



The Scottish
Government



obesity

dental health

diet

physical activity

mental health

The Scottish Health Survey

Volume I: Adults

2011

smoking

alcohol

cardiovascular disease

A National Statistics Publication for Scotland



The Scottish Health Survey

Volume 1: Adults

2011

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Lisa Rutherford, Clare Sharp and Catherine Bromley

FOREWORD FROM THE CHIEF MEDICAL OFFICER

This report presents the findings of the seventh Scottish Health Survey and is the fourth report published since the survey moved to a continuous design in 2008. It has been commissioned by the Scottish Government and produced by a collaboration between ScotCen Social Research, the MRC/CSO Social and Public Health Sciences Unit at the University of Glasgow and the Department of Epidemiology and Public Health at University College London.

The survey provides us with an immensely valuable collection of data gathered from interviews of more than 9,000 adults and children each year. It provides essential data on cardiovascular disease and the related risk factors, including smoking, alcohol, diet, physical activity and obesity. Information on general health, mental health and dental health are also included.

When the survey moved to an annual basis in 2008, it was designed to produce a large enough sample to allow NHS Board analysis every four years. The publication of the 2011 data gives us the first opportunity since 2003 to publish results for all fourteen NHS Boards in Scotland. This report is accompanied by a set of web tables and an interactive mapping tool breaking down the key results by NHS Board and creates a valuable local data resource.

In addition to allowing geographical breakdowns, combining the data for recent years allows more detailed analysis of sub-groups than was previously possible. For example, a more in-depth look at how different age groups behave or examination of the different health behaviours of equality groups.

Because of the additional capacity for analysis the 2011 data provides, this year's report has been expanded to include separate volumes for adults and children. The focus on children's health underlines the Scottish Government's commitment to improving outcomes for children and young people and recognises the strong links between early experiences and outcomes in adulthood.

I am pleased to welcome this valuable report and to thank ScotCen Social Research, the MRC/CSO SPHSU and UCL for their hard work in conducting the survey and preparing this report. Most importantly, I would also like to thank the 9,531 people who gave their time to participate in the survey. The information they have provided is invaluable in developing and monitoring public health policy in Scotland.

Sir Harry Burns
Chief Medical Officer for Scotland
Scottish Government Health Directorates

INTRODUCTION

Lisa Rutherford and Catherine Bromley

OVERVIEW OF THE ADULTS' VOLUME

Policy context

This report provides an overview of some of the key information collected about adult health in the recent surveys in the Scottish Health Survey (SHeS) series.

Health features strongly within the Scottish Government's National Performance Framework (NPF).^{1,2} One of the Government's five strategic objectives for a *healthier* Scotland focuses on Scotland's considerable need for health improvement particularly in disadvantaged communities. Of the 16 national outcomes allied to the Government's strategic objectives, those of greatest relevance to health are:

We live longer, healthier lives.

We have tackled the significant inequalities in Scottish society.

Several of the 50 national indicators that track progress towards these outcomes relate to health and the addition, in the revised NPF published in December 2011,² of new health related indicators highlight the ongoing commitment to improving health; Progress towards the following national indicators is monitored via SHeS:

Improve mental wellbeing

Increase physical activity

Improve self-assessed general health

As a study of public health, SHeS plays an important role in assessing health outcomes and the extent of health inequalities in Scotland and how these have changed over time. Each of the chapters in this report addresses an aspect of health that relates either directly or indirectly to the Government's objective of improving health in Scotland. Chapters begin with a brief introduction to the relevant policy initiatives in that area. These should be considered alongside the higher level policies noted above and related policy initiatives covered in other chapters.

The Scottish Health Survey

The 2008-2011 Scottish Health Surveys were commissioned by the Scottish Government Health Directorates. It is the continuation of a series of surveys aimed at monitoring health in Scotland. During 2005 and 2006 a comprehensive review of the survey was carried out by the then Scottish Executive.³ One of the key recommendations to emerge from the review was that the survey should be carried out on a more frequent basis. This recommendation was adopted and the survey began running continuously in 2008 with a contract awarded for the

2008-2011 surveys. A further contract has now been awarded for the 2012 - 2015 surveys, by the end of which there will health survey data spanning two decades, and eight continuous years of data from 2008 onwards. This report is based on data collected in the fourth year of its new format, 2011.

Prior to 2008, the previous three surveys took place in 1995,⁴ 1998,⁵ and 2003⁶ and were conducted by the Joint Health Surveys Unit (JHSU) of the National Centre for Social Research (NatCen) and the Department of Epidemiology and Public Health at University College London (UCL). In 2003, the JHSU collaborated with the MRC/CSO Social and Public Health Sciences Unit based in Glasgow (MRC/CSO SPHSU). The 2008-2011 surveys were conducted by a collaboration between ScotCen Social Research, the MRC/CSO SPHSU and UCL.

Topics

Each survey in the series consists of main questions and measurements (for example, anthropometric and, if applicable, blood pressure measurements and analysis of blood and saliva samples), plus modules of questions on specific health conditions. The principal focus of the 2008-2011 surveys was cardiovascular disease (CVD) and related risk factors. The main components of CVD are coronary heart disease (CHD) and stroke. As noted in Chapter 8, CHD is Scotland's second biggest cause of death and is the focus of a significant number of health policies, many of which have a specific emphasis on reducing the significant health inequalities associated with CVD in Scotland. The SHeS series means that there are now trend data going back for over a decade, and providing the time series is an important function of the survey.

Many of the key behavioural risk factors for CVD are in themselves of particular interest to health policy makers and the NHS. For example, smoking, poor diet, lack of physical activity, obesity and alcohol misuse are all the subject of specific strategies targeted at improving the nation's health. SHeS includes detailed measures of all these factors and these are reported on separately in Chapters 3-7.

Sample design

The sample covering the four year period 2008-2011 was designed to provide data, at both national and Health Board level, about the population living in private households in Scotland. Each single year of the survey has been designed to provide estimates at the national level. The survey used a multi-stage stratified probability sampling design, with data zones (or groups of data zones) selected at the first stage and addresses (delivery points) at the second.

Prior to 2008 the samples were designed to ensure that the sample size was sufficiently large within seven regions based on aggregations of Health Boards for the purpose of regional analysis. When the survey moved to an annual basis in 2008, it was designed to produce a large enough sample to allow NHS Board analysis every four years. The publication of the 2011 data provides the first opportunity since 2003, to publish results for all fourteen NHS Boards in Scotland.

Two samples were selected for the survey: a general population (main) sample in which all adults and up to two children were eligible to be interviewed in each household; and a child boost sample in which up to two children were eligible to be interviewed but adults were not.

The sample of addresses was selected from the small user Postcode Address File (PAF). This is a list of nearly all the residential addresses in Scotland and is maintained by The Royal Mail. The population surveyed was therefore people living in private households in Scotland. People living in institutions, who are likely to be older and, on average, in poorer health than those in private households, were not covered. This should be considered when interpreting the survey estimates. The very small proportion of households living at addresses not on PAF (less than 1%) was not covered.

Data collection

Interviewing was conducted using Computer Assisted Personal Interviewing (CAPI). Children aged 13-15 were interviewed in the presence of a parent or guardian. Parents answered on behalf of younger children, who were nevertheless required to be present.

In addition, those aged 13 and over were asked to complete a short paper questionnaire on more sensitive topics. There were four such booklets: one for adults aged 18 and over, one for young adults aged 16-17 (with the option of using it for those aged 18-19 at the interviewer's discretion), and one for teenagers aged 13-15. Parents of children aged 4-12 years, included in the sample, were also asked to fill in a self completion booklet about the child's strengths and difficulties designed to detect behavioural, emotional and relationship difficulties in children.

Interviewers were also responsible for measuring the height and weight of participants aged 2 and over. For adults, these measurements are reported in Chapter 7, while child measurements are presented in Volume 2 Chapter 5.

Finally, in a sub-sample of households, interviewers sought permission from adults (aged 16 and over) for a follow-up visit by a specially trained survey nurse. At the nurse interview, participants were asked about their use of prescribed medication and recent experiences of food poisoning and stress, anxiety and depression. The nurse then took the blood pressure and waist and hip measurements for all aged 16 and over, and measured the arm length (demi-span) for those aged 65 and over. Lung function was measured via a spirometer. With written agreement, a small sample of blood was taken by venepuncture. The blood sample was analysed for: total and HDL-cholesterol, c-reactive protein, fibrinogen, glycated haemoglobin and vitamin D.⁷ Nurses also sought agreement for the storage of a small sample of blood for possible future analysis. Samples of saliva and urine were also collected. Further details of these samples and measurements are available in the Glossary.

Survey response and sample sizes

The following table sets out the numbers of participating households and adults in the four most recent survey years. It also presents response rates for each year. Further details of all the 2011 figures are presented in Volume 3 of this report, information about the 2008, 2009 and 2010 surveys can be found in the technical reports accompanying the annual reports.^{8,9,10}

	2008	2009	2010	2011
<i>Numbers participating:</i>				
Participating households (main & health board boost sample)	4,139	4,872	4,776	5,010
Adult interviews	6,465	7,531	7,245	7,544
Adults eligible for nurse sample	1,878	2,205	2,199	2,224
Adults who saw a nurse	1,123	1,115	1,063	972
Adults who gave a blood sample	903	885	843	725
<i>Response rates:</i>				
% of all eligible households (main & health board boost sample)	61%	64%	63%	66%
% of all eligible adults	54%	56%	55%	56%

Data

Since addresses and individuals did not all have equal chances of selection, the data have to be weighted for analysis. SHeS comprises of a general population (main sample) and a boost sample of children screened from additional addresses. Therefore slightly different weighting strategies were required for the adult sample (aged 16 or older) and the child main and boost samples (aged 0-15). Different weights were also created for the various combined datasets (described below). These are described in full in Volume 3.

The 2011 SHeS data will be deposited at the Data Archive at the University of Essex, from where earlier years' datasets and combined years datasets can also be obtained.

This report

This report is based on data collected in all the survey years to date (1995, 1998, 2003, and 2008 to 2011). It takes advantage of the continuous sample design since 2008 to include analysis based on a number of pooled datasets:

- The 2008, 2009, 2010 and 2011 surveys combined – this enables more detailed analysis of sub-groups to be conducted, for example by age group or socio-economic groups.
- The 2008/2009 and 2010/2011 surveys combined – these enable short-term trends to be examined, while still providing greater precision for the estimates than is the case with the single years' figures.
- The 2009 and 2011 surveys combined – some topics, such as accidents, were only included in the 2009 and 2011 survey years. The combined sample allows more detailed reporting of sub-group differences.

The 2011 SHeS report consists of three volumes, published as a set as 'The Scottish Health Survey 2011.' Volume 1 presents results for adults and covers the topics listed below; Volume 2 presents results for children and Volume 3 provides methodological information and survey documentation. These three volumes are available on the Scottish Government's SHeS website along with a short summary report of the key findings from Volumes 1 and 2. A set of web tables and an interactive mapping tool breaking down the key results by NHS Board are also available on the survey website. (www.scotland.gov.uk/scottishhealthsurvey).

Volume 1 contents: Adults

1. General health and mental wellbeing
2. Dental health
3. Alcohol consumption
4. Smoking
5. Diet
6. Physical activity
7. Obesity
8. Cardiovascular disease, diabetes and hypertension

While preparing the SHeS chapter on lung function some anomalous results were apparent and, as a consequence, the decision was taken to withdraw the chapter from this report to allow a full investigation of these anomalies to be carried out. A separate topic report on lung function will be published in winter 2012.

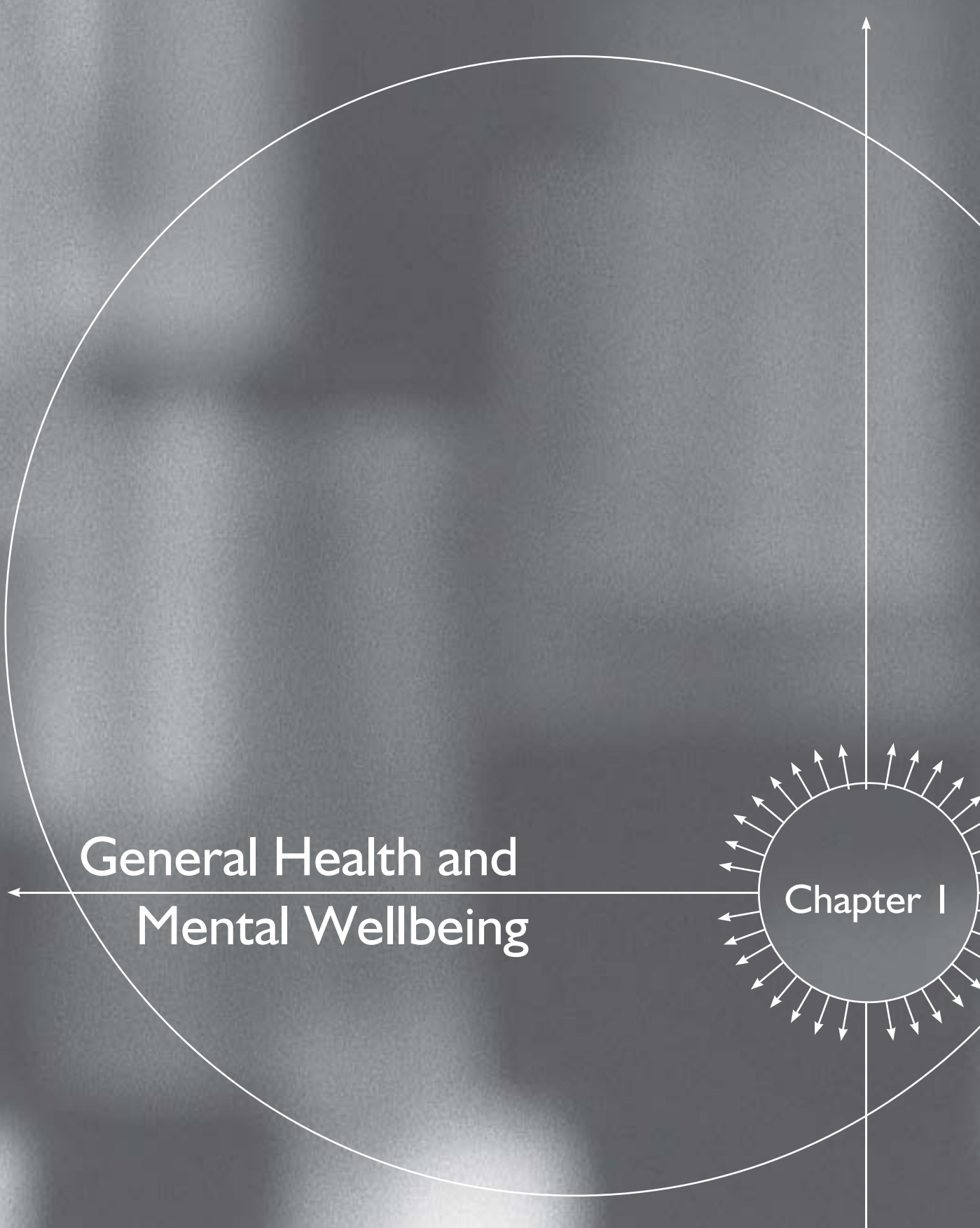
As in all previous SHeS reports, data for men and women are presented separately. Many of the measures are also reported for the whole adult population. Survey variables are tabulated by age groups and, usually, Scottish Index of Multiple Deprivation (SIMD), National Statistics Socio-Economic Classification (NS-SEC), and equivalised household income. Trend data are presented, where possible, from the seven surveys in the SHeS series (1995, 1998, 2003, 2008, 2009, 2010 and 2011). In some cases trend data are restricted to those aged 16-64 (the age range common to all seven surveys), for some measures trends are available for the 16-74 age range (common to the 1998 survey onwards). Trends based on the surveys from 2003 onwards can be presented for all adults aged 16+.

References and notes

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- ² National Performance Framework: Changes to the National Indicator Set, Edinburgh: Scottish Government, 2012. [online] Available from: <www.scotland.gov.uk/About/scotPerforms/Nlchanges> See also: www.scotlandperforms.com
- ³ Further information on the Scottish Health Survey review and recommendations adopted as a result of the review can be found on the Scottish Government Scottish Health Survey website <www.scotland.gov.uk/Topics/Statistics/Browse/Health/scottish-health-survey>
- ⁴ Dong, W. and Erens, B. (1997). *The 1995 Scottish Health Survey*. Edinburgh: The Stationery Office.
- ⁵ Shaw, A., McMunn, A. and Field, J. (2000). *The 1998 Scottish Health Survey*. Edinburgh: The Stationery Office.
- ⁶ Bromley, C., Sproston, K. and Shelton, N. [eds] (2005). *The Scottish Health Survey 2003*. Edinburgh: The Scottish Executive.
- ⁷ The vitamin D samples were commissioned by the Food Standards Agency in Scotland and the Scottish Government Directorate for Chief Medical Officer, Public Health and Sport.
- ⁸ Bromley, C., Bradshaw, P. and Given, L. [eds.] *The 2008 Scottish Health Survey*. Edinburgh: Scottish Government. <www.scotland.gov.uk/Publications/2009/09/28102003/0>
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- ¹⁰ Bromley, C., and Given, L. [eds.] *The 2010 Scottish Health Survey*. Edinburgh: Scottish Government. <www.scotland.gov.uk/Publications/2011/09/27124046/0>

NOTES TO TABLES

- 1 The following conventions have been used in tables:
n/a no data collected
- no observations (zero value)
0 non-zero values of less than 0.5% and thus rounded to zero
[] normally used to warn of small sample bases, if the unweighted base is less than 50. (If a group's unweighted base is less than 30, data are normally not shown for that group.)
- 2 Because of rounding, row or column percentages may not add exactly to 100%.
- 3 A percentage may be quoted in the text for a single category that aggregates two or more of the percentages shown in a table. The percentage for the single category may, because of rounding, differ by one percentage point from the sum of the percentages in the table.
- 4 Values for means, medians, percentiles and standard errors are shown to an appropriate number of decimal places. Standard Errors may sometimes be abbreviated to SE for space reasons.
- 5 'Missing values' occur for several reasons, including refusal or inability to answer a particular question; refusal to co-operate in an entire section of the survey (such as a self-completion questionnaire); and cases where the question is not applicable to the participant. In general, missing values have been omitted from all tables and analyses.
- 6 The population sub-group to whom each table refers is stated at the upper left corner of the table.
- 7 Both weighted and unweighted sample bases are shown at the foot of each table. The weighted numbers reflect the relative size of each group in the population, not numbers of interviews conducted, which are shown by the unweighted bases.
- 8 The term 'significant' refers to statistical significance (at the 95% level) and is not intended to imply substantive importance.



General Health and
Mental Wellbeing

Chapter I

1 GENERAL HEALTH AND MENTAL WELLBEING

Sally McManus

SUMMARY

- In 2011, 76% of adults described their health in general as 'good' or 'very good' and 7% described it as 'bad' or 'very bad'. These figures were very similar in 2008, 2009 and 2010.
- Perceptions of health varied significantly with age: 92% of people aged 16-24 had 'good' or 'very good' health compared with 51% of those aged 75 and over.
- 44% of adults reported a long-standing physical or mental condition or disability in 2011. This was a significant increase on the 41% in 2008 and the 40% in 2009 reporting such a condition.
- Women were more likely than men to report having a limiting long-term condition (30% and 26% respectively).
- Prevalence of limiting long-term conditions increased sharply with age. 11% of both men and women aged 16-24 reported a limiting long-term condition, compared with 55% of men and 60% of women aged 75 and over.
- Area deprivation was significantly associated with long-term conditions prevalence. The proportion of people reporting a long-term condition increased steadily in line with deprivation, from 35% of those living in the 20% least deprived areas in Scotland to 51% of those living in the 20% most deprived areas.
- In 2011, the mean score on the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) was 49.9, and was higher among men (50.2) than women (49.7). The mean WEMWBS score was not significantly different to that seen in 2008, 2009 or 2010.
- WEMWBS mean scores had a complex pattern of association with age. People aged 25-34 and 65-74 had the highest levels of positive wellbeing and those aged 45-54 and 75 and over had the lowest.
- People in work characterised by low autonomy, high demands, and with low levels of social support in the workplace all had lower levels of wellbeing than those with more positive experiences of their working lives. Similarly, people with stressful jobs and with lower than average satisfaction with their work-life balance had lower levels of wellbeing.
- Multi-variate analysis was carried out to identify factors that were independently associated with having a below average level of wellbeing. Women had higher odds than men for having a low level of wellbeing. Among both men and women, being younger, with poor self-assessed health, experience of discrimination, few people to turn to in a crisis, and with no involvement in the local community all had higher odds of low wellbeing. Among men only, a low level of physical activity was also a significant predictor of low wellbeing. Women with no educational qualifications, those who were single and those with a limiting longstanding illness had increased odds of having below average wellbeing.
- The proportion of adults with one symptom of depression increased from 5% in 2008/2009 to 12% in 2010/2011, while the proportion with two or more symptoms remained stable at 8% and 7%, respectively. The increase occurred

in both men and women. Depressive symptoms were more common in women than men.

- The prevalence of anxiety symptoms was very similar in 2008/2009 and 2010/2011 with no change in the proportion of adults that had two or more symptoms (9%).
- 5% of adults in 2010/2011 reported that they had ever attempted suicide. This was similar to the 2008/2009 figure.
- Women were more likely than men to report attempted suicide; however levels of self-harm were similar for both sexes. Older people were less likely than younger and middle-aged people to report a suicide attempt or self-harm.

1.1 INTRODUCTION

This chapter covers two interrelated topics. The first is self-assessed general health and long-term conditions in adults. These are critical measures of the population's overall health status and are key markers of health inequalities.¹ The second topic focuses on adult mental health and wellbeing. In Scotland, there is a focus on the promotion of good mental health as well as the prevention and treatment of mental illness. The measures reported in this chapter reflect this broad definition and cover wellbeing as well as depression, anxiety, self-harm and suicide attempts.

The Scottish Government's revised National Performance Framework includes National Indicators on improving self-assessed health² and mental wellbeing³ and the Scottish Health Survey (SHeS) is used to monitor progress on these.^{4,5}

The introductions to the equivalent chapters in the three most recent SHeS Reports^{6,7,8} included a comprehensive overview of the recent policy context for these topics covering a number of strategies and initiatives that have been introduced by the Scottish Government and NHS Scotland to improve health and mental wellbeing. These included:

- The 2008 report of the Ministerial Taskforce on Health Inequalities *Equally Well* which included "enhancing mental health, wellbeing and resilience" as one of its key priorities.⁹
- The policy and action plan for mental health improvement in Scotland *Towards a Mentally Flourishing Scotland* (TAMFS),¹⁰ launched in May 2009
- The *Choose Life* strategy, which includes a target to reduce the rate of suicide by 20% between 2002 and 2013,¹¹ and its update in October 2010.¹²
- The NHS Scotland HEAT¹³ target - linked to the suicide reduction target - to educate and train 50% of its frontline staff in suicide prevention awareness techniques by the end of 2010 (52% of staff were trained by 2010).¹⁴
- NHS Health Scotland's set of national, sustainable mental health indicators,¹⁵ published in 2007, which are intended to allow national monitoring of *adult* mental health. SHeS is the data source for 28 of the 54 indicators.¹⁶

- Recommendations that subjective wellbeing should be measured alongside socio-economic indicators as a marker of a country's overall performance, and its growing use in UK surveys.^{17,18}

The Scottish Government published its new mental health strategy on 13 August 2012.¹⁹ The strategy supports the Quality Strategy and its focus on safe, effective and person-centred care. It focuses on aspects of service delivery (such as their speed of delivery and integration with other services) as well as broader aspects relating to people's own capacity to respond appropriately to poor mental health and the wider community's role in helping to prevent people becoming unwell.

This chapter starts by presenting the latest figures on self-assessed health. It then looks at the prevalence of long-term conditions by age, sex and the Scottish Index of Multiple Deprivation (SIMD). The trend data for wellbeing is updated, and more detailed analysis is presented in relation to work stress, social capital and discrimination. These were identified as important contextual determinants of wellbeing in the national mental health indicator set for adults,¹⁵ and they have been included in the survey both as indicators in their own right, and to enable analysis of their associations with wellbeing. The final section of the chapter provides the latest figures for the prevalence of depression, anxiety, suicide attempts and self-harm.

1.2 SELF-ASSESSED GENERAL HEALTH

1.2.1 Introduction

This section presents data on self-assessed general health among adults. All participants were asked to rate their health in general as 'very good', 'good', 'fair', 'bad' or 'very bad'. This question is used to monitor the National Indicator "*improve self-assessed health*" and is also part of the Scottish Government's adult mental health indicators set: "*percentage of adults who perceive their health in general to be good or very good*".^{2,15}

Self-assessed health is a useful measure of how individuals regard their own overall health status. It is strongly related to the presence of chronic and acute disease, as well as being a good predictor of hospital admission and mortality.^{20,21}

1.2.2 Trends in self-assessed general health since 2008, by age and sex

In 2011, 76% of adults described their health in general as either 'good' or 'very good' and 7% described it as 'bad' or 'very bad'. The proportion of adults with 'good' or 'very good' health has been very similar each year since 2008, while the proportion with 'bad' or 'very bad' health has remained unchanged since 2008.

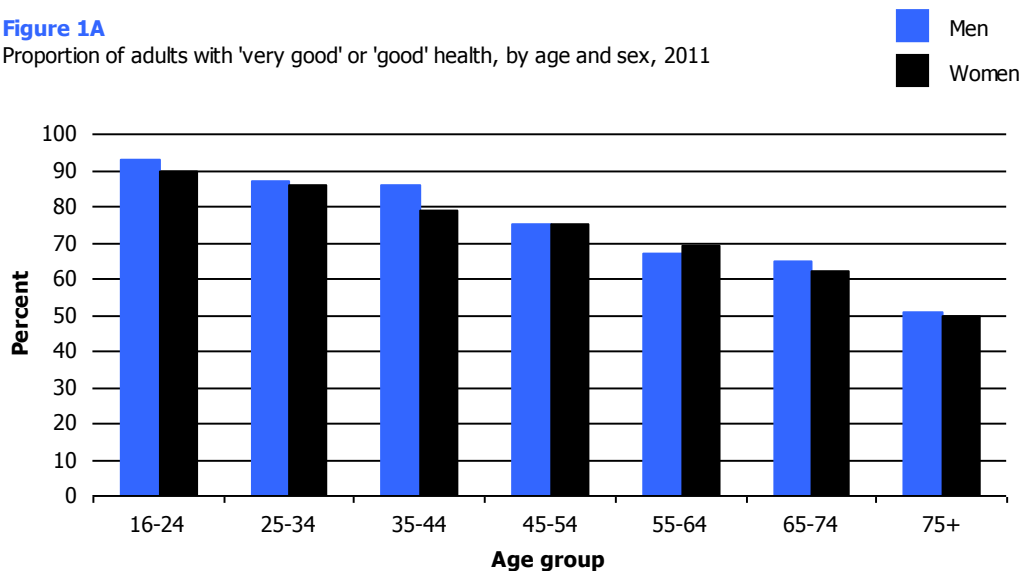
Although men were more likely than women to assess their health as 'good' or 'very good' in 2011 (77% and 74%, respectively), this difference was not significant.

Self-assessed general health varied greatly with age. The proportion of people describing their health as 'good' or 'very good' declined steadily with age from nine in ten (92%) of those aged 16-24 to five in ten (51%) of those aged 75 and over. As Figure 1A shows, this pattern was evident for both men and women.

Figure 1A, Table 1.1

Figure 1A

Proportion of adults with 'very good' or 'good' health, by age and sex, 2011



1.3 LONG-TERM CONDITIONS

1.3.1 Introduction

All participants were asked if they had any long-term physical or mental conditions or disabilities that had affected - or were likely to affect - them for at least twelve months. Those who reported having such a condition were asked to say whether it limited their daily activities in any way. This enabled conditions to be further classified as either 'limiting' or 'non-limiting'. As the question did not specify that conditions had to be doctor-diagnosed, responses were subject to some distortion due to variation in individuals' perceptions.

1.3.2 Trends in prevalence of long-term conditions since 2008, by age and sex

In 2011, 44% of adults reported a long-standing physical or mental condition or disability. This is a significant increase on the proportions reporting such a condition in 2008 (41%) and 2009 (40%).

Women were more likely than men to report having a limiting long-term condition (30% and 26% respectively).

The prevalence of long-term conditions increased sharply with age, but the gradient was much steeper for limiting conditions than non-limiting

ones. For example, 11% of both men and women aged 16-24 reported a limiting long-term condition, compared with 55% of men and 60% of women aged 75 and over. The equivalent figures for non-limiting conditions ranged between 12% and 22% for men, and 10% and 21% for women, and while prevalence was lower among the younger age groups, the pattern was not wholly linear.

Table 1.2

1.3.3 Long-term conditions (age-standardised) by Scottish Index of Multiple Deprivation (SIMD)

Two measures of SIMD are being used throughout this report. The first, which uses quintiles, enables comparisons to be drawn between the most and least deprived 20% of areas and the intermediate quintiles. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the '85% least deprived areas'). To ensure that the comparisons presented by SIMD are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (age-standardisation is described in the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only.

The proportion of adults with a long-term condition increased steadily in line with area level deprivation, from 35% of those living in the least deprived quintile to 51% in the most deprived quintile. As Figures 1B and 1C illustrate, the gradient was almost entirely accounted for by variation in the prevalence of limiting long-term conditions, rather than non-limiting ones. The association with deprivation was slightly more pronounced for women than for men. 36% of women in the least deprived quintile had a long-term condition compared with 54% of those living in the most deprived quintile. The equivalent figures from men were 33% and 49% respectively.

Those living in the 15% most deprived areas were more likely than those living in the rest of Scotland to have a long-term condition (52% and 40%, respectively). Again, the difference between the areas was particularly pronounced with limiting long-term conditions (39% of those living in the 15% most deprived areas in Scotland had a limiting condition compared with 25% of those living elsewhere).

Figure 1B, Figure 1C, Table 1.3

Figure 1B

Prevalence of long-term conditions in men aged 16+ (age-standardised), by Scottish Index of Multiple Deprivation quintile, 2008-2011 combined

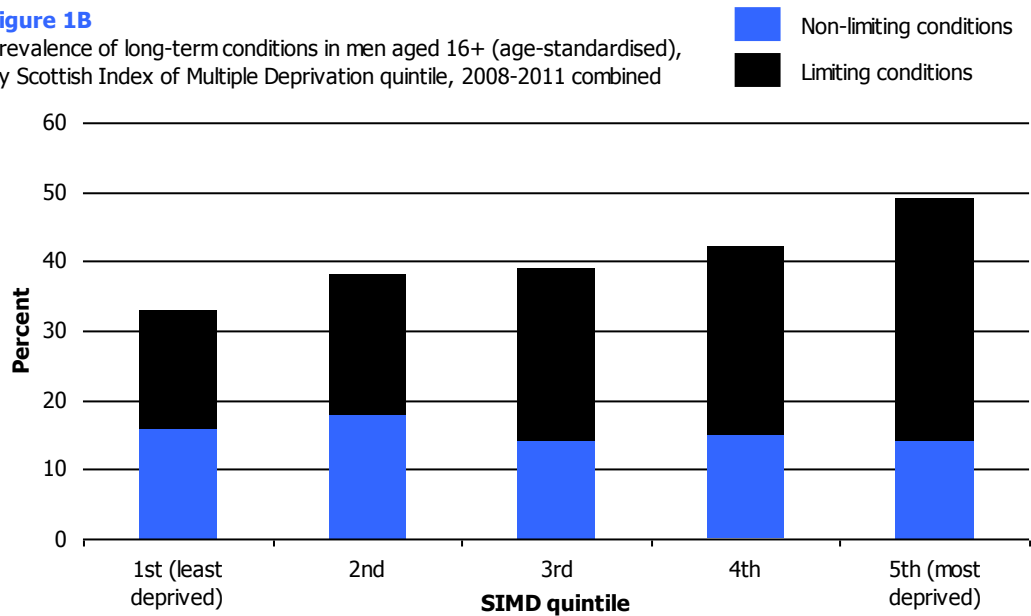
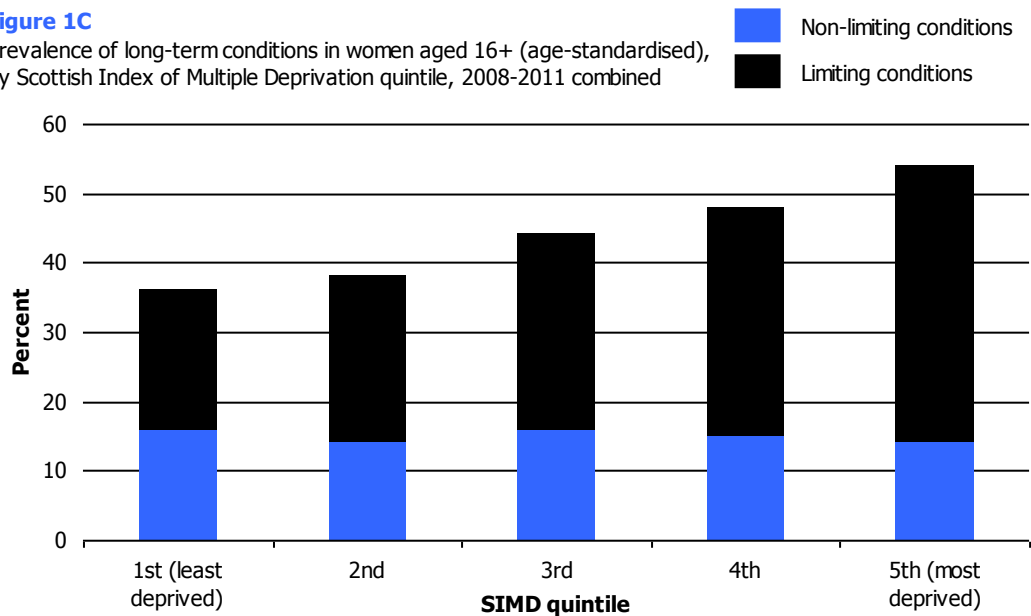


Figure 1C

Prevalence of long-term conditions in women aged 16+ (age-standardised), by Scottish Index of Multiple Deprivation quintile, 2008-2011 combined



1.4 WELLBEING

1.4.1 Introduction

Wellbeing was measured using the WEMWBS questionnaire. WEMWBS is used to monitor the National Indicator “*improve mental wellbeing*”.³ It has 14 items designed to assess: positive affect (optimism, cheerfulness, relaxation) and satisfying interpersonal relationships and positive functioning (energy, clear thinking, self-acceptance, personal development, mastery and autonomy).²² The scale uses positively worded statements with a five-item scale ranging from ‘1 - None of the time’ to ‘5 - All of the time’. The lowest score possible is therefore 14 and the highest score possible is 70; the tables present mean scores.

