annually among children aged 11-15 in secondary schools in England.<sup>10</sup> Results are presented in three separate columns for both boys and girls. The first column shows the proportion who have experienced alcohol as defined by the 'single' HSE question ('Have you ever had a proper alcoholic drink – a whole drink, not just a sip?'). This is the same question as that used in SDD. The second column shows the proportion who have experienced alcohol according to the 'double' HSE question (that is, including those who have had alcopops). The third column shows results from SDD.

Table 12B

#### Experience of drinking alcohol

Aged 11-15

Age	Boys			Girls		
	HSE single question	HSE double question	SDD 2007	HSE single question	HSE double question	SDD 2007
11	11	18	23	9	19	16
12	25	36	31	18	30	32
13	33	46	56	34	48	52
14	51	59	69	53	67	72
15	74	79	80	66	74	83
All 11-15	39	48	54	37	49	54

As the table shows, the single HSE question produced considerably lower estimates than the same question asked in SDD. This corroborates findings from HSE 2002 and 2006, and suggests that although questions about alcohol are asked as part of a self-completion questionnaire, children may still be concerned about parents seeing their answers. It is interesting to note that the double HSE question produced estimates that are closer to the results from SDD.

### 12.3.3 Frequency of drinking alcohol

Findings on children's self-reported usual frequency of drinking are shown in tables 12.2, 12.3 and 12.4. As most children, particularly in the younger age groups, are unlikely to have developed regular patterns of drinking, they might find the question on usual frequency

difficult to answer. There was very little reporting of current alcohol consumption among children under the age of 12, with the vast majority saying they never drank or drank only a few times a year. Overall 4% of boys and 3% of girls aged 8-15 reported drinking once a week or more. The proportion who reported drinking at least once a week increased from fewer than 1% of both boys and girls aged 8 to 21% of boys and 13% of girls aged 15 (with the difference between boys and girls not being statistically significant). Figure 12B shows the proportion of children aged 11-15 who said they usually drank alcohol once a week or more often.

Table 12.2, Figure 12B



Table 12C below shows a comparison with the SDD 2007<sup>10</sup> survey of the proportion of children aged 11-15 who reported usually drinking once a week or more. For reasons discussed above, the proportion of children who reported drinking regularly in HSE is considerably lower than that in SDD, but follows the same pattern of increasing with age.

Table 12C

Proportion usually drinking once a week or more

Aged 11-15

Age	Boys		Girls	
	HSE 2007	SDD 2007	HSE 2007	SDD 2007
11	0	2	-	1
12	2	3	1	5
13	3	12	3	9
14	6	18	6	22
15	21	34	13	30
All 11-15	6	15	5	14

There was some regional variation in frequency of drinking. While the proportions of children drinking at least once a week were similar across regions, the proportion of children who reported that they never drink was higher in London than other regions (82% of boys and 81% of girls in London said they never drink, compared with 70% and 71% nationally). There was no variation according to quintile of equivalised household income.

Tables 12.3-12.4

12.3.4 Types of alcoholic drink

15% of both boys and girls aged 13-15 reported drinking alcohol in the last seven days. These children were asked about the types of drinks and how much they had drunk. Beer, lager, cider or shandy were the drinks most frequently mentioned amongst boys, while

among girls similar proportions mentioned alcopops, wine and beer, lager, cider or shandy. Consumption of each type of alcoholic drink increased with age, except for consumption of fortified wines, which did not vary across the ages.

There were some differences in the types of drinks consumed by boys and girls. Boys were more likely than girls to have drunk beer, lager, cider or shandy (12% compared with 7%), whereas girls were more likely than boys to have drunk wine (6% compared with 4%) and alcopops (8% compared with 5%).

Among the minority of children aged 13-15 who had drunk alcohol in the last seven days, there was considerable variation in the amount of alcohol they reported having drunk, ranging from less than one unit to 15 units or more.

**Tables 12.5-12.6**

## **12.4 Attitudes to drinking alcohol**

### **12.4.1 Perceptions of parents' views on drinking alcohol and being drunk**

Children aged 13-15 were asked about their perceptions of their parents' views on drinking alcohol.

Those who stated that they ever drank alcohol were asked whether their parents knew about it, and if so what their parents thought about them drinking alcohol.<sup>18</sup> Very few who drank thought that their parents were unaware of this (5% of boys and 3% of girls). Among the rest, a minority said that their parents did not like them drinking (21% of boys and 17% of girls), while a slightly greater proportion said that their parents did not mind (38% and 35% respectively), or that their parents' views on their drinking varied (26% and 33% respectively).

**Table 12.7**

Children aged 13-15 who ever drank were also asked whether they had been drunk in the last twelve months, and, if so, whether their parents knew they had been drunk. Three fifths of both boys and girls (60% and 59% respectively) stated that they had not been drunk in the last twelve months.

