



The
Information
Centre
for health and social care

Health Survey for England

2008

Physical activity and fitness

Summary of key findings

A survey carried out on behalf of The NHS Information Centre

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Summary of key findings

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Introduction

The Health Survey for England

The Health Survey for England (HSE) is part of a programme of surveys commissioned by The NHS Information Centre for health and social care, 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. The study provides 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 monitor trends in the nation's health, to estimate the proportion of people in England who have specified health conditions, and to estimate the prevalence of certain risk factors and combinations of risk factors associated with these conditions. The survey is also used to monitor progress towards selected health targets.

Each survey in the series includes core questions and measurements (such as blood pressure, anthropometric measurements and analysis of blood, 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 this year's survey, children.

This is the eighteenth annual Health Survey for England. All surveys have covered the adult population aged 16 and over living in private households in England. Since 1995, the surveys have included children aged 2-15, and since 2001, infants under two years old who live in households selected for the survey. Those living in institutions were outside the scope of the survey. This should be borne in mind when considering survey findings since the institutional population is likely to be older and, on average, less healthy than those living in private households.

The HSE 2008 included a general population sample of adults and children, representative of the whole population at both national and regional level, and a boost sample of children aged 2-15. A sub-sample was identified in which the main survey was supplemented with objective measures of physical activity and fitness. For the general population sample, 16,056 addresses were randomly selected in 1,176 postcode sectors, issued over twelve months from January to December 2008. 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.

At each address, all households, and all persons in them, were eligible for inclusion in the survey. Where there were three or more children aged 0-15 in a household, two of the children were selected at random. A nurse visit was arranged for all participants who consented.

In addition to the core general population sample, a boost sample of children aged 2-15 was selected using 19,404 addresses. These were drawn from 996 of the core sampling points. 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. There was no nurse follow up for this child boost sample.

A sub-sample was identified in which the main survey was supplemented with objective measures of physical activity and fitness. The sub-sample was taken in 384 sampling points, including both core and boost addresses. Up to two individuals in the sub-sample

Figure A

Health Survey for England 2008: Contents

Individual level information	Age								
	0-1	2-3	4	5-7	8-10	11-12	13-15	16-74	75+
Household data									
Household size, composition and relationships									
Accommodation tenure and number of bedrooms									
Economic status/occupation of Household Reference Person									
								Household income	
								Smoking in household	
								Type of dwelling and area	
								Car ownership	
Interviewer visit									
General health, longstanding illness, limiting longstanding illness, acute sickness	●	●	●	●	●	●	●	●	●
Fruit and vegetable consumption				●	●	●	●	●	●
Children's eating habits (fat, sugar)		●	●	●	●	●	●		
Child physical activity		●	●	●	●	●	●		
Adult physical activity								●	●
Smoking					● ^a	● ^a	● ^a	● ^b	●
Drinking (seven day period)					● ^a	● ^a	● ^a	● ^b	●
Economic status/occupation, educational achievement								●	●
Ethnic origin	●	●	●	●	●	●	●	●	●
Height measurement		●	●	●	●	●	●	●	●
Weight measurement	●	●	●	●	●	●	●	●	●
Reported birth weight	●	●	●	●	●	●	●		
Consent to linkage to NHS Central Register/ Hospital Episodes Statistics								●	●
GHQ12							● ^a	● ^a	● ^a
EQ5D								● ^a	● ^a
Cycling safety					● ^a				
Perception of weight					● ^a	● ^a	● ^a		
Accelerometer ^c			●	●	●	●	●	●	●
Nurse visit									
Immunisations	●								
Infant length	●								
Prescribed medicines and vitamin supplements	●	●	●	●	●	●	●	●	●
Nicotine replacements								●	●
Waist and hip circumference						●	●	●	●
Blood pressure				●	●	●	●	●	●
Step test ^c								●	●
Saliva sample (cotinine)			●	●	●	●	●	●	●
Blood sample								●	●
Adult eating habits								● ^a	● ^a

^a This module was administered by self-completion.

^b This module was administered by self-completion for those aged 16-17 and some aged 18-24.

^c This module was administered among a sub-sample.

households were selected to wear an accelerometer to measure physical activity; in households where both adults and children of the appropriate age were interviewed, an adult and a child were selected. In these households, eligible adults aged 16-74 were offered the step test in the nurse visit, to measure fitness.

A total of 15,102 adults and 7,521 children were interviewed in 2008, with 3,473 children from the core sample and 4,048 from the boost. A household response rate of 64% was achieved for the core sample, and 73% for the boost sample. Among the general population sample, 10,740 adults and 2,464 children had a nurse visit.

Topics covered in the 2008 Health Survey for England

The 2008 survey focused on physical activity and fitness levels. Participants were interviewed, and for those in the core sample this was followed by a visit from a specially trained nurse. Adults and children were asked modules of questions including general health, fruit and vegetable consumption, alcohol consumption and smoking, as well as physical activity.

Height was measured for those aged two and over and weight for all participants. Nurses measured infant length (aged at least six weeks and under two years), blood pressure (aged five and over), and waist and hip circumference (aged 11 and over). Non-fasting blood samples were collected from adults aged 16 and over, and saliva samples for cotinine analysis from adults aged 16 and over and children aged 4-15. Nurses obtained written consent before taking samples from adults, and parents gave written consent for their children's samples. Consent was also obtained from adults to send results to their GPs, and from parents to send their children's results to their GPs.

Results

This booklet presents findings for adults and children from the 2008 Health Survey for England, looking particularly at physical activity and fitness. All 2008 data in this report are weighted. Data for adults in the general population have been weighted to allow for non-response, and data for children (combining core and boost samples) have been weighted for selection differences and non-response. Both weighted and unweighted bases are given in participants involved. The weighted bases show the relative sizes of the various sample elements after weighting, reflecting their proportions in the English population.

The full report consists of two volumes, published as a set as 'The Health Survey for England 2008':

1. Physical activity and fitness
2. Methods and documentation.

The second volume, Methods and documentation, provides details of the survey design, methods and response.

Physical activity and fitness

The primary focus of the Health Survey for England in 2008 was physical activity and fitness. Adults and children were asked to recall their physical activity over recent weeks, and objective measures of physical activity and fitness were also obtained.

Physical activity has become an increasingly important public health issue as governments attempt to curb the levels of child and adult obesity. The health benefits of a physically active lifestyle have been well documented, and participation in regular physical activity can increase the quality of life and independence in older age. Physical inactivity is associated with all-cause mortality and many chronic diseases, including ischaemic heart disease, diabetes, certain cancers and obesity.

In England, physical inactivity was estimated in 2002 to cost £8.2 billion a year. Sedentary time is at least as important as moderate-intensity physical activity as a disease risk factor. Sedentary behaviours are also associated with increased risk of obesity and cardiovascular disease independently of moderate to vigorous activity levels.

This report also examines cardiovascular fitness among adults. Greater physical fitness is associated with lower mortality in the general population and mitigates the effect of metabolic syndrome (a disorder characterised by increased risk of developing diabetes and cardiovascular disease) on all-cause and cardiovascular death. Lack of fitness affects deaths from all causes, cardiovascular disease and cancers. Increasing activity levels increases fitness as well as reducing obesity and risks of diseases associated with inactivity, low fitness levels or obesity.