WEMWBS is not designed to identify individuals with exceptionally high or low levels of positive mental health so cut off points have not been developed.²³ The scale was designed for use in English speaking populations, however in a very small number of cases, the questions were translated to enable the participation of people who did not speak English.²⁴

Job quality and work-life balance

In 2009 and 2011 the survey included a series of questions on working life from the adult mental health indicators set.¹⁵ As work is considered to be an important contextual factor associated with mental health, adults in paid employment or on a government training scheme were asked questions about their experience of stress at work, their work/life balance, and working conditions.²⁵ The responses to these questions, presented by age and sex, are being published as supplementary web tables. The following analysis explores the association between mean WEMWBS scores and stress at work.

There are different theories about what determines job quality. Some researchers have emphasised the negative consequences of stress resulting from an imbalance between the efforts an employee makes and the rewards they receive in terms of recognition or payment.²⁶ Others have focused more on the relationship between the degree of control (or autonomy) that employees feel over their work, the demands being placed on them, and the extent of any social support they receive from the organisation or fellow workers.²⁷ Good quality work is associated with higher levels of subjective wellbeing. It should be noted that cross-sectional analysis may overstate the association between poor quality work and low levels of wellbeing because low mood might lead people to perceive their work situation more negatively. As these questions were only asked of a sub-sample of people in the study the data from 2009 and 2011 have been combined to provide a larger number of cases.

Social capital

The 2009 and 2011 surveys also included questions about other important contextual factors for mental wellbeing: social capital and people's experience of discrimination and harassment. The rationale for including such measures is set out in detail in the adult mental health indicators report.¹⁵ Social capital is a well-established concept within mental health literature and encompasses aspects of social connectedness via friend and kinship networks, trust in others, the ability to draw on support from others, as well as a sense of connectedness to places through involvement in the local community and the ability to influence local decisions.

Discrimination

Poor health and low wellbeing are among the many negative consequences for people who experience discrimination and harassment. Participants were given a list of different grounds on which people can experience discrimination and harassment (including age, gender, disability, ethnicity, religion, sexual orientation) and asked whether they had direct experience of this within the previous 12 months.²⁸ The results are presented in full in supplementary web tables. The analysis of risk factors for low mental wellbeing presented in Section 1.5 includes the social capital, discrimination and harassment measures. As with the stress at work analysis, this analysis is based on data from the combined 2009 and 2011 surveys.

1.4.2 Trends in WEMWBS mean score since 2008, by age and sex

In 2011, the WEMWBS mean score for adults aged 16 and over was 49.9. This was not significantly different from the mean WEMWBS scores in 2008, 2009 or 2010.

Wellbeing, as assessed by WEMWBS, was higher among men (50.2) than women (49.7). This pattern is consistent with that found in previous years of the survey.

WEMWBS scores have a complex pattern of association with age. In 2011, people aged 25-34 (50.6) and 65-74 (51.0) had the highest levels of positive wellbeing and those aged 45-54 (49.0) and 75 and over (49.2) had the lowest. This pattern is broadly similar to that found in previous years of the survey and fits with the widely cited 'U-curve' in subjective wellbeing, where levels of self-reported subjective wellbeing dip during the middle years and among the oldest in society.²⁹

Table 1.4

1.4.3 WEMWBS mean score, 2009 and 2011 combined, by job quality and work-life balance

Table 1.5 presents mean WEMWBS scores according to the responses people gave to various questions about their paid work for 2009 and 2011 combined. The items shown in the table are part of the national mental health indicator set;¹⁵ the summary rows presented are the specific indicator measures.

Job demands

Job demands (also referred to as work effort or work intensity) were captured with a question about whether employed adults felt they had 'unrealistic time pressures at work'. People who reported that this was always or often the case had a significantly lower WEMWBS mean score than those who experienced this seldom or never (48.6 compared with 51.2). This pattern was evident among both men (48.7 compared with 51.5) and women (48.4 compared with 51.0).

Table 1.5

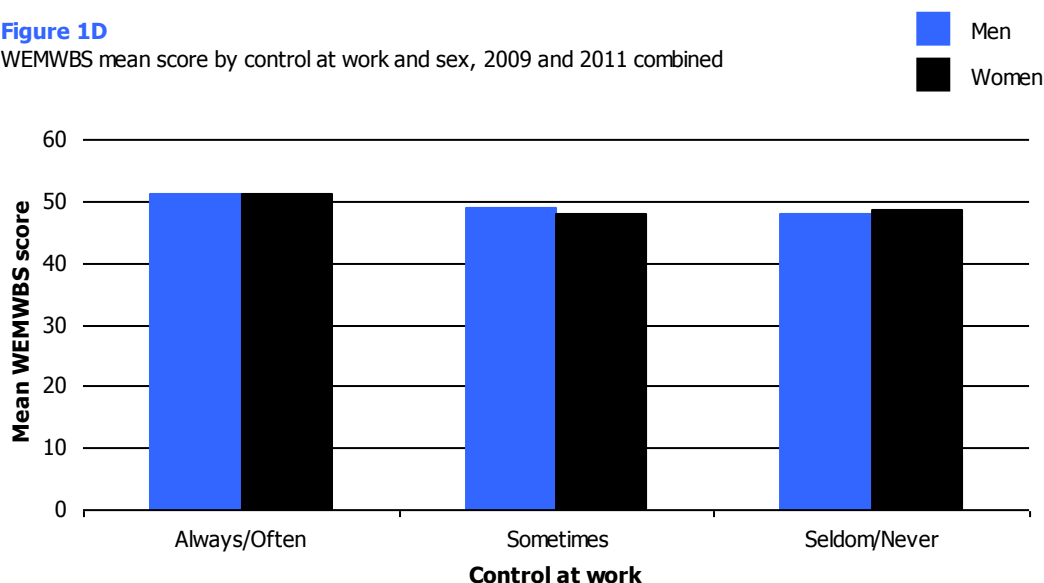
Autonomy

Autonomy, or control, in the workplace was captured with a question about how much choice employed respondents felt they had in deciding how they do their work. People in work characterised by low levels of autonomy (who reported that they seldom or never have control at work) had a significantly lower wellbeing than those who experienced this always or often (48.3 compared with 51.3). This pattern was evident among both men (48.0 compared with 51.2) and women (48.6 compared with 51.3).

Figure 1D, Table 1.5

Figure 1D

WEMWBS mean score by control at work and sex, 2009 and 2011 combined



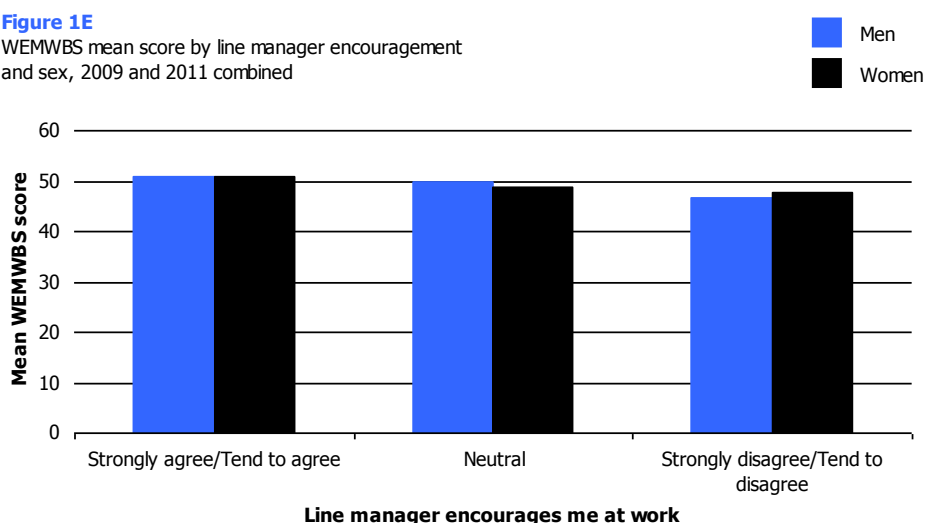
Social support in the workplace

Levels of social support in the workplace have widely been identified as a factor predicting work-related stress. Respondents were asked about social support from two sources: line managers and colleagues. People who agreed that their line manager encourages them at work had a higher WEMWBS mean score than those who disagreed (50.9 compared with 47.3). This association was particularly pronounced among men (51.0 compared with 46.8).

Figure 1E, Table 1.5

Figure 1E

WEMWBS mean score by line manager encouragement and sex, 2009 and 2011 combined



A similar pattern of association was found between perceived level of help and support from colleagues and wellbeing. The WEMWBS mean score was 50.9 among people who agreed that colleagues provided support and 45.6 among those that disagreed. It is worth noting however that very few respondents reported that colleagues did not provide support, and so while the association was significant these figures should be treated with some caution.

Table 1.5

Self-perceived work-related stress

How stressful people perceived their job to be was strongly associated with their level of wellbeing. The WEMWBS mean score was 51.5 among those describing their job as not at all or mildly stressful, and 47.4 among those whose job was described as very or extremely stressful. This pattern was apparent among both men and women. A small minority of respondents found their job to be very or extremely stressful.

Table 1.5

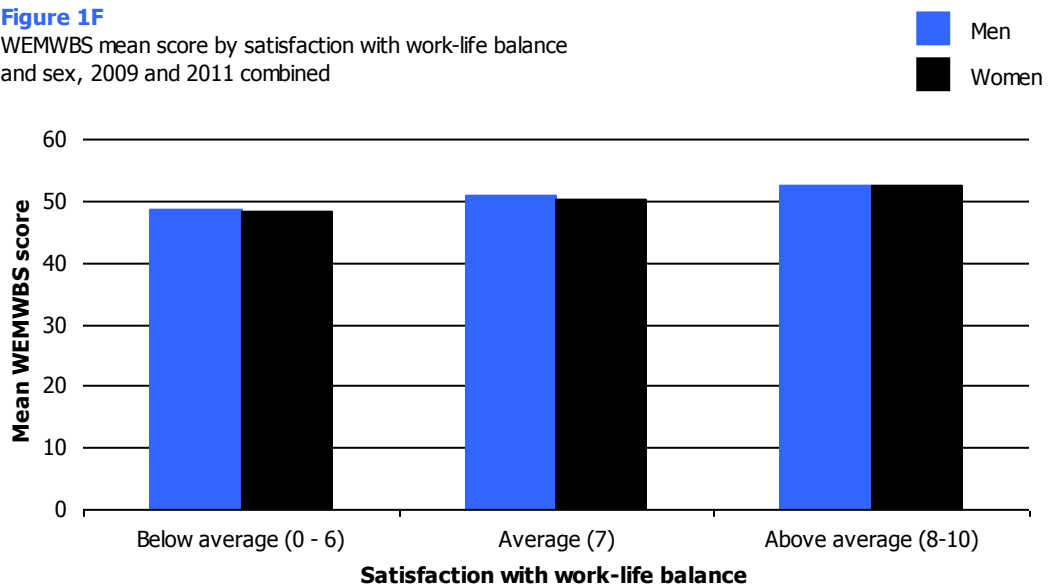
Satisfaction with work-life balance

The final measure presented in Table 1.5 is satisfaction with work-life balance. Answers were given using a scale from 0 to 10. The median score given was 7, so the data have been grouped according to whether scores were below average (0-6), average (7) or above average (8-10). Satisfaction with work-life balance was also strongly associated with wellbeing. The WEMWBS mean score was 52.4 among those who had above average satisfaction levels with their work-life balance, and 48.4 among those who had below average satisfaction. A small minority reported dissatisfaction with the balance between work and other aspects of their life.

Figure 1F, Table 1.5

Figure 1F

WEMWBS mean score by satisfaction with work-life balance and sex, 2009 and 2011 combined



1.5 FACTORS ASSOCIATED WITH BELOW AVERAGE WELLBEING, 2009 AND 2011 COMBINED

1.5.1 Introduction

Multivariate logistic regression was used to estimate the independent effect of a range of socio-demographic and behavioural factors associated with having low wellbeing, after each factor had been adjusted for simultaneously. In these analyses low wellbeing is defined as a having a below average mean WEMWBS score. The value of multivariable analyses like these is being able to disentangle confounding factors, for example being able to test whether or not the lower levels of wellbeing observed among people who are not married or cohabiting is due to the age profile of this group.

A large number of socio-demographic and behavioural factors were tested for significance. These were:

- socio-demographic characteristics (age group, equivalised household income, household NS-SEC, highest educational qualification, economic activity and marital/partnership status);
- health status (self-reported general health and limiting longstanding illness);
- health behaviours (smoking, alcohol consumption, fruit and vegetable consumption and physical activity level);
- discrimination (discrimination and harassment);
- social capital and support (trust in people generally, trust in people in the neighbourhood, involvement in local community, influence over local decisions, how often contact people and how many friends can contact in a crisis); and
- neighbourhood deprivation (SIMD quintile).

Regression models were run on combined 2009 and 2011 data for all adults (data not shown) and then run separately for men and women. The odds ratios of having below average wellbeing are presented in Table 1.6. In these analyses, the odds of a reference group (shown in the table with a value of 1) are compared with that of the other categories for each of the individual factors. In this example, an odds ratio of greater than one indicate that the group in question had higher odds of low wellbeing and an odds ratio of less than one mean they had lower odds of having low wellbeing compared to the reference group. Odds ratios whose confidence intervals contain the value 1 are not significantly different to the reference category. By simultaneously controlling for a number of factors, the independent effect each factor has on the variable of interest can be established. For more information about logistic regression models and how to interpret their results see the glossary at the end of this volume.

1.5.2 Results

Socio-demographic factors

Overall, sex was a significant predictor of wellbeing; women had higher odds than men of having a below average WEMWBS score (odds ratio of 1.30, data not shown). The following results are based on separate models for men and women.

Age group and marital status were associated with wellbeing for both men and women. People aged 16-44 had double the odds of having low wellbeing than those aged 65 and over (odds ratios for men and women aged 65 and over were 0.53 and 0.48 respectively). With regards marital status, single women had significantly higher odds of having a below average WEMWBS score than women who were married or in a civil partnership (odds ratio of 1.62). While the overall association between marital status and low wellbeing was significant for men, the nature of the relationship was not clear.

Education level was a significant predictor of wellbeing among women, but not men. Women with no qualifications had twice the odds of low wellbeing compared with women with a degree (odds ratio of 2.00). While education level was not significant for men overall, men educated to standard grade (or equivalent qualification) level did have significantly higher odds of low wellbeing compared with men with a degree or higher qualification (odds ratio of 1.82).

Once other factors were controlled for neither household income or socio-economic classification (NS-SEC) were significantly associated with low wellbeing.

Health status

Men who assessed their general health as bad or very bad had odds six times greater than men who assessed their health as good or very good (odds ratio of 6.03). The comparable odds for women were five (odds ratio of 5.18). For both men and women, those who defined their longstanding condition as limiting had higher odds of low wellbeing than people with a non-limiting illness (odds ratio of 0.34 for men and 0.49 for women).

Health behaviours

Physical activity level was the only health behaviour found to significantly predict below average wellbeing after other factors were controlled for. Among men, the odds of those with low physical activity levels were 1.61 times higher than those meeting the physical activity recommendations. For women, there was no independent significant association between physical activity levels and below average wellbeing for women.

Discrimination and harassment

While both experience of discrimination or unfair treatment and of harassment were significant univariate predictors of wellbeing, harassment was no longer significant once discrimination and other factors were controlled for. This suggests that the fact that discrimination is perceived to be motivated by personal characteristics may be more detrimental to wellbeing than the act of the harassment itself. Men who reported experiencing discrimination in the previous year had increased odds of low wellbeing (2.02) compared with men who did not report experiencing discrimination. Experience of discrimination was also significantly associated with low wellbeing for women (odds ratio of 1.68).

Social capital and support

The two aspects of social capital that significantly predicted wellbeing were the number of people that participants said they could turn to in a crisis, and the extent to which they said they felt involved in their local community. The odds of having below average wellbeing were highest among men and women reporting that they had three or fewer people that they could turn to in a crisis.

Similarly, those who said that they were 'not at all' involved in the local community had the highest odds of having a below average wellbeing score (odds ratios of 2.08 among men and 1.86 among women).

Table 1.6

1.6 DEPRESSION AND ANXIETY

1.6.1 Introduction

Details of anxiety and depression symptoms are collected in the nurse interview via a standardised instrument, the Revised Clinical Interview Schedule (CIS-R). The CIS-R is a well-established tool for measuring the prevalence of mental disorders.³⁰ The CIS-R comprises 14 sections, each covering a type of neurotic symptom and asks about presence of symptoms in the week preceding the interview. Prevalence of two of these neurotic symptoms - depression and anxiety - were introduced to the survey in 2008. Questions about suicide attempts and self-harm were also asked, and are reported below. Given the potentially sensitive nature of these topics, these questions were included in the nurse interview part of the survey.³¹ Because only a sub-sample of adults was invited to participate in the nurse interview the results that follow are based on combined data from 2008 and 2009, and from 2010 and 2011. This allows for greater accuracy when figures are presented for different age or socio-demographic groups.

The following two mental health indicators are based on the data reported here:¹³

Percentage of adults who have a symptom score of 2 or more on the depression section of the CIS-R.

Percentage of adults who have a symptom score of 2 or more on the anxiety section of the CIS-R.

1.6.2 Symptoms of depression

The proportion of people with two or more symptoms (indicating depression of moderate to high severity) in 2010/2011 (7%) was broadly similar to levels in 2008/2009 (8%). There has, however, been an increase in the proportion with one symptom, from 5% in 2008/2009 to 12% in 2010/2011. This pattern was evident for both men and women (between the two periods, the proportion with one symptom increased from 4% to 11% in men, and from 6% to 13% in women).

For every age group (except 16-24 year olds) there was a small decline in the proportion with two or more symptoms of depression between 2008/2009 and 2010/2011. The overall increase in the proportion with one symptom of depression was true of all age groups.

Looking at the age patterns separately for men and women shows a slightly different picture. The increase in depression symptoms was particularly evident in men aged 16-34 and 45-54, and women aged 35-44 and 65-74, though the relatively small sample sizes for these sub-groups mean that strong inferences cannot be drawn from these patterns. However, it is plausible that the overall increase in the prevalence of depressive symptoms in this period could be attributed to the worsening economic conditions in 2010/2011 compared with 2008/2009.

Focusing on the 2010/2011 figures, depressive symptoms were more common in women (13% had one symptom, 8% had two or more) than men (11% and 5%, respectively). The presence of depressive symptoms was not associated with age.

Table 1.7

1.6.3 Symptoms of anxiety

There was no significant change in the prevalence of anxiety symptoms between 2008/2009 and 2010/2011. The proportion of people with two or more symptoms (indicating anxiety of moderate to high severity) remained at 9% in 2010/2011. The proportion with just one symptom was also very similar (9% in 2008/2009 and 7% in 2010/2011).

As Figure 1G illustrates, anxiety was associated with gender, with women more likely than men to have symptoms (in 2010/2011, 9% of women and 5% of men had one symptom, and 10% and 8% had two or more, respectively).

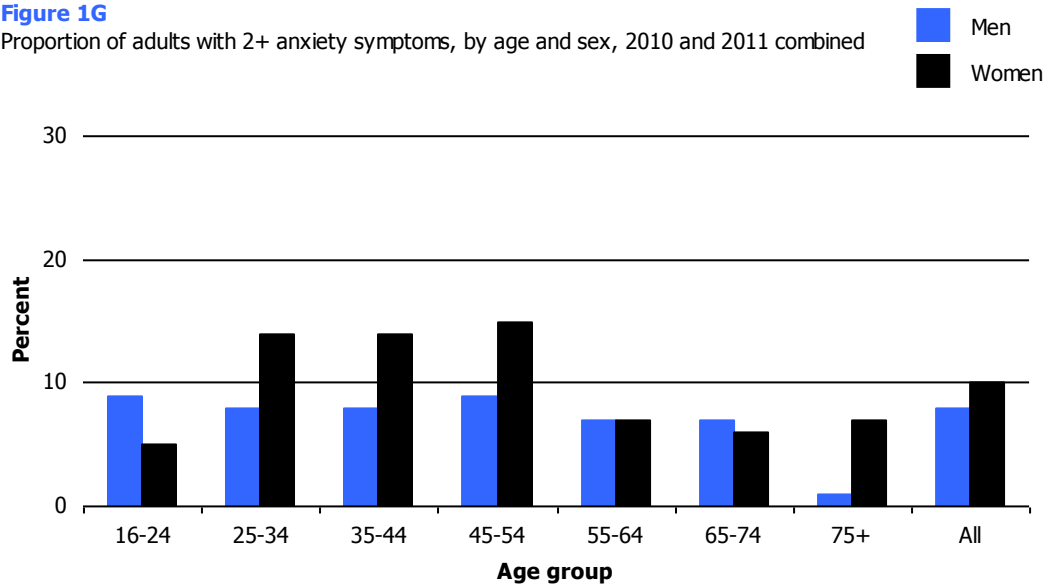
There was a significant association between anxiety and age. For men aged 16-54, prevalence of two or more symptoms ranged from 8-9%, it was 7% for those aged 55-74 and just 1% at age 75 and over. Women

aged 25-54 were twice as likely as women of other ages to have two or more symptoms of anxiety (14%-15% compared with 5%-7%). The presence of any symptoms of anxiety (i.e. one or more symptoms) was lowest among men aged 65 and over and highest among women aged 25-54 (with a particular peak in the 25-34 age group) (data not shown).

Figure 1G, Table 1.7

Figure 1G

Proportion of adults with 2+ anxiety symptoms, by age and sex, 2010 and 2011 combined



1.7 SUICIDE ATTEMPTS AND DELIBERATE SELF-HARM

1.7.1 Introduction

In addition to being asked about symptoms of depression and anxiety, those who took part in the nurse visit were also asked whether they had ever attempted to take their own life. The question was worded as follows:

Have you ever made an attempt to take your own life, by taking an overdose of tablets or in some other way?

Those who said yes were asked if this was in the last week, in the last year or at some other time. Note that this question is likely to underestimate the prevalence of very recent attempts, as people might be less likely to agree to take part in a survey immediately after a traumatic life event such as this and due to underreporting in response to a question administered face to face. Furthermore, suicide attempts will only be captured in a survey among people who have not succeeded.

Participants in the nurse visit were also asked whether they had ever deliberately harmed themselves but not with the intention of killing themselves.

1.7.2 Suicide attempts

The NHS Scotland HEAT target is to reduce the suicide rate between 2002 and 2013 by 20 percent.³² In 2011, 639 males and 250 females died from suicide and the age standardised suicide rate for 2009-11 was 14.5 deaths per 100,000 population.³³ Between 2000-02 and 2009-11, there was an overall downward trend of 17% in suicide rates.

In SHeS 2010/2011, 5% of adults reported having attempted suicide at some point in their life. This was very similar to the 2008/2009 figure of 4%. While death records indicate that men are markedly more likely than women to complete a suicide,³⁴ survey data indicate that women are more likely to report having made an attempt. The data here confirmed this pattern: in 2010/2011, 6% of women reported ever having made an attempt, compared with 4% of men.

Despite presenting figures based on two years of data combined, commenting on differences among age sub-groups in 2010/2011 and over time is difficult due to the small sample sizes and the greater likelihood of sample fluctuation. However, there did appear to be an association between age and reporting a suicide attempt with older people generally less likely to report an attempt than younger people, despite this variable relating to lifetime experience. This is likely to reflect several factors, such as a healthy survivor effect and issues relating to repression and diminished recall. Men aged 25-44 (5%) and women aged 35-54 (7-11%) were most likely to report a suicide attempt. However it is important to note that there were wide confidence intervals around these estimates.

Table 1.7

1.7.3 Deliberate self-harm

Overall, 2% of people in 2010/2011 reported that they had ever deliberately harmed themselves without suicidal intent. 3% reported self-harm in 2008/2009. Levels of self-harm were similar for men and women. These figures are lower than that reported elsewhere, which will in part be due to the method of questioning. For example, the Adult Psychiatric Morbidity Survey conducted in England in 2007 recorded a prevalence of self-harm of 4.9% when asked in a self-completion questionnaire, and 3.4% when asked in a face to face interview.³⁵ The 2008-2011 SHeS self-harm questions (along with the suicide, depression and anxiety questions) were asked face to face by nurses.

Self-harming was associated with age, with prevalence higher among younger age groups. It was reported by 6% of those aged 16-24 and 5% of those aged 35-44 compared with no more than 2% for all other age groups (no one aged 75 and over reported ever having self-harmed). The lower reporting among older age groups may be subject to similar factors as discussed above in relation to suicide attempts.

Table 1.7

References and notes

- 1 *Inequalities in Health. Report of the Measuring Inequalities in Health Working Group.* Measuring Inequalities in Health Working Group, 2003. [online] Available from: <www.scotland.gov.uk/Resource/Doc/47171/0013513.pdf>
- 2 See: <www.scotland.gov.uk/About/Performance/scotPerforms/indicator/generalhealth>
- 3 See: <www.scotland.gov.uk/About/scotPerforms/indicator/wellbeing>
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- 5 *National Performance Framework: Changes to the National Indicator Set*, Edinburgh: Scottish Government, 2012. [online] Available from: <www.scotland.gov.uk/About/scotPerforms/Nlchanges> See also: <www.scotlandperforms.com>
- 6 Given, L. (2009). Chapter 1: General Health and Mental Wellbeing. In Bromley, C., Bradshaw, P. and Given, L. [eds.] *The 2008 Scottish Health Survey – Volume 1: Main Report*. Edinburgh, Scottish Government. <www.scotland.gov.uk/Publications/2009/09/28102003/0>
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- 9 *Equally Well – Report of the Ministerial Taskforce on Health Inequalities*, Edinburgh: Scottish Government, 2008.
- 10 *Towards a Mentally Flourishing Scotland: Scottish Government, 2009.* Available from: <www.scotland.gov.uk/Publications/2007/10/26112853/0>
- 11 See: <www.chooselife.net/home/Home.asp>
- 12 National Suicide Prevention Working Group.(2010). *Refreshing the national strategy and action plan to prevent suicide in Scotland*. Edinburgh: Scottish Government. <www.scotland.gov.uk/Publications/2010/10/26112102/0>
- 13 The 2007 *Better Health, Better Care* action plan for improving health and health care in Scotland set out how NHS Scotland’s HEAT performance management system (based around a series of targets against which the performance of its individual Boards are measured) would feed into the Government’s overarching objectives. The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
- 14 *HEAT Targets due for delivery in 2010/11 – Summary of performance.* (2012). NHS Scotland Performance and Business Management. <www.scotland.gov.uk/Resource/0039/00391013.pdf>
- 15 Parkinson, J. (2007). *Establishing a core set of national, sustainable mental health indicators for adults in Scotland: Final report*. Glasgow: NHS Health Scotland.
- 16 A parallel set of national mental health indicators for children and young people has also been developed and is discussed in Volume 2 of this Report.

- 17 Stiglitz, J., Sen, A. and Fitoussi, J-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*.
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- 18 Waldron, S. *Measuring Subjective Wellbeing in the UK*. London: Office for National Statistics, 2010.
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- 20 Idler, E.L. and Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behaviour*. 38 (1), 21-37.
- 21 Hanlon, P., Lawder, R., Elders, A., Clark, D., Walsh, D., Whyte, B. and Sutton, M. (2007). An analysis of the link between behavioural, biological and social risk factors and subsequent hospital admission in Scotland. *Journal of Public Health*. 29, 405-412.
- 22 The briefing paper on the development of WEMWBS is available online from:
<www.wellscotland.info/indicators.html>
- 23 Stewart-Brown, S. and Janmohamed, K. (2008). *Warwick-Edinburgh Mental Well-being Scale (WEMWBS). User Guide Version 1*. Warwick and Edinburgh: University of Warwick and NHS Health Scotland.
- 24 The translation was carried out solely to ensure that speakers of other languages were not excluded from the Scottish Health Survey. There were insufficient numbers of non-English speaking people in the sample to enable comparisons of their health with the rest of the population. As the primary intention was to prevent the exclusion of people due to language barriers, the translated WEMWBS questions were not subject to the full extent of validation that would need to take place if the questionnaire was being used to assess wellbeing in a whole population of non-English speakers. It is therefore possible that the translated WEMWBS scale (and other questions in the survey) is not directly comparable to the English version. However, the number of interviews that used translated materials was judged to be too small to affect the national estimates presented here so all cases have been included in the analysis.
- 25 A subset of the stress at work questions was selected for use in the chapter. The question wording for these items was:
I have unrealistic time pressures at work
I have a choice in deciding how I do my work
Answer options: Always, Often, Sometimes, Seldom, Never
- My line manager encourages me at work
I get the help and support I need from colleagues at work
Answer options: Strongly agree, tend to agree, neutral, tend to disagree, strongly disagree, does not apply.
- How satisfied are you with the balance between the time you spend on your paid work and the time you spend on other aspects of your life? Please take your answer from this card.
Answer options: 0- Extremely dissatisfied, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10- Extremely satisfied
- In general, how do you find your job?
Answer options: Not at all stressful, mildly stressful, moderately stressful, very stressful, extremely stressful.
- 26 Siegrist, J, Starke, D, Chandola, T, Godin, I, Marmot, M, Niedhammer, I, Peter, R. (2004) *The measurement of effort-reward imbalance at work: European comparisons*. Soc Sci Med. 58(8):1483-99.
- 27 Karasek, R, Brisson, C, Kawakami, N, Houtman, I, Bongers, P, Amick, B. (1998) The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, 3(4), 322-355.