The proportion of children aged 13-15 who said that they had been drunk in the last twelve months, and that their parents knew about it, increased with age (from 17% of boys aged 13 to 43% aged 15, and from 24% of girls aged 13 to 42% aged 15).

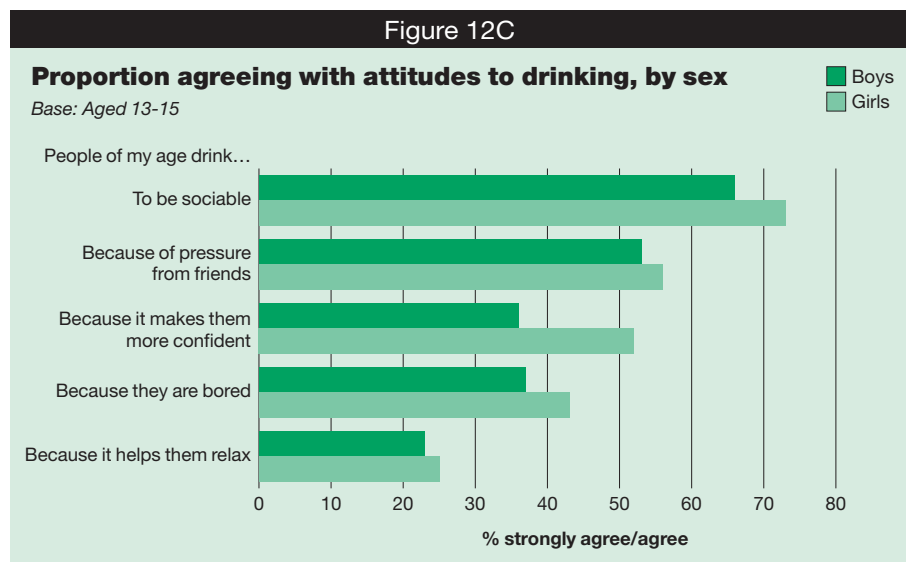
Overall, a smaller proportion of children stated that they had been drunk in the last twelve months and their parents did not know about it (9% for both boys and girls). However, while the proportion was similar across the age range for boys (7% of those aged 13 to 9% of those aged 15), the proportion of girls increased substantially with age (2% of girls aged 13 to 15% of those aged 15).

**Table 12.8**

### **12.4.2 Reasons why young people drink**

All children aged 13-15 were asked about their attitudes to why people their age may drink alcohol. They were asked to state whether they agreed strongly, agreed, disagreed or disagreed strongly with five statements.<sup>19</sup> They were also given the option of answering 'neither agree nor disagree' or 'can't choose' at each statement. The total level of agreement (combining 'strongly agree' and 'agree') is presented as a summary measure here.

Girls were slightly more likely than boys to agree that 'People of my age drink to be sociable with friends' (73% and 66% respectively). More than half of both boys and girls agreed that young people drink because of pressure from friends (56% of girls and 53% of boys). Girls were more likely than boys to agree that young people drink because it gives them confidence (52% and 36% respectively) and because they are bored (43% and 37% respectively). Only around a quarter agreed that young people drink because it helps them relax (23% of boys and 25% of girls).



There were some variations in attitudes by age. Nearly three fifths (56%) of boys aged 13 agreed with the statement ‘People my age drink to be sociable with friends’, rising to nearly four fifths (78%) of boys aged 15. The proportion of girls in agreement with this statement followed a similar pattern, ranging from 62% of girls aged 13 to 80% of girls aged 15. This pattern was also apparent for two further statements: agreement that drinking gave young people confidence (ranging from 26% of boys aged 13 to 49% of those aged 15, and 39% of girls aged 13 to 61% of those aged 15); and agreement that young people ‘drink because they are bored’, where the pattern was stronger for boys than girls.

Tables 12.9-12.10, Figure 12C

### 12.4.3 Reasons why young people drink alcohol, by socio-economic variables

Levels of agreement varied by region for the statements that young people drink ‘to be sociable’ and ‘because of pressure from friends’.

Differences in attitudes were also apparent according to equivalised household income. There was generally an increase with increasing income quintile in level of agreement that young people drink ‘to be sociable with friends’ and ‘because it helps them relax’. Going in the opposite direction, agreement tended to increase from lower to higher income groups that young people ‘drink because they are bored’. There was a slightly different pattern for boys and girls for the statement that drinking ‘makes young people more confident’. Among boys, agreement was highest in the highest income group and varied little in other groups; among girls agreement was higher in the top three quintiles and decreased in the lower two.

Tables 12.11-12.12

### 12.4.4 Reasons why young people drink alcohol, by frequency of own drinking

There were considerable variations in children’s attitudes to why people their age may drink alcohol, according to the frequency with which they usually drink. However, it is important to note that it is difficult to make any strong generalisations due to the relatively small base sizes of children aged 13-15 who reported drinking alcohol at least once a week. Results are shown in Figure 12D.