The 2008 HSE interview included detailed questions about physical activity in the preceding four weeks for adults, and the preceding week for children, from which self-reported measures of physical activity were derived. In addition, a sub-sample of adults and children were asked to wear an accelerometer for a week to provide objective measures of activity.

Self-reported physical activity among adults

In 2008, based on self-reported physical activity, 39% of men and 29% of women aged 16 and over met the Chief Medical Officer's minimum recommendations for physical activity in adults (using information from the enhanced 2008 questionnaire). The proportion of both men and women who met the recommendations generally decreased with age.

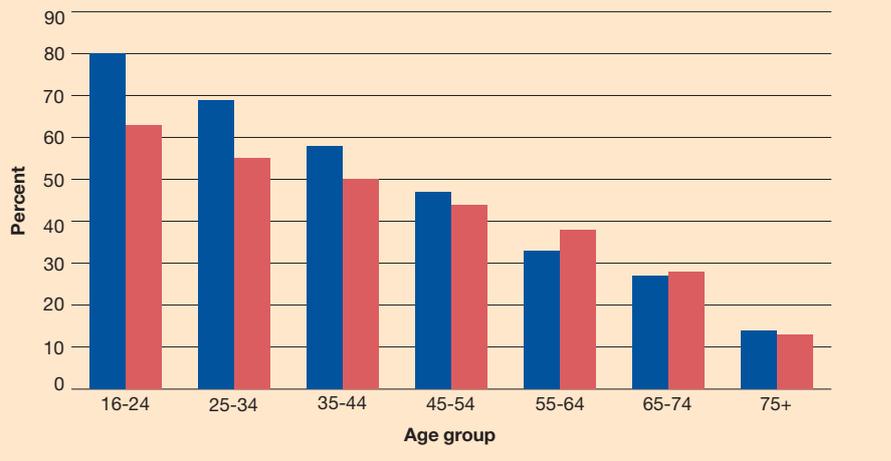
There was a clear association between meeting the physical activity recommendations and body mass index (BMI) category. 46% of men and 36% of women who were neither overweight nor obese met the recommendations, followed by 41% of men and 31% of women who were overweight and only 32% of men and 19% of women who were obese.

Details of time spent in walking, sports and exercise, housework and heavy manual/gardening/DIY activities were established. Men averaged more days than women in each activity except heavy housework. On average, men participated in non-occupational physical activity on 13.9 days in the past four weeks, compared with 12.2 days for women. 18% of men and 21% of women spent no time in non-occupational physical activity in the last four weeks.

For both men and women, participation in walking and in sports and exercise generally fell with age. The pattern for the number of days' participation in heavy housework and heavy manual/gardening/DIY activities was similar for both men and women, with participation in these generally lowest in the youngest and oldest age groups.

Proportion participating in any sports and exercise (for at least 10 continuous minutes) in the last four weeks, by age and sex

Base: Aged 16 and over



Questions were also asked about occupational activity. Men and women were similar in terms of the proportion who spent at least some time walking around at work. Men spent slightly more time than women sitting and/or standing; climbing stairs or ladders; and lifting, carrying, or moving heavy loads. Most men and women considered themselves to be very or fairly physically active at work (62% and 59% respectively); however, only 24% of men and 11% of women spent, on average, 30 minutes in at least moderate activity at work per day.

Total average sedentary time (apart from at work) on weekdays was very similar for men and women; however, on weekend days men were more likely than women to average six or more hours of sedentary time (44% and 39% respectively). For both men and women, time spent watching television on weekdays and other sedentary time on both weekdays and weekend days decreased into middle age and rose again among older age groups.

Objective measures of physical activity: accelerometry among adults

Increasing physical activity has become a global health priority, so researchers have been developing practical tools that measure physical activity more precisely and accurately than self-report surveys. The use of accelerometry has become the most common method applied to assess physical activity in free-living individuals. To date, a large number of studies, including general population surveys, have investigated the validity of accelerometry under both field and laboratory conditions.

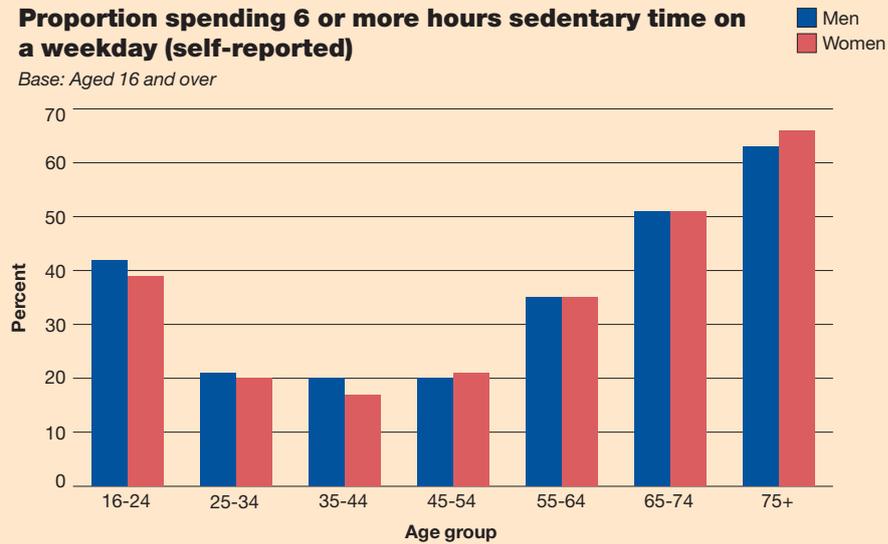
In the 2008 HSE, 1,998 men and 2,509 women aged 16 and over were selected for the accelerometry sample. 53% of men and 51% of women provided eligible data for at least one day, while 49% of men and 46% of women wore the accelerometer for at least four days for at least 10 hours per day.

Overall, men had significantly longer periods of sedentary time per day on average than women (595 minutes and 584 minutes respectively), and longer periods of moderate intensity activity (30 minutes and 23 minutes respectively). The reverse was true for light physical activity, where women averaged more time per day than men (212 minutes among men, 231 minutes among women). Among both men and women, an average of only one minute per day was spent in vigorous activity.

While men spent an average of 31 minutes in moderate or vigorous activity (MVPA) in total per day, and women an average of 24 minutes, most of this was sporadic activity, and only about a third was accrued in bouts of at least 10 minutes. Government recommendations specify that physical activity should be in 10 minute bouts to count towards meeting the targets.