- 28 The question wording was:
Have you personally been **unfairly treated** or **discriminated** against in the last 12 months, that is since (*date 12 months ago*), for any of the reasons on this card?
Have you personally experienced harassment or abuse in the last 12 months, that is since (*date 12 months ago*), for any of the reasons on this card?
- Answer options: your accent, your ethnicity, your age, your language, your colour, your nationality, your mental ill-health, any other health problems or disability, your sex, your religious beliefs or faith, your sexual orientation, where you live, other reason, I have not experienced this.*
- 29 Blanchflower, DG and Oswald, AJ. (2007) *Is well-being U-shaped over the life cycle?* Working Paper. Coventry: University of Warwick, Department of Economics.
- 30 Lewis, G. & Pelosi, A. J. (1990) *Manual of the Revised Clinical Interview Schedule CIS-R*. London: Institute of Psychiatry; Lewis G, Pelosi AJ, Araya R, Dunn G. (1992) *Measuring psychiatric disorder in the community; a standardised assessment for use by lay interviewers*. *Psychological Medicine*, 22, 465-486.
- 31 The nurse interview is conducted with one adult at a time, whereas the main interview can be conducted concurrently with up to four household members present. It was therefore easier to ensure that these questions could be answered in confidence. Nurses were also thought to be better placed to handle very sensitive topics such as these than interviewers conducting a general health survey who would have required additional specialist briefing. A leaflet with various help lines was handed to all participants in the nurse visit. From 2012, these questions are included in the biological module of the survey, conducted by specially trained interviewers, and will be completed by participants using a self-completion computer aided questionnaire.
- 32 The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
- 33 In 2011, the National Records of Scotland (NRS) changed its coding practice to take account of changes made by the World Health Organisation (WHO) to coding rules for certain causes of death. As a result there is a difference in how death data were coded for 2011 compared to previous years, with some deaths previously coded under 'mental and behavioural disorders' now being classed as 'self-poisoning of undetermined intent' and consequently as suicides. The figures presented are based on the new coding rules. Further details available from: <http://www.scotpho.org.uk/health-wellbeing-and-disease/suicide/data/national-trends>
- 34 For estimates of deaths by suicide in Scotland in 2011 see: <http://www.scotpho.org.uk/health-wellbeing-and-disease/suicide/data/national-trends>
- 35 McManus S, Meltzer H, Brugha T, Bebbington P, Jenkins R (eds) (2009). *Adult Psychiatric Morbidity in England 2007: results of a household survey*. The NHS Information Centre.

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Table 1.1 Adult self-assessed general health, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2008, 2009, 2010, 2011

Self-assessed general health	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Very good								
2008	54	48	39	35	30	24	17	37
2009	49	49	43	33	29	24	18	37
2010	49	42	37	35	26	24	18	35
2011	51	47	41	34	27	25	17	37
Good								
2008	34	40	44	43	36	37	38	39
2009	42	38	39	41	40	42	33	40
2010	41	46	42	41	41	37	40	41
2011	42	40	45	40	40	39	34	41
Fair								
2008	12	9	12	14	21	28	27	16
2009	9	11	12	17	20	22	32	16
2010	8	9	15	19	21	27	28	17
2011	7	11	10	18	20	24	33	16
Bad								
2008	1	2	5	7	9	9	14	6
2009	0	1	5	7	9	9	13	6
2010	2	2	4	4	9	9	9	5
2011	-	2	3	6	9	8	12	5
Very bad								
2008	-	1	1	2	4	2	4	2
2009	-	0	1	2	2	2	5	1
2010	-	1	2	2	3	3	5	2
2011	0	0	1	2	4	3	3	2
Very good/good								
2008	88	88	82	78	66	61	55	76
2009	91	87	83	75	69	66	50	77
2010	90	88	79	75	67	61	58	76
2011	93	87	86	75	67	65	51	77
Bad/very bad								
2008	1	3	5	8	13	12	17	7
2009	0	2	5	8	11	11	17	7
2010	2	2	6	6	12	13	14	7
2011	0	2	3	8	13	11	15	7

Continued...

Table 1.1 - Continued

Aged 16 and over

2008, 2009, 2010, 2011

Self-assessed general health	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
Very good								
2008	41	45	42	36	29	26	18	35
2009	43	47	42	37	31	25	15	36
2010	39	43	42	35	32	29	20	35
2011	48	49	39	35	30	24	18	36
Good								
2008	45	40	41	39	40	37	34	40
2009	47	40	41	39	42	39	39	41
2010	47	41	39	38	34	39	35	39
2011	42	38	40	40	38	37	33	39
Fair								
2008	12	12	14	18	20	26	36	19
2009	9	10	12	14	20	25	34	17
2010	11	12	13	18	23	22	33	18
2011	7	9	15	17	19	27	35	18
Bad								
2008	2	3	3	5	8	8	10	5
2009	1	2	5	8	6	9	10	6
2010	3	3	6	8	8	8	10	6
2011	2	3	5	6	9	10	11	6
Very bad								
2008	-	0	0	2	4	3	3	2
2009	0	1	1	1	1	2	2	1
2010	-	0	1	1	4	2	3	2
2011	-	1	1	2	3	2	3	2
Very good/good								
2008	86	85	82	75	69	64	51	75
2009	90	87	82	76	73	64	54	77
2010	86	84	81	73	66	68	54	74
2011	90	86	79	75	69	62	50	74
Bad/very bad								
2008	2	3	3	7	11	11	13	7
200	1	3	6	9	7	11	12	7
2010	3	3	6	10	11	10	12	8
2011	2	4	6	8	12	12	15	8

Continued...

Table 1.1 - Continued

Aged 16 and over

2008, 2009, 2010, 2011

Self-assessed general health	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All adults								
Very good/good								
2008	87	86	82	76	67	62	53	75
2009	90	87	83	76	71	65	53	77
2010	88	86	80	74	66	64	56	75
2011	92	87	83	75	68	63	51	76
Bad/very bad								
2008	1	3	4	8	12	11	15	7
2009	1	2	6	9	9	11	14	7
2010	3	3	6	8	12	11	13	7
2011	1	3	5	8	13	11	15	7
<i>Bases (weighted):</i>								
<i>Men 2008</i>	464	481	563	555	480	327	218	3087
<i>Men 2009</i>	538	568	634	650	563	387	259	3598
<i>Men 2010</i>	515	560	588	631	542	374	253	3464
<i>Men 2011</i>	536	583	613	655	565	390	266	3608
<i>Women 2008</i>	444	487	616	591	504	384	350	3376
<i>Women 2009</i>	511	571	695	700	590	450	410	3926
<i>Women 2010</i>	494	556	645	682	571	432	396	3775
<i>Women 2011</i>	514	580	671	710	595	449	413	3932
<i>All adults 2008</i>	908	968	1179	1146	983	711	568	6463
<i>All adults 2009</i>	1050	1138	1328	1349	1153	836	669	7524
<i>All adults 2010</i>	1009	1116	1233	1313	1114	806	649	7239
<i>All adults 2011</i>	1051	1163	1285	1365	1159	839	679	7541
<i>Bases (unweighted):</i>								
<i>Men 2008</i>	246	317	460	535	525	453	304	2840
<i>Men 2009</i>	272	406	550	602	575	517	363	3285
<i>Men 2010</i>	274	421	477	566	555	489	330	3112
<i>Men 2011</i>	308	399	516	599	602	511	344	3279
<i>Women 2008</i>	333	451	648	632	632	516	410	3622
<i>Women 2009</i>	383	580	780	733	735	550	480	4241
<i>Women 2010</i>	373	565	682	763	701	574	470	4128
<i>Women 2011</i>	364	562	711	803	739	597	486	4262
<i>All adults 2008</i>	579	768	1108	1167	1157	969	714	6462
<i>All adults 2009</i>	655	986	1330	1335	1310	1067	843	7526
<i>All adults 2010</i>	647	986	1159	1329	1256	1063	800	7240
<i>All adults 2011</i>	672	961	1227	1402	1341	1108	830	7541

Table 1.2 Prevalence of long-term conditions, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2008, 2009, 2010, 2011

Long-term conditions and limiting long-term conditions	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
No long-term conditions								
2008	84	79	67	61	46	38	33	62
2009	83	80	73	62	48	39	30	63
2010	76	77	64	62	42	35	31	59
2011	77	74	70	53	41	37	27	57
Limiting long-term conditions								
2008	7	10	20	22	34	43	50	23
2009	9	10	16	22	32	40	58	23
2010	11	11	23	22	35	45	48	25
2011	11	13	15	25	38	43	55	26
Non-limiting long-term conditions								
2008	10	12	14	17	20	19	17	15
2009	8	10	11	16	20	21	12	14
2010	13	12	13	16	23	21	21	16
2011	12	13	15	22	21	20	17	17
Total with conditions								
2008	16	21	33	39	54	62	67	38
2009	17	20	27	38	52	61	70	37
2010	24	23	36	38	58	65	69	41
2011	23	26	30	47	59	63	73	43
Women								
No long-term conditions								
2008	82	71	70	58	45	34	29	58
2009	79	73	67	61	45	38	31	58
2010	76	74	63	54	42	36	28	55
2011	79	73	61	51	44	37	22	54
Limiting long-term conditions								
2008	8	17	19	25	39	44	54	28
2009	12	16	19	24	34	40	55	27
2010	12	16	25	30	40	42	55	30
2011	11	18	23	30	37	43	60	30
Non-limiting long-term conditions								
2008	10	11	11	17	16	22	17	15
2009	9	11	14	14	21	21	14	15
2010	12	10	12	16	18	21	17	15
2011	10	10	15	19	20	21	18	16

Continued...

Table 1.2 - Continued

Aged 16 and over

2008, 2009, 2010, 2011

Long-term conditions and limiting long-term conditions	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Total with conditions								
2008	18	29	30	42	55	66	71	42
2009	21	27	33	39	55	62	69	42
2010	24	26	37	46	58	64	72	45
2011	21	27	39	49	56	63	78	46
All adults								
Total with conditions								
2008	17	25	32	41	54	64	69	41
2009	19	23	30	39	54	61	69	40
2010	24	25	36	42	58	64	71	43
2011	22	27	35	48	57	63	76	44
<i>Bases (weighted):</i>								
<i>Men 2008</i>	464	481	563	555	480	327	218	3087
<i>Men 2009</i>	538	568	633	649	563	387	259	3597
<i>Men 2010</i>	515	560	589	631	542	374	253	3465
<i>Men 2011</i>	536	583	613	657	565	390	266	3610
<i>Women 2008</i>	445	487	616	591	504	384	350	3377
<i>Women 2009</i>	511	571	695	700	590	450	410	3926
<i>Women 2010</i>	493	557	645	682	571	432	397	3777
<i>Women 2011</i>	514	580	671	710	595	449	413	3932
<i>All adults 2008</i>	909	968	1179	1146	983	711	568	6464
<i>All adults 2009</i>	1050	1138	1328	1349	1153	836	669	7523
<i>All adults 2010</i>	1009	1117	1234	1313	1114	805	650	7242
<i>All adults 2011</i>	1051	1163	1285	1366	1159	839	679	7542
<i>Bases (unweighted):</i>								
<i>Men 2008</i>	246	317	460	535	525	453	304	2840
<i>Men 2009</i>	272	406	549	601	575	517	363	3283
<i>Men 2010</i>	274	421	478	566	555	488	330	3112
<i>Men 2011</i>	308	399	516	600	602	511	344	3280
<i>Women 2008</i>	334	451	648	632	632	516	410	3623
<i>Women 2009</i>	383	580	780	733	735	550	480	4241
<i>Women 2010</i>	372	566	682	763	701	574	471	4129
<i>Women 2011</i>	364	562	711	803	739	597	486	4262
<i>All adults 2008</i>	580	768	1108	1167	1157	969	714	6463
<i>All adults 2009</i>	655	986	1329	1334	1310	1067	843	7524
<i>All adults 2010</i>	646	987	1160	1329	1256	1062	801	7241
<i>All adults 2011</i>	672	961	1227	1403	1341	1108	830	7542

Table 1.3 Prevalence of long-term conditions, 2008-2011 combined (age-standardised), by Scottish Index of Multiple Deprivation and sex

Aged 16 and over

2008-2011 combined

Long-term conditions and limiting long-term conditions	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
No long-term conditions	67	61	61	58	51	61	50
Limiting long-term conditions	17	20	25	27	35	23	36
Non-limiting long-term conditions	16	18	14	15	14	16	14
<i>Total with conditions</i>	33	39	39	42	49	39	50
Women							
No long-term conditions	64	61	57	52	46	58	45
Limiting long-term conditions	20	24	28	33	40	27	41
Non-limiting long-term conditions	16	14	16	15	14	15	13
<i>Total with conditions</i>	36	39	43	48	54	42	55
All adults							
No long-term conditions	65	61	59	55	49	60	48
Limiting long-term conditions	18	22	26	30	38	25	39
Non-limiting long-term conditions	16	16	15	15	14	16	14
<i>Total with conditions</i>	35	39	41	45	51	40	52
<i>Bases (weighted):</i>							
<i>Men</i>	2732	3009	2705	2693	2626	11783	1982
<i>Women</i>	2943	3100	2946	3003	3014	12775	2231
<i>All adults</i>	5675	6109	5651	5695	5640	24558	4213
<i>Bases (unweighted):</i>							
<i>Men</i>	2234	2887	2679	2359	2356	10697	1818
<i>Women</i>	2844	3602	3423	3125	3262	13758	2498
<i>All adults</i>	5078	6489	6102	5484	5618	24455	4316

Table 1.4 WEMWBS mean scores, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2008, 2009, 2010, 2011

WEMWBS scores ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
Men								
Mean								
2008	51.1	50.4	50.6	49.6	50.0	50.7	48.7	50.2
2009	50.2	50.1	49.5	48.8	50.3	51.4	49.1	49.9
2010	51.7	50.8	49.1	49.5	49.5	51.6	50.1	50.2
2011	50.3	51.1	50.1	49.1	49.7	51.3	49.7	50.2
SE of the mean								
2008	0.57	0.47	0.48	0.42	0.48	0.50	0.63	0.20
2009	0.58	0.38	0.37	0.39	0.38	0.38	0.53	0.16
2010	0.51	0.49	0.44	0.43	0.44	0.43	0.53	0.19
2011	0.54	0.49	0.42	0.39	0.44	0.43	0.58	0.19
Standard deviation								
2008	7.54	7.52	8.80	8.47	9.48	9.49	8.51	8.55
2009	7.65	7.09	8.23	8.44	8.27	7.99	8.18	8.02
2010	7.26	7.81	8.47	8.42	9.27	8.51	8.30	8.37
2011	8.06	8.19	7.91	8.50	8.67	8.76	8.29	8.35
Women								
Mean								
2008	49.8	49.4	49.5	49.5	49.7	51.2	49.0	49.7
2009	50.3	49.5	49.6	48.9	50.4	50.5	48.3	49.7
2010	49.5	50.0	49.4	48.6	49.9	51.3	49.0	49.6
2011	50.0	50.1	49.7	48.9	49.9	50.7	48.8	49.7
SE of the mean								
2008	0.48	0.43	0.36	0.43	0.42	0.43	0.49	0.16
2009	0.51	0.38	0.32	0.36	0.35	0.41	0.48	0.16
2010	0.47	0.41	0.37	0.37	0.38	0.43	0.44	0.17
2011	0.49	0.40	0.31	0.37	0.36	0.35	0.46	0.17
Standard deviation								
2008	7.66	8.23	8.24	9.32	8.81	8.57	7.98	8.48
2009	8.23	8.23	8.39	9.10	8.49	8.27	8.39	8.51
2010	7.82	8.57	8.74	9.06	8.94	8.92	7.96	8.67
2011	7.64	8.53	7.76	9.07	8.83	7.73	8.59	8.37
All adults								
Mean								
2008	50.5	49.9	50.0	49.6	49.8	51.0	48.9	50.0
2009	50.2	49.8	49.5	48.8	50.3	50.9	48.6	49.7
2010	50.6	50.4	49.2	49.0	49.7	51.5	49.4	49.9
2011	50.1	50.6	49.9	49.0	49.8	51.0	49.2	49.9
SE of the mean								
2008	0.37	0.34	0.32	0.31	0.33	0.35	0.40	0.14
2009	0.39	0.28	0.25	0.29	0.27	0.29	0.37	0.12
2010	0.36	0.34	0.30	0.30	0.32	0.33	0.35	0.14
2011	0.40	0.34	0.25	0.29	0.30	0.29	0.38	0.14
Standard deviation								
2008	7.62	7.90	8.52	8.91	9.14	8.99	8.19	8.52
2009	7.94	7.68	8.31	8.79	8.38	8.15	8.31	8.28
2010	7.62	8.21	8.61	8.77	9.10	8.73	8.10	8.54
2011	7.85	8.37	7.83	8.80	8.75	8.22	8.48	8.36

Continued...

Table 1.4 - Continued

Aged 16 and over

2008, 2009, 2010, 2011

WEMWBS scores ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
Men 2008	420	435	519	510	436	285	181	2785
Men 2009	480	537	584	599	519	346	216	3282
Men 2010	464	524	540	580	514	345	204	3171
Men 2011	477	521	550	592	501	336	213	3191
Women 2008	404	447	566	546	456	344	264	3026
Women 2009	478	527	654	663	551	398	314	3586
Women 2010	461	519	607	647	530	394	318	3478
Women 2011	471	542	618	648	540	389	333	3540
All adults 2008	823	882	1085	1056	892	629	444	5812
All adults 2009	958	1065	1238	1262	1070	744	530	6868
All adults 2010	926	1043	1147	1228	1045	739	522	6649
All adults 2011	948	1063	1168	1240	1041	725	546	6731
<i>Bases (unweighted):</i>								
Men 2008	222	285	425	487	475	398	247	2539
Men 2009	244	384	507	559	532	464	304	2994
Men 2010	253	394	437	519	526	451	262	2842
Men 2011	277	357	468	542	536	441	279	2900
Women 2008	304	415	600	585	572	463	309	3248
Women 2009	360	540	736	698	687	488	377	3886
Women 2010	350	530	644	722	653	524	382	3805
Women 2011	334	527	654	740	676	524	390	3845
All adults 2008	526	700	1025	1072	1047	861	556	5787
All adults 2009	604	924	1243	1257	1219	952	681	6880
All adults 2010	603	924	1081	1241	1179	975	644	6647
All adults 2011	611	884	1122	1282	1212	965	669	6745

a Mean WEMWBS score is part of the national mental health indicator set for adults

Table 1.5 WEMWBS mean score, 2009 and 2011 combined, by stress at work, work-life balance, job/workplace conditions and sex

Aged 16 and over and in work

2009 and 2011 combined

	WEMWBS Mean Score	WEMWBS SE	WEMWBS Standard Deviation	Weighted Bases	Unweighted Bases
Men					
I have unrealistic time pressures at work					
Always/Often	48.7	0.52	8.09	366	294
Sometimes	50.2	0.41	6.48	436	358
Seldom/Never	51.5	0.38	7.53	534	491
I have a choice in deciding how I do my work					
Always/Often	51.2	0.30	7.13	874	765
Sometimes	49.1	0.54	7.11	269	224
Seldom/Never	48.0	0.81	8.54	192	154
My line manager encourages me at work					
Tend to agree/ Strongly agree	51.0	0.33	7.10	720	602
Neutral	49.8	0.51	7.17	251	221
Tend to disagree/ Strongly disagree	46.8	0.75	8.28	195	154
I get the help and support I need from colleagues at work					
Tend to agree/ Strongly agree	51.0	0.27	7.06	1029	884
Neutral	49.6	0.67	7.64	172	153
Tend to disagree/ Strongly disagree	45.0	0.94	8.32	122	91
In general, how do you find your job					
Not at all stressful/ Mildly stressful	51.9	0.33	7.01	692	607
Moderately stressful	49.1	0.37	6.77	460	386
Very stressful/ Extremely stressful	47.3	0.86	9.06	183	150
How satisfied with balance between time on paid work and time on other aspects of life					
Below average (0-6)	48.6	0.39	7.77	617	524
Average (7)	50.8	0.45	6.31	279	230
Above average (8-10)	52.4	0.41	7.09	440	389

Continued...

Table 1.5 - Continued

Aged 16 and over and in work

2009 and 2011 combined

	WEMWBS Mean Score	WEMWBS SE	WEMWBS Standard Deviation	Weighted Bases	Unweighted Bases
Women					
I have unrealistic time pressures at work					
Always/Often	48.4	0.43	7.44	326	331
Sometimes	50.6	0.38	7.30	417	428
Seldom/Never	51.0	0.40	7.90	504	538
I have a choice in deciding how I do my work					
Always/Often	51.3	0.30	7.55	771	801
Sometimes	48.1	0.43	6.96	273	284
Seldom/Never	48.6	0.59	8.07	202	212
My line manager encourages me at work					
Tend to agree/ Strongly agree	50.9	0.29	7.35	811	833
Neutral	48.9	0.55	7.62	197	208
Tend to disagree/ Strongly disagree	47.8	0.65	8.32	167	171
I get the help and support I need from colleagues at work					
Tend to agree/ Strongly agree	50.8	0.25	7.43	985	1032
Neutral	48.7	0.61	7.70	167	168
Tend to disagree/ Strongly disagree	46.4	0.98	8.82	84	82
In general, how do you find your job					
Not at all stressful/ Mildly stressful	51.1	0.33	7.46	622	653
Moderately stressful	50.0	0.37	7.46	434	449
Very stressful/ Extremely stressful	47.4	0.61	8.03	192	196
How satisfied with balance between time on paid work and time on other aspects of life					
Below average (0-6)	48.3	0.33	7.49	560	568
Average (7)	50.4	0.56	7.56	228	233
Above average (8-10)	52.4	0.36	7.31	459	495

Continued...

Table 1.5 - Continued

Aged 16 and over and in work

2009 and 2011 combined

	WEMWBS Mean Score	WEMWBS SE	WEMWBS Standard Deviation	Weighted Bases	Unweighted Bases
All Adults					
I have unrealistic time pressures at work					
Always/Often	48.6	0.35	7.79	691	625
Sometimes	50.4	0.28	6.89	853	786
Seldom/Never	51.2	0.29	7.71	1038	1029
I have a choice in deciding how I do my work					
Always/Often	51.3	0.22	7.33	1646	1566
Sometimes	48.6	0.36	7.05	542	508
Seldom/Never	48.3	0.49	8.29	394	366
My line manager encourages me at work					
Tend to agree/ Strongly agree	50.9	0.23	7.23	1531	1435
Neutral	49.4	0.38	7.38	448	429
Tend to disagree/ Strongly disagree	47.3	0.51	8.30	362	325
I get the help and support I need from colleagues at work					
Tend to agree/ Strongly agree	50.9	0.20	7.25	2014	1916
Neutral	49.1	0.45	7.67	339	321
Tend to disagree/ Strongly disagree	45.6	0.67	8.54	205	173
In general, how do you find your job					
Not at all stressful/ Mildly stressful	51.5	0.24	7.23	1314	1260
Moderately stressful	49.6	0.26	7.12	894	835
Very stressful/ Extremely stressful	47.4	0.52	8.54	375	346
How satisfied with balance between time on paid work and time on other aspects of life					
Below average (0-6)	48.4	0.26	7.64	1177	1092
Average (7)	50.6	0.34	6.89	506	463
Above average (8-10)	52.4	0.29	7.20	899	884

Table 1.6 Estimated odds ratios for below average WEMWBS mean scores, 2009/2011 combined, by associated risk factors and sex

<i>Aged 16 and over</i>		<i>2009/2011 combined</i>				
Independent variables ^a	Men			Women		
	Base (weighted)	Odds ratio	95% CI ^b	Base (weighted)	Odds ratio	95% CI ^b
	1977			2577		
Age		(p=0.006)			(p<0.001)	
16-44	761	1		1036	1	
45-64	735	0.95	0.61, 1.49	952	0.84	0.61, 1.49
65+	481	0.53	0.30, 0.91	569	0.48	0.31, 0.91
Marital Status		(p=0.018)			(p=0.009)	
Married/civil partner	1120	1.00		1330	1.00	
Living as married	201	1.39	0.77, 2.51	251	1.00	0.61, 1.66
Single	403	1.44	0.94, 2.20	431	1.62	1.12, 2.36
Separated/ Divorced/ Widowed	253	1.57	0.99, 2.49	545	1.27	0.94, 1.74
Highest educational qualification		(p=0.068)			(p<0.001)	
Degree or higher	523	1		699	1	
HNC/D or equivalent	224	0.96	0.54, 1.71	249	1.48	0.88, 2.50
Higher grade or equivalent	331	0.88	0.52, 1.47	344	1.07	0.65, 1.74
Standard grade or equivalent	374	1.82	1.09, 3.05	507	1.37	0.91, 2.06
Other school level	117	0.95	0.46, 1.96	219	1.59	0.93, 2.72
No qualifications	408	1.22	0.72, 2.08	539	2.00	1.26, 3.18
NS-SEC of household reference person		(p=0.005)			(p=0.296)	
Managerial/professional	808	1		956	1	
Intermediate	148	1.18	0.64, 2.16	257	1.22	0.79, 1.89
Small employer/own accounts workers	180	0.92	0.47, 1.81	218	1.08	0.64, 1.82
Lower supervisory/technical	278	0.87	0.54, 1.41	289	1.31	0.88, 1.95
Semi-routine	521	1.01	0.63, 1.60	775	1.27	0.91, 1.77
Missing	42	0.28	0.11, 0.75	62	0.74	0.33, 1.67
Self-assessed general health		(p<0.001)			(p<0.001)	
Good/very good	1464	1		1935	1	
Fair	357	2.73	1.77, 4.21	418	2.13	1.53, 2.96
Bad/Very bad	156	6.03	3.49, 10.40	204	5.18	3.37, 7.97
Long term conditions		(p=0.231)			(p=0.005)	
Limiting longstanding illness	559	1		787	1	
Non-limiting longstanding illness	310	0.34	0.18, 0.64	398	0.49	0.31, 0.75
None	1108	0.69	0.45, 1.06	1372	0.58	0.41, 0.80

Continued...

Table 1.6 - Continued
Aged 16 and over

2009/2011 combined

Independent variables ^a	Men			Women		
	Base (weighted)	Odds ratio	95% CI ^b	Base (weighted)	Odds ratio	95% CI ^b
	1977			2577		
Physical activity levels^c		(p=0.023)			(p=0.075)	
High	805	1		806	1	
Medium	554	1.10	0.71, 1.70	893	0.99	0.72, 1.38
Low	618	1.61	1.05, 2.47	858	1.33	0.94, 1.87
Discriminated against or unfairly treated in last 12 months		(p<0.001)			(p=0.004)	
No	1757	1		2276	1	
Yes	220	2.02	1.33, 3.07	281	1.68	1.18, 2.39
Number of people can turn to in a crisis		(p=0.013)			(p<0.001)	
0-3	464	1		470	1	
4-5	411	0.64	0.41, 0.98	555	0.56	0.40, 0.78
6	359	0.63	0.38, 1.04	458	0.42	0.29, 0.62
7-10	408	0.49	0.30, 0.81	618	0.46	0.32, 0.66
11 or more	335	0.66	0.40, 1.10	456	0.25	0.16, 0.40
Involvement in local community		(p<0.001)			(p<0.001)	
A great deal/fair amount	534	1		797	1	
Not very much	952	0.98	0.63, 1.53	1187	1.35	0.97, 1.89
Not at all	491	2.08	1.31, 3.28	573	1.86	1.31, 2.66

a Binary variable: 0= average or above average WEMWBS score and 1=at least 1 SD below average WEMWBS score.

b Confidence intervals.

c High= 30 minutes or more on at least 5 days a week (this group represents those who meet the current physical activity recommendations); Medium= 30 minutes or more on 1 to 4 days a week; Low= fewer than 30 minutes of moderate or vigorous activity a week.

Table 1.7 CIS-R anxiety and depression symptom scores, attempted suicide and deliberate self-harm, 2008/2009 combined, 2010/2011 combined, by age and sex

Mental health problem	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Depression symptom score								
2008/2009								
0	97	92	88	86	87	87	87	89
1	3	2	4	5	4	5	5	4
2 or more symptoms ^a	-	5	8	10	9	7	8	7
2010/2011								
0	87	82	86	78	83	86	91	84
1	7	14	10	15	11	9	6	11
2 or more symptoms ^a	7	4	4	7	5	4	3	5
Anxiety symptom score								
2008/2009								
0	93	87	83	87	87	88	88	87
1	6	8	8	4	7	6	2	6
2 or more symptoms ^b	1	6	9	10	6	6	9	7
2010/2011								
0	86	85	88	83	89	93	96	87
1	5	7	5	8	4	1	3	5
2 or more symptoms ^b	9	8	8	9	7	7	1	8
Attempted suicide								
2008/2009								
No	99	99	94	97	95	98	98	97
Yes	1	1	6	3	5	2	2	3
2010/2011								
No	96	95	95	96	97	99	100	96
Yes	4	5	5	4	3	1	-	4
Deliberate self-harm								
2008/2009								
No	99	99	95	99	99	99	100	98
Yes	1	1	5	1	1	1	-	2
2010/2011								
No	95	100	96	99	99	100	100	98
Yes	5	-	4	1	1	-	-	2

Continued...

Table 1.7 - Continued

Aged 16 and over with a nurse visit

2008/2009 combined, 2010/2011 combined

Mental health problem	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
Depression symptom score								
2008/2009								
0	85	80	85	82	78	91	85	84
1	6	8	4	6	9	4	6	6
2 or more symptoms ^a	8	12	11	12	12	5	9	10
2010/2011								
0	83	78	73	79	81	80	85	79
1	11	13	14	11	14	15	10	13
2 or more symptoms ^a	6	9	13	10	5	6	5	8
Anxiety symptom score								
2008/2009								
0	76	80	74	77	79	85	81	78
1	16	11	14	10	6	10	9	11
2 or more symptoms ^b	8	9	12	12	15	5	10	11
2010/2011								
0	89	70	78	77	84	88	86	81
1	6	15	8	9	9	6	7	9
2 or more symptoms ^b	5	14	14	15	7	6	7	10
Attempted suicide								
2008/2009								
No	93	91	92	96	94	98	97	94
Yes	7	9	8	4	6	2	3	6
2010/2011								
No	95	94	89	93	94	99	99	94
Yes	5	6	11	7	6	1	1	6
Deliberate self-harm								
2008/2009								
No	93	93	94	97	99	100	100	96
Yes	7	7	6	3	1	0	-	4
2010/2011								
No	94	96	94	99	98	99	100	97
Yes	6	4	6	1	2	1	-	3

Continued...

Table 1.7 - Continued

Aged 16 and over with a nurse visit

2008/2009 combined, 2010/2011 combined

Mental health problem	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All adults								
Depression symptom score^c								
2008/2009								
0	91	86	86	84	83	89	86	86
1	5	5	4	5	7	5	5	5
2 or more symptoms ^a	4	9	10	11	10	6	9	8
2010/2011								
0	85	80	79	78	82	83	87	82
1	9	13	12	13	13	12	9	12
2 or more symptoms ^a	6	7	9	8	5	5	4	7
Anxiety symptom score^d								
2008/2009								
0	85	83	78	82	83	86	84	83
1	11	10	11	7	7	8	7	9
2 or more symptoms ^b	4	7	11	11	10	6	10	9
2010/2011								
0	87	77	83	80	86	90	90	84
1	6	11	6	8	7	3	6	7
2 or more symptoms ^b	7	11	11	12	7	6	5	9
Attempted suicide								
2008/2009								
No	96	95	93	96	94	98	97	96
Yes	4	5	7	4	6	2	3	4
2010/2011								
No	96	95	92	94	95	99	100	95
Yes	4	5	8	6	5	1	0	5
Deliberate self-harm								
2008/2009								
No	96	96	95	98	99	99	100	97
Yes	4	4	5	2	1	1	-	3
2010/2011								
No	94	98	95	99	99	100	100	98
Yes	6	2	5	1	1	0	-	2

Continued...

Table 1.7 - Continued

Aged 16 and over with a nurse visit

2008/2009 combined, 2010/2011 combined

Mental health problem	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
<i>Men 2008/2009</i>	160	168	191	193	165	113	76	1066
<i>Men 2010/2011</i>	144	158	163	177	153	106	72	972
<i>Women 2008/2009</i>	150	167	206	205	175	131	121	1154
<i>Women 2010/2011</i>	138	158	178	192	161	120	111	1059
<i>All adults 2008/2009</i>	310	334	397	398	340	244	197	2220
<i>All adults 2010/2011</i>	282	316	341	369	314	226	183	2031
<i>Bases (unweighted):</i>								
<i>Men 2008/2009</i>	64	103	164	173	198	171	101	974
<i>Men 2010/2011</i>	69	97	140	171	166	139	93	875
<i>Women 2008/2009</i>	101	146	233	210	245	186	125	1246
<i>Women 2010/2011</i>	87	151	188	249	195	156	129	1155
<i>All adults 2008/2009</i>	165	249	397	383	443	357	226	2220
<i>All adults 2010/2011</i>	156	248	328	420	361	295	222	2030

a Two or more symptoms indicate depression of moderate to high severity.

