Cardiovascular disease and risk factors

Summary of key findings

A survey carried out on behalf of The Information Centre

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Joint Health Surveys Unit

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National Centre for Social Research

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Health Survey for England 2006
Cardiovascular disease and risk factors
Summary of key findings

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Introduction

The Health Survey for England (HSE) is part of a programme of surveys commissioned by the 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 Royal Free and University College Medical School (UCL). 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 sixteenth 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 two to 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 2006 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 two to 15. For the general population sample, 14,400 addresses were randomly selected in 720 postcode sectors, issued over twelve months from January to December 2006. 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. 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 informants who consented.

In addition to the core general population sample, a boost sample of children aged two to 15 was selected using 16,848 addresses in an additional 468 postcode sectors 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. There was no nurse follow up for this child boost sample.

Interviews were held with 14,142 adults aged 16 and over and 3,491 children from the general population. The boost sample resulted in an additional 3,766 children aged 2-15 being interviewed, giving a total child sample of 7,257. Interviews were carried out at 68% of households in the general population sample, and at 73% of known eligible boost sample households. 88% of adults in co-operating households were interviewed in the general population sample.
### Health Survey for England 2006: Contents

#### 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

<table>
<thead>
<tr>
<th>Individual level information</th>
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<td>Height measurement</td>
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<td>Strengths and difficulties</td>
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<td>Perception of weight</td>
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<td>Use of contraceptive pill</td>
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<tr>
<td>Hormone replacement therapy</td>
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</table>

#### Nurse visit
- Prescribed medicines and vitamin supplements
- Nicotine replacements
- Immunisations
- Blood pressure
- Eating habits
- Infant length
- Waist and hip circumference
- Demi-span
- Blood sample – total & HDL cholesterol, ferritin, haemoglobin, glycated haemoglobin, fibrinogen, C-reactive protein
- Saliva sample (cotinine)
- Urine sample

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*a* To avoid an overlong interview for informants aged 65 and over, they were randomly allocated to one of two groups: one group answered CVD questions and a short version of the physical activity questions, and the second group completed the full version of the physical activity questions, but not the CVD questions.

*b* These modules were administered by self-completion.

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

*d* This module was administered by self-completion to parents of 4-15 year olds.

*e* This is asked of women aged 18 and over only (there are no HRT questions in the young adult self-completion).
Informants were given an interview, and for those in the core sample this was followed by a visit from a specially trained nurse. The 2006 survey for adults focused on cardiovascular disease and its risk factors. Adults were asked modules of questions including general health, cardiovascular disease (including the Rose Angina Questionnaire), physical activity, alcohol consumption, smoking, and fruit and vegetable consumption. To avoid an overlong interview for older informants, those aged 65 and over were allocated at random to one of two questionnaire versions. This included either the CVD and short physical activity modules, or the long physical activity module but not the CVD module. Adults aged 16-64 completed both the CVD and long physical activity modules.

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 physical activity and fruit and vegetable consumption. Parents were normally present when older children were interviewed.

Height was measured for those aged two and over and weight for all informants.

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). Demi-span measurements (the length between the sternal notch and the end of the outstretched arm) were taken for informants aged 65 and over. Non-fasting blood samples and spot urine samples were collected from informants aged 16 and over, and a saliva sample for cotinine assay from children aged four to 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.

This booklet presents findings for adults and children from the 2006 Health Survey for England, looking particularly at income inequalities. All 2006 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) are weighted for selection differences and non-response. Both weighted and unweighted bases are given in each table. The unweighted bases show the number of informants 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 three volumes:

1. Cardiovascular disease and risk factors in adults
2. Obesity and other risk factors in children
3. Methodology and documentation

The third volume, Methodology and documentation, provides details of the survey design, methodology and response.
Cardiovascular disease (CVD) and associated risk factors among adults

CVD is one of the leading contributors to the global disease burden. The single most common cardiovascular disease is ischaemic heart disease (IHD, also called coronary heart disease (CHD) or coronary artery disease). IHD includes myocardial infarction (MI, i.e. heart attack) and angina (chest pain on exertion due to inadequate blood flow to the heart muscle). CVD death rates in England have been falling, but CVD remains the main cause of death.