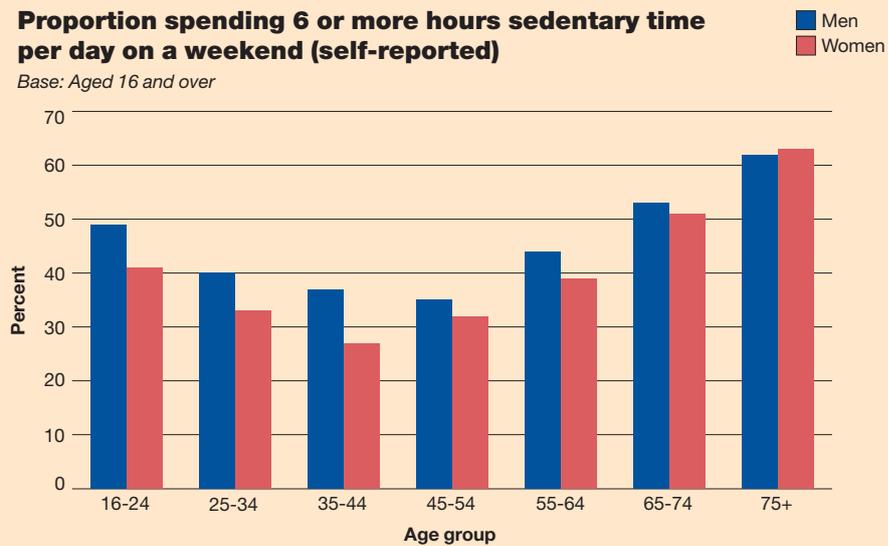
Proportion spending 6 or more hours sedentary time on a weekday (self-reported)

Base: Aged 16 and over



Proportion spending 6 or more hours sedentary time per day on a weekend (self-reported)

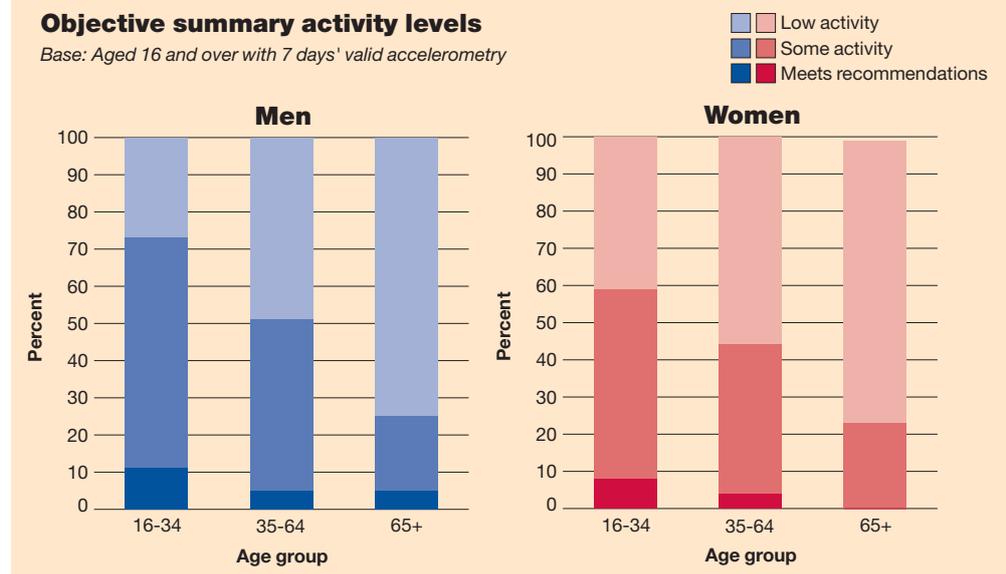
Base: Aged 16 and over



Based on accelerometry, only 6% of men and 4% of women met the government's current recommendations for physical activity, by achieving at least 30 minutes of moderate or vigorous activity on at least five days in the week of accelerometer wear, accumulated in bouts of at least 10 minutes. Men were less likely than women to be in the low activity category (50% and 58% respectively), defined as doing less than 30 minutes of moderate

Objective summary activity levels

Base: Aged 16 and over with 7 days' valid accelerometry



or vigorous activity (accumulated in 10 minute bouts) on all days in the week of accelerometer wear.

Men and women aged 16-34 were most likely to have met the recommendations (11% and 8% respectively), and the proportion of both men and women meeting the recommendations fell in the older age groups. Similarly, the proportion in the low activity category increased with age for both sexes.

Among those whose self-reported activity level corresponded with meeting the recommendations, only 10% of men and 8% of women also met the recommendations based on accelerometry. Just under half were in the intermediate category (49% of men, 48% of women), and 41% of men and 44% of women were actually in the low activity category.

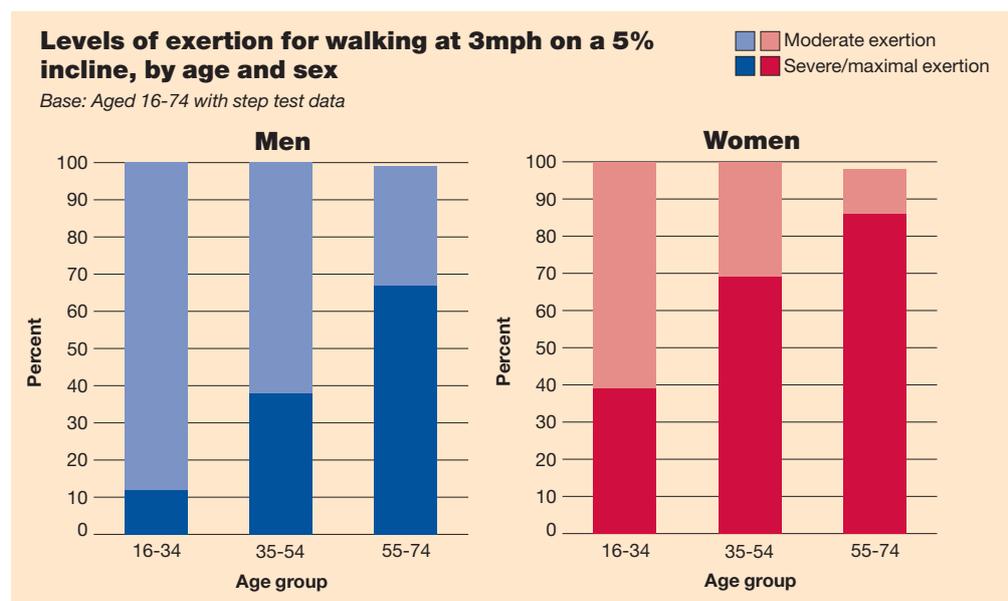
Fitness among adults

Cardiovascular fitness was measured in the HSE 2008 among a sub-sample of survey participants aged 16-74. A step test was used, which involved the participant stepping up and down a single step to a rhythm given digitally by the nurse's laptop, for a maximum of eight minutes. The pace of stepping increased throughout the test. Heart rate measurements were taken during and after the test, and combined with the resting heart rate to provide an estimate of the individual's maximal oxygen uptake (VO_{2max}), a measure of the overall level of fitness.

Of 1,635 men and 2,010 women selected for the test, 41% of men and 45% of women were not eligible because of a stringent set of exclusion criteria. Of the 914 men and 1,055 women who started the test, 92% completed at least four minutes, providing usable data. 69% of men and 46% of women completed the full eight minutes of the test.

Men were significantly fitter than women: the average level of maximal oxygen uptake (VO_{2max}) was 36.3 ml O_2 /min/kg for men and 32.0 ml O_2 /min/kg for women. In both sexes, the mean VO_{2max} decreased with age.

Virtually all participants were deemed able to walk at 3mph on the flat. 84% of men and 97% of women would require moderate exertion for this activity. 32% of men and 60% of women were not fit enough to sustain walking at 3mph up a 5% incline (i.e. they would require severe or maximal exertion, and were classified as 'unfit'). Lack of fitness increased significantly with age; only 32% of men and 12% of women aged 55-74 would find that this exercise required only moderate exertion.