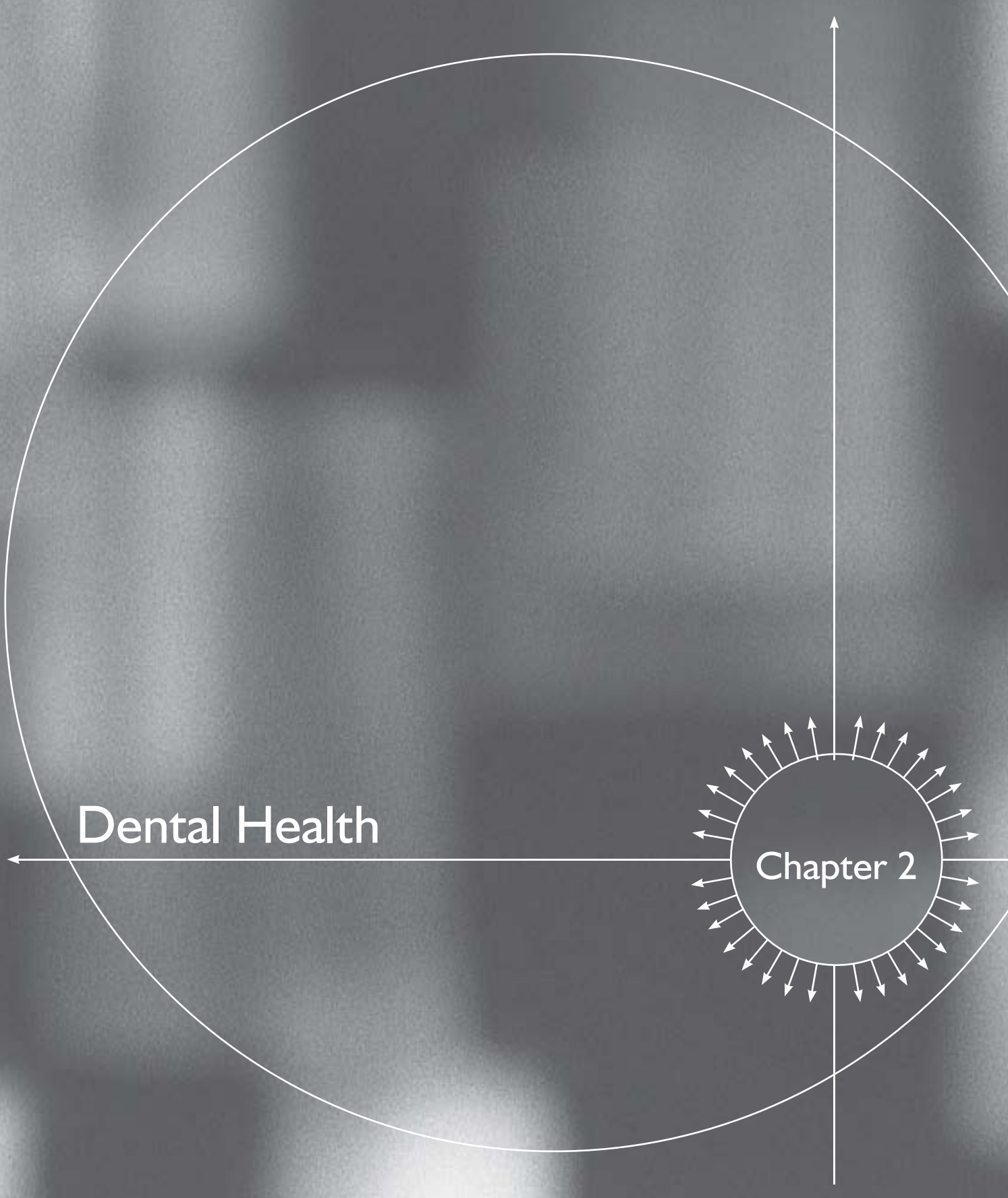
b Two or more symptoms indicate anxiety of moderate to high severity.

c Percentage of adults with a score of 2+ on depression section of CIS-R is part of the national mental health indicator set for adults.

d Percentage of adults with a score of 2+ on anxiety section of CIS-R is part of the national mental health indicator set for adults.

Dental Health

Chapter 2



2 DENTAL HEALTH

Lisa Rutherford

SUMMARY

- In 2011, 90% of all adults aged 16 and over had some natural teeth (91% of men and 89% of women).
- Between 1995 and 2003 the percentage of men aged 16-64 with all false teeth fell from 9% to 5% (the corresponding figures for women were 13% and 7%). Since 2008, the proportion reporting no natural teeth has remained stable (3-4% of men and 4-5% of women).
- There was a strong association between area deprivation and prevalence of natural teeth. Those living in the most deprived SIMD quintile were the least likely to have some natural teeth (83% compared with 94% of those in the least deprived quintile).
- Similarly, men and women living in the 15% most deprived areas of Scotland were more likely than those living elsewhere to have no natural teeth (18% compared with 10%).
- Almost all (96%) adults with teeth said they brush them daily with fluoride toothpaste.
- Four in ten adults reported using a mouth-wash daily, though women were more likely than men to do this (45% compared with 36%).
- A quarter (26%) of adults with teeth said they used dental floss daily, with women twice as likely as men to report doing so (33% versus 17%).
- One in five (22%) of people said they restrict their sugar intake to improve their dental health. 16-24 year olds and those aged 75 and over were least likely to say that they took this action daily.

2.1 INTRODUCTION

To address Scotland's poor oral health record and increase access to dental health services, the then Scottish Executive published *An Action Plan for Improving Oral Health and Modernising NHS Dental Services in Scotland*¹ in 2005. This laid out a series of national dental health and dental service targets, including the aim that by 2010 90% of all adults in Scotland, and 65% of adults aged between 55 and 74 years, would possess some natural teeth. The dental health chapter in the 2008 Scottish Health Survey (SHeS) report² noted that the separate target for adults in the 55-74 age group had already been met.

The introductions to the three previous dental health chapters in the 2008, 2009, and 2010 (SHeS) reports^{2,3,4} outlined the recent policy context in this area, much of which focuses on improving children's oral health, especially among those in the most deprived areas. The key initiatives highlighted were:

- The opening of a new dental school in Aberdeen in 2008, and steps to attract more dentists to work in Scotland.
- Two NHS HEAT targets⁵ relating to child dental health (one on NHS dentist registration rates for 3-5 year olds by 2010/11, and one on fluoride varnish applications for 3-4 year olds by March 2014).

- The Childsmile national oral health improvement programme for children in Scotland.
- The introduction of free dental checks for adults.

The HEAT target for 80% of 3-5 year old children to be registered with an NHS dentist by 2010/11 was surpassed (88% were registered).⁶ The annual report from NHS Scotland's Chief Executive also highlighted a number of recent developments in the field of dental health.⁷ For example, the expansion of rural dental services through the opening of new premises in Stornoway (Isle of Lewis) which provides services to patients as well as training for student dentists and uses IT links to larger practices to support this. There are now 17 dental outreach centres where senior student dentists can gain experience of working in a primary care setting. These deliver treatment to patients in rural areas and other places with a high demand for such services, many of whom are not registered with a dentist.

The origins of poor adult oral health often lie in childhood, hence the focus on children's teeth outlined above. A target for 60% of primary 1 children to be free of dental decay by 2010 was achieved nationally, and locally in 12 health board areas. However, stark differences by area deprivation persist: 45% of primary 1 children in the 10% most deprived areas had no decay compared with 82% in the 10% least deprived areas.

This chapter provides the 2011 figures for the reported prevalence of natural teeth in adults. Reflecting the concerns noted above about inequalities in oral health, the prevalence of natural teeth is also shown by the Scottish Index of Multiple Deprivation (SIMD). The chapter then reports details of steps adults say they take to improve their oral health. There was not space to cover all aspects of dental health within this chapter so supplementary web tables are being published at the same time as this report.

2.2 METHODS AND DEFINITIONS OF MEASUREMENT

In 1995, 1998 and 2003 SHeS included similar questions about the number of natural teeth people have, but there has been a notable change to the wording that affects the data presented here. The three surveys conducted prior to 2008 asked participants whether they had their own teeth. From 2008 onwards people were asked how many natural teeth they had. Consequently, it is only possible to compare the people in 1995-2003 who said they had all false teeth with the proportion from 2008 onwards who said they had no natural teeth. In addition, the definition of false teeth used in 1995 was not the same as in 1998 and 2003. In 1998 and 2003 participants were asked to count caps and crowns as natural teeth but there was no such instruction in 1995. Although the question format from 2008 onwards is very different, it attempts to measure the same underlying concept (having no teeth) and might therefore be functionally equivalent. However, as there is no way of quantifying this, the comparison over time between 1995-2003 and 2008 onwards needs to be treated with caution.

The dental health chapters in the 2008² and 2009³ SHeS reports outlined the full range of adult dental health questions included in the survey. Questions

focusing on dental health are asked every year while questions about dental services, and actions to improve oral health, were only asked in 2009 and 2011.

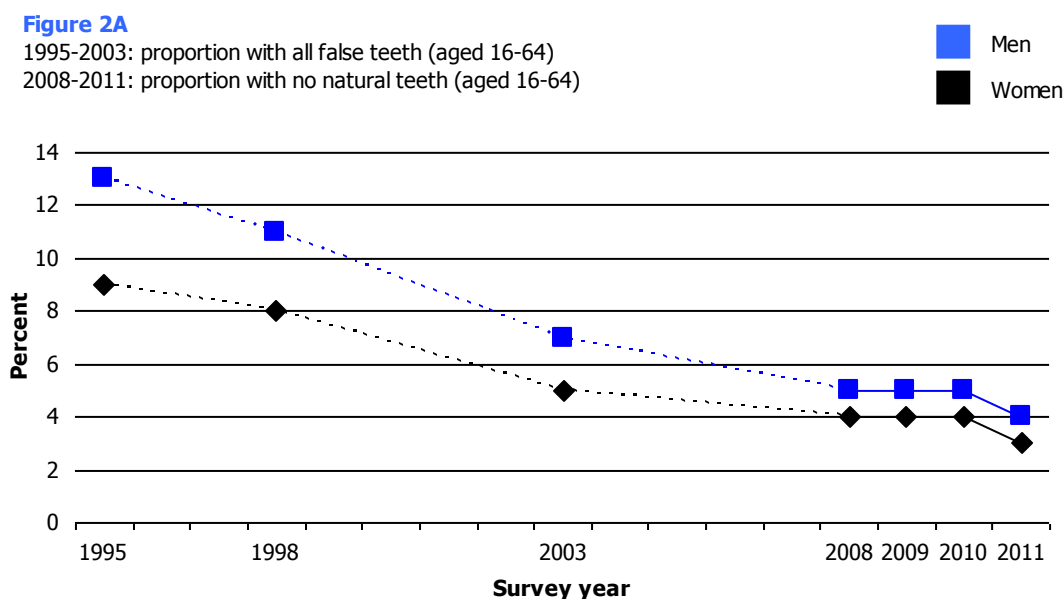
2.3 DENTAL HEALTH

2.3.1 Trends in prevalence of natural teeth since 1995, by age and sex

Figures for the prevalence of natural teeth are presented in Figure 2A and Table 2.1 for 1995 onwards. Changes to the sample composition in the first three surveys mean that the discussion of 1995-2011 figures presented here is based only on those aged 16 to 64. Figures from 2003 onwards, based on adults aged 16 and over, are also presented in Table 2.1.

As noted in the previous section, some of the data reported here are based on previous survey years when the questions about natural teeth were slightly different. Table 2.1 and Figure 2A present the proportion of adults aged 16-64 with all false teeth in 1995, 1998 and 2003, and the proportion with no natural teeth from 2008 onwards. The results for the last four years have been very similar, with just 3%-4% of men and 4%-5% of women aged 16-64 reporting that they had no natural teeth.

Figure 2A, Table 2.1



The 2005 *Action Plan* target was that by 2010 90% of all adults in Scotland, and 65% of adults aged 55-74, would possess some natural teeth.¹ The 2010⁴ SHeS report noted that the proportion of all adults possessing some natural teeth was just short of the target in 2010 (89%). As shown in Table 2.1, the target was met in 2011 with 90% of all adults reporting some natural teeth. The figure for men remained unchanged from 2010 (91%), and the proportion for women increased by one percentage point (from 88% to 89%).

The target for 65% of adults aged 55-74 to possess some natural teeth by 2010 was comfortably met by 2008 (78%). The increase to 81% in 2011 (82% of men and 80% of women), was largely driven by an increase in prevalence among women of this age (from 75% in 2008 to 80% in 2011) (data not shown).

Table 2.1

2.3.2 Number of natural teeth and % with no natural teeth, 2008-11, (age-standardised) by Scottish Index of Multiple Deprivation (SIMD)

Two measures of SIMD are being used throughout this report. The first – which uses quintiles – enables comparisons to be drawn between the most and least deprived 20% of areas and the three intermediate quintiles. The second contrasts the most deprived 15% of areas with the 85% least deprived. The Scottish Health Survey was designed to provide robust data for the SIMD 15% areas after four years of data had been collected and combined (2008-2011). The figures discussed below are based on these combined data. To ensure that the comparisons presented by SIMD are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (age-standardisation is described in the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only.

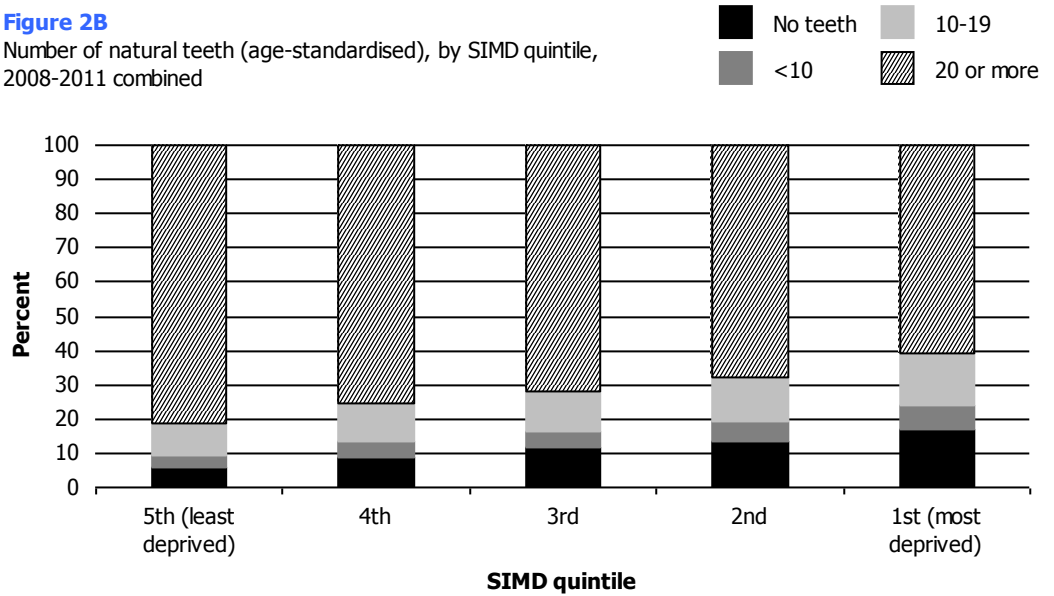
As Figure 2B illustrates, there was a significant association between area deprivation (measured in quintiles) and the number of teeth people had. The proportion of adults with some natural teeth declined from 94% in the least deprived quintile to 83% in the most deprived, while there was a threefold increase (from 6% to 17%) in the proportion with no teeth at all between the least and most deprived.

The decrease in prevalence of any natural teeth by increasing deprivation followed a linear pattern for both sexes, although was slightly more pronounced for women. 94% of women and 95% of men in the least deprived quintile had some natural teeth compared with 80% and 86%, respectively, in the most deprived quintile.

This pattern was also evident when prevalence among those living in the 15% most deprived areas of Scotland was compared with those living elsewhere. 15% of men and 20% of women in the 15% most deprived areas had no natural teeth compared with 8% and 12%, respectively, living in the rest of Scotland.

Figure 2B, Table 2.2

Figure 2B
 Number of natural teeth (age-standardised), by SIMD quintile,
 2008-2011 combined



2.3.3 Actions taken to improve dental health

This section reports various actions people said they took daily to improve their dental health and is based on data collected in 2011. The figures presented in Table 2.3 are based on all adults with some natural teeth. Note that this includes some people who have a combination of natural teeth and dentures.

Not surprisingly, brushing teeth with fluoride toothpaste was the most common action mentioned, with almost all (96%) adults with some natural teeth doing this daily. The next most common action reported was using a mouth rinse, but this lagged some way behind fluoride toothpaste use with four in ten adults with teeth doing this. Even fewer (26%), said they used dental floss daily, while 22% said they restricted their intake of sugary foods and drinks. Only 2% said they did not take any of the daily actions listed.

Men and women were equally likely to brush their teeth with fluoride toothpaste daily (95% and 97%, respectively), and similar proportions also reported restricting their intake of sugary foods (20% and 24%, respectively). In contrast, women were twice as likely as men to report using dental floss every day (33% compared with 17%) and were also more likely to use mouth rinse (45% compared with 36%).

There were some notable differences across the age groups for some of the actions. For example, use of mouth rinse was highest among those aged 25-34 (49%) and declined with age thereafter to 26% for those aged 75 and over. Adults in the youngest and oldest age groups were the least likely to report restricting their sugar intake (12%).

Actions to care for dentures increased sharply with age, as would be expected given their low use among younger people.

Table 2.3

References and Notes

- ¹ *Action plan for improving oral health and modernising NHS dental services in Scotland.* Edinburgh: Scottish Executive, 2005. [online] Available from: <www.scotland.gov.uk/Resource/Doc/37428/0012526.pdf>
- ² Miller, M. (2009). Chapter 2: Dental Health. In Bromley, C., Bradshaw, P. and Given, L. [eds.] *The 2008 Scottish Health Survey – Volume 1: Main Report.* Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2009/09/28102003/0
- ³ Dobbie, F. (2010). Chapter 2: Dental Health. In Bromley, C., Bradshaw, P. and Given, L. [eds.] *The 2009 Scottish Health Survey – Volume 1: Main Report.* Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2010/09/23154223/0
- ⁴ Given, L. (2011). Chapter 2: Dental Health. In Bromley, C. and Given, L. [eds.] *The 2010 Scottish Health Survey – Volume 1: Main Report.* Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2011/09/27084018/17
- ⁵ The 2007 Better Health, Better Care action plan for improving health and health care in Scotland set out how NHS Scotland's HEAT performance management system (based around a series of targets against which the performance of its individual Boards are measured) would feed into the Government's overarching objectives. The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
- ⁶ *NHSScotland HEAT Targets due for delivery in 2010/11 – Summary of performance.* (2012). NHSScotland Performance and Business management. Available from: www.scotland.gov.uk/About/scotPerforms/partnerstories/NHSScotlandperformance/HT201011
- ⁷ *NHSScotland Chief Executive's Annual Report 2010/11.* (2011). Edinburgh: Scottish Government. Available from: <www.scotland.gov.uk/Publications/2011/11/10140644/15>

Table list

Table 2.1	Number of natural teeth, and % with no natural teeth, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex
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Table 2.1 Number of natural teeth, and % with no natural teeth, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

False teeth/number of natural teeth	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
1995									
All own teeth	92	83	70	54	36	n/a	n/a	69	n/a
All false teeth	0	2	5	13	34	n/a	n/a	9	n/a
1998									
All own teeth	95	86	76	60	41	25	n/a	73	n/a
All false teeth	0	1	5	12	29	46	n/a	8	n/a
2003									
All own teeth	98	90	79	65	50	30	17	76	67
All false teeth	0	1	2	8	18	34	53	5	12
2008									
No natural teeth	0	0	1	4	13	29	43	4	9
Fewer than 10	0	1	2	5	11	15	15	4	6
Between 10 and 19	1	3	10	14	24	21	25	11	13
20 or more	98	96	86	77	52	36	17	82	72
<i>All with teeth</i>	<i>100</i>	<i>100</i>	<i>99</i>	<i>96</i>	<i>87</i>	<i>71</i>	<i>57</i>	<i>96</i>	<i>91</i>
2009									
No natural teeth	0	2	2	6	12	24	45	4	9
Fewer than 10	0	0	2	5	10	20	12	3	6
Between 10 and 19	1	5	8	15	23	20	22	11	12
20 or more	99	93	88	74	55	36	21	82	72
<i>All with teeth</i>	<i>100</i>	<i>98</i>	<i>98</i>	<i>94</i>	<i>88</i>	<i>76</i>	<i>55</i>	<i>96</i>	<i>90</i>
2010									
No natural teeth	-	1	2	4	13	25	44	4	9
Fewer than 10	-	0	2	4	8	15	16	3	5
Between 10 and 19	0	2	10	17	25	22	20	11	13
20 or more	100	97	86	75	53	38	21	82	73
<i>All with teeth</i>	<i>100</i>	<i>99</i>	<i>98</i>	<i>96</i>	<i>86</i>	<i>75</i>	<i>57</i>	<i>96</i>	<i>91</i>
2011									
No natural teeth	-	0	1	5	10	29	40	3	9
Fewer than 10	-	1	2	4	10	12	17	3	5
Between 10 and 19	1	4	8	16	24	23	21	11	13
20 or more	99	95	90	75	56	37	22	83	73
<i>All with teeth</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>95</i>	<i>90</i>	<i>72</i>	<i>60</i>	<i>97</i>	<i>91</i>

Continued...

Table 2.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

False teeth/number of natural teeth	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Women									
1995									
All own teeth	96	85	71	45	26	n/a	n/a	66	n/a
All false teeth	0	2	5	20	45	n/a	n/a	13	n/a
1998									
All own teeth	98	91	77	49	29	15	n/a	70	n/a
All false teeth	0	1	4	17	39	61	n/a	11	n/a
2003									
All own teeth	98	90	80	67	38	20	14	75	62
All false teeth	0	0	3	9	26	51	61	7	18
2008									
No natural teeth	0	1	2	6	17	36	57	5	14
Fewer than 10	0	1	1	4	9	12	12	3	5
Between 10 and 19	1	2	8	12	21	23	15	9	11
20 or more	99	96	89	79	53	29	17	83	70
<i>All with teeth</i>	<i>100</i>	<i>99</i>	<i>98</i>	<i>94</i>	<i>83</i>	<i>64</i>	<i>43</i>	<i>95</i>	<i>86</i>
2009									
No natural teeth	0	1	2	6	16	38	56	5	14
Fewer than 10	-	0	2	3	7	11	8	3	4
Between 10 and 19	2	3	8	16	20	21	17	10	12
20 or more	98	96	88	76	56	30	19	82	70
<i>All with teeth</i>	<i>100</i>	<i>99</i>	<i>98</i>	<i>95</i>	<i>83</i>	<i>62</i>	<i>44</i>	<i>95</i>	<i>86</i>
2010									
No natural teeth	0	-	1	4	19	32	54	5	13
Fewer than 10	-	0	1	4	8	13	11	3	5
Between 10 and 19	1	1	6	12	20	19	18	8	11
20 or more	99	99	92	80	54	36	17	84	72
<i>All with teeth</i>	<i>100</i>	<i>100</i>	<i>99</i>	<i>96</i>	<i>82</i>	<i>68</i>	<i>46</i>	<i>95</i>	<i>88</i>
2011									
No natural teeth	-	1	1	4	13	28	46	4	11
Fewer than 10	0	1	1	4	9	10	18	3	6
Between 10 and 19	1	2	4	13	20	25	15	8	11
20 or more	98	96	93	80	58	36	21	85	72
<i>All with teeth</i>	<i>99</i>	<i>99</i>	<i>98</i>	<i>97</i>	<i>87</i>	<i>71</i>	<i>54</i>	<i>96</i>	<i>89</i>

Continued...

Table 2.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

False teeth/number of natural teeth	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
All adults									
1995									
All own teeth	94	84	70	49	31	n/a	n/a	68	n/a
All false teeth	0	2	5	17	40	n/a	n/a	11	n/a
1998									
All own teeth	97	88	77	55	35	19	n/a	72	n/a
All false teeth	0	1	4	15	34	54	n/a	9	n/a
2003									
All own teeth	98	90	79	66	44	25	15	75	64
All false teeth	0	1	3	8	22	43	58	6	15
2008									
No natural teeth	0	1	2	5	15	33	51	4	12
Fewer than 10	-	1	2	4	10	13	13	4	5
Between 10 and 19	1	3	9	13	23	22	19	11	12
20 or more	99	96	88	78	52	32	17	82	71
<i>All with teeth</i>	<i>100</i>	<i>99</i>	<i>98</i>	<i>95</i>	<i>85</i>	<i>67</i>	<i>49</i>	<i>96</i>	<i>88</i>
2009									
No natural teeth	0	1	2	6	14	32	51	5	12
Fewer than 10	0	0	2	4	8	15	10	3	5
Between 10 and 19	1	4	8	15	22	21	19	10	12
20 or more	98	95	88	75	56	33	20	82	71
<i>All with teeth</i>	<i>99</i>	<i>99</i>	<i>98</i>	<i>94</i>	<i>86</i>	<i>69</i>	<i>49</i>	<i>95</i>	<i>88</i>
2010									
No natural teeth	0	0	2	4	16	29	50	4	11
Fewer than 10	-	0	2	4	8	14	13	3	5
Between 10 and 19	1	2	8	14	23	20	19	10	12
20 or more	99	98	89	77	53	37	19	83	72
<i>All with teeth</i>	<i>100</i>	<i>100</i>	<i>99</i>	<i>95</i>	<i>84</i>	<i>71</i>	<i>51</i>	<i>96</i>	<i>89</i>
2011									
No natural teeth	-	1	1	4	12	28	43	3	10
Fewer than 10	0	1	1	4	10	11	18	3	5
Between 10 and 19	1	3	6	15	22	24	17	10	12
20 or more	99	95	92	78	57	36	21	84	73
<i>All with teeth</i>	<i>100</i>	<i>99</i>	<i>99</i>	<i>97</i>	<i>89</i>	<i>71</i>	<i>56</i>	<i>97</i>	<i>90</i>

Continued...

Table 2.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

False teeth/number of natural teeth	Age							Total 16-64	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
<i>Bases (weighted):</i>									
Men 1995	723	979	851	749	600	n/a	n/a	3902	n/a
Men 1998	708	953	903	779	607	469	n/a	3950	n/a
Men 2003	576	601	759	666	567	405	259	3169	3833
Men 2008	461	479	563	554	480	327	218	2537	3083
Men 2009	536	565	631	648	561	386	259	2940	3585
Men 2010	510	559	583	631	541	374	252	2824	3450
Men 2011	532	581	613	653	564	389	266	2944	3598
Women 1995	695	990	870	777	665	n/a	n/a	3998	n/a
Women 1998	677	940	913	798	661	584	n/a	3989	n/a
Women 2003	566	655	808	689	601	491	467	3318	4276
Women 2008	441	487	616	586	502	382	348	2632	3362
Women 2009	510	569	693	699	590	450	407	3060	3917
Women 2010	494	555	641	678	570	431	393	2938	3762
Women 2011	513	580	671	708	591	448	413	3063	3924
All adults 1995	1418	1969	1721	1527	1265	n/a	n/a	7900	n/a
All adults 1998	1384	1894	1816	1577	1268	1053	n/a	7939	n/a
All adults 2003	1142	1256	1567	1355	1168	896	726	6487	8109
All adults 2008	902	966	1179	1140	981	709	566	5169	6445
All adults 2009	1046	1134	1324	1347	1151	836	666	6001	7502
All adults 2010	1004	1114	1224	1309	1111	805	646	5762	7212
All adults 2011	1045	1161	1284	1361	1155	837	679	6007	7522
<i>Bases (unweighted):</i>									
Men 1995	475	840	811	709	689	n/a	n/a	3524	n/a
Men 1998	399	763	826	693	683	572	n/a	3364	n/a
Men 2003	334	449	730	611	632	508	325	2756	3589
Men 2008	244	316	460	534	524	453	304	2078	2835
Men 2009	271	404	548	601	574	516	362	2398	3276
Men 2010	272	420	475	566	554	488	329	2287	3104
Men 2011	306	398	516	596	600	510	344	2416	3270
Women 1995	547	1160	992	825	884	n/a	n/a	4408	n/a
Women 1998	528	972	1008	896	808	889	n/a	4212	n/a
Women 2003	403	597	882	793	776	579	492	3451	4522
Women 2008	331	451	648	627	630	513	408	2687	3608
Women 2009	382	579	778	732	735	550	478	3206	4234
Women 2010	373	564	678	759	699	573	468	3073	4114
Women 2011	363	562	710	802	735	594	486	3172	4252
All adults 1995	1022	2000	1803	1534	1573	n/a	n/a	7932	n/a
All adults 1998	927	1735	1834	1589	1491	1461	n/a	7576	n/a
All adults 2003	737	1046	1612	1404	1408	1087	817	6207	8111
All adults 2008	575	767	1108	1161	1154	966	712	4765	6443
All adults 2009	653	983	1326	1333	1309	1066	840	5604	7510
All adults 2010	645	984	1153	1325	1253	1061	797	5360	7218
All adults 2011	669	960	1226	1398	1335	1104	830	5588	7522

Table 2.2 Number of natural teeth, and % with no natural teeth, 2008-2011 combined (age-standardised), by Scottish Index of Multiple Deprivation and sex

<i>Aged 16 and over</i>		<i>2008-2011 combined</i>					
False teeth/number of natural teeth	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
No natural teeth	5	8	9	11	14	8	15
Fewer than 10	4	4	6	6	8	5	8
Between 10 and 19	9	12	13	14	16	12	17
20 or more	82	76	72	69	62	75	60
<i>All with teeth</i>	95	92	91	89	86	92	85
Women							
No natural teeth	6	10	14	15	20	12	20
Fewer than 10	3	4	4	6	6	5	6
Between 10 and 19	9	10	11	12	14	11	14
20 or more	81	75	71	66	60	73	59
<i>All with teeth</i>	94	90	86	85	80	88	80
All adults							
No natural teeth	6	9	12	13	17	10	18
Fewer than 10	4	4	5	6	7	5	7
Between 10 and 19	9	11	12	13	15	11	15
20 or more	81	76	72	68	61	74	60
<i>All with teeth</i>	94	91	88	87	83	90	82
<i>Bases (weighted):</i>							
<i>Men</i>	2726	2998	2700	2684	2618	11749	1977
<i>Women</i>	2936	3090	2938	2995	3002	12735	2225
<i>All adults</i>	5661	6088	5638	5678	5620	24484	4201
<i>Bases (unweighted):</i>							
<i>Men</i>	2230	2877	2675	2352	2352	10671	1815
<i>Women</i>	2838	3591	3413	3117	3250	13718	2491
<i>All adults</i>	5068	6468	6088	5469	5602	24389	4306

Table 2.3 Daily actions taken by people with some natural teeth to improve dental health, 2011, by age and sex

Aged 16 and over with some natural teeth^a

2011

Daily actions taken	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Brush teeth with fluoride toothpaste	94	98	97	93	94	90	91	95
Use dental floss	13	24	18	18	15	23	6	17
Use mouth rinse	32	45	47	29	34	26	23	36
Restrict intake of sugary foods and drinks	10	25	25	25	18	14	13	20
Clean dentures (including soaking with a sterilising tablet)	-	-	3	8	19	22	30	8
Leave dentures out at night	-	-	1	4	10	12	25	5
None of these	4	1	2	5	3	5	3	3
Mean number of actions	1.5	1.9	1.9	1.8	1.9	1.9	1.9	1.8
SE of the mean	0.08	0.08	0.08	0.08	0.09	0.10	0.15	0.04
Women								
Brush teeth with fluoride toothpaste	95	99	98	99	97	97	95	97
Use dental floss	24	33	34	39	37	38	20	33
Use mouth rinse	48	54	39	49	43	36	28	45
Restrict intake of sugary foods and drinks	15	26	30	28	24	22	11	24
Clean dentures (including soaking with a sterilising tablet)	1	-	4	8	21	26	40	10
Leave dentures out at night	1	1	2	7	11	20	23	7
None of these	1	-	0	0	-	-	1	0
Mean number of actions	1.8	2.1	2.1	2.3	2.3	2.4	2.2	2.2
SE of the mean	0.08	0.06	0.06	0.06	0.07	0.10	0.12	0.03
All Adults								
Brush teeth with fluoride toothpaste	95	98	97	96	95	94	93	96
Use dental floss	19	29	26	29	26	31	14	26
Use mouth rinse	40	49	43	40	39	31	26	40
Restrict intake of sugary foods and drinks	12	25	28	27	21	18	12	22
Clean dentures (including soaking with a sterilising tablet)	0	-	3	8	20	24	36	9
Leave dentures out at night	0	1	2	5	10	16	24	6
None of these	3	0	1	2	1	2	2	2
Mean number of actions	1.7	2.0	2.0	2.0	2.1	2.1	2.0	2.0
SE of the mean	0.06	0.06	0.05	0.06	0.06	0.07	0.10	0.03

Continued...