Many risk factors for IHD, stroke, and other cardiovascular diseases are known, and some of these can be modified by lifestyle changes. Information on the prevalence of some of these risk factors, with or without drug treatment, are examined in the 2006 Health Survey for England (HSE2006): raised blood pressure (hypertension), diabetes, obesity, insufficient physical activity, a diet low in fruit and vegetables and high in fat, smoking, alcohol consumption, and raised cholesterol. Other risk factors are markers for CVD risk but as yet are not modifiable, for example blood levels of C-reactive protein.

This section covers age and sex differences and income inequalities in cardiovascular disease and its risk factors. Equivalised household income is a measure of income that takes into account the number of adults and children living in a household; this was divided into quintiles (five equal size groups). To remove the effects of age and sex on income inequalities, the income data have been age-standardised.
In 2006 13.6% of men and 13.0% of women reported having been diagnosed with cardiovascular disease. The prevalence of IHD or stroke was higher among men than women, with 8.1% of men and 5.6% of women suffering from either or both conditions. The difference between the sexes was most marked among those aged 65 and over, with the prevalence of CVD being approximately twice as high among men as women in the 65-74 age group. The prevalence of CVD conditions increased with age for both men and women.

For men and women aged 35 and over, the prevalence of CVD varied by income (prevalence is very low below this age). Men in the lowest two quintiles of equivalised household income had higher rates of CVD than those in the highest three quintiles, while women in the highest quintile and the two lowest quintiles had higher rates of CVD than those in the second and third quintiles.
In 2001 the NHS funded 90 million prescription drugs to treat people with high blood pressure. This accounted for almost 15% of the total annual cost of all drugs prescribed in primary care. NICE, the National Institute for Health and Clinical Excellence, has estimated that 40% of adults in England and Wales are hypertensive; this increases with age. It has been estimated that a small drop in mean population systolic blood pressure of 2 mmHg could save up to 14,000 lives in the UK per year.

The prevalence of survey-defined hypertension (at least 140 mmHg systolic and/or at least 90 mmHg diastolic blood pressure and/or on treatment for hypertension) in HSE 2006 was 31% in men and 28% in women. It increased substantially with age for both men and women, and prevalence was higher among men than women up to age 64.

As with CVD, the age-standardised prevalence of hypertension was inversely related to quintile of equivalised household income among women (women in the lowest income groups had the highest levels of hypertension). However unlike CVD, hypertension was not related to income in men. It is of concern that the main difference by income among women was in the proportion with untreated hypertension, suggesting that those who most need care are the least likely to obtain it.
Diabetes is characterised by high blood glucose levels (hyperglycaemia). Untreated, hyperglycaemia is associated with damage and possible failure of many organs, especially the eyes, kidneys, nerves, heart, and blood vessels. Diabetes substantially increases the risk of CVD. Glycated haemoglobin (Hb) is a measure of average blood sugar levels and has been suggested as a diagnostic or screening tool for diabetes.

The prevalence of doctor-diagnosed diabetes in 2006 was higher in men (5.6%) than in women (4.2%). The prevalence increased with age from 0.8% in men aged 16-24 to 15.7% in men aged 65-74 and 13.5% in men aged 75 and over. In women, the prevalence increased from 0.9% aged 16-24 to 10.6% aged 75 and over.

Women in households within the highest income quintile had the lowest prevalence of self-reported doctor-diagnosed diabetes. The prevalence of doctor-diagnosed diabetes in men varied between income groups, with the highest prevalences in the lowest and highest income groups. The combined prevalence of doctor-diagnosed diabetes and/or raised glycated haemoglobin (an estimate of the true prevalence of diabetes, including undiagnosed cases) was highest in the two lowest equivalised household income quintiles in both men and women.
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.

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 is weight (kg) divided by the square of height (m²) and was grouped into the following categories:

<table>
<thead>
<tr>
<th>BMI (kg/m²)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 to less than 25</td>
<td>Normal</td>
</tr>
<tr>
<td>25 to less than 30</td>
<td>Overweight</td>
</tr>
<tr>
<td>30 or more</td>
<td>Obese</td>
</tr>
<tr>
<td>40 or more</td>
<td>Morbidly obese</td>
</tr>
</tbody>
</table>

A raised waist circumference is taken to be greater than 102 cm in men and greater than 88 cm in women.