Among boys, agreement decreased with frequency of drinking for four statements: ‘People my age drink to be sociable with friends’, ‘because it makes them more confident’, ‘because they are bored and have nothing else to do’ and ‘because it helps them relax’. The pattern was similar among girls for being sociable, relaxing and gaining confidence, but there was little difference by frequency for the statements ‘because they are bored’.

A different pattern was observed for the statement ‘People my age drink because of pressure from friends’. The proportion of boys and girls who agreed with this statement increased as frequency of drinking decreased, from 35% of boys and 40% of girls who reported drinking once a week or more to 59% of boys and 66% of girls who have never drunk.

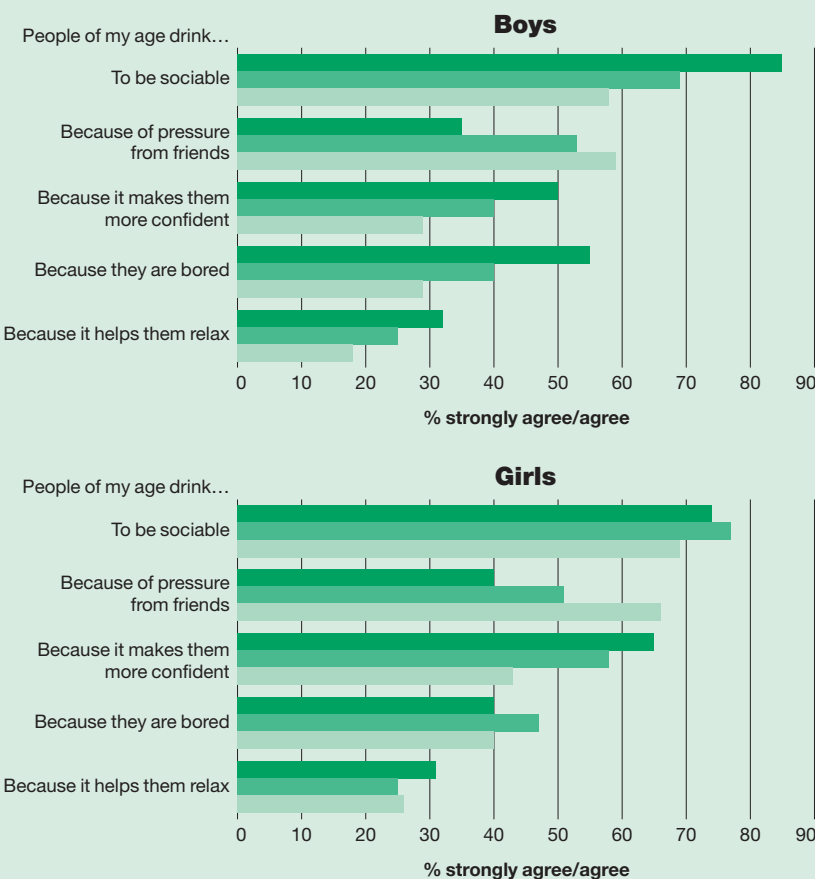
Table 12.13, Figure 12D

Figure 12D

### Proportion agreeing with attitudes to drinking, by frequency of own drinking

Base: Aged 13-15

■ Drink once a week  
■ Drink less than once a week  
■ Never drink



## 12.5 Discussion

When interpreting HSE data about children's drinking, it should be remembered that there is likely to be some under-reporting both of frequency of drinking and amount drunk. Comparisons with the survey of Drug Use, Smoking and Drinking Among young People (SDD) suggest that the data collection method influences responses among some children, and answering in the presence of parents sometimes inhibits honest reporting of drinking behaviour. Nevertheless, the HSE provides consistent trends over time (trend data are also published by The NHS Information Centre<sup>14</sup>). The 2007 questionnaire introduced attitude questions for the first time, and they refer more generally to 'people my age' rather than to the child's own behaviour or attitudes. It would therefore be expected that children would feel less pressure to modify their views when responding to these questions.

Findings presented in this chapter suggest that age is a significant factor associated with children's alcohol consumption. The proportion of those ever having had an alcoholic drink increased with age, as did the frequency with which alcohol was consumed. Consistent with previous HSE findings, no significant differences between the sexes were observed in the 2007 survey, in terms of experience of drinking alcohol and frequency of consumption, suggesting that boys and girls had very similar patterns of alcohol consumption. Some differences between the sexes were observed in terms of the type of alcoholic drinks consumed, with boys being more likely to drink beer, lager, cider or shandy, and girls being more likely than boys to drink wine and alcopops. Again, these findings are consistent with previous HSE findings.