Table 2.3 - Continued

Aged 16 and over with some natural teeth

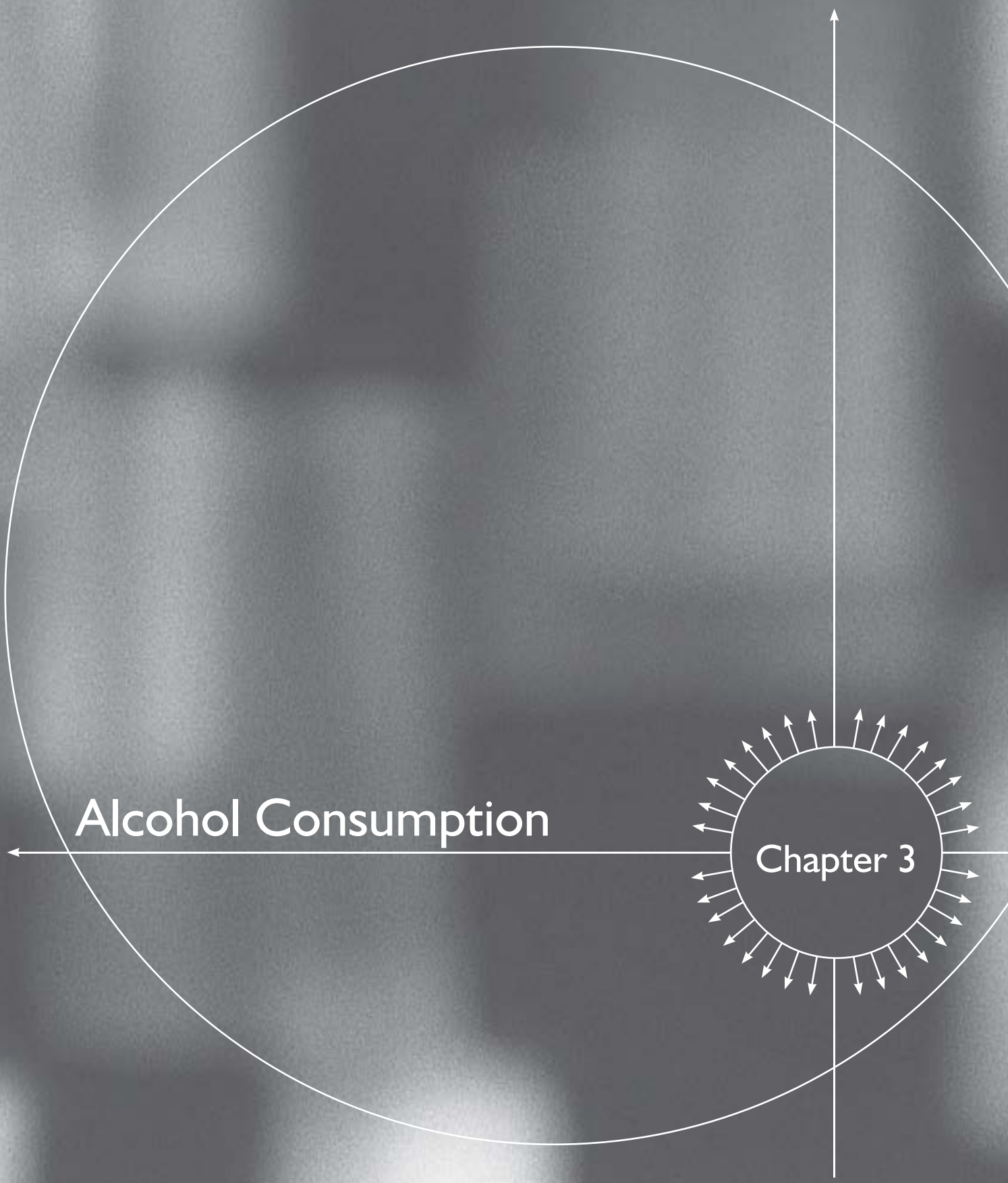
2011

Daily actions taken	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
<i>Men</i>	171	195	192	201	169	85	56	1071
<i>Women</i>	166	190	209	226	162	95	72	1120
<i>All adults</i>	338	385	401	427	332	180	129	2191
<i>Bases (unweighted):</i>								
<i>Men</i>	99	122	171	186	187	108	70	943
<i>Women</i>	120	169	218	256	212	120	78	1173
<i>All adults</i>	219	291	389	442	399	228	148	2116

a This category includes some people who have both dentures and natural teeth.

Alcohol Consumption

Chapter 3



3 ALCOHOL CONSUMPTION

Clare Sharp

SUMMARY

- Weekly mean alcohol consumption in 2011 was 15.0 units for men and 7.4 units for women.
- Between 2003 and 2011 mean weekly alcohol consumption among adults aged 16 and over declined from 14.1 units to 11.1 units. For men, the mean units consumed per week fell from 19.8 units to 15.0 units in this period. The figures for women were 9.0 units in 2003 and 7.4 units in 2011.
- A quarter of men (25%) and just under a fifth of women (18%) were categorized as hazardous or harmful drinkers (men drinking more than 21 units per week and women drinking more than 14) in 2011.
- As with mean weekly alcohol consumption, the proportion of adults drinking in excess of recommended weekly limits also declined between 2003 and 2011 from 28% to 21% (from 33% to 25% for men and from 23% to 18% of women).
- Harmful/hazardous drinking was most common among those living in higher income households and those living in less deprived areas. These associations with income and deprivation were stronger for women than for men. Women in the highest household income group were twice as likely as those living in the lowest income households to be harmful/hazardous drinkers (27% compared with 14%)
- Hazardous/harmful drinkers in low income households consumed more units of alcohol per week than those in higher income households. For example, male hazardous/harmful drinkers in the lowest income group consumed 61.6 units per week compared with the 38.6 to 44.3 consumed by those in the other income groups. Similarly, hazardous/harmful drinkers in areas of greater deprivation consumed more units per week than those living elsewhere.
- In terms of daily alcohol consumption in 2011, on their heaviest drinking day in the last week men drank an average of 5.5 units and women 3.2 units (the figure for all adults was 4.3 units).
- On their heaviest drinking day, 41% of men and 34% of women (37% of all adults) drank more than the recommended daily amount (no more than 4 units for men and 3 units for women). One in five adults drank more than twice the recommended daily amount (25% of men and 17% of women).
- Between 2003 and 2011 the proportion of men exceeding the recommended daily limits fell from 45% to 41%. For women there was a decline from 37% in 2003 to 33% in 2011.
- The proportion of people drinking more than twice the daily recommended units on their heaviest drinking day declined slightly between 2003 and 2011 (from 29% to 25% for men and from 19% to 17% for women).
- There was a drop in the proportion of adults drinking outwith the recommended government guidelines (weekly and/or daily), from 47% in 2003 to 42% in 2011. The decline was steeper for men than for women (from 53% to 46% compared with 42% to 38% for women) and was greatest among men aged under 45 and women aged 25-34.
- On average in 2011, men drank alcohol on 2.8 days in the last week and women drank on 2.5 days. One in ten adults (13% of men and 10% of women) drank on more than five days in the last week.

- The mean number of days on which adults drank in the previous week declined from 3.0 to 2.7 between 2003 and 2011 (among men, it fell from 3.3 to 2.8 days; for women it fell from 2.7 to 2.5 days). Over this same period there was also a decline in the proportion of adults who drank on more than five days in the last week from 17% to 12%.
- There was a strong association between the number of days on which alcohol was consumed in the last week and both household income and area deprivation level. As household income fell and area deprivation increased both the mean number of days drank in the previous week and the proportion drinking on more than five days in the last week decreased.

3.1 INTRODUCTION

Misuse of alcohol contributes to a wide range of health problems, including high blood pressure, chronic liver disease and cirrhosis, pancreatitis, some cancers, mental ill-health, and accidents, as well as social problems such as antisocial behaviour and violent crime. A report published in 2009 attributed 5% of deaths in Scotland to alcohol,¹ while the annual costs of excessive alcohol consumption are estimated to be £3.6 billion.² Alcohol-related morbidity and mortality is not evenly distributed throughout the population and the burden is greatest among those living in the most deprived areas.³ Its status as an issue of significant concern was underlined by its inclusion in the Scottish Government's 2007-11 National Performance Framework (NPF) via the following national indicator:⁴

Reduce alcohol related hospital admissions by 2011

Provisional estimates for 2010/11 show a 6% reduction in admissions, from 737 to 695 per 100,000 population, between 2006/7 and 2010/11, so this target was met.⁵ The revised NPF, published in December 2011 retains this indicator about alcohol related hospital admissions, but has removed the timeframe so it is now an ongoing indicator.⁶

Alcohol is also the subject of the following NHS Scotland HEAT targets:⁷

Achieve agreed number of screenings using the setting-appropriate screening tool and appropriate alcohol brief intervention, in line with SIGN 74 guidelines during 2011/12

By March 2013, 90 per cent of clients will wait no longer than 3 weeks from referral received to appropriate drug or alcohol treatment that supports their recovery.

Data for the first of these targets were published in June 2012 and showed that 97,830 alcohol brief interventions were delivered during 2011/12, exceeding the target of 61,081.⁸ Data for the referrals target are published quarterly and the most recent figures (for January-March 2012) show that 87.7% of clients waited no longer than three weeks.⁹

The introductions to the alcohol chapters in the 2008,¹⁰ 2009¹¹ and 2010¹² Scottish Health Survey (SHeS) reports provided a detailed account of the costs

and burdens harmful and excessive drinking places on Scottish society, as well as a number of key recent legislative and policy developments. These included:

- The Licensing (Scotland) Act 2005, which came into full force in September 2009.
- The 2009 publication *Changing Scotland's Relationship with Alcohol: A Framework for Action*.¹³
- The notable new powers contained within the Alcohol etc. (Scotland) Act 2010 passed by the Scottish Parliament in November 2010, which came into force in October 2011.¹⁴ The Act included new powers to: ban quantity discounts (such as '3 for 2') in off-sales (complementing the restrictions on irresponsible promotions in the Licensing Act for on-sales), limit price promotions and restrict the display of alcohol promotions in off-sales establishments, and introduce a mandatory Challenge 25 age verification scheme for all licensed premises.¹⁵

The February 2012 progress report on the *Framework for Action*⁶ provides a comprehensive overview of all the policies being pursued, and associated funds being invested, to support the 41 actions set out in the Framework. For example, it highlights the £155 million that has been committed to tackle alcohol misuse since 2008; the establishment of 30 Alcohol and Drug Partnerships that bring together representatives from local authorities, health boards, voluntary agencies and the police to develop strategies and commission services at the local level; the launch of new health behaviour change campaigns (including one targeted specifically at women); and the provision of refreshed advice for parents and carers to support them to talk to young people about alcohol consumption. These examples illustrate the wide range of actions being taken, and the extent of joint-working required to make progress on the Framework's actions.

In addition to the kinds of steps outlined above, significant new legislation has also been implemented. The Alcohol (Minimum Pricing) (Scotland) Bill was introduced to parliament in October 2011, was passed into law in May 2012, and is due to be implemented from April 2013.¹⁶ Following two amendments to the Bill, the Act contains a 'sunset clause' imposing a six year time limit on the policy, unless Ministers make further provisions to continue its operation, and a requirement to evaluate the effect of the bill after five years.¹⁷ Based on modelling evidence provided by the University of Sheffield¹⁸ - some of which draws on SHeS alcohol consumption data - Scottish Ministers have recommended a minimum unit price of 50p for the first two years (which will be reviewed biennially thereafter). The Act's provisions around evaluation, and the fact that SHeS data were used in the modelling that informed the unit pricing level, mean that the alcohol consumption estimates provided by the survey will continue to perform an important monitoring role once the policy is implemented.

The estimates of alcohol consumption discussed later in this chapter are based on self-reported data. However, it is important to note that surveys often obtain lower estimates of consumption than implied by alcohol sales data. The most recently available estimates of alcohol sales in Scotland show that 11.2 litres of pure alcohol per person aged 16 and over were sold in 2011 (the equivalent

figure for England and Wales was 9.3 litres).¹⁹ This volume is sufficient for every adult aged 16 and over in Scotland to exceed the weekly recommended maximum consumption for men of 21 units. Although survey estimates are typically lower than sales estimates, surveys can provide information about the social patterning of individuals' alcohol consumption which sales data cannot. For example, the evaluation of the implementation of minimum pricing will use evidence from the survey to help assess the impact on consumption patterns across different social groups.

This chapter updates the key trend figures on weekly and daily alcohol consumption presented in the three previous SHeS reports.^{10,11,12} It also provides, for the first time, trend data on the proportion of people who do not adhere to either the recommended weekly or daily drinking guidelines. The trend for the numbers of days in the previous week people reported drinking alcohol is also presented for the first time. Weekly drinking patterns, and the numbers of days on which alcohol was consumed, are also shown by household income and the Scottish Index of Multiple Deprivation (SIMD).

3.1.1 Definitions used in this chapter

The recommended sensible drinking guideline in the UK is that women should not regularly drink more than 2-3 units of alcohol per day and men should not regularly exceed 3-4 units per day. In addition, the Scottish Government recommends that everyone aim to have at least 2 alcohol free days per week.

Over the course of a week, it is also recommended that women and men should not exceed 14 units and 21 units respectively. The term 'harmful drinking' is used to describe those who are drinking at a level which is already causing physical, social or psychological harm. People whose drinking is not currently causing clear evidence of harm, but which may cause harm in the future have been described as 'hazardous' drinkers.²⁰ In terms of units, men who consume over 21 and up to 50 units per week and women who consume over 14 and up to 35 units are usually classed as 'hazardous' drinkers, while those who consume above 50/35 units a week are considered to be drinking at 'harmful' levels.²¹

There is no standard definition of 'binge' drinking in the UK. To enable comparisons between other major surveys of alcohol consumption in Britain, SHeS uses the definition used by the Health Survey for England and the General Lifestyle Survey. These define binge drinking as more than 6 units on one occasion for women and more than 8 units for men.

An additional measure of people's adherence to the advice not to exceed the daily and weekly drinking levels set out above is reported in this chapter. The two key groups of interest are:

- People who adhere to the guidelines i.e.
 - women who drink no more than 14 units per week, and no more than 3 units on their heaviest drinking day
 - men who drink no more than 21 units per week, and no more than 4 units on their heaviest drinking day.

- People who do not adhere to the guidelines i.e.
 - women who drink more than 14 units per week, and/or more than 3 units on their heaviest drinking day
 - men who drink more than 21 units per week, and/or more than 4 units on their heaviest drinking day.

3.2 METHODS

3.2.1 Data collection in the 2008-2011 surveys

The way in which SHeS estimates alcohol consumption was changed significantly in 2008. The revisions are detailed extensively in the alcohol consumption chapter of the 2008 report¹⁰ so are not repeated here. The following instead outlines the methods now used to collect and analyse the alcohol consumption data.

Three aspects of alcohol consumption are measured: usual weekly consumption, daily consumption on the heaviest drinking day in the previous week, and indicators of potential problem drinking (including physical dependence).

To estimate weekly consumption, participants aged 16 and over were asked preliminary questions on whether they drank alcohol at all; followed by questions on how often during the past 12 months they had drunk each of six different types of alcoholic drink:

- normal beer, lager, cider and shandy
- strong beer, lager and cider
- sherry and martini
- spirits and liqueurs
- wine
- alcoholic soft drinks (“alcopops”).

The average number of days a week the participant had drunk each type of drink was estimated from these questions. A follow-up question asked how much of each drink type they had usually drunk on each occasion. These data were converted into units of alcohol and multiplied by the amount they said they usually drank on any one day (see below for discussion of this process).²²

It is well known that surveys tend to underestimate adults’ levels of alcohol consumption for a number of reasons, including problems of recall, social desirability, and the difficulties involved in assigning an average estimate to an activity that varies from day to day. It is also worth noting that medium to high alcohol consumption can often impair a person’s ability to recall the volume consumed on that particular occasion. Also, as the questions ask about ‘usual’ behaviour, responses are unlikely to reflect occasions of heavier drinking. Nevertheless, survey estimates provide useful comparisons of the consumption of

different population groups and enable change over time to be monitored.

Daily consumption was measured by asking about drinking in the week preceding the interview, and looked at actual consumption on the heaviest drinking day in that week. Participants aged 16 and over were asked whether they had drunk alcohol in the past seven days. If they had, they were asked on how many days and, if on more than one, whether they had drunk the same amount on each day or more on one day than others. If they had drunk more on one day than others, they were asked how much they drank on that day. If they had drunk the same on several days, they were asked how much they drank on the most recent of those days. If they had drunk on only one day, they were asked how much they had drunk on that day. In each case, the questions asked for details of the amounts consumed of each of the six types of drink listed above, rather than asking participants to give a direct estimate of units consumed. This part of the process was therefore similar to the one used to estimate weekly drinking.

The CAGE questionnaire was asked of participants aged 16 and over, and highlights up to six indicators of problem drinking, including three indicators of physical dependency on alcohol. Due to the sensitive nature of the questions, this questionnaire was administered in self-completion format

3.2.2 Unit calculations and conversion factors

In the UK, a standard unit of alcohol is 10 millilitres or around 8 grams of ethanol. As described above, the majority of advice given in relation to safe alcohol consumption refers to units. The need for accurate estimates of units consumed is therefore paramount. However, there are numerous difficulties associated with calculating units at a population level, not least of which are the variability of alcohol strengths and the fact that these have changed over time.

As described above, information was collected about the volumes of alcohol participants had drunk in a typical week and also on their heaviest drinking day in the week preceding the survey. The volumes reported were not validated but in response to growing concerns about the reliability of consumption estimates from studies such as this, and the increasing consumption of wine – especially amongst women – extra efforts were made to measure wine glass sizes. This was done in two ways. Firstly, participants who reported drinking any wine were asked directly what size of glass they had been drinking from. Secondly, showcards depicting glasses with 125ml, 175ml and 250mls of liquid were used to help people make more accurate judgements.

The following table outlines how the volumes of alcohol reported in the survey were converted into units (the 2008 report provides full information about how this process has changed over time).¹⁰

Type of drink	Volume reported	Unit conversion factor
Normal strength beer, lager, stout, cider, shandy (less than 6% ABV)	Half pint	1.0
	Can or bottle	Amount in pints multiplied by 2.5
	Small can (size unknown)	1.5
	Large can/bottle (size unknown)	2.0
Strong beer, lager, stout, cider, shandy (6% ABV or more)	Half pint	2.0
	Can or bottle	Amount in pints multiplied by 4
	Small can (size unknown)	2.0
	Large can/bottle (size unknown)	3.0
Wine	250ml glass	3.0
	175ml glass	2.0
	125ml glass	1.5
	750ml bottle	1.5 x 6
Sherry, vermouth and other fortified wines	Glass	1.0
Spirits	Glass (single measure)	1.0
Alcopops	Small can or bottle	1.5
	Large (700ml) bottle	3.5

3.3 WEEKLY ALCOHOL CONSUMPTION LEVELS

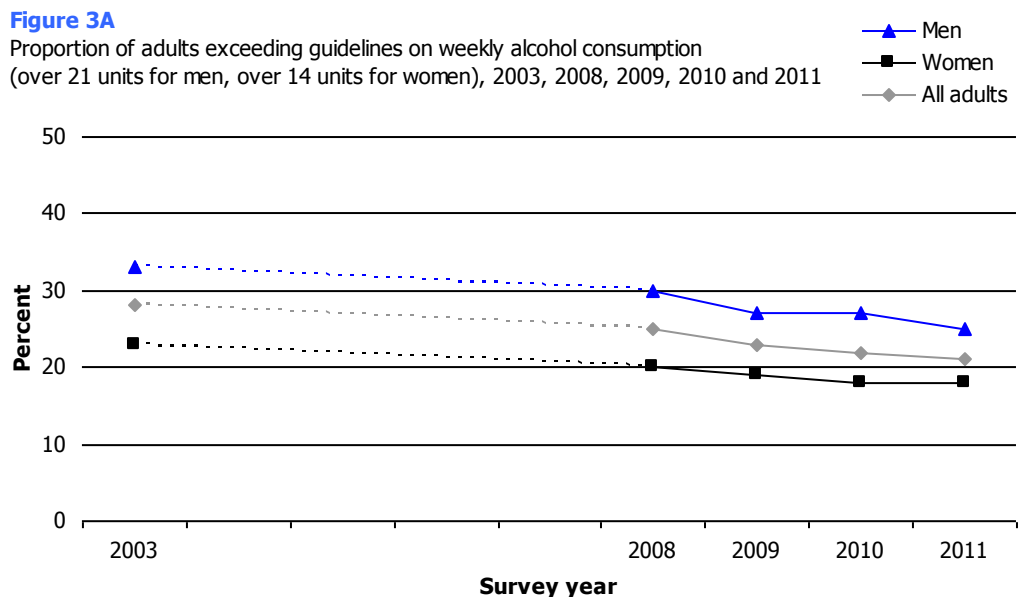
3.3.1 Trends in weekly alcohol consumption since 2003

Trends in weekly consumption levels are presented using the following categories: non-drinkers, moderate, and hazardous or harmful drinkers. Men who drank some alcohol, but no more than 21 units in a typical week, and women who drank but did not exceed 14 units, were classified as moderate drinkers. Consumption in excess of these thresholds was classified as hazardous or harmful. The trend figures for these three categories, and the mean units consumed, for men, women and all adults are presented in Table 3.1.

There was an overall downward trend in usual weekly alcohol consumption in adults aged 16 and over between 2003 and 2011. The mean weekly units consumed by all adults declined steadily, from 14.1 in 2003 to 11.1 in 2011. This decline was more sustained among men than women. Men consumed 19.8 mean units in 2003, and 18.0 in 2008, and consumption then fell by 0.5-1.0 units each year thereafter to 15.0 units in 2011. In contrast, women's consumption declined most between 2003 and 2009 (from 9.0 to 7.8 mean units), and while the decline has continued (to 7.4 units in 2011), it has been much less steep in recent years. As has been discussed in previous SHeS chapters on alcohol consumption,¹² commenting on change over time among age sub-groups is difficult due to the small sample sizes and the

greater likelihood of sample fluctuation. However, the general pattern emerging across the years is that the decline in unit consumption has tended to be more apparent among those aged under 65, which is unsurprising as alcohol consumption was higher in this age group to start with.

The proportion of adults classified as hazardous or harmful drinkers has also declined, from 28% in 2003 to 21% in 2011. As with mean unit consumption, the decline was a little steeper for men (from 33% to 25%) than for women (from 23% to 18%). As Figure 3A illustrates, the greatest decline occurred between 2003 and 2009, with only smaller drops occurring thereafter. There has been no change for women since 2009 suggesting that there may be some levelling off in the proportions engaging in harmful or hazardous drinking. Again, the general patterns suggest that the decline in harmful or hazardous drinking was greatest among men under 65 and women under 55. **Figure 3A, Table 3.1**



3.3.2 Weekly alcohol consumption by age and sex, 2011

As illustrated in the discussion above, in 2011 weekly mean alcohol consumption was higher among men (15.0 units) than women (7.4 units). For both sexes, mean consumption varied by age, with men aged 75 and over (9.9 units), and women aged 65 and above (3.4-5.9 units) consuming less units than younger people.

Men were also more likely than women to be categorized as hazardous or harmful drinkers (25% compared with 18%). Those aged 75 and over were the least likely to be classified as hazardous or harmful drinkers (14% of men and 8% of women), whereas the figures for those aged 16-74 ranged, with no obvious pattern, between 22% and 29% for men and 16% and 23% for women. The low level of hazardous or harmful drinking among men aged 25-34 (22%) in 2011 may well be a blip as

the equivalent figure in previous years was consistently higher than this (28%-29% between 2008 and 2010).

Women were more likely than men to be non-drinkers (17% and 11%, respectively). Among men, those aged 25-64 were the least likely to be non-drinkers (8%-11%), compared with 15%-18% of the remaining age groups. The pattern for women was clearer, 12%-16% of those aged 16-64 were non-drinkers, this increased to 26% of those aged 65-74, and to 36% of those aged 75 and over.

Table 3.1

3.3.3 Weekly alcohol consumption, 2008-2011 combined, by equivalised household income and Scottish Index of Multiple Deprivation (SIMD)

Weekly alcohol consumption levels by equivalised household income and the Scottish Index of Multiple Deprivation are presented in Tables 3.2 and 3.3 respectively (descriptions of each of these measures are available in the Glossary at the end of this volume). Four years of data (2008-2011) have been combined to enable more robust estimates of drinking patterns in each of the sub-groups to be made. Due to space constraints, an equivalent table by socio-economic classification has been omitted.

To ensure that the comparisons presented in this section are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (age-standardisation is also described in the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only

Equivalised household income

The proportions of men and women in each household income quintile classified as hazardous or harmful drinkers (and moderate and non-drinkers) are shown in Table 3.2. The mean weekly units consumed by moderate and hazardous or harmful drinkers, by income quintile are also presented in this table.

The proportion of men classed as hazardous/harmful drinkers generally declined in line with income – from 35% for those in the highest income quintile, to 28% for those in the 2nd and 3rd quintiles, and further still to 22%-24% for those in the two lowest income quintiles. The pattern was similar for women, but the decline was a little steeper, from 27% in the highest quintile to 14% in the lowest. Moderate drinking levels were fairly similar across the quintiles so the decline of hazardous/harmful drinking in line with household income was largely accounted for by a linear increase, as income decreased, in the proportion of non-drinkers. 5% of men and 8% of women in the highest income households were non-drinkers, compared with 21% of men and 24% of women in the lowest.

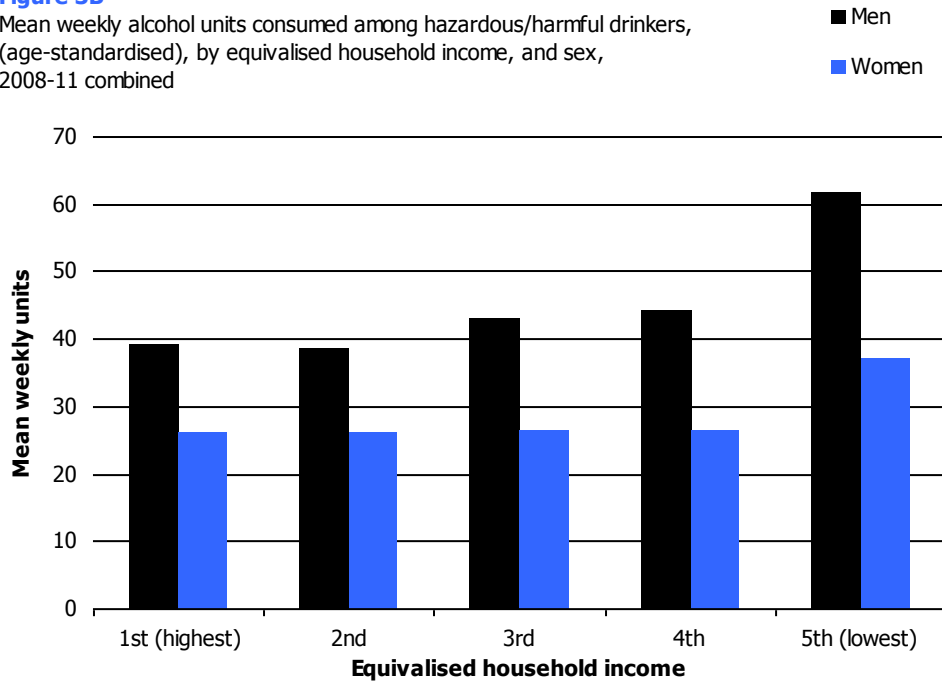
However, while non-drinking was most common in low income households, and hazardous/harmful drinking less common, Figure 3B

illustrates that hazardous/harmful drinkers in the lowest income households consumed more units than hazardous/harmful drinkers in the other income groups. Men in the lowest income households who were hazardous/harmful drinkers consumed 61.6 units per week, compared with the 38.6-44.3 units consumed by men in the other income quintiles. The corresponding figures for women were 37.2 units and 26.0-26.4, respectively.

Figure 3B, Table 3.2

Figure 3B

Mean weekly alcohol units consumed among hazardous/harmful drinkers, (age-standardised), by equivalised household income, and sex, 2008-11 combined



Scottish Index of Multiple Deprivation (SIMD)

Two measures of SIMD are being used throughout this report. The first, which uses quintiles, enables comparisons to be drawn between the most and least deprived 20% of areas and the intermediate quintiles. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the “85% least deprived areas”).

The general patterns seen for household income were also seen for SIMD, but with some notable differences. For men, the prevalence of hazardous/harmful drinking did not vary greatly by SIMD quintile (ranging between 26% and 29%). For women however, as deprivation level increased the proportion of hazardous/harmful drinkers steadily decreased (from 24% in the least deprived quintile to 15%-16% in the most deprived two quintiles). As seen with income, levels of moderate drinking were broadly similar across the SIMD quintiles, whereas non-drinking increased in line with deprivation, from 7% to 16% in men, and from 10% to 24% in women.

Although the prevalence of hazardous/harmful drinking varied little by SIMD for men, mean weekly consumption among male

hazardous/harmful drinkers increased steadily in line with deprivation, from 36.7 units in the least deprived quintile to 52.8 units in the most deprived quintile. There was a particularly pronounced increase between the most deprived and the second most deprived quintiles (difference of 9.2 units). There was a corresponding, but less pronounced, increase in mean weekly consumption as deprivation increases among female hazardous/harmful drinkers from 24.9 units in the least deprived quintile to 30.6 units in the most deprived.

These patterns were confirmed when the weekly consumption of those living in the 15% most deprived areas in Scotland was compared with those living elsewhere. Men and women in the 15% most deprived areas were more likely to be non-drinkers than those in the rest of Scotland (17% for men and 24% for women compared with 10% and 14% respectively for those living in the 85% least deprived areas). Levels of moderate drinking were similar in both areas, and while the prevalence of hazardous/harmful drinking in both areas was also similar for men, women in the 15% most deprived areas were less likely than those living elsewhere to be hazardous/harmful drinkers (14% and 19%, respectively).

Mean unit consumption among harmful/hazardous drinkers was higher in the 15% most deprived areas than in the rest of Scotland and this was true for both men (54.9 compared with 41.1 units) and women (30.6 compared with 26.9 units).

Table 3.3

3.4 ESTIMATED DAILY CONSUMPTION

3.4.1 Trends in alcohol consumption on the heaviest drinking day since 2003

Data on alcohol consumption on the heaviest drinking day in the last week for adults aged 16 is presented in Table 3.4 for 2003 onwards.

The mean number of units consumed by adults on their heaviest drinking day in the past week has declined gradually from 4.9 units in 2003 to 4.3 units in 2011. The latest figures suggest that decline is perhaps more apparent among men than women. To illustrate, in 2003, men consumed 6.5 mean units on their heaviest drinking day, between 2008 and 2010 it was a little lower (5.9-6.2 units), and then fell to 5.5 in 2011. In contrast, for women mean units fell between 2003 and 2009 for women (from 3.6 to 3.2 units) and has remained stable since then (3.1 in 2010 and 3.2 in 2011). The half a unit decrease in men's daily consumption between 2010 and 2011 is the largest in the series to date, so evidence from future years will be needed before we can establish more conclusively whether this has been a sustained decline rather than a single year's sampling variation. It is worth noting that the decline was most notable in men aged 25-34 (whose consumption fell by 1.6 units between 2010 and 2011), so it is possible that it does not represent a meaningful trend. As was the case with weekly drinking, the

general pattern of decline since 2003 tended to be due to reductions in the consumption of men aged under 65, and women aged 16-34.

The proportion of adults exceeding their recommended daily limits (more than 4 units for men, more than 3 for women), has declined by one percentage point in each survey year, from 41% in 2003 to 37% in 2011. As highlighted in the alcohol consumption chapter in the 2010 SHeS report,¹² between 2003 and 2010 there was little change in the proportion of men exceeding their recommended daily limits (43%-45%). At 41%, the 2011 figure was clearly lower than the 2003 high of 45%, indicating an overall downward trend for men between 2003 and 2011. However, it is worth noting that the decline from 2010 to 2011 was largely confined to men aged 25-34. A steady decline in the proportion of women exceeding their recommended daily limits (from 37% in 2003 to 33% in 2010) was reported in the 2010 chapter¹² and there was little change in 2011 (34%). Men aged 16-54, and women aged 16-34 have generally seen the largest declines over time in the proportions exceeding the daily limits.

Between 2003 and 2011, there was also an overall decrease in the prevalence of drinking more than twice the recommended daily limits (more than 8 units for men and more than 6 units for women) from 24% to 20%. As with the other measures discussed here, this decline was more pronounced and consistent among men (from 29% in 2003 to 25% in 2011), while recent figures for women have fluctuated between 16% and 17% (compared with 19% in 2003).