67% of men and 56% of women were either overweight or obese. A greater proportion of men than women were overweight (43% vs 32%). There was no difference in the proportion of men and women that were obese (24%), but women had a significantly higher prevalence of morbid obesity than men (3% vs 1% respectively). Mean BMI in men (27.2) was similar to women (26.8). In men, mean BMI increased with age up to age 55-64, levelled off up to age group 65-74, and was lower in those aged 75 and over, although differences between age groups were not always significant. In women, mean BMI increased with age up to age 65-74, and, as for men, was lower in those aged 75 and over.

Mean waist circumference was 96.8 cm in men and 86.4 cm in women. Unlike general obesity measured by BMI, the proportion of informants with a raised waist circumference, indicating abdominal obesity, was higher in women (41%) than in men (32%) both overall and in each age group. The largest difference between the sexes was in those aged 75 and over (57% of women, 41% of men).

Recent guidance from the National Institute of Health and Clinical Excellence (NICE) currently states that assessment of the health risks associated with overweight and obesity should be based on both BMI and waist circumference in adults with a BMI less than 35 kg/m². 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 kg/m²; health risks are very high for those with a BMI of 35 kg/m² or more with any waist circumference.

The great majority of men and women who were overweight or obese also had a high or very high waist circumference. Using the NICE categories of BMI and waist circumference to assess risk, for men 20% were estimated to be at increased risk, 13% at high risk and 21% at very high risk. The equivalent percentages for women were 14% at increased risk, 16% at high risk and 23% at very high risk.

Obesity prevalence, measured both by BMI and raised waist circumference, increased as equivalised household income fell among women. In contrast to obesity in women, and several other cardiovascular risk factors in men, the prevalence of overweight in men was generally positively related to income, with prevalence of overweight generally higher among men in higher income households. Obesity, whether measured by BMI or waist circumference, was not related to equivalised household income in men.

Physical activity is associated with all-cause mortality and many chronic diseases, including ischaemic heart disease, diabetes, certain cancers, and obesity. A minority of people meet the current minimum recommendations (30 minutes or more activity per day of at least moderate intensity, on at least five days per week). Many people attribute their failure to achieve the target recommendations to a lack of time to take exercise.

In 2006, 40% of men and 28% of women aged 16 and over met the Chief Medical Officer’s minimum recommendations for physical activity in adults. The proportion meeting the recommended level decreased with age for both men and women. The amount of physical activity undertaken was significantly related to equivalised household income among men. Between 42-45% of men in the three highest quintiles met the recommendations for physical activity, falling to 35% in the lowest income quintile. While the pattern was not as clear in women, women from the second and third higher income categories were more likely to have met the recommendations than women from the lowest income group (31% vs 26%). In the ‘low’ physical activity level group, there was a clear gradient across the income quintiles for both men and women, with those in the lowest income quintile more likely to be in the low activity group than those in the highest income quintile.
Diet is an important aspect of prevention of CVD, particularly coronary heart disease and stroke. The protective health benefits of a diet rich in fruit and vegetables and low in saturated fat are well recognised as key factors in the prevention of premature mortality from CVD related conditions.

Fruit and vegetable consumption was higher among women than men. On average, women consumed 3.9 portions of fruit and vegetables per day while men consumed 3.6 portions. More women than men consumed the recommended five or more portions per day (32% and 28% respectively). Mean consumption of fruit and vegetables was lowest among those aged 16-24 among both men and women (with a mean of 3.0 and 3.3 portions per day respectively). It then increased with age, peaking at 4.0 portions among men aged 65-74, and 4.5 portions among women aged 55-64, and dropped back slightly among older informants.

There were significant differences in fruit and vegetable consumption by equivalised household income. Those in the highest income quintile were the most likely to eat at least five portions of fruit and vegetables a day (36% of men, 38% of women) and those in the lowest quintiles the least likely to do so (20% and 22% among men in the lowest two quintiles, 23% among women in the lowest).
Men were more likely to have high fat scores (representing an intake of fats over the recommended level) than women (14% and 7% respectively). Among women, mean fat scores varied little with age up to the age of 64 but increased among older informants, peaking in those aged 75 and over. The pattern was different among men, where those aged 16-24 and those aged 75 and over had the highest mean fat scores, while scores were lower and varied relatively little among the age groups in between.