The new questions relating to attitudes to drinking, among participants aged 13-15, show that age continued to be a factor in determining whether participants believed their parents knew they had been drunk in the previous twelve months. The proportion who stated their parents did know they had been drunk increased with age for both boys and girls. However, among girls, the proportion who stated their parents did *not* know they had been drunk in the last year also increased with age. Furthermore, girls tended to agree with the attitude statements more related to social life: they were more likely than boys to agree with the statements 'People of my age drink to be sociable with their friends', 'People of my age drink because it makes them more confident' and 'People of my age drink because they are bored and have nothing else to do'.

Peer pressure appears to become a less prominent issue, in terms of drinking, as children get older. Agreement with the statement 'People of my age drink because of pressure from friends' decreased with age for both boys and girls. Agreement with all other statements increased with age for boys; among girls, agreement about drinking to be sociable, to relax and to gain confidence also increased with age, while agreement that 'People of my age drink because they are bored' was at a similar level across all ages.

It would seem therefore that different views about drinking alcohol are beginning to emerge between girls and boys aged 13-15, even though drinking behaviour was similar. Attitudes are also changing among this age group, with variations in attitudes between 13 and 15 year olds.

The government's updated alcohol strategy, published in 2007, identified drinkers under the age of 18 as a particular group at risk.<sup>1</sup> It noted the conflicting views widely held about the generally positive social effects of alcohol<sup>20</sup> and the damage caused by harmful drinking behaviour. Certainly the attitudes examined in this chapter support the view that children aged 13-15 perceived drinking as a sociable activity, and one that boosts confidence, with girls more likely than boys to agree with these ideas. More negatively, a substantial proportion felt that young people drink because they are bored. It is perhaps encouraging that, although around half the children aged 13-15 felt that peer pressure was an influence on young people's drinking, fewer who were already regular drinkers felt that peer pressure was an influence, compared with those who did not drink. Nevertheless, more than a third of those usually drinking once a week agreed that peer pressure could apply.

The priorities identified in the Youth Alcohol Action Plan<sup>9</sup> include developing a consensus on young people and alcohol, and establishing a partnership with parents on teenage drinking, as well as reinforcing the original objective of providing young people with the information to make responsible choices about drinking. While sample sizes in the 2007 survey are not large enough to allow detailed cross analyses of parental drinking behaviour and teenagers' drinking patterns and attitudes, there is much evidence that reinforces the importance of parental influence and support in shaping young people's developing attitudes to alcohol. While the Action Plan states drinking by young people in the home is for parents and families to decide, it also identifies the need for much clearer information about the effects of alcohol on children to inform parents' decisions about when and how much young people may drink. The Action Plan thus endorses the Chief Medical Officer's view that there should be clearer information for young people and parents about the risks of drinking alcohol.

## References and notes

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- 13 Craig R & Mindell J (eds.). *Health Survey for England 2006: Obesity and other risk factors among children*. (Volume 2.) The NHS Information Centre, Leeds, 2008.
- 14 [www.ic.nhs.uk/pubs/hse07trends](http://www.ic.nhs.uk/pubs/hse07trends)
- 15 Prior to 1998, the question read:  
How often do you usually have an alcoholic drink?  
Less than once a year  
Once or twice a year  
Once every couple of months  
Once or twice a month  
Once or twice a week  
Three or four times a week  
Five or six days a week  
Almost every day  
In 1998, the response categories were changed to:  
Almost every day  
About twice a week  
About once a week  
About once a fortnight  
About once a month  
Only a few times a year  
I never drink alcohol now.
- 16 Smyth M, Browne F. *General Household Survey 1990*. HMSO, 1992.
- 17 Goddard E. *Estimating alcohol consumption from survey data: improved method of converting volume to units*. ONS, 2007, available on <http://www.statistics.gov.uk/statbase/product.asp?vlnk=15067>

18 Participants were given 5 options:

They don't like me drinking alcohol

They don't mind me drinking alcohol

They like me drinking alcohol

It varies

I don't know.

19 Attitude statements:

People of my age drink because it helps them relax

People of my age drink because it makes them more confident

People of my age drink to be sociable with their friends

People of my age drink because of pressure from their friends

People of my age drink because they are bored and have nothing else to do.

20 '[Alcohol] is part of our social and family life, and can enhance meal times, special occasions and time spent with friends.' (Department of Health et al, 2007, p.5).