Figure 3C, Figure 3D, Table 3.4

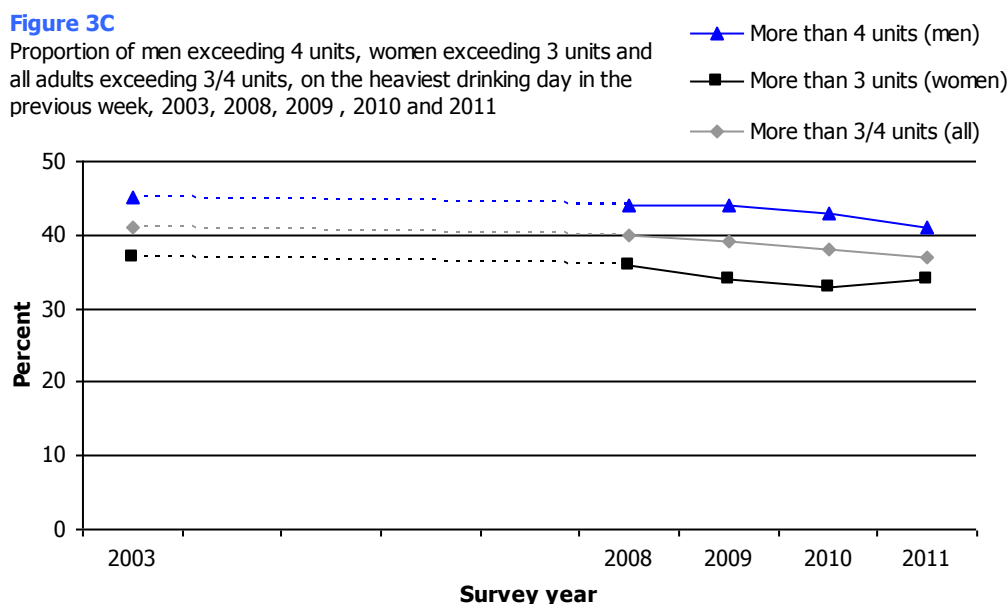
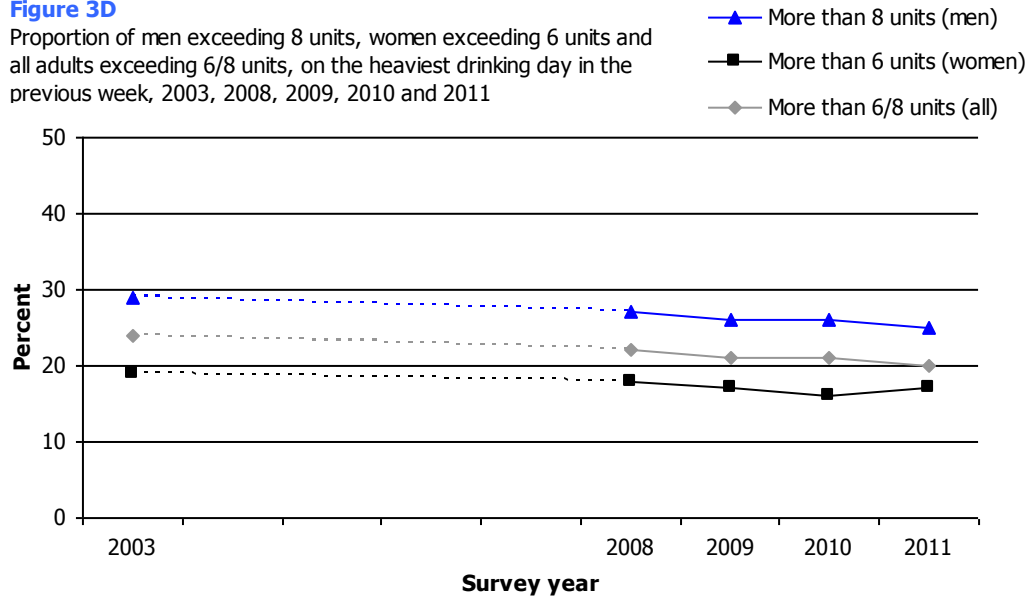


Figure 3D

Proportion of men exceeding 8 units, women exceeding 6 units and all adults exceeding 6/8 units, on the heaviest drinking day in the previous week, 2003, 2008, 2009, 2010 and 2011



3.4.2 Alcohol consumption on the heaviest drinking day by age and sex, 2011

In 2011, men consumed more units on their heaviest drinking day in the last week than women (5.5 and 3.2 respectively). They were also more likely than women to exceed their recommended daily limits (41% compared with 34%) and to consume twice their recommended daily limits (25% compared with 17%).

Daily drinking showed variations with age. Mean units consumed decreased as age increased (from 5.9 in those aged 16-24 down to 2.9 in those aged 75 and above). This pattern was observed for both men and women. The proportion exceeding their daily limits was similar for those aged 16 to 54, and dropped quite sharply for each successive age group thereafter. For example, the proportion of men aged 16-54 that drank more than 8 units on their heaviest drinking day ranged from 28% to 32%, this then dropped to 20% at age 55-64, 12% at age 65-74, and to just 3% for men aged 75 and over.

Table 3.4

3.5 ADHERENCE TO WEEKLY AND DAILY DRINKING ADVICE

3.5.1 Trends in adherence to weekly and daily drinking advice since 2003

As noted in Section 3.1.1, the recommended daily drinking guidelines are that men should not regularly exceed 3-4 units and women should not regularly drink more than 2-3 units. In addition, the recommended weekly drinking guidelines are that men and women should not exceed 21 units and 14 units respectively.

The proportion of adults who drank within these recommended government guidelines remained fairly stable between 2003 and 2011 (ranging from 42% - 44%). Similarly, there was little change when the

trends for men and women were looked at separately (although there was a slight increase for men from 39% in 2010 to 42% in 2011 but the figures have fluctuated each year). However when examining variations by age there was an overall increase in adherence to the guidelines among men aged 16-54 and 75 and above, and women aged 25 to 34. Among men aged 65-74 and women aged 65 and above the proportion adhering to the guidelines decreased between 2003 and 2011.

Between 2003 and 2011 there was a decline in the proportion of people drinking outwith the guidelines (47% and 42% respectively), although there was no significant change between 2009 and 2011. The drop was steepest among men (from 53% in 2003 to 46% in 2011) and was largely explained by a decline among younger men (aged 16-44). The decline among women (from 42% to 38%) was mainly driven by a decrease among those aged 25-34 (from 55% to 42%).

Over this same period (2003-2011) the proportion of ex-drinkers increased from 5% to 8% (for men it increased from 4% to 6%, the equivalent figures for women were 5% and 9%). The increase was greatest in the older age groups, with little change among those aged under 45.

While there was little change in the overall proportion of adults reporting that they had never drunk alcohol between 2003 and 2011, there was a notable increase in the proportion of 16-24 year olds reporting this (from 8% to 13% in men and from 9 to 12% in women). Most of this change occurred between 2009 and 2010. **Table 3.5**

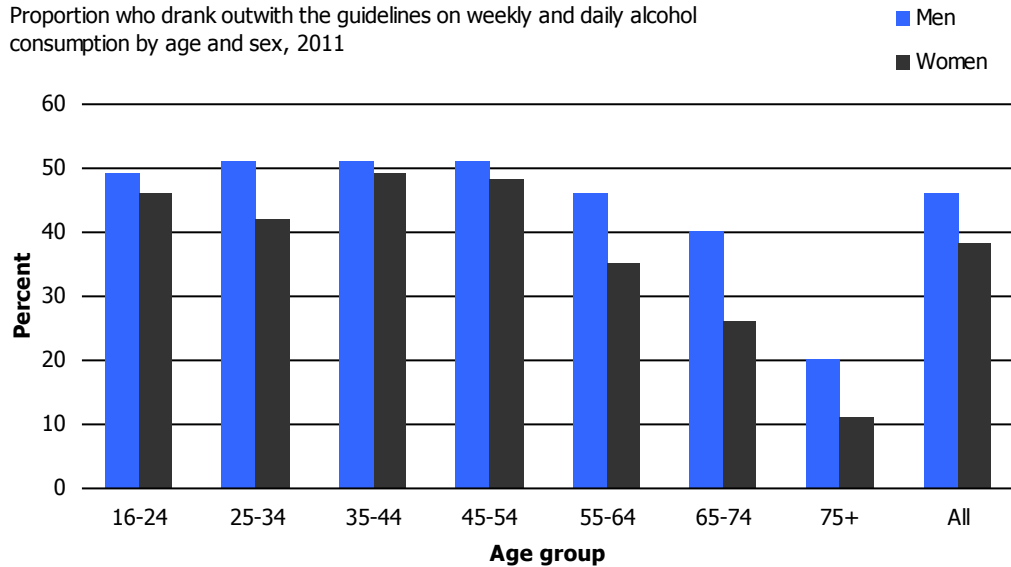
3.5.2 Adherence to weekly and daily drinking advice by age and sex, 2011

In 2011, 43% of adults drank within the recommended guidelines (42% of men and 44% of women). As would be expected, the patterning by age was similar to that described above for weekly and daily drinking: 37%-43% of those aged 16-54 drank within the guidelines, this increased to 46%-47% of those aged 55-74, and further still to 57% of those aged 75 and over. This was true for men and women, with the increase occurring slightly later among men (aged 75 and over compared with aged 55-64 for women).

The proportion drinking outwith the guidelines (42%) was similar to the proportion that adhered to them (43%). Men were more likely than women to drink outwith the weekly and daily guidelines (46% compared with 38%). As Figure 3E illustrates, the age-related pattern for drinking outwith the guidelines was the reverse of that seen for drinking within them, with prevalence declining from the age of 65-74 among men and 55-64 among women. **Figure 3E, Table 3.5**

Figure 3E

Proportion who drank outwith the guidelines on weekly and daily alcohol consumption by age and sex, 2011



3.6 NUMBER OF DAYS ALCOHOL WAS CONSUMED IN PAST WEEK

3.6.1 Trends in number of days alcohol was consumed in past week since 1998

The trend for the number of days in the previous week that people said they had consumed alcohol is presented in Table 3.6. The figures presented are based only on those who said they had drunk alcohol in the past week. While the changes made to the alcohol estimates from 2003 onwards (detailed in the 2008 SHeS chapter on alcohol consumption)¹⁰ mean that consumption volumes cannot be compared, the question about the number of drinking days was unaffected, so the trend figures in the table extend back to 1998 when the question was first asked. Adults aged 75 and over were not included in the 1998 survey therefore the discussion on trends since 1998 is based on adults aged 16 to 74 (totals for this age group are also presented in Table 3.6). Figures for all adults (aged 16 and over) from 2003 onwards are also presented.

These figures provide useful contextual information about people's drinking patterns, and help to illustrate whether changes over time in overall consumption levels are the result of people drinking on fewer occasions over the week, or whether they are drinking less on the same number of occasions. In addition, people are advised to have at least two alcohol-free days per week so the trend in the proportion who drank on more than five days in the previous week helps show the extent to which this advice has been adhered to.

Between 1998 and 2008 there was little change in the mean number of days on which adults aged 16-74 consumed alcohol (ranging from 2.8 to 3.0 days) though it has been a little lower since then (2.6 days). The figures for men aged 16-74 followed a similar pattern to this (3.1-3.2 days between 1998 and 2008 and 2.8 days since 2009). For women,

with the exception of 2003 (2.7 days), the figure remained unchanged from 1998 (2.4 days in 1998 and 2011).

As shown in Figure 3F, among adults aged 16-74 the prevalence of drinking on more than five days a week declined between 1998 and 2011 (from 14% to 10%) but has been largely static since 2009. As seen with the trend in mean days, the decline since 1998 was greater for men (from 17% to 12% in 2011), than for women for whom the figures have decreased from 10% in 1998 to 8% in 2011.

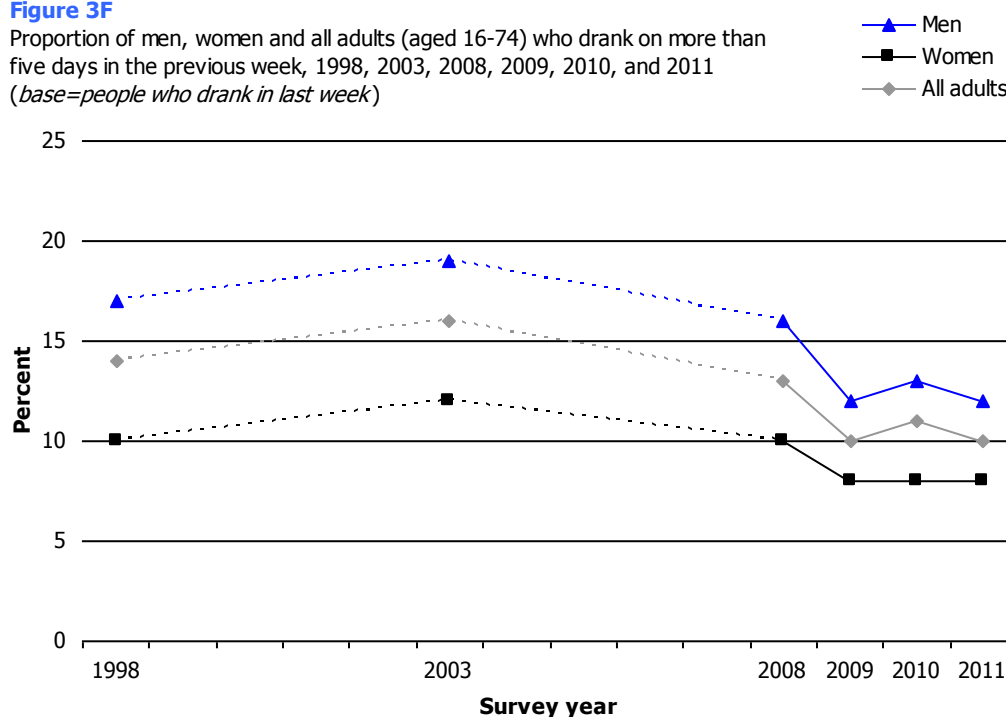
The decline is slightly greater when the figures for all adults aged 16 and over are considered. Between 2003 and 2009 the mean number of days on which alcohol was consumed in the previous week declined from 3.0 to 2.7 and has remained at this level since then. Again, the decline was more evident for men (from 3.3 days in 2003 to 2.8 days in 2011) than for women (from 2.7 days in 2003 to 2.5 days each year since 2008). The downward trend was evident for men of all ages but for women was more consistent among those aged 25-54.

For all adults aged 16 and over, the trend (since 2003) in drinking on more than five days a week has also been downward. In 2003, 17% drank on more than five days a week. The equivalent figure in 2011 was 12%. This too was largely confined to men (down from 20% in 2003 to 13% in 2011) with the equivalent figures for women showing a much smaller decline (13% to 10%). The change over time was evident for almost all age groups, with the exception of the youngest age group and women aged 75 and over.

Figure 3F, Table 3.6

Figure 3F

Proportion of men, women and all adults (aged 16-74) who drank on more than five days in the previous week, 1998, 2003, 2008, 2009, 2010, and 2011
(base=people who drank in last week)



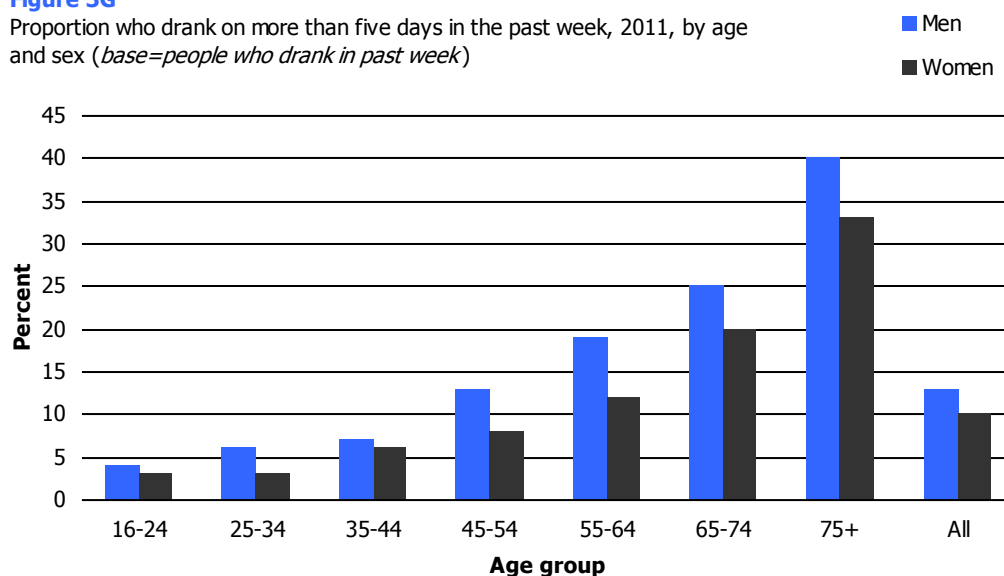
3.6.2 Number of days alcohol was consumed in past week, by age and sex, 2011

In 2011, the mean number of days on which adults who drank consumed alcohol was 2.7 (2.8 days for men and 2.5 for women). Just over one in ten (12%) drank on more than five days in the previous week (13% of men and 10% of women). Both the mean number of days, and the proportion drinking on more than five days, increased in line with age with similar patterns for men and women (see Figure 3G). Just 4%-6% of people aged 16-44 who had drunk alcohol in the previous week did so on more than five days, this increased with each successive age group to 37% of those aged 75 and over. These figures, in combination with the daily alcohol consumption figures presented in Table 3.4, suggest that the way in which people consume their alcohol differs notably across the lifecycle, with older people drinking less alcohol overall, spread across more days of the week, and younger age groups drinking higher volumes of alcohol on fewer occasions.

Figure 3G, Table 3.6

Figure 3G

Proportion who drank on more than five days in the past week, 2011, by age and sex (*base=people who drank in past week*)



3.6.3 Number of days alcohol was consumed in past week, 2008-2011 combined, (age-standardised), by equivalised household income and Scottish Index of Multiple Deprivation (SIMD)

Equivalised household income

Both the mean number of days on which drinkers drank in the previous week, and the proportions drinking on more than five days are presented by household income in Table 3.7. As the figures are based only on people who drank, the table is based on the combined 2008-2011 data.

The prevalence of drinking on more than five days a week varied significantly by household income for men but with no clear pattern. Those in the highest income households were most likely to drink on

more than five days (18%) while prevalence was lowest among those in the 2nd and 4th income quintiles (13% and 14% respectively). In contrast, the pattern for women was much clearer with a decline from 15% of those in the highest income households to 8%-9% in the three lowest income quintiles.

For both men and women the mean number of days on which drinkers consumed alcohol in the previous week declined fairly consistently in line with household income. Among men it declined from 3.2 days for those the highest income households to 2.7-2.8 days for those in the bottom two quintiles; for women it declined steadily from 3.0 to 2.1 days between those in the highest and lowest quintiles. **Table 3.7**

Scottish Index of Multiple Deprivation (SIMD)

The patterns by SIMD (Table 3.8) are similar to those for household income discussed above. There was a clear association between area level deprivation and drinking on more than five days a week for both sexes although the pattern was more pronounced for women. Women living in the least deprived quintile were almost three times as likely as those in the most deprived to drink on more than five days in the previous week (13% and 5%, respectively). For men, it was those living in the 4th and 3rd quintiles that were most likely to drink this frequently (16% and 17% respectively).

The mean number of days on which female drinkers had drunk in the previous week declined as area level deprivation increased (2.8 days for those living in the least deprived quintile compared with 2.0 days for those in the most deprived). The pattern for men was similar to that for prevalence of drinking on more than five days: with a mean of 2.7 drinking days for those in the two most deprived quintiles compared with 3.0-3.1 days for those living elsewhere.

Comparing the 15% most deprived areas with the rest of Scotland shows similar patterns, with bigger differences evident for women than for men. For example, 5% of women in the 15% most deprived areas drank on five or more days compared with 10% of women in the rest of Scotland. The equivalent figures for men were 14% and 15%. Similarly, the difference in the mean days figure for women in both groups was 0.6 days compared a difference of 0.3 days for men. **Table 3.8**

References and notes

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- ³ Beeston C., Robinson M., Craig, N and Graham, L. *Monitoring and Evaluating Scotland's Alcohol Strategy. Setting the Scene: Theory of change and baseline picture*. Edinburgh: NHS Health Scotland; 2011. <www.healthscotland.com/documents/5072.aspx>
- ⁴ *Scottish Budget Spending Review 2007*. Edinburgh: Scottish Government, 2007. [online] Available from: <www.scotland.gov.uk/Publications/2007/11/13092240/0>
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- ⁵ See: <www.scotland.gov.uk/About/Performance/scotPerforms/indicator/alcohol>
- ⁶ *National Performance Framework: Changes to the National Indicator Set*, Edinburgh: Scottish Government, 2012. [online] Available from: <www.scotland.gov.uk/About/scotPerforms/Nlchanges> See also: <www.scotlandperforms.com>
- ⁷ The 2007 Better Health, Better Care action plan for improving health and health care in Scotland set out how NHS Scotland's HEAT performance management system (based around a series of targets against which the performance of its individual Boards are measured) would feed into the Government's overarching objectives. The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
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- ¹⁴ See: <www.scottish.parliament.uk/s3/bills/34-AlcoholEtc/index.htm>
- ¹⁵ See: <www.scottish.parliament.uk/s3/bills/34-AlcoholEtc/AlcoholBillsummary.pdf>

- ¹⁶ Alcohol (Minimum Pricing) (Scotland) Act 2012. See: <www.scottish.parliament.uk/help/43354.aspx>
- ¹⁷ SPICe Briefing 12/34. 17 May 2012. *Alcohol (Minimum Pricing) (Scotland) Bill: Stage 3*. Scottish Parliament Information Centre. Available from: <www.scottish.parliament.uk/help/43354.aspx>
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- ²⁰ Drummond, C., Deluca, P., Oyefeso, A., Rome, A., Scafton, S., Rice, P. (2009). *Scottish Alcohol Needs Assessment*. London: Institute of Psychiatry, King's College.
- ²¹ See for example the North West Public Health Observatory's Local Alcohol Profiles for England, which use these definitions - <www.nwph.net/alcohol/lape/>
- ²² For participants aged 16 and 17, details on alcohol consumption were collected as part of a special smoking and drinking self-completion questionnaire. Some 18 and 19 year olds also completed the self-completion if the interviewer felt it was appropriate. For all other adult participants, the information was collected as part of the face-to-face interview. The method of estimating consumption follows that originally developed for use in the General Household Survey and is also used in the Health Survey for England. For six types of alcoholic drink (normal strength beer/lager/cider/shandy, strong beer/lager/cider, spirits/liqueurs, fortified wines, wine, and alcoholic soft drinks), participants were asked about how often they had drunk each one in the past twelve months, and how much they had usually drunk on any one day. The amount given to the latter question was converted into units of alcohol, with a unit equal to half a pint of normal strength beer/lager/cider/alcoholic soft drink, a single measure of spirits, one glass of wine, or one small glass of fortified wine. A half pint of strong beer/lager/cider was equal to 1.5 units. The number of units was then multiplied by the frequency to give an estimate of weekly consumption of each type of drink. The frequency multipliers were:
- | Drinking frequency | Multiplying factor |
|-------------------------|--------------------|
| Almost every day | 7.0 |
| 5 or 6 times a week | 5.5 |
| 3 or 4 times a week | 3.5 |
| Once or twice a week | 1.5 |
| Once or twice a month | 0.375 |
| One every couple months | 0.115 |
| Once or twice a year | 0.029 |
- The separate consumption figures for each type of drink were rounded to two decimal places and then added together to give an overall weekly consumption figure. The results were then banded, using the same bands as the ones used in the 1995 Scottish Health Survey and in all years of the Health Survey for England. The bandings for men are as follows:
- 1 Under 1 unit (less than or equal to 0.50 units)
 - 2 1-10 units (over 0.50 units, but less than or equal to 10.00 units)
 - 3 Over 10-21 units (over 10.00 units, but less than or equal to 21.00 units)
 - 4 Over 21-35 units (over 21.00 units, but less than or equal to 35.00 units)
 - 5 Over 35-50 units (over 35.00 units, but less than or equal to 50.00 units)
 - 6 Over 50 (over 50.00 units)
- The bands for women were similar, but with breaks at 7, 14, 21 and 35 units, instead of 10, 21, 35 and 50.

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Table 3.1 Estimated usual weekly alcohol consumption level, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per week ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Non-drinker								
2003	10	7	7	5	7	10	20	8
2008	8	9	10	8	9	15	20	10
2009	9	8	10	7	9	14	20	10
2010	14	10	10	11	12	13	21	12
2011	15	10	8	9	11	15	18	11
Moderate								
2003	58	57	58	57	58	64	59	58
2008	51	63	59	60	60	59	66	59
2009	59	65	66	61	62	62	67	63
2010	59	61	63	63	58	60	61	61
2011	58	68	68	62	63	60	68	64
Hazardous/Harmful								
2003	32	36	35	38	35	26	21	33
2008	41	28	31	32	31	25	14	30
2009	33	28	24	31	29	24	14	27
2010	27	29	27	26	30	27	19	27
2011	27	22	24	29	26	25	14	25
Mean units per week								
2003	17.4	19.9	22.9	23.0	20.9	15.3	12.2	19.8
2008	23.5	17.8	19.4	19.0	18.0	13.8	8.3	18.0
2009	22.4	16.3	17.4	20.1	16.6	15.3	8.5	17.5
2010	15.4	16.7	17.8	15.9	17.0	14.8	10.9	16.0
2011	16.7	12.9	14.9	17.1	16.3	14.6	9.9	15.0
SE of the mean								
2003	1.21	1.26	1.76	1.64	1.20	0.85	1.09	0.62
2008	1.96	1.43	1.37	1.09	1.07	0.86	0.69	0.53
2009	4.06	1.07	1.32	1.57	0.82	0.99	0.68	0.75
2010	1.45	1.37	1.69	0.87	1.03	1.07	1.09	0.50
2011	1.70	0.78	1.05	0.88	1.11	0.86	0.86	0.42
<i>Bases (weighted):</i>								
<i>Men 2003</i>	<i>546</i>	<i>596</i>	<i>755</i>	<i>665</i>	<i>567</i>	<i>404</i>	<i>258</i>	<i>3791</i>
<i>Men 2008</i>	<i>405</i>	<i>475</i>	<i>559</i>	<i>549</i>	<i>478</i>	<i>326</i>	<i>218</i>	<i>3011</i>
<i>Men 2009</i>	<i>514</i>	<i>568</i>	<i>634</i>	<i>652</i>	<i>563</i>	<i>387</i>	<i>259</i>	<i>3576</i>
<i>Men 2010</i>	<i>459</i>	<i>558</i>	<i>581</i>	<i>626</i>	<i>540</i>	<i>373</i>	<i>251</i>	<i>3388</i>
<i>Men 2011</i>	<i>497</i>	<i>578</i>	<i>610</i>	<i>651</i>	<i>562</i>	<i>389</i>	<i>264</i>	<i>3551</i>
<i>Bases (unweighted):</i>								
<i>Men 2003</i>	<i>315</i>	<i>446</i>	<i>726</i>	<i>610</i>	<i>631</i>	<i>507</i>	<i>323</i>	<i>3558</i>
<i>Men 2008</i>	<i>220</i>	<i>312</i>	<i>456</i>	<i>530</i>	<i>523</i>	<i>451</i>	<i>304</i>	<i>2796</i>
<i>Men 2009</i>	<i>261</i>	<i>406</i>	<i>550</i>	<i>604</i>	<i>575</i>	<i>517</i>	<i>363</i>	<i>3276</i>
<i>Men 2010</i>	<i>244</i>	<i>417</i>	<i>474</i>	<i>562</i>	<i>553</i>	<i>486</i>	<i>328</i>	<i>3064</i>
<i>Men 2011</i>	<i>287</i>	<i>395</i>	<i>513</i>	<i>593</i>	<i>599</i>	<i>510</i>	<i>342</i>	<i>3239</i>

Continued...

Table 3.1 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per week ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
Non-drinker								
2003	10	9	9	8	14	21	32	13
2008	7	11	10	10	11	20	28	13
2009	11	9	13	12	15	24	33	16
2010	12	14	12	12	17	22	38	17
2011	14	12	12	15	16	26	36	17
Moderate								
2003	60	63	64	62	65	66	64	64
2008	56	68	68	66	70	68	69	67
2009	61	67	68	66	68	66	63	66
2010	62	67	69	66	67	66	53	65
2011	63	71	67	64	67	59	57	65
Hazardous/Harmful								
2003	31	28	27	30	21	12	5	23
2008	37	20	22	23	19	12	4	20
2009	28	24	19	22	18	10	3	19
2010	25	19	20	22	16	12	10	18
2011	23	17	21	22	17	16	8	18
Mean units per week								
2003	11.5	11.8	10.3	11.2	7.8	5.1	2.7	9.0
2008	16.2	8.2	9.9	9.2	7.2	5.4	2.7	8.6
2009	11.9	8.9	8.3	9.0	7.4	4.6	2.5	7.8
2010	10.8	8.0	8.2	8.9	6.9	5.3	3.5	7.6
2011	9.6	7.5	8.4	8.6	7.1	5.9	3.4	7.4
SE of the mean								
2003	1.04	1.10	0.54	0.56	0.43	0.42	0.27	0.31
2008	1.86	0.54	0.69	0.60	0.44	0.51	0.36	0.34
2009	1.23	0.51	0.44	0.48	0.50	0.34	0.40	0.24
2010	1.04	0.63	0.47	0.47	0.42	0.41	0.39	0.24
2011	0.99	0.46	0.47	0.44	0.43	0.43	0.33	0.23
<i>Bases (weighted):</i>								
<i>Women 2003</i>	<i>512</i>	<i>655</i>	<i>805</i>	<i>685</i>	<i>599</i>	<i>491</i>	<i>467</i>	<i>4215</i>
<i>Women 2008</i>	<i>402</i>	<i>487</i>	<i>614</i>	<i>585</i>	<i>502</i>	<i>382</i>	<i>348</i>	<i>3319</i>
<i>Women 2009</i>	<i>500</i>	<i>571</i>	<i>693</i>	<i>700</i>	<i>590</i>	<i>450</i>	<i>408</i>	<i>3912</i>
<i>Women 2010</i>	<i>447</i>	<i>555</i>	<i>641</i>	<i>678</i>	<i>569</i>	<i>429</i>	<i>391</i>	<i>3711</i>
<i>Women 2011</i>	<i>471</i>	<i>577</i>	<i>670</i>	<i>707</i>	<i>591</i>	<i>448</i>	<i>411</i>	<i>3874</i>
<i>Bases (unweighted):</i>								
<i>Women 2003</i>	<i>372</i>	<i>598</i>	<i>879</i>	<i>788</i>	<i>774</i>	<i>579</i>	<i>492</i>	<i>4482</i>
<i>Women 2008</i>	<i>305</i>	<i>450</i>	<i>646</i>	<i>627</i>	<i>630</i>	<i>513</i>	<i>408</i>	<i>3579</i>
<i>Women 2009</i>	<i>376</i>	<i>580</i>	<i>779</i>	<i>733</i>	<i>735</i>	<i>550</i>	<i>479</i>	<i>4232</i>
<i>Women 2010</i>	<i>341</i>	<i>564</i>	<i>677</i>	<i>759</i>	<i>698</i>	<i>571</i>	<i>466</i>	<i>4076</i>
<i>Women 2011</i>	<i>338</i>	<i>559</i>	<i>709</i>	<i>801</i>	<i>734</i>	<i>595</i>	<i>484</i>	<i>4220</i>

Continued...