Among men, fat intake varied with equivilised household income. The proportion with a high fat score was significantly lower among men in the highest income quintile (11%) than in the other quintiles (ranging from 15%-19%). There was no pattern by income quintile among women.

Smoking is recognised to be the greatest single cause of preventable illness and premature death in the United Kingdom. It is estimated that 86,500 deaths in England per year are directly attributable to smoking. 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 occupational groups to 26% or less.

Exposure to other people’s smoke causes conditions such as heart disease, lung cancer, and, among children, ear and respiratory problems and cot deaths. In 2006, the Health Act was passed which included legislative provisions for establishing SmokeFree public places and work places in England; this was implemented on 1st July 2007.

In 2006, 24% of men and 21% of women reported currently smoking cigarettes. Cigarette smoking prevalence varied by sex and by age. Prevalence was highest among men aged 25-34 (34%) and among women aged 16-24 (28%), and in each case decreased with age thereafter. Male smokers also reported smoking more cigarettes on average per day than their female counterparts; 13.8 cigarettes per day for men compared with 12.2 cigarettes per day for women. For both men and women, the average smoker consumed around two thirds of a standard packet of cigarettes per day.

Mean hourly exposure per week to other people’s smoke in 2006 was also higher among men than women: 6.0 hours per week for men and 4.5 hours a week for women. For both sexes, mean hours of exposure were greatest among the youngest age groups and generally decreased with advancing age.

Prevalence of current cigarette smoking varied by equivilised household income. For both men and women, those in the lowest income quintile were more than twice as likely to smoke as those in the highest income quintile. In men, 16% of those in the highest income households smoked compared with 36% of those in the lowest income households. Among
Alcohol consumption

Drinking alcohol has been linked to increased risks of hypertension, stroke, coronary heart disease, liver cirrhosis and some cancers, though there is evidence that, for men over 40 and post-menopausal women, moderate daily alcohol intake may confer a protective effect against coronary heart disease and stroke. Alcohol consumption is also sometimes implicated in other hazardous behaviour such as violent assaults and road traffic accidents.

The recommended maximum daily intake is three to four units for men, and two to three units for women. Binge drinking is defined as drinking more than twice the recommended daily amount, though in practice, many binge drinkers drink substantially more than this. These definitions, and the method of converting actual drinks into units of alcohol consumed, have been revised this year. The changes have an impact on the estimated consumption of beer, wine and alcopops, with the most significant change for wine. Details of these revisions can be found in the main report.

72% of men and 58% of women had drunk alcohol in the past week, including 23% of men and 13% of women who had drunk alcohol on five or more days. 41% of all men and 33% of all women had drunk more than the recommended amounts (more than four units for men and more than three units for women) on at least one day in the past week.

Of those who drank within the last seven days, more than half drank above recommended amounts at least once (57% of men and women), and 34% of men and 28% of women had consumed more than twice the recommended amounts on at least one day.

The average number of drinking days in the past week increased with income: men and women in higher income households were more likely to have drunk on five or more days in the past week.

Blood analytes

Total and HDL-cholesterol and C-reactive protein (CRP) are independently associated with CVD. Total and HDL-cholesterol are used in predicting risk of developing CVD. Total cholesterol can be reduced by drug treatment, while the beneficial HDL-cholesterol is increased by exercise and reduced alcohol consumption. CRP is a marker for inflammation, a process involved in atherosclerosis (‘furring’ of the arteries due to a build up of calcium and fats in the artery wall).
Mean levels of total cholesterol values were 5.3mmol/l for men and 5.4mmol/l for women (5.0mmol or above indicates raised cholesterol). These levels increased from the ages of 16-24 to 55-64. After the age of 65, mean levels decreased, more so in men than in women. Mean levels of beneficial HDL-cholesterol were 1.3mmol/l and 1.6mmol/l in men and women respectively. Mean C-reactive protein levels were 3.1mg/l in men and 3.6 mg/l in women. Levels increased with age in men, ranging from 1.8mg/l in those aged 16-24 to 6.8mg/l in those aged 75 and over. The pattern was more varied in women.