- 12.1 Self-reported experience of drinking alcohol, by age and sex
- 12.2 Self-reported frequency of drinking alcohol, by age and sex
- 12.3 Self-reported frequency of drinking alcohol, by Government Office Region/Strategic Health Authority and sex
- 12.4 Self-reported frequency of drinking alcohol, by equivalised household income and sex
- 12.5 Self-reported alcohol consumption in the last 7 days, by age and sex
- 12.6 Alcoholic drinks consumed in the last 7 days, by age and sex
- 12.7 Perceptions of parents' views on drinking alcohol, by age and sex
- 12.8 Self-reported prevalence of being drunk in last 12 months and parents' knowledge of being drunk, by age and sex
- 12.9 Attitudes to drinking: summary of agreement and disagreement, by sex
- 12.10 Proportion agreeing with attitudes to drinking, by age and sex
- 12.11 Proportion agreeing with attitudes to drinking, by Government Office Region/Strategic Health Authority and sex
- 12.12 Proportion agreeing with attitudes to drinking, by equivalised household income and sex
- 12.13 Proportion agreeing with attitudes to drinking, by sex and frequency of drinking

Table 12.1

**Self-reported experience of drinking alcohol, by age and sex**

Aged 8-15

2007

Experience of alcohol <sup>a</sup>	Age								Total
	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%
<b>Boys</b>									
Ever had proper alcoholic drink	7	14	12	18	36	46	59	79	35
<b>Girls</b>									
Ever had proper alcoholic drink	8	7	11	19	30	48	67	74	34
<i>Bases (unweighted)</i>									
Boys	244	215	271	262	254	288	266	237	2037
Girls	225	229	235	220	262	283	239	225	1918
<i>Bases (weighted)</i>									
Boys	222	191	225	217	217	247	260	225	1803
Girls	204	206	217	202	212	233	232	221	1726

<sup>a</sup> Results are based on those children who answered 'yes' either to the question about whether they have ever had a proper alcoholic drink, or to the question about whether they have ever had alcopops.

Table 12.2

**Self-reported frequency of drinking alcohol, by age and sex**

Aged 8-15

2007

Frequency of drinking	Age								Total
	8	9	10	11	12	13	14	15	
	%	%	%	%	%	%	%	%	%
<b>Boys</b>									
Almost every day	-	-	-	-	1	-	0	-	0
About twice a week	-	-	-	-	0	0	0	6	1
About once a week	0	-	0	0	1	2	5	15	3
About once a fortnight	-	0	0	1	2	4	6	13	4
About once a month	-	1	1	1	6	4	10	12	5
Only a few times a year	2	8	7	12	19	28	29	29	17
Never drinks	98	91	91	86	70	61	49	25	70
Once a week or more <sup>a</sup>	0	-	0	0	2	3	6	21	4
<b>Girls</b>									
Almost every day	-	-	-	-	0	-	-	-	0
About twice a week	-	-	-	-	-	1	1	4	1
About once a week	-	1	1	-	1	1	5	9	2
About once a fortnight	1	-	-	1	2	3	6	16	4
About once a month	0	0	0	0	4	8	9	13	5
Only a few times a year	3	3	7	11	15	29	40	27	18
Never drinks	96	96	92	87	78	57	40	30	71
Once a week or more <sup>a</sup>	-	1	1	-	1	3	6	13	3
<i>Bases (unweighted)</i>									
Boys	240	211	269	262	251	285	264	236	2018
Girls	223	228	233	218	260	281	239	223	1905
<i>Bases (weighted)</i>									
Boys	218	187	223	217	215	244	258	224	1788
Girls	202	205	215	201	210	232	232	218	1715

<sup>a</sup> Figures for 'Once a week or more' are the sum of 'Almost every day', 'About twice a week' and 'About once a week'.

Table 12.3

# Self-reported frequency of drinking alcohol, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex

Aged 8-15

2007

Frequency of drinking	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>											
Almost every day	-	1	0	-	-	-	-	-	-	-	-
About twice a week	-	-	2	0	1	2	0	-	1	2	1
About once a week	1	2	4	3	2	3	2	4	5	6	3
About once a fortnight	1	1	6	2	2	6	3	6	4	6	2
About once a month	3	2	6	6	5	8	2	6	5	2	7
Only a few times a year	22	17	19	18	23	21	11	13	17	15	19
Never drinks	74	76	63	70	67	61	82	70	68	68	68
Once a week or more <sup>b</sup>	1	3	7	4	3	4	3	4	6	8	5
<b>Girls</b>											
Almost every day	-	0	-	-	-	-	-	-	-	-	-
About twice a week	2	1	0	0	1	1	0	3	0	1	-
About once a week	6	1	2	3	2	1	2	2	2	1	3
About once a fortnight	3	4	5	2	5	3	2	5	4	5	4
About once a month	6	5	8	5	5	5	0	6	4	6	3
Only a few times a year	12	21	21	15	19	18	13	20	15	13	17
Never drinks	71	67	63	75	68	71	81	65	74	75	73
Once a week or more <sup>b</sup>	8	2	3	3	3	2	3	5	2	1	3
<b>Bases (unweighted)</b>											
Boys	94	284	243	208	207	208	218	190	366	180	186
Girls	90	257	212	199	200	216	211	194	326	146	180
<b>Bases (weighted)</b>											
Boys	80	258	216	158	186	190	228	169	303	151	152
Girls	78	236	183	161	177	195	233	178	274	123	152

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Figures for 'Once a week or more' are the sum of 'Almost every day', 'About twice a week' and 'About once a week'.