Table 3.1 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per week ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All adults								
Non-drinker								
2003	10	8	8	7	11	16	27	11
2008	7	10	10	9	10	18	25	12
2009	10	8	11	10	12	19	28	13
2010	13	12	11	11	15	18	31	15
2011	14	11	10	12	14	21	29	14
Moderate								
2003	59	60	61	60	62	65	62	61
2008	54	66	64	63	65	64	68	63
2009	60	66	67	64	65	64	65	64
2010	61	64	66	65	62	63	56	63
2011	60	69	68	63	65	59	61	64
Hazardous/Harmful								
2003	31	32	31	34	27	19	11	28
2008	39	24	26	28	25	18	8	25
2009	30	26	22	26	23	16	7	23
2010	26	24	23	24	23	19	13	22
2011	25	20	22	25	21	20	10	21
Mean units per week								
2003	14.6	15.6	16.4	17.0	14.2	9.7	6.1	14.1
2008	19.9	13.0	14.4	13.9	12.5	9.3	4.8	13.1
2009	17.3	12.6	12.6	14.3	11.9	9.5	4.9	12.4
2010	13.1	12.4	12.7	12.3	11.8	9.7	6.4	11.6
2011	13.2	10.2	11.5	12.7	11.6	9.9	5.9	11.1
SE of the mean								
2003	0.81	0.86	0.94	0.93	0.72	0.51	0.51	0.36
2008	1.39	0.78	0.81	0.65	0.63	0.52	0.37	0.34
2009	2.24	0.63	0.70	0.81	0.53	0.56	0.42	0.40
2010	0.93	0.80	0.87	0.48	0.60	0.59	0.55	0.29
2011	1.01	0.49	0.61	0.53	0.64	0.53	0.45	0.27
<i>Bases (weighted):</i>								
<i>All adults 2003</i>	<i>1058</i>	<i>1252</i>	<i>1560</i>	<i>1350</i>	<i>1166</i>	<i>895</i>	<i>725</i>	<i>8006</i>
<i>All adults 2008</i>	<i>807</i>	<i>962</i>	<i>1174</i>	<i>1134</i>	<i>979</i>	<i>708</i>	<i>566</i>	<i>6330</i>
<i>All adults 2009</i>	<i>1014</i>	<i>1138</i>	<i>1327</i>	<i>1352</i>	<i>1153</i>	<i>836</i>	<i>668</i>	<i>7488</i>
<i>All adults 2010</i>	<i>906</i>	<i>1113</i>	<i>1222</i>	<i>1304</i>	<i>1109</i>	<i>802</i>	<i>642</i>	<i>7098</i>
<i>All adults 2011</i>	<i>968</i>	<i>1155</i>	<i>1280</i>	<i>1358</i>	<i>1152</i>	<i>836</i>	<i>675</i>	<i>7425</i>
<i>Bases (unweighted):</i>								
<i>All adults 2003</i>	<i>687</i>	<i>1044</i>	<i>1605</i>	<i>1398</i>	<i>1405</i>	<i>1086</i>	<i>815</i>	<i>8040</i>
<i>All adults 2008</i>	<i>525</i>	<i>762</i>	<i>1102</i>	<i>1157</i>	<i>1153</i>	<i>964</i>	<i>712</i>	<i>6375</i>
<i>All adults 2009</i>	<i>637</i>	<i>986</i>	<i>1329</i>	<i>1337</i>	<i>1310</i>	<i>1067</i>	<i>842</i>	<i>7508</i>
<i>All adults 2010</i>	<i>585</i>	<i>981</i>	<i>1151</i>	<i>1321</i>	<i>1251</i>	<i>1057</i>	<i>794</i>	<i>7140</i>
<i>All adults 2011</i>	<i>625</i>	<i>954</i>	<i>1222</i>	<i>1394</i>	<i>1333</i>	<i>1105</i>	<i>826</i>	<i>7459</i>

a Non-drinker: no units per week; Moderate: >0 units and up to 21 units for men / 14 units for women; hazardous/harmful: more than 21 units for men / 14 units for women.

Table 3.2 Estimated usual weekly alcohol consumption level and mean units by drinking category, 2008-2011 combined, (age-standardised), by equivalised household income quintile and sex

Aged 16 and over *2008-2011 combined*

Drinking category ^a / Alcohol units per week	Equivalised annual household income quintile				
	1 st (highest)	2 nd	3 rd	4 th	5 th (lowest)
	%	%	%	%	%
Men					
Non drinker	5	7	10	15	21
Moderate	61	65	61	63	56
Hazardous/Harmful	35	28	28	22	24
Mean units					
Moderate	9.0	8.3	7.4	7.5	6.8
Hazardous/Harmful	39.1	38.6	42.9	44.3	61.6
SE of the mean					
Moderate	0.20	0.20	0.19	0.25	0.26
Hazardous/Harmful	2.22	0.85	1.82	1.80	3.23
Women					
Non drinker	8	10	14	18	24
Moderate	65	69	68	66	62
Hazardous/Harmful	27	21	18	16	14
Mean units					
Moderate	5.1	4.5	4.1	3.8	3.2
Hazardous/Harmful	26.0	26.1	26.4	26.4	37.2
SE of the mean					
Moderate	0.12	0.11	0.10	0.11	0.11
Hazardous/Harmful	0.75	0.66	0.88	0.92	1.98
<i>Bases (weighted):</i>					
<i>Men</i>	2929	2625	2311	2069	1746
<i>Men: non-drinker</i>	132	177	232	310	364
<i>Men: moderate</i>	1772	1704	1421	1304	971
<i>Men: hazardous/harmful</i>	1024	744	658	454	411
<i>Women</i>	2677	2644	2479	2490	2259
<i>Women: non-drinker</i>	215	258	336	440	549
<i>Women: moderate</i>	1732	1837	1697	1650	1399
<i>Women: hazardous/harmful</i>	730	549	445	399	311
<i>Bases (unweighted):</i>					
<i>Men</i>	2516	2328	2149	2063	1655
<i>Men: non-drinker</i>	109	151	238	316	352
<i>Men: moderate</i>	1554	1523	1356	1343	920
<i>Men: hazardous/harmful</i>	853	654	555	404	383
<i>Women</i>	2713	2827	2745	2859	2520
<i>Women: non-drinker</i>	172	266	407	583	642
<i>Women: moderate</i>	1796	1982	1870	1885	1577
<i>Women: hazardous/harmful</i>	745	579	468	391	301

a Non-drinker: no units per week; Moderate: >0 units and up to 21 units for men / 14 units for women; hazardous/harmful: more than 21 units for men / 14 units for women.

Table 3.3 Estimated usual weekly alcohol consumption level and mean units by drinking category, 2008-2011 combined, (age-standardised), by Scottish Index of Multiple Deprivation and sex

<i>Aged 16 and over</i>		<i>2008-2011 combined</i>					
Drinking category^a/ Alcohol units per week	Scottish Index of Multiple Deprivation					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Non drinker	7	9	10	14	16	10	17
Moderate	64	63	64	61	58	63	57
Hazardous/Harmful	29	28	27	26	26	27	26
Mean units							
Moderate	8.7	8.0	7.7	7.5	7.6	7.9	7.7
Hazardous/Harmful	36.7	40.7	43.1	43.6	52.8	41.1	54.9
SE of the mean							
Moderate	0.20	0.18	0.19	0.21	0.21	0.09	0.24
Hazardous/Harmful	0.85	1.09	2.74	1.55	2.17	0.74	2.69
Women							
Non drinker	10	12	15	19	24	14	24
Moderate	66	68	66	66	61	66	61
Hazardous/Harmful	24	20	19	16	15	19	14
Mean units							
Moderate	4.7	4.2	4.2	3.8	3.7	4.2	3.7
Hazardous/Harmful	24.9	26.7	28.0	27.8	30.6	26.9	30.6
SE of the mean							
Moderate	0.10	0.09	0.10	0.10	0.10	0.05	0.11
Hazardous/Harmful	0.53	0.92	1.01	0.89	1.25	0.42	1.36
<i>Bases (weighted):</i>							
<i>Men</i>	2686	2955	2664	2656	2567	11594	1936
<i>Men: non-drinker</i>	190	256	255	363	417	1154	330
<i>Men: moderate</i>	1706	1873	1701	1609	1483	7259	1107
<i>Men: hazardous/harmful</i>	790	826	708	684	667	3181	499
<i>Women</i>	2905	3058	2918	2963	2968	12606	2206
<i>Women: non-drinker</i>	295	379	432	550	706	1820	535
<i>Women: moderate</i>	1923	2064	1934	1952	1820	8333	1355
<i>Women: hazardous/harmful</i>	687	615	552	461	443	2453	316
<i>Bases (weighted):</i>							
<i>Men</i>	2214	2856	2652	2337	2316	10591	1784
<i>Men: non-drinker</i>	157	259	293	333	388	1120	310
<i>Men: moderate</i>	1415	1845	1701	1431	1331	6708	1015
<i>Men: hazardous/harmful</i>	642	752	658	573	597	2763	459
<i>Women</i>	2819	3574	3398	3095	3222	13634	2474
<i>Women: non-drinker</i>	286	447	558	608	777	2080	596
<i>Women: moderate</i>	1881	2456	2262	2032	1977	9082	1526
<i>Women: hazardous/harmful</i>	652	671	578	455	468	2472	352

a Non-drinker: no units per week; Moderate: >0 units and up to 21 units for men / 14 units for women; hazardous/harmful: more than 21 units for men / 14 units for women.

Table 3.4 Units consumed on heaviest drinking day in past week, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Consumed over 4 units								
2003	51	54	51	49	43	29	16	45
2008	49	53	48	50	42	29	14	44
2009	48	53	48	49	44	35	12	44
2010	43	54	47	49	41	30	15	43
2011	42	45	47	45	42	34	14	41
Consumed over 8 units								
2003	39	40	33	30	24	11	5	29
2008	37	37	30	31	21	11	2	27
2009	35	36	30	28	23	12	2	26
2010	33	38	30	29	22	12	3	26
2011	32	31	30	28	20	12	3	25
Mean units								
2003	8.1	8.2	7.6	6.6	5.5	3.5	2.2	6.5
2008	8.6	7.8	7.1	6.7	5.0	3.4	1.8	6.2
2009	7.4	7.6	6.4	6.1	5.5	3.7	1.8	5.9
2010	7.6	8.1	6.4	6.4	5.1	3.5	2.0	6.0
2011	7.1	6.5	6.1	6.1	4.9	3.6	1.9	5.5
SE of the mean								
2003	0.69	0.44	0.41	0.31	0.26	0.20	0.19	0.18
2008	0.77	0.53	0.49	0.37	0.28	0.21	0.15	0.19
2009	0.66	0.50	0.34	0.30	0.37	0.20	0.13	0.17
2010	1.02	0.56	0.39	0.36	0.28	0.22	0.16	0.21
2011	0.78	0.50	0.35	0.31	0.25	0.19	0.15	0.15
Women								
Consumed over 3 units								
2003	46	50	45	46	32	19	6	37
2008	54	47	45	41	34	15	6	36
2009	41	44	44	44	31	17	5	34
2010	40	39	41	44	30	18	5	33
2011	40	39	44	44	31	20	6	34
Consumed over 6 units								
2003	35	31	23	21	11	3	0	19
2008	41	27	22	17	11	2	1	18
2009	27	28	23	17	10	3	1	17
2010	28	23	21	20	9	3	1	16
2011	29	23	23	21	9	5	0	17
Mean units								
2003	5.7	5.1	4.1	3.9	2.6	1.6	0.7	3.6
2008	7.1	4.6	3.8	3.4	2.7	1.4	0.7	3.5
2009	4.5	4.4	3.8	3.7	2.5	1.5	0.7	3.2
2010	4.7	3.8	3.7	3.8	2.5	1.6	0.8	3.1
2011	4.5	4.0	3.9	3.6	2.6	1.8	0.8	3.2

Continued...

Table 3.4 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
SE of the mean								
2003	0.45	0.27	0.18	0.17	0.14	0.10	0.06	0.10
2008	0.84	0.30	0.18	0.18	0.13	0.10	0.07	0.14
2009	0.42	0.26	0.17	0.23	0.12	0.10	0.08	0.09
2010	0.45	0.25	0.18	0.16	0.13	0.10	0.10	0.09
2011	0.43	0.27	0.18	0.15	0.16	0.11	0.07	0.09
All adults								
Consumed over 3/4 units								
2003	49	52	48	48	37	23	10	41
2008	52	50	46	46	38	22	9	40
2009	44	48	46	46	38	26	8	39
2010	42	46	44	46	35	23	9	38
2011	41	42	46	45	36	27	9	37
Consumed over 6/8 units								
2003	37	35	28	26	17	7	2	24
2008	39	32	26	24	16	6	1	22
2009	31	32	26	23	16	7	1	21
2010	31	30	25	25	15	7	2	21
2011	31	27	26	24	15	9	1	20
Mean units								
2003	7.0	6.6	5.8	5.2	4.0	2.5	1.3	4.9
2008	7.8	6.2	5.4	5.0	3.8	2.3	1.1	4.8
2009	6.0	6.0	5.0	4.9	4.0	2.5	1.1	4.5
2010	6.2	5.9	4.9	5.0	3.8	2.5	1.3	4.5
2011	5.9	5.3	4.9	4.8	3.7	2.6	1.3	4.3
SE of the mean								
2003	0.43	0.28	0.23	0.19	0.17	0.12	0.09	0.12
2008	0.56	0.32	0.28	0.22	0.17	0.13	0.08	0.13
2009	0.42	0.30	0.19	0.21	0.20	0.12	0.08	0.10
2010	0.57	0.33	0.22	0.21	0.17	0.13	0.09	0.12
2011	0.48	0.30	0.21	0.18	0.16	0.12	0.08	0.10

Continued...

Table 3.4 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Alcohol units per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
Men 2003	563	601	758	666	568	405	259	3819
Men 2008	403	476	562	552	478	326	217	3015
Men 2009	481	561	629	648	558	386	259	3521
Men 2010	446	559	584	629	542	374	253	3386
Men 2011	489	581	611	652	564	386	265	3549
Women 2003	543	657	806	689	601	491	467	4254
Women 2008	400	486	616	586	502	382	348	3320
Women 2009	459	568	692	699	589	450	408	3865
Women 2010	439	556	643	678	569	432	392	3710
Women 2011	448	579	671	708	593	448	413	3860
All adults 2003	1106	1258	1564	1355	1168	896	726	8073
All adults 2008	803	962	1178	1138	980	708	565	6335
All adults 2009	940	1128	1320	1347	1147	836	667	7385
All adults 2010	885	1115	1227	1307	1111	806	646	7096
All adults 2011	937	1160	1282	1360	1157	835	678	7409
<i>Bases (unweighted):</i>								
Men 2003	325	449	729	612	632	508	325	3580
Men 2008	221	313	458	532	524	450	303	2801
Men 2009	247	402	546	601	570	516	362	3244
Men 2010	237	419	475	563	554	488	330	3066
Men 2011	283	398	514	595	601	508	343	3242
Women 2003	388	599	880	793	776	579	492	4507
Women 2008	303	450	648	627	630	513	408	3579
Women 2009	353	577	777	732	734	550	479	4202
Women 2010	340	565	680	759	698	574	467	4083
Women 2011	325	561	710	802	737	596	486	4217
All adults 2003	713	1048	1609	1405	1408	1087	817	8087
All adults 2008	524	763	1106	1159	1154	963	711	6380
All adults 2009	600	979	1323	1333	1304	1066	841	7446
All adults 2010	577	984	1155	1322	1252	1062	797	7149
All adults 2011	608	959	1224	1397	1338	1104	829	7459

Table 3.5 Adherence to weekly and daily drinking advice, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Adherence to weekly and daily drinking advice	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Never drunk alcohol								
2003	8	4	4	1	4	3	10	4
2008	8	4	3	3	2	4	7	4
2009	7	3	5	1	2	3	7	4
2010	14	8	3	4	3	3	6	6
2011	13	4	3	3	4	4	5	5
Ex drinker								
2003	2	3	3	4	3	7	10	4
2008	1	5	7	6	6	11	14	6
2009	2	5	5	6	7	11	12	6
2010	1	2	7	7	9	10	15	7
2011	2	5	4	6	8	11	13	6
Drinks within government guidelines^a								
2003	33	34	34	37	42	52	53	39
2008	33	33	36	37	41	46	59	39
2009	38	36	39	38	41	45	60	41
2010	35	33	37	37	40	47	54	39
2011	36	40	41	40	42	46	62	42
Drinks outwith government guidelines^b								
2003	57	59	59	58	51	39	27	53
2008	58	57	54	55	50	39	21	51
2009	52	56	52	55	50	41	20	49
2010	50	57	52	52	48	40	25	49
2011	49	51	51	51	46	40	20	46
Women								
Never drunk alcohol								
2003	9	5	4	3	8	13	25	9
2008	5	5	6	4	4	10	20	7
2009	9	5	5	6	7	12	21	8
2010	10	7	5	5	7	11	24	9
2011	12	7	7	6	6	11	19	9
Ex drinker								
2003	1	3	4	4	7	8	6	5
2008	2	6	4	6	7	10	7	6
2009	3	4	8	6	8	12	12	7
2010	3	6	6	7	10	11	14	8
2011	3	5	5	9	10	14	17	9

Continued...

Table 3.5 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Adherence to weekly and daily drinking advice	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Drinks within government guidelines^a								
2003	41	37	40	40	49	55	60	45
2008	32	39	41	45	52	59	64	47
2009	43	43	41	41	49	55	60	47
2010	39	42	43	40	48	56	51	45
2011	39	46	39	38	49	48	53	44
Drinks outwith government guidelines^b								
2003	49	55	51	52	37	24	9	42
2008	61	49	49	45	38	21	8	40
2009	46	48	46	47	37	21	6	38
2010	47	44	45	49	35	22	12	38
2011	46	42	49	48	35	26	11	38
All adults								
Never drunk alcohol								
2003	8	5	4	2	6	9	20	7
2008	6	5	5	3	3	7	15	6
2009	8	4	5	4	5	8	16	6
2010	12	8	4	4	5	7	17	7
2011	13	6	5	5	5	8	14	7
Ex drinker								
2003	2	3	4	4	5	7	8	5
2008	2	5	5	6	6	11	10	6
2009	2	4	6	6	7	11	12	7
2010	2	4	7	7	10	11	14	7
2011	3	5	5	7	9	13	15	8
Drinks within government guidelines^a								
2003	37	35	37	38	45	53	57	42
2008	33	36	39	41	46	53	62	43
2009	41	40	40	40	45	51	60	44
2010	37	38	40	38	44	52	52	42
2011	37	43	40	39	46	47	57	43
Drinks outwith government guidelines^b								
2003	53	57	55	55	44	31	15	47
2008	60	53	51	50	44	29	13	45
2009	49	52	49	51	43	30	12	43
2010	49	50	49	50	41	30	17	43
2011	47	47	50	49	40	32	15	42

Continued...

Table 3.5 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Adherence to weekly and daily drinking advice	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
Men 2003	532	596	754	663	563	404	257	3769
Men 2008	379	473	559	548	478	325	217	2981
Men 2009	480	561	629	648	558	386	257	3519
Men 2010	430	558	581	623	539	373	251	3355
Men 2011	470	578	609	651	562	386	264	3520
Women 2003	502	655	803	685	599	491	467	4203
Women 2008	380	486	614	584	502	382	348	3296
Women 2009	457	568	691	699	589	450	408	3862
Women 2010	412	554	641	678	569	429	391	3675
Women 2011	425	577	670	707	590	448	411	3827
All adults 2003	1035	1252	1557	1348	1162	895	724	7972
All adults 2008	759	959	1174	1133	979	707	565	6277
All adults 2009	937	1128	1320	1347	1147	836	666	7381
All adults 2010	842	1112	1222	1302	1108	802	642	7030
All adults 2011	895	1155	1279	1358	1151	834	675	7347
<i>Bases (unweighted):</i>								
Men 2003	306	446	725	609	628	507	322	3543
Men 2008	209	310	455	529	523	449	303	2778
Men 2009	246	402	546	601	570	516	361	3242
Men 2010	227	417	473	559	552	486	328	3042
Men 2011	273	395	512	593	599	508	342	3222
Women 2003	362	598	877	787	774	579	492	4469
Women 2008	288	449	646	626	630	513	408	3560
Women 2009	351	577	776	732	734	550	479	4199
Women 2010	322	563	677	759	697	571	466	4055
Women 2011	311	559	709	801	733	595	484	4192
All adults 2003	668	1044	1602	1396	1402	1086	814	8012
All adults 2008	497	759	1101	1155	1153	962	711	6338
All adults 2009	597	979	1322	1333	1304	1066	840	7441
All adults 2010	549	980	1150	1318	1249	1057	794	7097
All adults 2011	584	954	1221	1394	1332	1103	826	7414

a Drank no more than 4 units (men) or 3 units (women) on heaviest drinking day, and drank no more than 21 units (men) or 14 units (women) in usual week.

b Drank more than 4 units (men) or 3 units (women) on heaviest drinking day, and/or drank more than 21 units (men) or 14 units (women) in usual week.

Table 3.6 Number of days on which drank alcohol in the past week, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over and drank alcohol in past week

1998, 2003, 2008, 2009, 2010, 2011

% who drank on >5 days / mean number of days drank alcohol in last week	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
Men									
Drank on >5 days									
1998	5	10	15	22	28	34	n/a	17	n/a
2003	6	14	16	22	27	32	51	19	20
2008	5	7	16	18	25	30	33	16	17
2009	2	6	12	12	19	25	33	12	14
2010	4	5	11	12	19	32	42	13	15
2011	4	6	7	13	19	25	40	12	13
Mean number of days									
1998	2.4	2.8	3.0	3.4	3.6	3.8	n/a	3.1	n/a
2003	2.5	2.9	3.0	3.5	3.7	3.8	4.7	3.2	3.3
2008	2.4	2.5	3.0	3.3	3.6	3.8	3.8	3.1	3.1
2009	2.2	2.3	2.7	2.9	3.4	3.5	3.7	2.8	2.9
2010	2.2	2.4	2.6	2.8	3.2	3.8	4.2	2.8	2.9
2011	2.2	2.3	2.5	2.9	3.2	3.6	4.1	2.8	2.8
SE of the mean									
1998	0.09	0.08	0.09	0.10	0.12	0.13	n/a	0.04	n/a
2003	0.12	0.11	0.09	0.11	0.10	0.13	0.18	0.05	0.05
2008	0.14	0.12	0.12	0.10	0.12	0.14	0.20	0.06	0.05
2009	0.11	0.09	0.10	0.10	0.11	0.12	0.19	0.04	0.04
2010	0.15	0.12	0.11	0.09	0.12	0.14	0.20	0.05	0.05
2011	0.12	0.11	0.10	0.10	0.11	0.12	0.20	0.05	0.05
Women									
Drank on >5 days									
1998	5	6	11	11	15	22	n/a	10	n/a
2003	3	6	11	15	18	24	30	12	13
2008	5	6	5	13	14	20	22	10	10
2009	3	3	4	10	16	14	22	8	9
2010	1	6	6	8	13	20	37	8	10
2011	3	3	6	8	12	20	33	8	10
Mean number of days									
1998	2.0	2.1	2.6	2.6	2.8	2.9	n/a	2.4	n/a
2003	2.1	2.4	2.7	3.0	3.1	3.1	3.5	2.7	2.7
2008	2.3	2.1	2.3	2.8	2.7	3.0	3.0	2.5	2.5
2009	1.7	2.1	2.3	2.6	3.0	2.8	3.2	2.4	2.5
2010	1.7	2.1	2.3	2.6	2.7	2.9	3.7	2.4	2.5
2011	1.8	2.0	2.3	2.6	2.8	3.1	3.6	2.4	2.5
SE of the mean									
1998	0.09	0.07	0.08	0.09	0.11	0.14	n/a	0.04	n/a
2003	0.11	0.09	0.09	0.09	0.11	0.15	0.23	0.05	0.05
2008	0.17	0.10	0.08	0.10	0.12	0.16	0.22	0.05	0.05
2009	0.10	0.08	0.07	0.09	0.11	0.13	0.21	0.04	0.04
2010	0.09	0.09	0.08	0.09	0.11	0.14	0.21	0.04	0.04
2011	0.11	0.09	0.07	0.08	0.11	0.13	0.20	0.04	0.05

Continued...

Table 3.6 - Continued

Aged 16 and over and drank alcohol in past week

1998, 2003, 2008, 2009, 2010, 2011

% who drank on >5 days / mean number of days drank alcohol in last week	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
All adults									
Drank on >5 days									
1998	5	8	13	17	23	29	n/a	14	n/a
2003	5	10	13	18	23	28	40	16	17
2008	5	6	10	15	20	25	28	13	14
2009	2	4	8	11	18	20	28	10	11
2010	3	5	9	10	16	27	40	11	13
2011	4	4	6	10	16	23	37	10	12
Mean number of days									
1998	2.2	2.5	2.8	3.0	3.2	3.4	n/a	2.8	n/a
2003	2.3	2.6	2.9	3.2	3.4	3.5	4.1	3.0	3.0
2008	2.4	2.3	2.7	3.0	3.2	3.5	3.4	2.8	2.8
2009	2.0	2.2	2.5	2.8	3.2	3.2	3.4	2.6	2.7
2010	2.0	2.2	2.5	2.7	3.0	3.4	4.0	2.6	2.7
2011	2.0	2.1	2.4	2.8	3.0	3.4	3.8	2.6	2.7
SE of the mean									
1998	0.07	0.05	0.06	0.07	0.08	0.10	n/a	0.03	n/a
2003	0.10	0.08	0.07	0.08	0.09	0.11	0.17	0.04	0.04
2008	0.11	0.08	0.08	0.08	0.09	0.12	0.16	0.04	0.04
2009	0.08	0.07	0.06	0.07	0.09	0.10	0.16	0.03	0.03
2010	0.10	0.08	0.08	0.07	0.09	0.12	0.16	0.04	0.04
2011	0.08	0.08	0.07	0.07	0.09	0.10	0.15	0.04	0.04
<i>Bases (weighted):</i>									
<i>Men 1998</i>	508	745	742	625	438	322	n/a	3379	n/a
<i>Men 2003</i>	363	457	564	528	432	276	143	2619	2762
<i>Men 2008</i>	298	352	398	419	348	223	123	2038	2160
<i>Men 2009</i>	311	417	443	485	421	267	153	2344	2497
<i>Men 2010</i>	285	398	398	448	389	243	145	2162	2307
<i>Men 2011</i>	333	363	438	474	389	255	155	2251	2406
<i>Women 1998</i>	409	601	609	515	354	236	n/a	2722	n/a
<i>Women 2003</i>	333	418	513	480	340	237	152	2320	2472
<i>Women 2008</i>	276	298	388	379	304	189	120	1834	1953
<i>Women 2009</i>	288	340	431	449	347	217	128	2071	2199
<i>Women 2010</i>	258	306	387	451	331	208	130	1940	2070
<i>Women 2011</i>	289	323	411	434	335	215	145	2007	2152
<i>All adults 1998</i>	917	1345	1350	1140	792	557	n/a	6101	n/a
<i>All adults 2003</i>	697	875	1077	1008	772	512	295	4940	5234
<i>All adults 2008</i>	574	650	786	798	652	412	242	3871	4113
<i>All adults 2009</i>	598	757	873	934	768	484	281	4415	4696
<i>All adults 2010</i>	543	704	785	899	721	451	275	4102	4377
<i>All adults 2011</i>	621	686	849	908	724	470	299	4258	4557

Continued...

Table 3.6 - Continued

Aged 16 and over and drank alcohol in past week

1998, 2003, 2008, 2009, 2010, 2011

% who drank on >5 days / mean number of days drank alcohol in last week	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
<i>Bases (unweighted):</i>									
<i>Men 1998</i>	278	584	667	547	488	396	<i>n/a</i>	2960	<i>n/a</i>
<i>Men 2003</i>	212	339	545	485	479	350	180	2410	2590
<i>Men 2008</i>	159	233	323	399	379	301	173	1794	1967
<i>Men 2009</i>	146	293	389	440	435	352	211	2055	2266
<i>Men 2010</i>	152	291	323	398	391	321	181	1876	2057
<i>Men 2011</i>	194	253	359	434	403	330	201	1973	2174
<i>Women 1998</i>	310	624	673	560	424	359	<i>n/a</i>	2950	<i>n/a</i>
<i>Women 2003</i>	236	372	572	549	439	280	161	2448	2609
<i>Women 2008</i>	204	274	410	401	377	250	137	1916	2053
<i>Women 2009</i>	203	344	491	465	427	264	152	2194	2346
<i>Women 2010</i>	188	300	404	490	399	272	147	2053	2200
<i>Women 2011</i>	191	297	423	490	407	281	167	2089	2256
<i>All adults 1998</i>	588	1208	1340	1107	912	755	<i>n/a</i>	5910	<i>n/a</i>
<i>All adults 2003</i>	448	711	1117	1034	918	630	341	4858	5199
<i>All adults 2008</i>	363	507	733	800	756	551	310	3710	4020
<i>All adults 2009</i>	349	637	880	905	862	616	363	4249	4612
<i>All adults 2010</i>	340	591	727	888	790	593	328	3929	4257
<i>All adults 2011</i>	385	550	782	924	810	611	368	4062	4430

Table 3.7 Number of days on which drank alcohol in the past week, 2008-11 combined, (age-standardised), by equivalised household income quintile and sex

Aged 16 and over and drank alcohol in past week

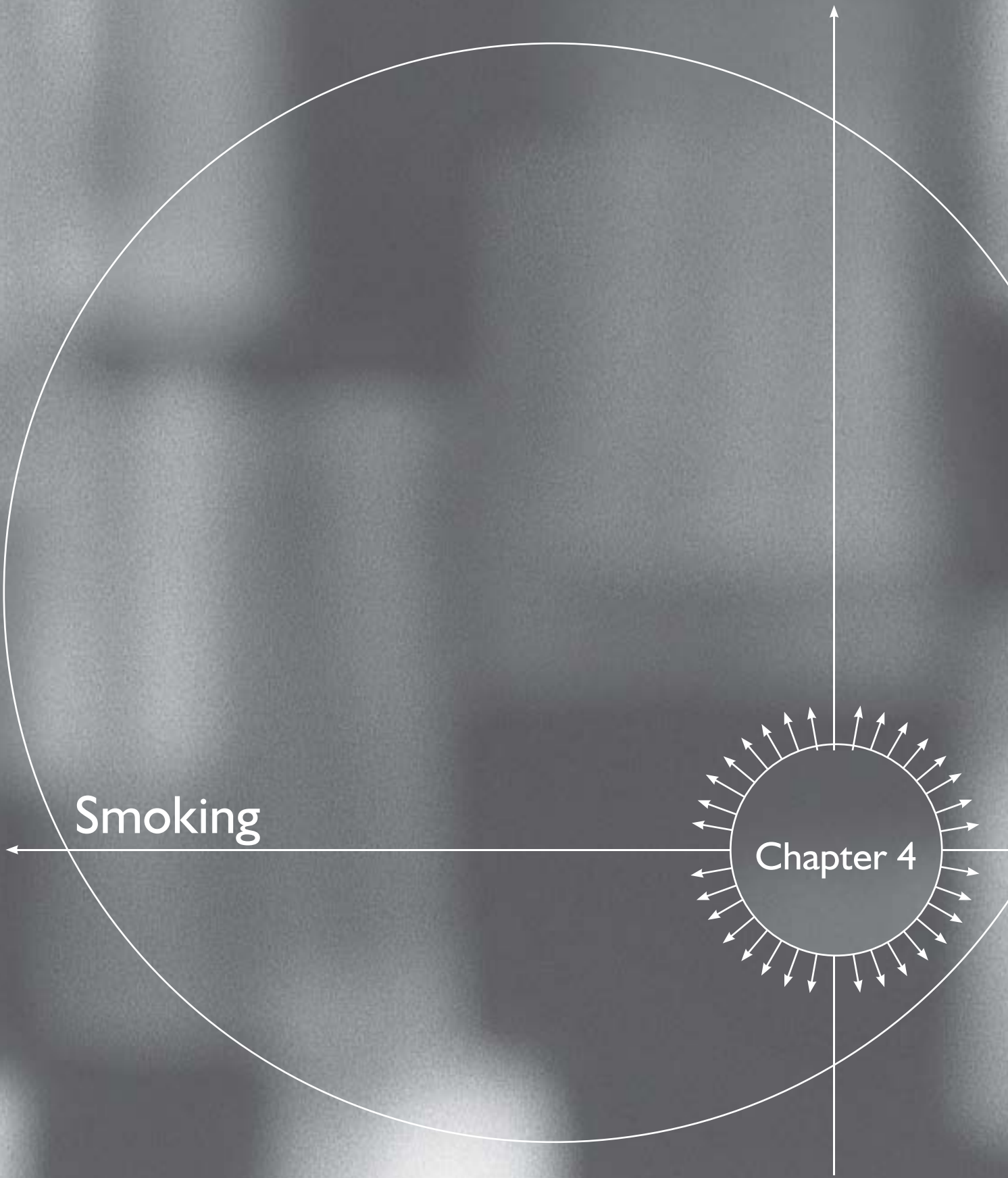
2008-2011 combined

Number of days drank alcohol	Equivalised annual household income quintile				
	1 st (highest)	2 nd	3 rd	4 th	5 th (lowest)
	%	%	%	%	%
Men					
Drank on >5 days	18	14	16	13	16
Mean number of days	3.2	3.0	2.9	2.7	2.8
SE of the mean	0.06	0.06	0.06	0.07	0.08
Women					
Drank on >5 days	15	11	9	8	8
Mean number of days	3.0	2.6	2.4	2.3	2.1
SE of the mean	0.06	0.06	0.05	0.05	0.06
<i>Bases (weighted):</i>					
<i>Men</i>	2342	1950	1614	1306	976
<i>Women</i>	1897	1705	1399	1288	937
<i>Bases (unweighted):</i>					
<i>Men</i>	2026	1735	1463	1289	920
<i>Women</i>	1985	1825	1510	1382	997

Table 3.8 Number of days on which drank alcohol in the past week, 2008-11 combined, (age-standardised), by Scottish Index of Multiple Deprivation and sex

Aged 16 and over and drank alcohol in past week *2008-2011 combined*

Number of days drank alcohol	Scottish Index of Multiple Deprivation					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Drank on >5 days	14	16	17	13	13	15	14
Mean number of days	3.1	3.0	3.0	2.7	2.7	3.0	2.7
SE of the mean	0.05	0.05	0.06	0.05	0.06	0.03	0.07
Women							
Drank on >5 days	13	12	10	7	5	10	5
Mean number of days	2.8	2.7	2.5	2.2	2.0	2.6	2.0
SE of the mean	0.05	0.04	0.05	0.05	0.04	0.02	0.05
<i>Bases (weighted):</i>							
<i>Men</i>	2097	2157	1839	1719	1557	8219	1161
<i>Women</i>	2018	1832	1676	1505	1302	7397	949
<i>Bases (unweighted):</i>							
<i>Men</i>	1725	2057	1809	1473	1401	7396	1069
<i>Women</i>	1948	2126	1864	1510	1407	7789	1066



Smoking

Chapter 4

4 SMOKING

Shanna Dowling

SUMMARY

- In 2011, 23% of all adults aged 16 and over were current smokers. The smoking rates for men and women were similar (24% and 22% respectively).
- Smoking prevalence was highest among those aged 25-34 (30%) and lowest among over 75s (8%).
- Rates of smoking among men and women aged 16-64 declined between 1995 and 2011, from 35% to 26%.
- There was also a significant decline in smoking rates among all adults aged 16 and over since 2003 from 28% to 23% in 2011. The two percentage point drop in the prevalence between 2010 and 2011 was statistically significant.
- In 2011, the mean number of cigarettes smoked per day by smokers aged 16 and over was 13.8. Female smokers smoked fewer cigarettes per day on average than male smokers (13.3 and 14.3 cigarettes respectively).
- There has been a decline over time in the mean number of cigarettes smoked per day. In 2011, 16-64 year olds smoked on average 3 fewer cigarettes per day than they did in 1995 (from 16.7 cigarettes per day to 13.7). The figures for all adults aged 16 and over also show a decline from 2003 (from 15.3 cigarettes per day to 13.8 cigarettes).
- There was a clear association between smoking prevalence and socio-economic classification. People living in semi-routine and routine households were more than twice as likely as those living in managerial and professional households to report that they smoked (36% compared with 15%). Smokers in semi-routine and routine households also had the highest mean number of cigarettes smoked per day (15.1 cigarettes).
- For both men and women, smoking rates steadily increased as household income decreased. People in the lowest household income quintile were almost three times as likely as those in the highest income group to report that they smoked cigarettes (40% compared with 14%). However, there was no significant variation in the number of cigarettes smoked per day.
- Four in ten adults living in the 20% most deprived areas in Scotland reported smoking cigarettes compared with just one in ten of those living in the 20% least deprived areas. The mean number of cigarettes smoked per day by smokers also increased in line with deprivation from 12.3 cigarettes in the least deprived quintile to 15.2 cigarettes in the most deprived group.
- An estimate of the percentage of people who mis-report themselves as non-smokers can be made by comparing self-reported smoking estimates with cotinine levels. In 2008-2011, the under-estimation of current smoking was 3 percentage points. Mis-reporting was greatest among men aged 16-24 and 65 and over (6 percentage point difference).
- The sharp decrease in non-smokers' exposure to second-hand smoke in public places seen in the decade between 1998 and 2008 was maintained in 2011 when 8% of non-smokers (aged 16 and over) reported being exposed to smoke in public places. Non-smokers' (aged 16-74) exposure to second-hand smoke in either their own or someone else's home fell from 31% in 1998 to 16% in 2011 for men and from 35% to 14% for women.