No clear pattern was found for either sex for the relationship between mean or raised total cholesterol levels and income. Nor did mean HDL-cholesterol levels vary significantly across quintiles of equivalised household income in either sex. However, prevalence of low HDL-cholesterol levels (below 1.0%) rose as income fell, especially in women. Mean CRP levels generally increased as income levels decreased. This pattern was clearer in men, whose levels increased by 2.2mg/l (from 2.3mg/l to 4.5mg/l from the highest to the lowest income quintiles), than in women, whose levels increased by 1.6mg/l (from 2.8mg/l to 4.4mg/l).

Cardiovascular disease and its risk factors generally increased with age at least until age 65. The prevalence of IHD (ischaemic heart disease) and stroke, and many of their risk factors, were higher in men than in women. This was the case for IHD or stroke, hypertension, diabetes, low HDL-cholesterol, being overweight, smoking and exposure to other people's smoke. However, low physical activity levels and raised waist circumference occurred more frequently in women.

Cardiovascular disease and many of its risk factors were highest in low income groups. The following factors were higher in lowest income groups:

- CVD (among men only)
- Hypertension (among women only)
- Diabetes and raised glycated haemoglobin combined
- Obesity and raised waist circumference (among women only)
- Low levels of physical activity
- Low levels of fruit and vegetable consumption
- Low HDL-cholesterol level
- Mean C-reactive protein level.

Conversely being overweight, but not obese, measured by BMI, was higher among men in high income groups. The number of (alcohol) drinking days in the last week also increased with income, and men and women in higher income households were more likely to have drunk alcohol on five or more days in the past week. Some risk factors were not related to income: hypertension, general and abdominal obesity in men only, and mean and raised total cholesterol and mean HDL-cholesterol levels in both men and women.

CVD, diabetes and hypertension

Since 1994, the prevalence of stroke has increased in both men (1.8% to 2.4%) and women (1.6% to 2.2%), with the majority of this change being attributed to those aged 75 and over. There has also been a substantial increase in IHD or stroke among men (27.7% to 36.9%) and women (20.2% to 27.9%) aged 75 and over.

Doctor-diagnosed diabetes prevalence more than doubled among women between 1994 and 2003, and almost doubled among men over the same period; the largest increases were in men and women aged 45 and over. There has been a further rise since 2003 from 4.3% to 5.6% in men and from 3.4% to 4.2% in women. There has also been an increase in the proportion of men with a glycated haemoglobin level at or above 7% (indicating undiagnosed or uncontrolled diabetes) between 2003 and 2006, but no significant increase in the mean level in men or women. In contrast to other CVD and diabetes trends, the prevalence of grade 1 angina fell slightly for both men and women from 1998 to 2006.
The proportion of people in 2006 with hypertension decreased for both sexes compared with 2003 (32% to 31% among men and 30% to 28% among women). Similarly, the proportion of people with untreated hypertension decreased from 2003 to 2006 (20% to 18% among men and 16% to 13% among women). Concomitantly, the proportion of men and women with controlled hypertension increased since 2003 (from 5% to 7% in men and 6% to 8% in women).

**Lifestyle risk factors**

Accompanying the increase in CVD and diabetes, there has been an increase in obesity. However there have been improvements in some lifestyle measures: higher proportions of adults meet the physical activity recommendations, and eat the recommended daily portions of fruit and vegetables. Prevalence of smoking cigarettes has decreased since 1993, while there has been little change in alcohol consumption.

Mean BMI and the prevalence of obesity have continued to rise in both sexes since 1994. Mean BMI increased from 26.0 kg/m² in 1994 to 27.2 kg/m² in 2006 among men and from 25.8 kg/m² in 1994 to 26.8 kg/m² in 2006 among women. The prevalence of overweight, including obesity, increased in men from 58% in 1994 to 67% in 2006 and among women from 49% to 56%, respectively. Obesity increased in men from 14% in 1994 to 24% in 2006 and among women from 17% to 24%. The increase in prevalence of raised waist circumference between 1994 and 2006 was marked among both men (from 22% to 32%) and women (29% to 41%), although there was no change in prevalence of raised waist circumference between 2003 and 2006 in either sex.
Overall, the proportion of men and women achieving the current physical activity recommendations has increased from 1997 to 2006 (from 32% to 40% of men and from 21% to 28% of women). There was no significant change in fruit and vegetable consumption between 2001 and 2004 but consumption among both men and women increased significantly in 2005, and this trend continued in 2006. The proportion of people meeting the recommended guidelines of consuming five or more portions of fruit and vegetables a day rose five percentage points from 23% in 2004 to 28% in 2006 in men and from 27% to 32% in women.