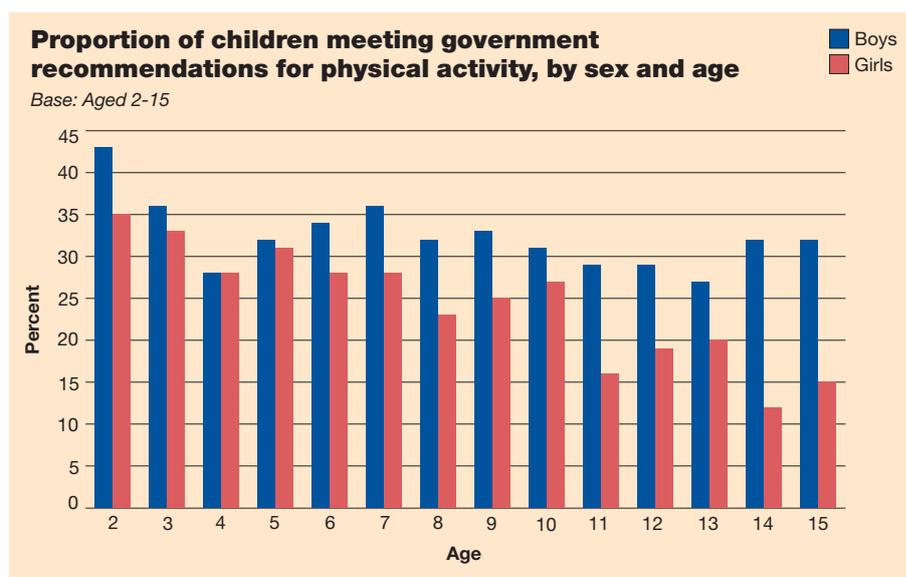


Physical fitness was related to self-reported physical activity. The average level of fitness (VO_{2max}) decreased, and the proportion classified unfit increased, as the self-reported activity level decreased.

Comparisons of fitness levels and the objective measure of physical activity were restricted by the small number of adults who had both measures, and no relationship was apparent. However, there was the expected relationship with age. Overall, mean of VO_{2max} decreased substantially with age within each objective physical activity level in both sexes. In the low activity group 12% of men and 43% of women aged 16-34 were unfit, and this rose to 75% of men and 96% of women aged 55 -74.

Self-reported physical activity among children

Based on self-reported measures (excluding time at school), a higher proportion of boys than girls aged 2-15 were classified as meeting the government's recommendations for physical activity, doing at least an hour of at least moderate activity every day (32% and 24% respectively). Among girls the proportion meeting the government recommendations generally decreased with age, ranging from 35% among girls aged 2 to 12% among those aged 14. There was a less consistent pattern with age among boys.



Overall, 95% of boys and girls had participated in some kind of physical activity in the last week. More girls than boys had done some walking (65% and 61% respectively). However, boys were more likely than girls to have participated in informal activities (90% and 86% respectively) and formal sports (49% and 38% respectively).

The average total number of hours of physical activity in the last seven days was greater for boys than for girls (10.0 and 8.7 respectively), with a clear decrease with age among girls. For most children, the largest contribution to their total physical activity came from informal sports and activities, but for girls aged 14-15, more of their activity came from walking than from informal sports.

Average total sedentary time (excluding time at school) was very similar for boys and girls on weekdays (3.4 hours each) and weekend days (4.1 hours and 4.2 hours respectively). Average sedentary time generally increased with age, whether for television viewing or other sedentary time.

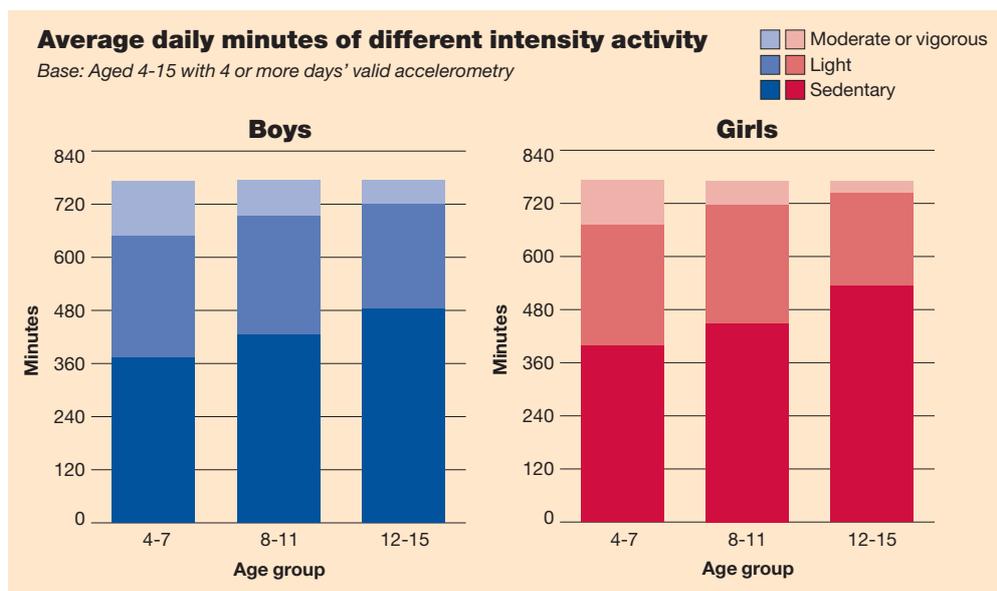
A different pattern of sedentary time was apparent for weekdays and weekend days. On weekdays, there was little variation among younger children, with fewer than 10% of those aged 2-9 sedentary for six or more hours, while the proportion rose steeply after that age. At weekends, the proportion that were sedentary for six or more hours generally increased across all ages, ranging from 8% of boys and girls aged 2 to 40% of boys and 41% of girls aged 15.

Objective measures of physical activity: accelerometry among children

In the 2008 HSE, 1,707 children aged 4-15 were selected for the accelerometry sample. 43% of boys and 47% of girls wore an accelerometer for at least ten hours per day on at least four days, and 16% of boys and 17% of girls wore the accelerometer for the full seven days.

Sedentary activity accounted for the largest amount of time, with girls spending more time in sedentary pursuits than boys (over seven hours in each case). Boys and girls did similar amounts of light activity on average. In contrast, boys spent significantly more time than girls on average in moderate activity. Overall, the average amount of moderate to vigorous physical activity (MVPA) was 85 minutes per day for boys and 61 minutes for girls.

Average time spent in sedentary pursuits increased with age for both girls and boys. Conversely, average time spent in light physical activity decreased with age, as did the average time spent doing any MVPA per day. MVPA decreased from 124 minutes among boys and 101 minutes among girls aged 4-7, to 52 minutes among boys and 28 minutes among girls aged 12-15.