Table 12.4

**Self-reported frequency of drinking alcohol, by equivalised household income and sex**

Aged 8-15

2007

Frequency of drinking	Equivalised household income quintile				
	Highest	2nd	3rd	4th	Lowest
	%	%	%	%	%
<b>Boys</b>					
Almost every day	-	-	-	0	0
About twice a week	0	1	0	1	1
About once a week	4	1	3	4	3
About once a fortnight	4	5	3	2	4
About once a month	6	5	5	4	4
Only a few times a year	18	15	19	21	16
Never drinks	69	73	70	67	72
Once a week or more <sup>a</sup>	4	3	3	6	4
<b>Girls</b>					
Almost every day	-	-	-	-	-
About twice a week	0	1	1	1	1
About once a week	3	1	3	3	2
About once a fortnight	5	3	6	4	2
About once a month	9	4	4	3	4
Only a few times a year	13	18	20	18	18
Never drinks	70	73	66	71	74
Once a week or more <sup>a</sup>	3	2	4	3	3
<i>Bases (unweighted)</i>					
Boys	269	334	381	360	356
Girls	266	319	285	312	404
<i>Bases (weighted)</i>					
Boys	229	274	331	322	345
Girls	230	270	250	281	395

<sup>a</sup> Figures for 'Once a week or more' are the sum of 'Almost every day', 'About twice a week' and 'About once a week'.

Table 12.5

**Self-reported alcohol consumption in the last 7 days, by age and sex**

Aged 13-15

2007

Alcohol units	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
None	95	86	74	85
Less than 1 unit	0	4	2	2
1, under 2 units	1	2	4	2
2, under 4 units	1	3	5	3
4, under 6 units	1	0	4	2
6, under 10 units	1	2	5	3
10, under 15 units	1	1	2	2
15 or more units	-	1	4	2
<b>Girls</b>				
None	91	86	78	85
Less than 1 unit	2	2	1	1
1, under 2 units	2	2	2	2
2, under 4 units	2	4	6	4
4, under 6 units	-	1	4	2
6, under 10 units	2	1	2	2
10, under 15 units	0	3	5	2
15 or more units	1	2	2	2
<i>Bases (unweighted)</i>				
Boys	286	263	234	783
Girls	279	237	224	740
<i>Bases (weighted)</i>				
Boys	246	256	222	724
Girls	230	230	220	680

Table 12.6

<b>Alcoholic drinks consumed in the last 7 days, by age and sex</b>				
<i>Aged 13-15</i>			<i>2007</i>	
Types of drink	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
Beer, lager, cider and shandy	4	10	23	12
Spirits and liqueurs	1	3	7	4
Fortified wines	1	1	1	1
Wine	1	3	7	4
Alcopops	1	5	10	5
Any alcoholic drink	5	14	26	15
<b>Girls</b>				
Beer, lager, cider and shandy	4	5	12	7
Spirits and liqueurs	1	3	7	4
Fortified wines	-	0	0	0
Wine	4	6	9	6
Alcopops	5	9	11	8
Any alcoholic drink	9	14	22	15
<i>Bases (unweighted)<sup>a</sup></i>				
Boys	286	263	234	783
Girls	279	237	224	740
<i>Bases (weighted)<sup>a</sup></i>				
Boys	246	256	222	724
Girls	230	230	220	680

<sup>a</sup> Bases shown are for valid cases on any alcoholic drink. Bases for the different types of drinks were of a similar magnitude.

Table 12.7

<b>Perceptions of parents' views on drinking alcohol, by age and sex</b>				
<i>Aged 13-15 who ever drink</i>			<i>2007</i>	
Perceptions of parents' views on drinking alcohol	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
They don't know I drink alcohol	4	7	3	5
They don't like me drinking alcohol	19	23	21	21
They don't mind me drinking alcohol	35	34	43	38
They like me drinking alcohol	1	1		1
It varies	25	27	25	26
Don't know	16	8	7	9
<b>Girls</b>				
They don't know I drink alcohol	3	2	3	3
They don't like me drinking alcohol	15	16	19	17
They don't mind me drinking alcohol	34	37	34	35
They like me drinking alcohol	1	1	1	1
It varies	29	34	33	33
Don't know	17	10	10	12
<i>Bases (unweighted)</i>				
Boys	93	136	161	390
Girls	117	143	151	411
<i>Bases (weighted)</i>				
Boys	78	129	152	359
Girls	91	134	145	370