The proportion of men and women consuming more than the recommended fat intake has increased markedly between 2003 and 2006 (from 6% to 14% among men, and from 3% to 7% among women).

For both men and women, cigarette smoking prevalence has decreased, falling from 28% among men in 1993 to 24% by 2006. For women, cigarette smoking prevalence fell from 26% to 21% over the same time period. Since 1998, mean hours of exposure per week to other people’s smoke has also fallen from 11.0 hours among men and 7.8 hours among women to 6.0 and 4.5 hours respectively in 2006.

The proportion of men and women drinking more than the recommended amounts and the proportions binge drinking (more than twice the recommended amounts of alcohol) have remained at similar levels since 1998.

### Trends in cigarette smoking prevalence, 1993-2006, by sex (moving average of three years)

**Aged 16 and over**

<table>
<thead>
<tr>
<th>Year (mid year of moving average)</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>30%</td>
<td>20%</td>
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<tr>
<td>1994</td>
<td>28%</td>
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<td>1999</td>
<td>18%</td>
<td>8%</td>
</tr>
<tr>
<td>2000</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>2001</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>2002</td>
<td>12%</td>
<td>2%</td>
</tr>
<tr>
<td>2003</td>
<td>10%</td>
<td>0%</td>
</tr>
<tr>
<td>2004</td>
<td>8%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>2006</td>
<td>4%</td>
<td>0%</td>
</tr>
</tbody>
</table>

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

### Trends in drinking, 1998-2006, by sex

**Base: Aged 16 and over**

<table>
<thead>
<tr>
<th>Year</th>
<th>Men: more than 4 units</th>
<th>Women: more than 3 units</th>
<th>Men: more than 8 units</th>
<th>Women: more than 6 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>10%</td>
<td>9%</td>
<td>5%</td>
<td>4%</td>
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<tr>
<td>1999</td>
<td>9%</td>
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</tr>
<tr>
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<td>2%</td>
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<tr>
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<td>1%</td>
</tr>
<tr>
<td>2002</td>
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<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>2003</td>
<td>5%</td>
<td>4%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2004</td>
<td>4%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>3%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2006</td>
<td>2%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: Data from 1998-2002 are unweighted, while data from 2003 onwards are weighted for non-response.
The proportion of men and women with raised cholesterol levels (5.0 mmol/l or above) has decreased from 66% in men and women in 2003, to 57% in men and 61% in women in 2006. Mean levels of HDL-cholesterol have not changed significantly since 2003 in men or women (1.3 mmol/l and 1.6 mmol/l respectively in 2006). Since 2003, the prevalence of low HDL-cholesterol levels has increased significantly in men (from 6.3% to 9.4%) although there has been no significant change in women (1.8% in 2006). Mean CRP levels have not changed significantly between 2003 and 2006. However, the proportion of women with the highest levels (>4.9 mg/l) decreased significantly (from 21% to 19%). Raised CRP levels were found in 19% of men in 2006, unchanged since 2003.
Health risk factors among children

Obesity

There is increasing evidence that childhood overweight and obesity can be linked with numerous long-term and immediate health risks. The 1990 UK National BMI percentiles classification was used in this report to calculate overweight and obesity prevalence estimates. The 85th percentile was used as the cut-off for overweight, the 95th percentile the cut-off for obesity.

Mean BMI varied little between the sexes for most ages. The most marked difference occurred at ages 12, 14 and 15 when girls had a higher BMI (differences from about 0.9 to 1.4 kg/m²). Around three in ten boys and girls aged 2-15 were either overweight or obese (31% and 29% respectively). 17% of boys aged 2-15 were obese, compared with 15% of girls. Among children aged 2-10, 29% of boys and 26% of girls were overweight or obese, with 17% of boys and 13% of girls classed as obese.