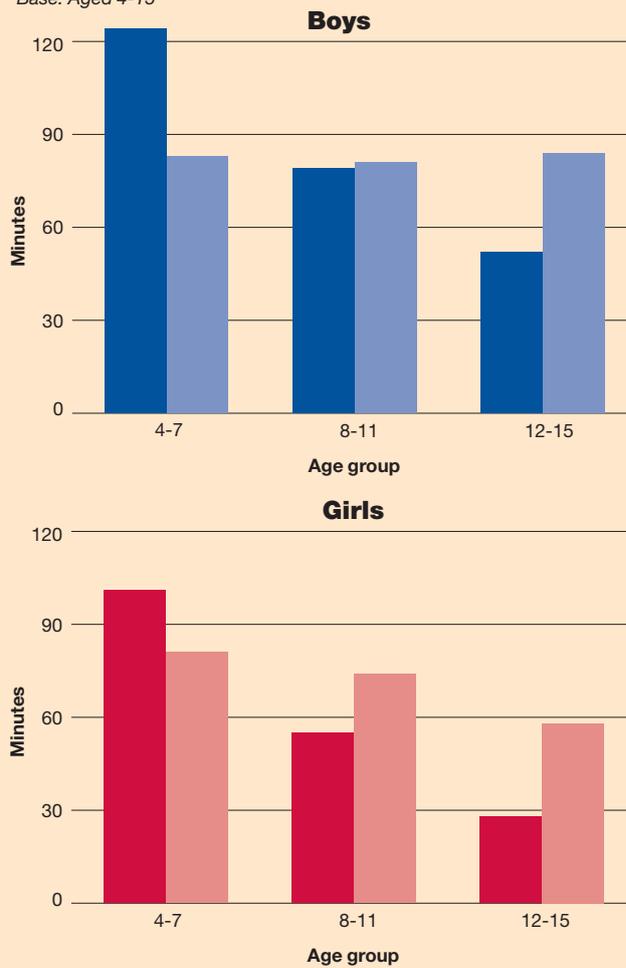
Based on accelerometry, a higher proportion of boys than girls were classified as meeting the government recommendations for physical activity (33% and 21% respectively). Only around one in five children had achieved the intermediate level of 'some activity' (at least 30 minutes of MVPA on each day), with 47% of boys and 61% of girls in the low activity group.

Based on self-reported data, 31% of boys and 22% of girls aged 4-15 met the government recommendations for children's physical activity. While the overall proportions classified as meeting recommendations are similar using the different methods of measurement, accelerometry indicates a much larger differentiation between younger and older children than is apparent with self-reported data. The comparison between the two measurements suggests that self-report may under-estimate MVPA in younger children, and over-estimate among older children.

Objective and self-reported measures of average daily minutes of MVPA time, by age and sex

Accelerometry
Self-reported

Base: Aged 4-15



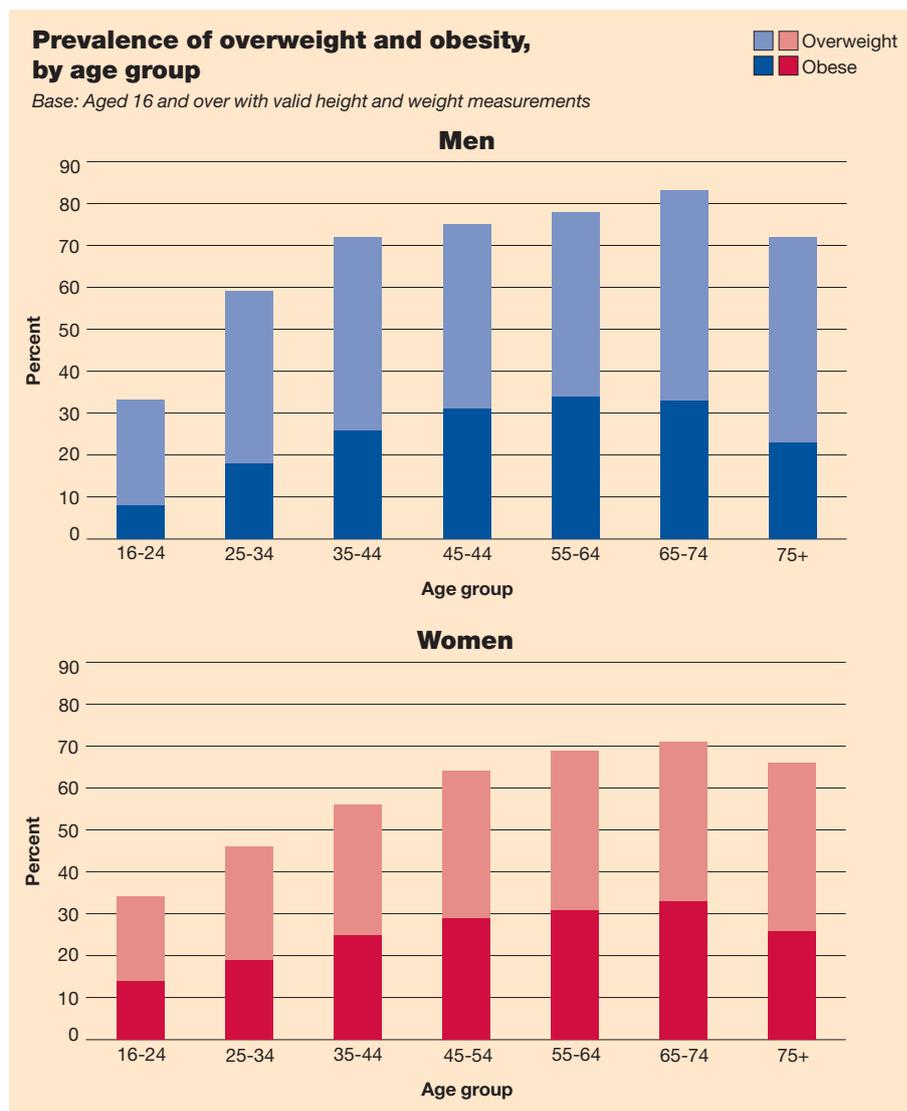
Accelerometry data are based on those with 4 or more days' valid accelerometry.

Health and lifestyle factors among adults

Overweight and obesity

Obesity is a major public health problem due to its association with serious chronic diseases such as type 2 diabetes, hypertension and hyperlipidaemia (high levels of fats in the blood that can lead to narrowing and blockages of blood vessels), all of which are major risk factors for cardiovascular disease and cardiovascular related mortality. Obesity is also associated with cancer, disability and reduced quality of life, and can lead to premature death. The annual cost of treating co-morbidities related to overweight and obesity is estimated to be £4.2 billion and is forecast to more than double by 2050.

The prevalence of overweight and obesity is indicated by body mass index (BMI) as a measure of general obesity, and/or waist circumference as a measure of abdominal obesity. BMI, defined as weight in kilograms divided by the square of the height in metres (kg/m^2) was calculated in order to group people into the following categories:



BMI (kg/m²)	Description
Less than 18.5	Underweight
18.5 to less than 25	Normal
25 to less than 30	Overweight
30 or more	Obese

Mean BMI was higher in men than women, 27.2kg/m² compared with 26.9kg/m². Mean BMI increased with age in both sexes up to the age group 65-74.

66% of men and 57% of women were overweight or obese, and almost a quarter of adults (24% of men and 25% of women) were obese. Prevalence of overweight and obesity was lowest in the 16-24 age group, and generally higher in the older age groups among both men and women.

A raised waist circumference is defined as greater than 102cm in men, and greater than 88cm in women. Mean waist circumference was 97.2cm in men and 87.4cm in women. The proportion of participants with a raised waist circumference was higher in women (44%) than men (34%). The prevalence of raised waist circumference increased with age in both sexes.

National Institute for Health and Clinical Excellence (NICE) guidelines recommend the use of both BMI and waist circumference to assess overweight and obesity and to identify the risk of co-morbidities. Different levels of health risk have been defined for different combinations of these two measures. For those with a BMI of less than 35 kg/m², waist circumference is a means of differentiating levels of increased health risk.

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, 20% of men were estimated to be at increased risk, 14% at high risk and 21% at very high risk. The equivalent proportions for women were 15% at increased risk, 17% at high risk and 24% at very high risk.

Hypertension

High blood pressure, or 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.