Table 12.8

**Self-reported prevalence of being drunk in last 12 months and parents' knowledge of being drunk, by age and sex**

Aged 13-15 who ever drink

2007

Whether been drunk in last 12 months	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
Been drunk in last 12 months	24	34	52	40
Been drunk in last 12 months and parents know	17	23	43	30
Been drunk in last 12 months and parents don't know	7	11	9	9
Not been drunk in last 12 months	76	66	48	60
<b>Girls</b>				
Been drunk in last 12 months	26	34	57	41
Been drunk in last 12 months and parents know	24	27	42	32
Been drunk in last 12 months and parents don't know	2	7	15	9
Not been drunk in last 12 months	74	66	43	59
<i>Bases (unweighted)</i>				
Boys	93	136	162	391
Girls	118	143	149	410
<i>Bases (weighted)</i>				
Boys	78	129	153	360
Girls	92	134	143	369

Table 12.9

**Attitudes to drinking: summary of agreement and disagreement, by sex**

Aged 13-15

2007

Attitudes to drinking <sup>b</sup>	Strongly agree	Agree	Neither <sup>a</sup>	Disagree	Strongly disagree	Total agree	Total disagree
<b>Boys</b>							
People of my age drink...							
To be sociable with friends	18	49	20	9	5	66	14
Because of pressure from friends	16	38	22	16	9	53	25
Because it makes them more confident	5	31	31	24	9	36	33
Because they are bored and have nothing else to do	10	27	30	21	12	37	34
Because it helps them relax	3	19	34	30	13	23	43
<b>Girls</b>							
People of my age drink...							
To be sociable with friends	22	51	14	9	3	73	13
Because of pressure from friends	19	37	20	17	7	56	24
Because it makes them more confident	10	42	23	18	7	52	25
Because they are bored and have nothing else to do	13	30	27	20	9	43	30
Because it helps them relax	2	23	34	30	11	25	40

<sup>a</sup> 'Neither' includes those who chose the answer categories 'Neither agree nor disagree' and 'Can't choose'.

<sup>b</sup> Bases for the first statement are:

Unweighted: Boys 770 Girls 731

Weighted: Boys 711 Girls 627

Bases for other statements vary but are of similar size.

Table 12.10

**Proportion agreeing with attitudes to drinking, by age and sex***Aged 13-15**2007*

Attitudes to drinking: % strongly agree/agree	Age			Total
	13	14	15	
	%	%	%	%
<b>Boys</b>				
People of my age drink...				
To be sociable with friends	56	65	78	66
Because of pressure from friends	57	56	46	53
Because it makes them more confident	26	35	49	36
Because they are bored and have nothing else to do	27	38	45	37
Because it helps them relax	16	22	31	23
<b>Girls</b>				
People of my age drink...				
To be sociable with friends	62	78	80	73
People drink because of pressure from friends	63	58	49	56
Because it makes them more confident	39	57	61	52
Because they are bored and have nothing else to do	41	42	46	43
Because it helps them relax	25	25	26	25
<i>Bases (unweighted)<sup>a</sup></i>				
Boys	279	257	234	770
Girls	275	238	218	731
<i>Bases (weighted)<sup>a</sup></i>				
Boys	239	250	222	711
Girls	226	232	214	672

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.



Table 12.11

# **Proportion agreeing with attitudes to drinking, by Government Office Region/Strategic Health Authority<sup>a</sup> and sex**

Aged 13-15

2007

Attitudes to drinking: % strongly agree/agree	Government Office Region									Strategic Health Authority	
	North East	North West	Yorkshire & the Humber	East Midlands	West Midlands	East of England	London	South West	South East	South East Coast	South Central
	%	%	%	%	%	%	%	%	%	%	%
<b>Boys</b>											
People of my age drink...											
To be sociable with friends	[55]	70	65	63	67	60	64	66	75	73	77
Because of pressure from friends	[46]	58	46	51	45	58	58	49	58	55	62
Because it makes them more confident	[22]	32	45	36	29	33	41	37	40	45	34
Because they are bored and have nothing else to do	[31]	42	35	41	41	28	37	41	33	32	33
Because it helps them relax	[13]	16	31	24	27	15	23	27	27	31	22
<b>Girls</b>											
People of my age drink...											
To be sociable with friends	[82]	81	64	70	82	72	69	67	74	75	74
Because of pressure from friends	[53]	56	50	58	61	63	69	43	50	49	52
Because it makes them more confident	[59]	63	52	48	52	52	47	43	53	62	46
Because they are bored and have nothing else to do	[50]	48	49	47	40	45	48	34	32	34	30
Because it helps them relax	[23]	27	33	28	17	25	28	20	24	26	22
<i>Bases (unweighted)<sup>b</sup></i>											
Boys	36	106	94	83	74	89	79	78	131	72	59
Girls	40	94	90	67	77	89	86	67	121	50	71
<i>Bases (weighted)<sup>b</sup></i>											
Boys	36	106	94	83	74	89	79	78	131	63	51
Girls	40	94	90	67	77	89	86	67	121	42	60

<sup>a</sup> This table provides data for regional analysis both by Government Office Region (GOR) and the configuration of Strategic Health Authorities (SHAs) in place from July 2006. The first eight columns represent GORs and SHAs of the same name, while the South East GOR (column nine) is divided into South East Coast SHA and South Central SHA, shown in the final two columns.