Among boys and girls aged 2-15, obesity prevalence rates were higher in the lowest income group. The proportions obese in the highest and lowest income quintiles respectively were 15% and 20% for boys, 9% and 20% for girls.

Among girls, overweight/obesity prevalence varied by overall physical activity levels. 33% of girls aged 2-15 in the low physical activity group were either overweight or obese, compared with 27% of the high group. Equivalent figures for girls aged 2-10 were 32% and 23%. Among girls, obesity prevalence rates were also higher in households where both natural parents, or the lone natural parent, were either overweight or obese. 22% of girls aged 2-15 living in households with overweight/obese parents were classed as obese compared with 8% in households where both parents or the lone parent were not overweight or obese. This pattern was not apparent among boys.

Trends in obesity and overweight in children

While there were fluctuations from year to year, overall increases in mean BMI were evident for each age group between 1995 and 2006. Among children aged 2-15, mean BMI increased by 0.7 kg/m² for boys and 0.6 kg/m² for girls.
It has been well documented that childhood obesity in the UK has increased significantly since 1995. Although the trends show yearly fluctuations between 1995 and 2006, obesity prevalence among boys aged 2-15 increased overall by 6 percentage points (from 11% to 17%). The equivalent increase for girls was 3 percentage points (from 12% to 15%).

Whilst marked increases have occurred in the prevalence of obesity, the prevalence of overweight for children aged 2-15 remained at a similar level for both sexes between 1995 and 2006, with some fluctuation between years.

Among girls aged 2-15, the proportion who were obese decreased between 2005 and 2006, from 18% in 2005 to 15% in 2006, and future years’ data will show whether this is part of a downward trend. There was no significant decrease among boys aged 2-15 over that period. In the 2-10 age group, the prevalence of overweight for boys decreased by 4 pp (from 16% in 2005 to 12% in 2006). There was no equivalent decrease among girls in this age group.

95% of boys and 92% of girls participated in some physical activity on five or more days in the last week. The most common types of activity for boys were active play (done by 70% of boys on five or more days) followed by walking (65%). The most common types of activity for girls were walking (63% taking part on at least five days) followed by active play (59%). Participation in sports and exercise was lower, with 22% of boys and 14% of girls taking part on at least five days, but 67% of boys and 60% of girls took part at least once in the last week.

Boys spent a mean of 13.8 hours in the last week being physically active, and girls spent 10.9 hours. Among girls, the weekly mean number of hours spent participating in physical activities broadly decreased with age, from a mean of 13.2 hours at the age of two to 8.9 hours for those aged 15. Among boys, the mean number of hours participating in physical activities remained at a similar level throughout childhood.

70% of boys met the current recommendations for physical activity in children, assuming all reported activity was of at least moderate intensity. Overall participation was lower among girls than boys. 59% of girls met current physical activity recommendations, participating for 60 minutes or more every day in the preceding week.

Parental activity levels were associated with children’s activity levels. Children of parents reporting high activity levels were much more likely to have high activity levels than children of parents with low or medium activity levels. Even among girls aged 11-15, who were less likely than other children to be physically active, those with active parents were less likely to be inactive themselves.
Among children aged 5–15, girls were more likely than boys to meet the recommended daily guidelines of consuming five or more portions of fruit and vegetables per day. 19% of boys ate five or more portions of fruit and vegetables on the day prior to the interview, compared with 22% of girls. Overall, the mean number of portions of any fruit and vegetables consumed per day was 3.2 for boys and 3.4 for girls.

Consumption of fresh fruit and fresh, tinned or frozen vegetables, among children decreased with age. For all children, the main source of fruit and vegetables was fresh fruit (67% of boys, and 71% of girls reported eating fresh fruit the previous day).

There was a strong association between equivalised household income and fruit and vegetable consumption. The mean number of portions of fruit and vegetables consumed by children aged 5–15 increased with increased equivalised household income. Boys in the highest income quintile consumed an average of 3.8 portions per day, compared with 2.7 portions among boys in the lowest income quintile. For girls, the equivalent mean numbers of portions were 4.1 and 3.0 respectively.