The prevalence of survey-defined hypertension (at least 140mmHg systolic and/or 90 mmHg diastolic blood pressure and/or on treatment for hypertension) in HSE 2008 was 32% in men and 29% in women. Prevalence increased with age in both sexes. Up to the age of 64, prevalence was higher among men than women, but by the age of 75 and over it was higher among women than men.

Among participants with survey-defined hypertension, 46% of men and 57% of women were on treatment for hypertension, and 26% of men and 32% of women had their hypertension controlled (BP below 140/90 mmHg). Thus 57% of both men and women who were on treatment for hypertension had their blood pressure controlled.

Blood analytes

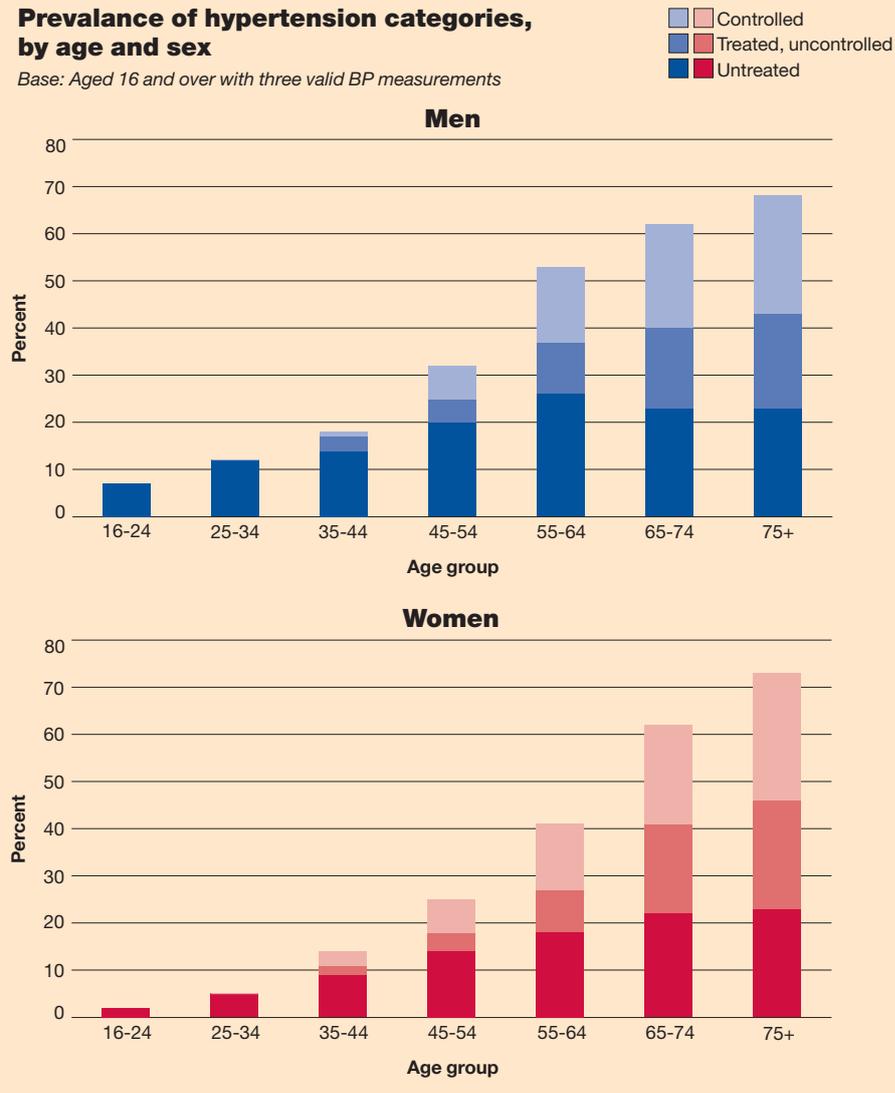
Three analytes were measured in non-fasting blood samples in 2008. These were total cholesterol, high-density lipoprotein (HDL) cholesterol and glycated haemoglobin.

Total cholesterol comprises three components: LDL-cholesterol (low density lipoprotein); VLDL-cholesterol (very low density lipoprotein), and HDL-cholesterol (high density lipoprotein). The majority of the cholesterol in the blood is carried as LDL-cholesterol, which contributes to atherosclerosis ('furring' of the arteries). VLDL-cholesterol is involved in clearing fat from the bowel after eating. HDL-cholesterol carries cholesterol away from the arteries back to the liver, and is considered to be beneficial cholesterol.

Mean levels of total cholesterol were 5.2mmol/l for men and 5.4mmol/l for women. The proportions of men and women with raised total cholesterol levels (5.0mmol/l or above)

Prevalence of hypertension categories, by age and sex

Base: Aged 16 and over with three valid BP measurements



were 58% and 61% respectively. Mean levels of HDL-cholesterol were 1.3mmol/l in men and 1.6mmol/l in women. Men continue to be more likely than women to have low levels of HDL-cholesterol (below 1.0mmol/l).

Diabetes is characterised by high blood glucose levels (hyperglycaemia). Glycated haemoglobin reflects medium-term blood glucose levels and is used for assessing diabetic control. In this report, a raised glycated haemoglobin level is taken to be 7% or more in the general population, while levels below 7% in people with doctor-diagnosed diabetes are indicative of good control of diabetes. Glycated haemoglobin levels above 7% were more frequent in men than in women (3.9% and 2.6% respectively).

Fruit and vegetable consumption

The '5 A DAY' programme is part of a preventative strategy aimed at improving diet and nutrition in the general population. Current guidelines recommend that adults and children should aim to eat five or more portions of fruit and vegetables each day.

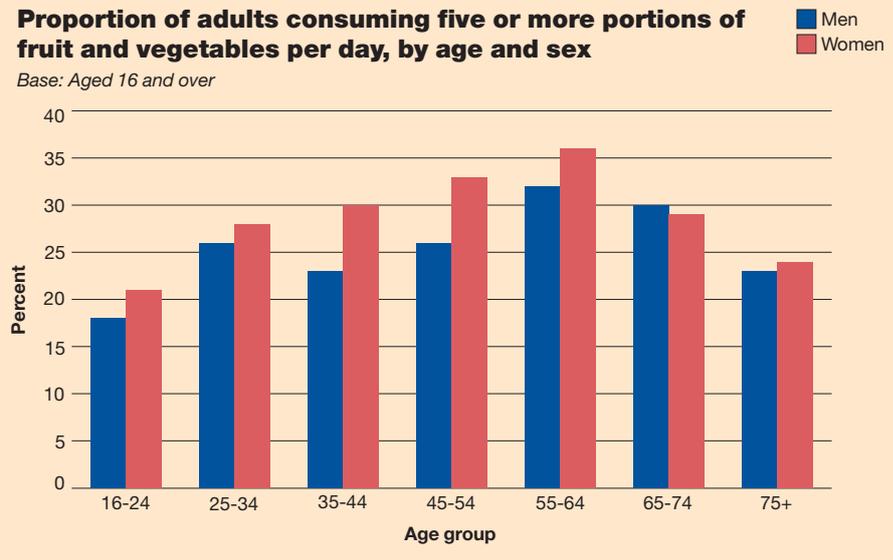
Fruit and vegetable consumption is measured in portions per day, based on consumption in the day before the interview. Portions are expressed in everyday units such as whole or half fruit and tablespoons or bowls, to make it easier for respondents to recall their consumption accurately.