<sup>b</sup> Bases vary but are of similar sizes; those shown are for the first statement.

Table 12.12

**Proportion agreeing with attitudes to drinking, by equivalised household income and sex**

Aged 13-15

2007

Attitudes to drinking: % strongly agree/agree	Equivalised household income quintile				
	Highest %	2nd %	3rd %	4th %	Lowest %
<b>Boys</b>					
People of my age drink...					
To be sociable with friends	78	64	65	65	61
Because of pressure from friends	61	49	54	51	50
Because it makes them more confident	55	34	31	31	31
Because they are bored and have nothing else to do	29	33	33	41	47
Because it helps them relax	27	18	26	16	26
<b>Girls</b>					
People of my age drink...					
To be sociable with friends	78	80	66	71	73
Because of pressure from friends	61	59	54	49	59
Because it makes them more confident	57	60	54	50	44
Because they are bored and have nothing else to do	38	47	44	42	46
Because it helps them relax	32	24	24	21	22
<i>Bases (unweighted)<sup>a</sup></i>					
Boys	109	119	139	140	134
Girls	96	110	111	132	156
<i>Bases (weighted)<sup>a</sup></i>					
Boys	97	102	128	128	137
Girls	87	94	97	121	161

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.

Table 12.13

**Proportion agreeing with attitudes to drinking, by sex and frequency of drinking**

Aged 13-15

2007

Attitudes to drinking: % strongly agree/agree	Frequency of drinking		
	Once a week or more %	Less than once week %	Never drinks %
<b>Boys</b>			
People of my age drink...			
To be sociable with friends	85	69	58
Because of pressure from friends	35	53	59
Because it makes them more confident	50	40	29
Because they are bored and have nothing else to do	55	40	29
Because it helps them relax	32	25	18
<b>Girls</b>			
People of my age drink...			
To be sociable with friends	[74]	77	69
People drink because of pressure from friends	[40]	51	66
Because it makes them more confident	[65]	58	43
Because they are bored and have nothing else to do	[40]	47	40
Because it helps them relax	[31]	25	26
<i>Bases (unweighted)<sup>a</sup></i>			
Boys	68	355	338
Girls	49	384	293
<i>Bases (weighted)<sup>a</sup></i>			
Boys	64	324	314
Girls	46	340	281

<sup>a</sup> Bases vary but are of similar sizes; those shown are for the first statement.

## **National Centre for Social Research**

[www.natcen.ac.uk](http://www.natcen.ac.uk)

The National Centre for Social Research is the largest independent social research institute in Britain, specialising in social survey and qualitative research for the development and evaluation of policy. NatCen specialises in research in public policy fields such as health, housing, employment, crime, education and political and social attitudes. Projects include ad hoc and continuous surveys, using face-to-face, telephone and postal methods; many use advanced applications of computer assisted interviewing. NatCen has approximately 300 staff, a national panel of over 1,000 interviewers and 200 nurses who work on health-related surveys.

## **Department of Epidemiology and Public Health, UCL Medical School**

[www.ucl.ac.uk/epidemiology](http://www.ucl.ac.uk/epidemiology)

The Department of Epidemiology and Public Health, chaired by Professor Sir Michael Marmot, is a leading centre for research into the social determinants of health. The department has a strong interdisciplinary structure. The Department houses over 170 staff, in 11 main research groups, namely the Joint Health Surveys Unit, part of the Health and Social Surveys Research Group; Cancer Research UK-funded Health Behaviour Research Centre; Central and Eastern Europe Research Group; Dental Public Health; Health Care Evaluation Group; International Centre for Life Course Studies; MRC Unit for Lifelong Health and Ageing (including the National Survey of Health and Development); Psychobiology Group; Clinical Epidemiology Group; Genetic Epidemiology Group; and the Whitehall II Study. Collaborative research is conducted through the International Institute for Society and Health and across the Division.

The Department's research programme is concerned particularly with social factors in health and illness and inequalities in these, including national cross-sectional surveys of health and behaviour (such as diet), longitudinal studies of cardiovascular disease (Whitehall studies) and the English Longitudinal Study of Ageing (ELSA); international studies of cardiovascular disease and diabetes; sociodemographic indicators of need; and the socio-economic and policy implications of an ageing population.



for health and social care