The proportion of children meeting the recommended five or more portions of fruit and vegetables a day showed little change between 2001 and 2004, but for both boys and girls there was a significant increase in 2005. For girls, there was a further significant increase in 2006.

The proportion of children who reported that they were regular smokers (at least one cigarette a week) was low (2% of boys and 3% of girls) and increased with age. The prevalence of regular smokers among those aged 8–12 remained low (1% or less) but increased by age 15 to 10% of boys and 12% of girls.

Fewer than a fifth (18%) of children aged 0–12 were looked after for at least two hours a week by someone who smoked. This was fewer than in HSE 2002 (26%). Older children were more likely than younger children to be looked after for at least two hours by someone who smoked; less than a seventh of infants aged 0–1 (14% of boys and 13% of girls) compared with nearly a quarter aged 10–12 (24%).

Children are likely to under report their smoking behaviour in home-based surveys like the HSE, and salivary cotinine is likely to be a more accurate indicator of children’s smoking status than self-report. Overall, few children had cotinine levels indicative of smoking.
(15 ng/ml or more); 4% of both boys and girls. However, the proportion of children aged 8-15 with a cotinine level of 15 ng/ml or more was higher than the proportion that reported regular smoking, particularly among older children. Of those aged 15, high cotinine prevalence was 23% for boys and 18% for girls, compared with the self-reported prevalence of smoking of 10% for boys and 12% for girls.

As with smoking, children are likely to under-report their alcohol consumption on home-based surveys because they may be worried about parents seeing their answers. This should be borne in mind when interpreting the findings.

The proportion who reported ever having had a proper alcoholic drink increased with age, from 6% of both boys and girls aged 8, to 77% of boys and 79% of girls aged 15. Overall, 36% of all children (both boys and girls) aged 8-15 reported having experience of drinking alcohol.

4% of boys and 3% of girls aged 8-15 reported drinking once a week or more. Frequency of drinking was also clearly related to age. The proportion who reported drinking at least once a week or more increased from 1% of both boys and girls aged 9 to 17% of boys and 14% of girls aged 15 (there were no occurrences among children aged 8).

16% of both boys and girls aged 13-15 reported drinking alcohol in the last 7 days. There
was significant variation by age; among children aged 13, only 7% of both boys and girls said they had drunk alcohol in the last 7 days, compared to 28% of boys and 25% of girls aged 15.

Comparisons with previous HSE years suggest that usual frequency of drinking alcohol has remained relatively stable.

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
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<tr>
<td>10</td>
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<tr>
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<td>20</td>
</tr>
<tr>
<td>15</td>
<td>60</td>
<td>25</td>
</tr>
</tbody>
</table>

Proportion of children who have had experience of drinking alcohol, by age and sex

Base: Aged 8-15
This booklet is a summary of the findings from the 2006 Health Survey for England: Craig R and Mindell J (eds) Health Survey for England 2006.

Volume 1: Cardiovascular disease and risk factors in adults;
Volume 2: Obesity and other risk factors in children;
Volume 3: Methodology and documentation.

The Information Centre, 2008.

Full results are available in the survey report, 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 2005 will be found on The Information Centre website at www.ic.nhs.uk/pubs/HSE06trends or at the address below.

Contact points

The Information Centre
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Boar Lane
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Email: info@natcen.ac.uk
Website: www.natcen.ac.uk

Department of Epidemiology and Public Health
at the Royal Free and University College Medical School
1-19 Torrington Place
London WC1E 6BT
Telephone: 020 7679 5646
Website: www.ucl.ac.uk/epidemiology/hssrg

ESRC Data Archive
University of Essex
Wivenhoe Park
Colchester
Essex CO4 3SQ
Telephone: 01206 872001
Website: www.data-archive.ac.uk
National Centre for Social Research

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, Division of Population Health, Royal Free and University College Medical School

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 (including Weight Concern); Central and Eastern Europe Research Group; Dental Public Health; Health Care Evaluation Group; International Centre for Life Course Studies in Society and Health; MRC Unit for Lifelong Health and Ageing (including the MRC 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, 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; the sociodental indicators of need; and the socio-economic and policy implications of an ageing population.