More women than men consumed the recommended five or more portions of fruit and vegetables daily (25% of men, 29% of women). These proportions in 2008 are slightly lower than in 2007, when 27% of men and 31% of women consumed at least five portions daily.

Consumption varied with age, increasing from 16-24 (18% of men and 21% of women) up to 55-64 (32% of men and 36% of women) and then decreasing again.

Proportion of adults consuming five or more portions of fruit and vegetables per day, by age and sex

Base: Aged 16 and over



Cigarette smoking

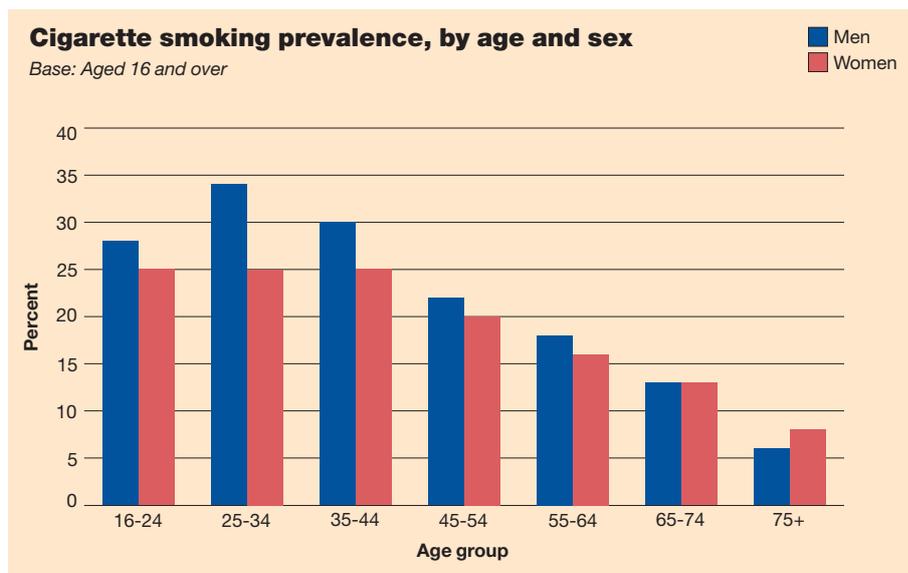
Smoking is recognised to be the greatest single cause of preventable illness and premature death in the United Kingdom. Figures from the report *Statistics on Smoking: England 2009* showed that in England in 2008 around 83,900 deaths among adults aged 35 and over were estimated to be caused by smoking, accounting for 23% of deaths in men and 14% of deaths in women aged 35 and over. Around 5% (440,900) of all hospital admissions among adults aged 35 and over in England were estimated to be attributable to smoking.

In addition to causing harm to the smoker, exposure to other people's smoke causes conditions such as heart disease and lung cancer; it exacerbates asthma; and, among children, contributes to ear and respiratory problems and cot deaths. There is no threshold for exposure to secondhand smoke below which it is harmless.

In the HSE 2008, self-reported cigarette smoking prevalence was 24% for men and 20% for women. Among those aged 16-44, men were more likely than women to report smoking cigarettes. Cigarette smoking prevalence was 9 percentage points higher among men aged 25-34 than women of the same age (34% men; 25% women). Male smokers also reported smoking more cigarettes than women. On average, male smokers smoked 13.7 cigarettes per day whereas women smoked 12.2.

Cigarette smoking prevalence, by age and sex

Base: Aged 16 and over



Cotinine is a derivative of nicotine and a level of 15 nanograms per millilitre (ng/ml) is indicative of personal tobacco use in the past 24 hours. Among self-reported non-smokers, detectable cotinine levels of less than 15ng/ml are indicative of exposure to other people's smoke.

26% of men and 21% of women had a cotinine level of 15ng/ml or above. This is slightly higher than self-reported cigarette smoking prevalence. Among men, most of the difference between the two estimates can be accounted for by cigar or pipe smoking. Among women aged 25-44, there appears to be a low but persistent level of under-reporting of cigarette smoking behaviour.

Smokefree legislation was introduced in England on 1st July 2007. Comparison of HSE data in the 12 months before and after the legislation shows that non-smokers were less exposed to the smoke of others after 1st July 2007 than previously. Geometric mean cotinine levels among male non-smokers fell from 0.20ng/ml to 0.14ng/ml, pre and post 1st July 2007. Equivalent estimates for women were 0.19ng/ml and 0.13ng/ml respectively.

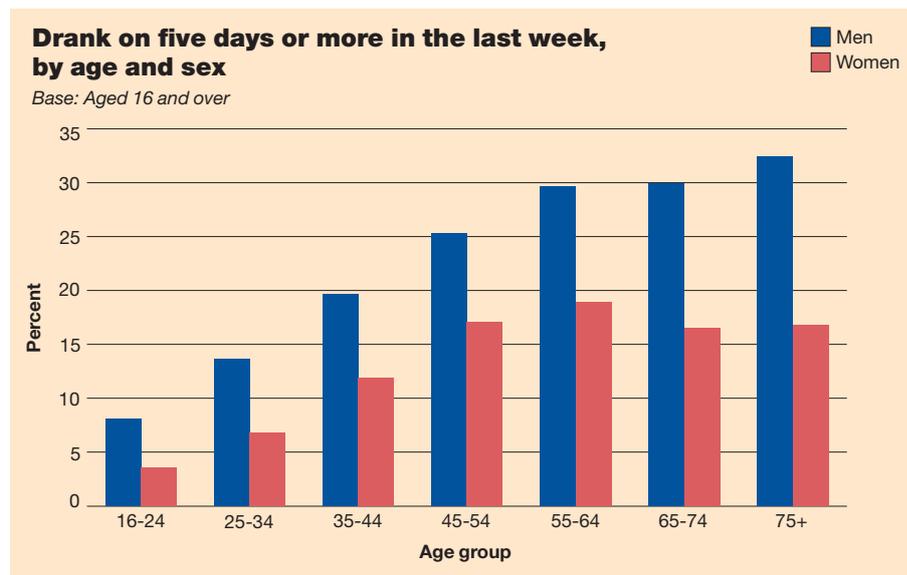
Self-reported mean hours of exposure to other people's smoke was also significantly lower post policy implementation, falling from 6.2 hours to 3.3 hours among men and 4.4 hours to 2.7 hours among women, pre and post 1st July 2007.

Self-reported cigarette smoking prevalence did not vary significantly pre and post policy implementation. However, there is evidence that cigarette consumption has declined post 1st July 2007.

Alcohol consumption

In recent years, concern has increased among policy makers and the general public about the damage caused by excessive drinking to individuals, communities and society as a whole. 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. Additionally, alcohol is implicated in many road traffic accidents and violent assaults. Both hospital admissions for conditions specifically related to alcohol and deaths attributed to alcohol increased substantially between 1991 and 2007. The annual cost to the NHS of alcohol misuse has been estimated as £2.7 billion.

The majority of adults had drunk alcohol in the last week; 71% of men, 58% of women. This includes 21% of men and 13% of women who had drunk alcohol on five or more days in the last week. Drinking at this frequency increased with age, from 8% of men and 4% of women aged 16-24 to 32% of men aged 75 and over and 19% of women aged between 55 and 64.



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, 41% of men and 32% of women had drunk more than the recommended maximum on at least one day. This includes 25% of men and 15% of women who had drunk more than twice the recommended maximum.

Among those adults who drank in the last week, the majority exceeded recommendations on at least one day; 58% of men and 55% of women had done so. 35% of men and 27% of women had drunk more than twice the recommended levels on at least one day in the last week. The proportions drinking at potentially harmful levels declined with age, from 52% of men and 50% of women aged 16-24 to just 4% of men and 3% of women aged 75 and over.

Obesity and health risk factors among children

The Health Survey for England 2008 focused on physical activity among children as well as adults. A secondary objective was to examine results on childhood obesity and other health risk factors for children, including fruit and vegetable consumption, drinking and smoking.

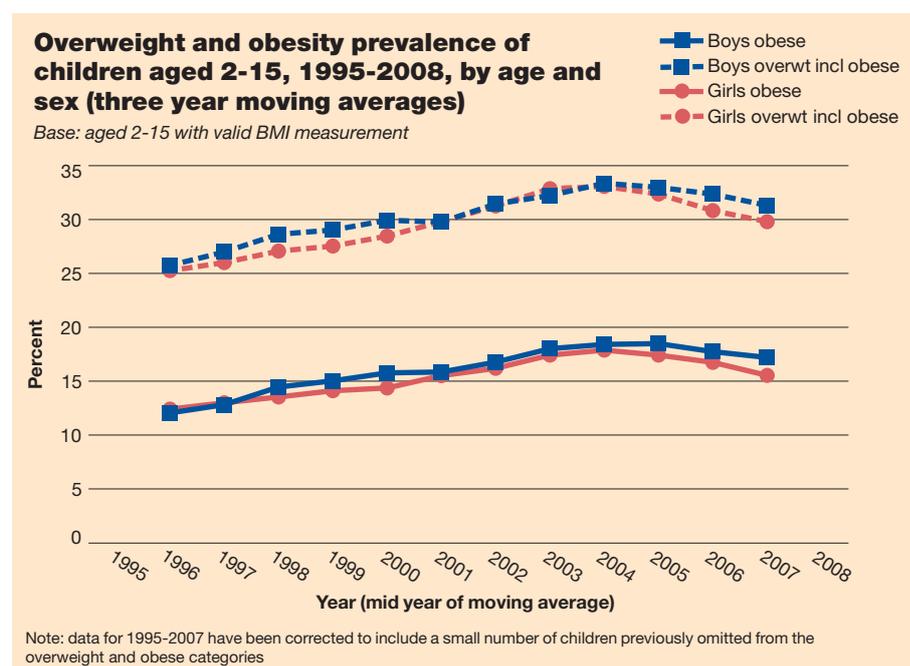
Correction to child BMI (body mass index) categories

In 2008, the definitions for children who were overweight or obese were revised from those used in previous years to correct an error which meant that small numbers of children that should have been classified as either 'overweight' or 'obese' were omitted from these categories because of rounding of age and BMI thresholds. These changes resulted in revisions to child BMI categories for the years 1995 to 2007. The revised percentages of those overweight or obese in each year, between 1995 and 2007, differ by less than 0.1-1.1 percentage points from those originally published, and 0.3%-1.2% of children in each year were misclassified. In no cases were results significantly different from those presented previously.

BMI, overweight and obesity

There is increasing evidence that childhood overweight and obesity can be linked with numerous long-term and immediate health risks. 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'.

17% of boys and 15% of girls were classed as obese, and around three in ten boys and girls were classed as either overweight or obese (31% and 29% respectively). Children aged 11-



15 were more likely than those aged 2-10 to be obese (21% of boys and 18% of girls aged 11-15, compared with 14% and 13% respectively aged 2-10).

Between 1995 and 2008, the prevalence of obesity among boys aged 2-15 increased from 11% to 17%, and the equivalent increase for girls was from 12% to 15%. However, the pattern has not been one of uniform increase over the period. The prevalence of obesity increased steadily in most years up to around 2004 and 2005, and since then the pattern has been slightly different for boys and girls. Among boys, the proportion who were obese has remained between 17% and 19% since 2002. Among girls, there was a significant decrease in obesity between 2005 and 2006, and levels have been similar from 2006 to 2008.

These results suggest that the trend in obesity now appears to be flattening out, and future HSE data will be important in confirming whether this is a continuing pattern, or whether the longer term trend is still gradually increasing.

Fruit and vegetable consumption

Among children aged 5-15, around one in five boys and girls met the government's recommended target of consuming at least five portions of fruit and vegetables per day (19% of boys and 20% of girls). Overall, the mean number of portions consumed was 3.1 portions for boys and 3.3 portions for girls.

The majority of boys and girls consumed some fruit and vegetables in the previous 24 hours (93% of boys and 96% of girls). Fresh fruit was the most commonly eaten item. More girls than boys reported eating fresh fruit the previous day (72% of girls and 68% of boys). The consumption of fresh fruit was related to age, with younger children consuming more fresh fruit than older children.

Cigarette smoking and exposure to others' smoke

A small proportion (2%) of children aged 8-15 reported that they were regular smokers (at least one cigarette a week). The proportion was higher among older children, with 8% of boys aged 15 and 9% of girls aged 15 reporting that they smoked regularly.

Saliva cotinine is likely to be a more accurate indicator of children's smoking status than self-report. 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; while only 9% of those aged 15 reported that they smoked at least weekly, 17% were identified as current smokers when the proportion with cotinine levels of 15ng/ml or more were taken into account.

Among non-smoking children aged 4-15, there was no significant change in cotinine levels or the proportion with detectable cotinine, immediately before and after implementation of the smokefree legislation in July 2007. The proportion of children aged 0-12 that were looked after by a smoker for more than two hours a week was significantly reduced after the smokefree legislation was implemented (from 14% of boys and 16% of girls before to 11% and 10% respectively after implementation). However, there was no significant change in the reported number of hours exposed to others' smoke.

Experience of alcohol

The proportion of children who reported ever having had a proper alcoholic drink increased with age, from 8% of boys aged 8 to 70% of boys aged 15, and from 5% of girls aged 8 to 74% of girls aged 15. Overall, 29% of boys and 32% of girls aged 8-15 reported having experience of drinking alcohol.

3% of boys and 2% of girls aged 8-15 reported usually drinking once a week or more. The proportion who reported drinking at least once a week increased from 1% of both boys and girls aged 8 to 11% of boys and 9% of girls aged 15 (the difference between boys and girls not being statistically significant).

11% of both boys and girls aged 13-15 reported drinking alcohol in the last seven days. Consumption of each type of alcoholic drink increased with age, except for consumption of wine and fortified wines.

Reports on the 2008 Health Survey

This booklet is a summary of the findings from the 2008 Health Survey for England: Craig R, Mindell J, Hirani V (eds). *Health Survey for England 2008*.

Volume 1: Physical activity and fitness

Volume 2: Methods and documentation.

The NHS Information Centre, 2009.

Full results are available in the survey report at www.ic.nhs.uk/pubs/hse08physicalactivity, and also in an anonymised data file lodged with the Data Archive at the University of Essex. Reports and data files from earlier surveys are similarly available.

For the general population, tables showing selected trends from 1993 to 2008 will be found on The NHS Information Centre website at www.ic.nhs.uk/pubs/hse08trends or at the address below.

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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, online 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.

Research Department of Epidemiology and Public Health, UCL Medical Schoolwww.ucl.ac.uk/epidemiology

The Research 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.



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