- Exposure to other people's smoke was also measured objectively using geometric mean cotinine levels. Since 2003 there has been a significant decline in geometric mean cotinine levels of non-smokers (from 0.40ng/ml to 0.11ng/ml) in 2010/2011. There was no change in levels between 2008/2009 and 2010/11.
- The geometric mean cotinine levels of male and female non-smokers were similar and levels did not vary significantly by age.
- Deprivation was strongly associated with non-smokers' cotinine levels. The geometric mean cotinine level for non-smokers living in the 20% most deprived areas in Scotland was three times that of those living in the least deprived group (0.20ng/ml compared with 0.07ng/ml).

4.1 INTRODUCTION

The Scottish Government's revised National Performance Framework (NPF), published in December 2011,¹ includes a new national indicator to reduce premature mortality (deaths from all causes in those aged under 75).² The fact that smoking, and its strong link to deprivation, is cited as one of the risk factors that needs to be addressed to reduce premature mortality underlines its status as one of Scotland's most significant public health concerns. It has been estimated that around 13,000 deaths a year are attributable to smoking – around a quarter of all deaths in Scotland.³ Smoking prevalence is itself the subject of a national indicator – reduce the percentage of adults who smoke⁴ – which is measured by the Scottish Household Survey.

The introductions to the smoking chapters in the 2008, 2009 and 2010 Scottish Health Survey (SHeS) Reports^{5,6,7} provided a comprehensive overview of the recent policy context and outlined a number of actions being taken by the Government and NHS to help support smokers to quit, and to discourage people from starting to smoke. These included:

- The introduction of a ban on smoking in public places in 2006.
- The raising of the legal age for buying tobacco from 16 to 18 in 2007.
- The strategic framework set out in the 2004 publication *A Breath of Fresh Air for Scotland* and the 2008 action plan *Scotland's Future is Smoke-Free*.
- The Tobacco and Primary Medical Services (Scotland) Act 2010, which introduced new measures specifically designed to reduce the attractiveness and availability of tobacco to those aged under 18.
- Plans to ban the display of tobacco products in shops. The implementation was originally planned to start in large stores in April 2012, and in April 2015 for smaller stores.⁸ Ongoing legal disputes have delayed its initial implementation, however the Scottish Government remains committed to the 2015 target.⁹
- The development of a new tobacco control strategy for Scotland, due to be published in 2012.

In April 2012, the Department for Health in England launched a 12-week UK-wide consultation outlining proposals to introduce plain packaging for cigarette products.^{10,11} The consultation document was developed with the support of the Scottish Government and the other devolved administrations in Wales and

Northern Ireland. A systematic review of plain packaging conducted in response to the publication of the Department for Health in England's Tobacco Control Plan for England concluded "*that plain packaging would reduce the attractiveness and appeal of tobacco products, it would increase the noticeability and effectiveness of health warnings and messages, and it would reduce the use of design techniques that may mislead consumers about the harmfulness of tobacco products*".¹²

The above policy actions to reduce the attractiveness of smoking are complimented by a programme of support to assist existing smokers who want to quit. For example, one of Scotland's HEAT targets¹³ for the NHS focuses specifically on smoking cessation, and includes a deprived-focused element:¹⁴

NHS Scotland to deliver universal smoking cessation services to achieve at least 80,000 successful quits (at one month post quit) including 48,000 in the 40% most-deprived within-Board SIMD areas over the three years ending March 2014.

According to the most recent figures, between April and December 2011, 14,637 successful quit attempts were recorded in the SIMD target areas described above.¹⁴ This target replaced a similar target for boards to deliver 83,975 successful quit attempts in the 2008/9-2010/11 period; 89,075 were recorded.¹⁵

This chapter presents figures for prevalence of smoking among adults aged 16 and over and for non-smokers' exposure to second-hand smoke. Two sources of data are used: self-reported information and direct assessment of smoking status and second-hand smoke exposure via saliva samples. Trends from 1995 onwards will be presented. Self-reported smoking prevalence is presented by age, sex, National Statistics Socio-economic classification, household income and Scottish Index of Multiple Deprivation (SIMD). Saliva-recorded second-hand smoke exposure is also presented by SIMD.

4.2 METHODS

4.2.1 Smoking questions in the 2011 Scottish Health Survey

The survey has included questions on smoking since 1995. Some small changes were introduced to the questionnaire in 2008, as outlined in the 2008⁵ Report. This information is not repeated here. Instead, the main measures and definitions used in this chapter are outlined.

Information about cigarette smoking was collected from adults aged 16 and 17 by means of a self-completion questionnaire which offered them the privacy to answer without disclosing their smoking behaviour in front of other household members. For adults aged 20 and over it was collected as part of the main interview. Those aged 18 and 19, at the interviewers' discretion, could answer the questions either in the self-completion booklet or the main interview.

For young adults, the smoking questions in the self-completion questionnaire focus upon:

- current smoking status
- frequency and pattern of current smoking
- the number of cigarettes smoked by current smokers
- ex-smokers' previous smoking history
- exposure to second-hand smoke.

The self-completion and main interview questions are mostly similar. However the main interview also asked about past smoking behaviour, desire to give-up smoking and medical advice to stop smoking. The question about non-smokers' exposure to second-hand smoke covers a range of domestic and public places, including some locations covered by the 2006 smoking ban (such as pubs). In previous reports, people who were not exposed to smoke in any of the places asked about were described as never being exposed to second-hand smoke. This is not wholly accurate as they might have been exposed to smoke in a location that was not asked about. The tables and text below have been amended to reflect this.

4.2.2 Cotinine

Since its inception, SHeS has been collecting saliva samples to assess people's cotinine levels. Cotinine, a derivative of nicotine, is an objective measure of smoking. Levels above a certain threshold indicate that someone has smoked recently while levels below the threshold are a measure of exposure to second-hand smoke. All those aged 16 years and over who were visited by the nurse were asked to provide a saliva sample in order to measure cotinine levels. The 2009 smoking chapter⁶ described why the cotinine threshold used to identify smokers changed from 15ng/ml (used in the 1995-2003 reports) to 12ng/ml (used from 2008 onwards).¹⁶ To ensure comparability, all trend data presented in this chapter use the 12ng/ml level.

The measurement of cotinine levels in the SHeS series provides an objective cross-check on self-reported smoking behaviour, which is known to under-estimate prevalence. Inaccuracies in reporting arise in part from difficulties participants may experience in providing quantitative summaries of variable behaviour patterns, but in some cases arise from a desire to conceal the truth from other people, such as other household members who may be present during the interview. This study is the only data source in Scotland which can provide a validated measure of self-reported smoking in this way.

This chapter updates the survey's measures of cotinine last presented in 2009.⁶ To increase the sample size available for analysis the data from the 2010 and 2011 surveys have been combined, and in some tables combined data for all four years (2008-2011) are presented.

4.2.3 Definitions

The tables reported in this chapter use the following classifications of smoking status:

- Current smoking status: current smokers, ex-regular smokers, ex-occasional smokers and never smoked at all.
- Mean number of cigarettes smoked by current smokers: this is measured as per smoker per day.

4.3 TRENDS IN SMOKING PREVALENCE SINCE 1995

Self-reported smoking status rates for adults aged 16-64 from 1995 to 2011 are presented in Table 4.1 along with rates for all adults aged 16 and over since 2003. Between 1995 and 2008 smoking prevalence among adults aged 16-64 declined from 35% to 29%. The rates did not change much in 2009 and 2010 (28%) but significantly decreased in 2011 (26%) This pattern of an overall decline among 16-64 year olds with a levelling out in more recent years was evident among both men and women and across all age groups. The decline in smoking rates since 1995 coincided with a gradual increase in the proportion of 16-64 year olds reporting that they had never smoked or had never smoked regularly (49% in 1995 and 57% in 2011). There was little change in the proportion of people describing themselves as ex-regular smokers between 1995 and 2011 (17%-19%).

There was also a decline in the mean number of cigarettes smoked per day by smokers (from 16.7 cigarettes per day to 13.7) between 1995 and 2011. This reduction was more apparent among men (18.1 cigarettes per day in 1995 to 14.2 in 2011) than women (15.4 and 13.2 respectively).

The trend in smoking prevalence for all adults (aged 16 and over) since 2003 was similar to that discussed above for those aged 16-64. The proportion of all adults aged 16 and over who smoked was 28% in 2003, ranged from 25%-26% between 2008 and 2010 and was 23% in 2011. The decline between 2010 and 2011 was statistically significant. Over this same period the proportion of adults who had never smoked or had never smoked regularly increased from 50% to 55%. Among smokers, there was a significant decline in the mean number of cigarettes smoked per day between 2003 and 2011 (from 15.3 cigarettes to 13.8).

Table 4.1

4.4 SMOKING PREVALENCE IN 2011

4.4.1 Smoking prevalence, by age and sex

23% of all adults aged 16 and over reported smoking cigarettes in 2011 (24% of men and 22% of women). A similar proportion (22%) reported that they used to smoke regularly while over half (55%) had either never smoked at all or used to smoke but not regularly. This suggests that significant progress is being made on the National indicator to *reduce the percentage of adults who smoke*.^{1,17} Progress towards the indicator

is being monitored via the Scottish Household Survey which had a smoking estimate of 23.3% in 2011. While there was no significant difference between the smoking rate for men and women, women were more likely to report having never smoked or never smoked regularly (57% compared with 52%).

As noted in previous SHeS reports,^{5,7} and shown in Table 4.1 there were some notable variations in cigarette smoking status by age. Smoking prevalence was highest among those aged 25-34 (30%) and lowest among those aged 65-74 (15%) and 75 and over (8%). Rates for the remaining age groups were very similar (ranging from 25% to 26%). The overall pattern of declining prevalence in the older age groups was true for both men and women but with slightly different patterning. The pattern for men was similar to that seen for all adults – a peak in smoking rates among those aged 25-34 (34%), followed by a steady decline to 8% among those aged 75 and over. In contrast, the rates among women under the age of 65 were very similar (ranging between 25%-27%) with the drop occurring in the oldest two age groups (15% aged 65-74 and 8% aged 75 and over).

The proportion of people describing themselves as an ex-regular smoker increased with age (from 4% for 16-24 year olds to 39% for those aged 65-74 and over). This increase was coupled with a decline by age in the proportions reporting that they had never smoked or had never smoked regularly (from 70% for 16-24 year olds to 46% for those aged 65-74 before rising slightly to 53% for those aged 75 and over). Both these patterns were more pronounced for men than for women.

In 2011 the mean number of cigarettes smoked per day was significantly higher for men than for women (14.3 compared with 13.3). The number of cigarettes smoked per day was lowest among 16-24 year olds (10.6 cigarettes) and increased gradually to a peak of 16.7 cigarettes for those aged 45-64 before declining in the oldest age groups (12.6-15.3 cigarettes). The consumption patterns for male and female smokers were very similar with men aged 55-64 (18.7) and women aged 45-54 (16.3) smoking the most cigarettes per day.

Table 4.1

4.4.2 Smoking prevalence, 2011, (age-standardised), by socio-demographic group

Tables 4.2 to 4.4 present self-reported smoking behaviour by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (SIMD) for 2011 (descriptions of each of these measures are available in the Glossary at the end of this volume). To ensure that the comparisons presented in this section are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (for a description of age-standardisation please refer to the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only.

Socio-economic Classification (NS-SEC)

As was the case when these data were last analysed in 2008,⁵ in 2011 there was a significant association between NS-SEC and smoking levels for both men and women.

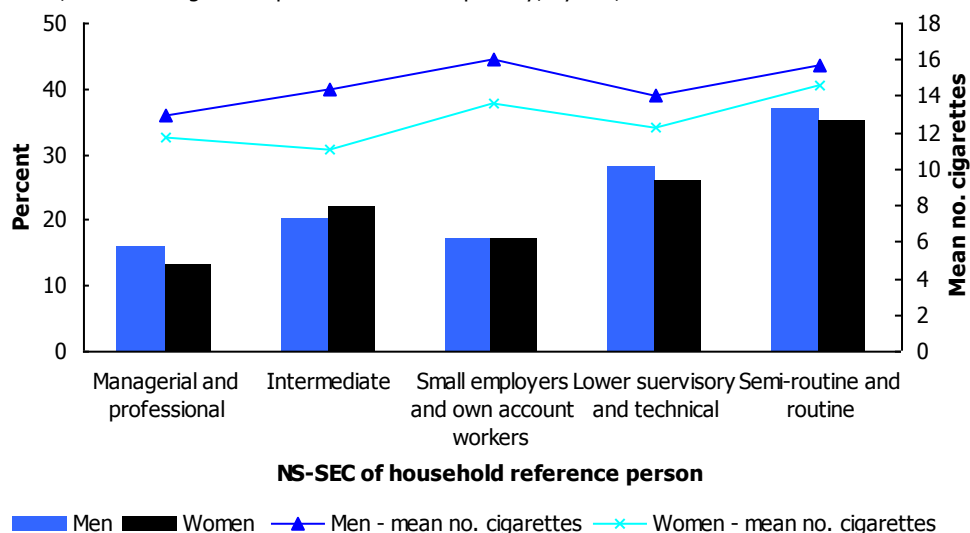
The smoking rate of those in semi-routine and routine households was more than double that of those in managerial and professional households (36% compared with 15%). Rates for the intervening groups varied from 17%-27%. This pattern by socio-economic group was similar for men and women. People living in lower-supervisory and technical and semi-routine and routine households were less likely than others to report that they had either never smoked or had never smoked regularly (49% and 42% respectively compared with 58%-64% for the other groups). The proportion of people describing themselves as an ex-regular cigarette smoker did vary a little by NS-SEC but with no obvious pattern.

Among smokers, the mean number of cigarettes smoked per day also varied by NS-SEC and followed a similar pattern to that of smoking prevalence. Those in semi-routine and routine households smoked more cigarettes per day than those in managerial and professional and intermediate households (15.1 cigarettes compared with 12.4 cigarettes). Male smokers from small employers and own account worker households and female smokers from semi-routine and routine households had the highest daily consumption of cigarettes (16.0 and 14.6 cigarettes respectively).

Figure 4A, Table 4.2

Figure 4A

Current cigarette smoking (age-standardised), by NS-SEC of household reference person, and mean cigarettes per current smoker per day, by sex, 2011



Equivalised household income

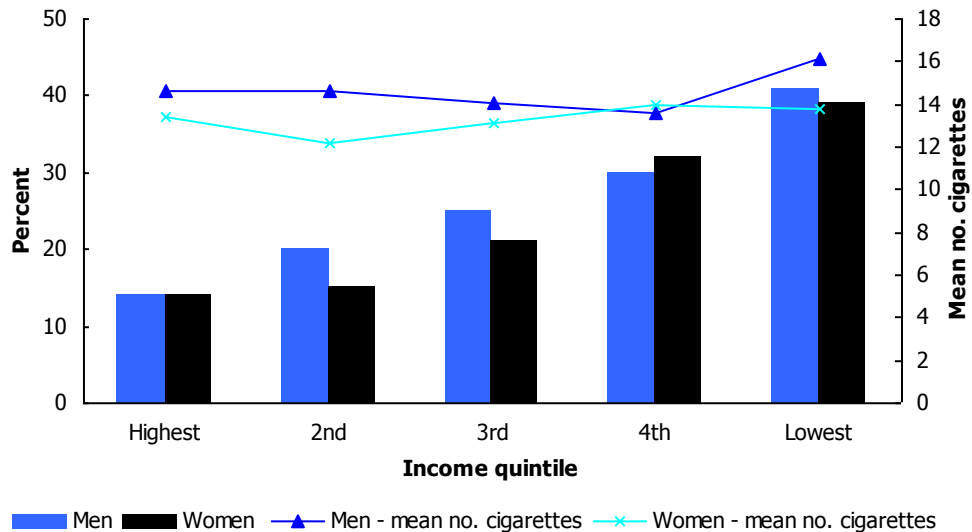
The significant association between self-reported smoking behaviour and equivalised household income is shown in Table 4.3 and Figure 4B.

For both men and women the smoking rate steadily increased in line with decreasing household income. People in the lowest household income quintile were almost three times as likely as those in the highest quintile to report that they currently smoked cigarettes (40% compared with 14%). The increase in prevalence by income coincided with a decrease in the proportions reporting that they had either never smoked or had never smoked regularly (65% in the highest income quintile compared with 41% in the lowest income group). The proportion of ex-regular smokers varied a little across income groups but with no obvious pattern. While smoking rates varied according to household income, for male and female smokers there was no significant variation in the mean number of cigarettes smoked per day across income groups.

Figure 4B, Table 4.3

Figure 4B

Current cigarette smoking (age-standardised), by equivalised income quintile, and mean cigarettes per current smoker per day, by sex, 2011



Scottish Index of Multiple Deprivation (SIMD)

Two measures of SIMD are being used throughout this report. The first, which uses quintiles, enables comparisons to be drawn between the most and least deprived 20% of areas and the intermediate quintiles. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the “85% least deprived areas”).

As noted in the 2008⁵ SHeS report and shown in Table 4.4 and Figure 4C, current smoking levels varied significantly according to area level deprivation. Four in ten adults (40%) living in the most deprived quintile were current smokers compared with just one in ten (11%) in the least deprived quintile. The pattern was slightly more pronounced for men with those living in the most deprived quintile four times as likely as those living the least deprived quintile to smoke (43% and 11% respectively). The equivalent figures for women were 38% and 11%.

Perhaps unsurprisingly, the increase in smoking prevalence as deprivation increased corresponded with a decrease in the proportion of men and women reporting that they had never smoked or had never

smoked regularly. Two-thirds (67%) of those living in the least deprived quintile reported this compared with 39% of those in the most deprived quintile. Overall, there was little variation by deprivation in the proportion of adults who were ex-regular cigarette smokers although men in the most deprived quintile were less likely to report this than men in other areas (19% compared with 24%-25%).

The mean number of cigarettes smoked per smoker per day also increased in line with deprivation (12.3 cigarettes in the least deprived quintile compared with 15.2 for those in the most deprived). This was true for both male and female smokers but with slightly different patterning for both. For women, consumption was highest among those in the most deprived quintile but was fairly constant across the other groups (14.9 compared with 12.0-13.1). For men however, the largest difference occurred between the least deprived quintile and those living elsewhere (12.5 compared with 14.0-15.4).

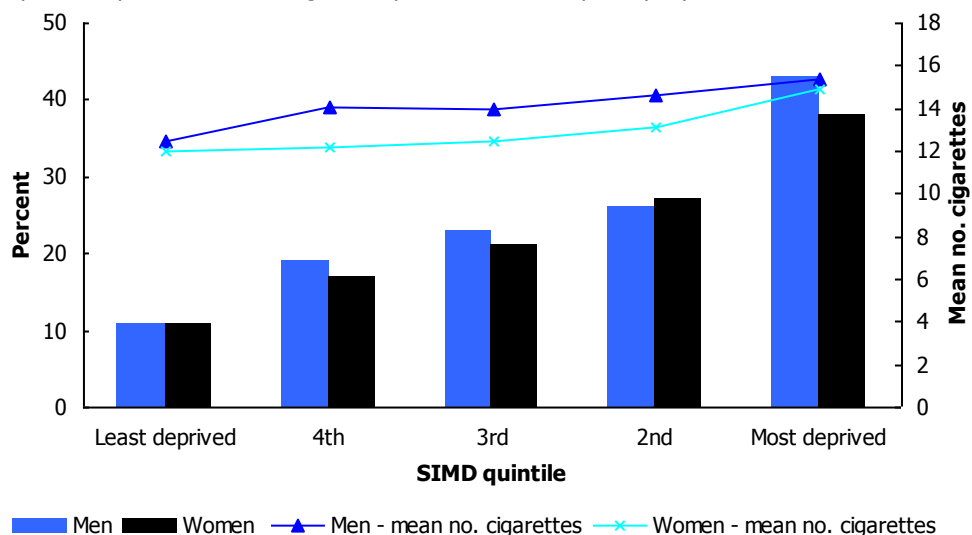
In line with the findings across the quintiles, smoking prevalence among those living in the 15% most deprived areas was more than double that for the rest of Scotland (42% compared with 20%). This difference was particularly pronounced for men (45% compared with 21%). While there was no difference in proportion of people describing themselves as ex-regular smokers, those living in the 15% most deprived areas of Scotland were much less likely than those living elsewhere to report that they had never smoked or had never smoked regularly (38% compared with 58%).

Among smokers, those living in the 15% most deprived areas smoked the most cigarettes per day. This was particularly apparent for female smokers who smoked on average 3 cigarettes more per day than those living in the remaining 85% of areas in Scotland (15.5 cigarettes compared with 12.5 cigarettes).

Figure 4C, Table 4.4

Figure 4C

Current cigarette smoking (age-standardised), by Scottish Index of Multiple Deprivation quintile, and mean cigarettes per current smoker per day, by sex, 2011



4.4.3 Cotinine-adjusted cigarette smoking status, by age and sex

The prevalence of smoking among adults before and after adjustment for saliva cotinine level is shown in Table 4.5. Note that the figures presented in this table are based on the sub-sample of participants who were eligible for a nurse visit and who provided a valid saliva sample. As the sample size is smaller than for the main survey interview, the figures presented here are based on combined data from the 2008 to 2011 surveys, so the self-reported estimates differ slightly to those in Table 4.1.

As discussed in Section 4.2.2, self-reported non-smokers with a cotinine level of 12ng/ml or above are very likely to be recent and/or regular smokers who have not disclosed their true smoking status in the main interview. The adjusted prevalence was calculated by classifying people as smokers if their cotinine level was 12ng/ml or above. However, the overall smoking prevalence for all adults eligible for the nurse visit, and for those who provided a valid cotinine sample differed as people who reported that they smoked were less likely than non-smokers to have participated in the nurse visit and/or provide a saliva sample. To analyse the adjusted smoking prevalence, the sub-sample of those with a valid saliva cotinine measurement was weighted back to the smoking profile of all adults who were eligible to take part in the nurse visit by age and sex, to correct for this bias in response.

In the 2008-2011 period, 24% of adults (24% of men and 23% of women) aged 16 and over reported being a current cigarette smoker. The adjusted rates, validated by participant cotinine levels, were 27% for all adults, 28% for men and 26% for women. This gap of three percentage points between self-reported smoking status and the adjusted smoking prevalence is consistent with findings from the 2003 and 2009 reports.^{6,18} As shown in Table 4.5, the gap between the self-reported and validated estimates were greatest for men aged 16-24 and 65 and over (6 percentage point difference) and women aged 35-44 (4 percentage point difference).

Table 4.5

4.5 EXPOSURE TO SECOND-HAND SMOKE

4.5.1 Trends in exposure to second-hand smoke since 1998 by age and sex

Since 1998, non-smokers have been asked whether they were regularly exposed to second-hand smoke in a variety of public and private settings. Previous SHeS reports^{5,6,7} have noted that exposure had fallen markedly since the introduction, in 2006, of the ban on smoking in public places. Non-smokers' self-reported exposure to smoke in a variety of contexts since 1998 is presented in Table 4.6. As the 1998 survey did not include adults aged 75 and over the below discussion of trends is based on adults aged 16-74. Figures for all adults aged 16 and over since 2003 are also presented in the table.

The proportion of non-smokers aged 16-74 who reported being exposed to second-hand smoke in any public place declined substantially from 50% in 1998 to 7% in 2008 and has remained fairly constant since then (7%-8% in the period 2009 to 2011). Over this same period there was also a significant drop in non-smokers exposure to smoke in the home (either own home or someone else's home) from 33% in 1998 to 20% in 2008. The 2009 and 2010 figures (19% and 18% respectively) were similar to the 2008 figure while there was a further small drop to 15% in 2011. The decline observed among those aged 16-74 between 2008 and 2011 was statistically significant.

These decreases in self-reported exposure to smoke were coupled with a corresponding increase in the proportion of non-smokers aged 16-74 reporting that they were not exposed to other people's smoke. In 1998 and 2003 the proportions reporting that they were not exposed to second-hand smoke in any of the places asked about were 36% and 40% respectively. This increased to 74% in 2008, 75% in 2009 and 2010 and 77% in 2011. These trends were similar for men and women.

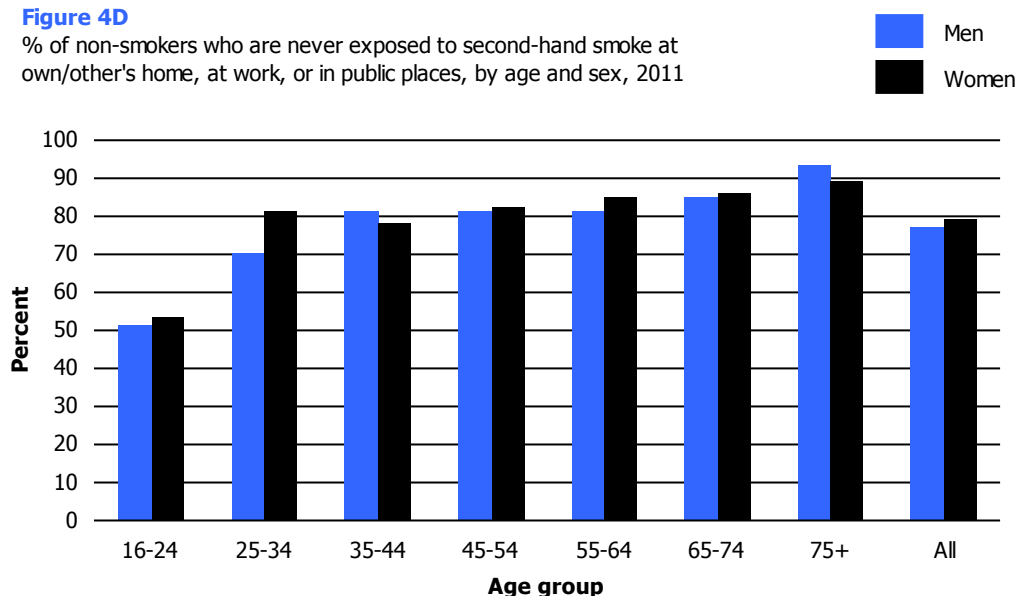
Looking at figures for all adults aged 16 and over since 2003, the biggest drops in exposure to smoke both within and outwith the home also occurred between 2003 and 2008. There was an additional significant decline in the proportion of non-smokers reporting that they were exposed to second-hand smoke in their own or someone else's home between 2010 and 2011 (from 17% to 14%).

While the decline in exposure to second-hand smoke (in both public and private contexts) occurred across non-smokers of all ages, there were still some notable age differences in reported exposure levels. In 2011 for example, the youngest non-smokers (those aged 16-24) were twice as likely as 25-74 years olds and around three times as likely as those aged 75 and over to report that they were exposed to smoke in their own or someone else's home (30%, 12-15% and 8% respectively). The same was true for exposure in any public place with 26% of those aged 16-24 reporting this compared with 2-8% for the remaining age groups.

Figure 4D, Table 4.6

Figure 4D

% of non-smokers who are never exposed to second-hand smoke at own/other's home, at work, or in public places, by age and sex, 2011



4.5.2 Trends in exposure to second-hand smoke: non-smokers' cotinine levels since 2003

The geometric mean¹⁹ cotinine levels of non-smokers in 2003, 2008/2009 and 2010/2011 are presented in Table 4.7. To be included in this analysis, self-reported non-smokers had to have a cotinine level below 12ng/ml (higher levels would suggest that these were smokers who misreported their behaviour in the interview). As the distribution of the data for non-smokers was very skewed, geometric means have been used rather than arithmetic means as these take into account extreme values (the Glossary at the end of this volume contains more details of these terms).

Non-smokers' geometric mean cotinine levels reduced significantly from 0.40ng/ml in 2003 to 0.11ng/ml in 2008/09 and remained at this level in 2010/2011. As Table 4.7 demonstrates, levels for male and female non-smokers were the same in 2010/2011 with both experiencing a decline since 2003. In 2003 the youngest age group (16-44 year olds) had significantly higher cotinine levels than older non-smokers (0.48ng/ml compared with 0.33-0.35ng/ml). The 2009 report⁶ noted that by 2008/2009 this difference across age groups had largely disappeared and by 2010/2011 there was no longer a significant difference in the mean cotinine levels by age (0.11ng/ml for all age groups). While there were some small differences by age, when the levels for male and female non-smokers when examined separately, these were not significant.

Table 4.7

4.5.3 Non-smokers' cotinine levels by Scottish Index of Multiple Deprivation (SIMD)

The geometric mean cotinine levels of non-smokers by SIMD for the 2008 to 2011 period combined is shown in Table 4.8. Area level deprivation was strongly associated with the saliva cotinine levels of non-smokers. The geometric mean cotinine level for non-smokers living

in the most deprived quintile was around three times higher than it was for those living in the least deprived quintile (0.20ng/ml compared with 0.07ng/ml). Levels for those in the intervening quintile groups ranged from 0.10ng/ml to 0.13ng/ml. This pattern was true for both male and female non-smokers but was slightly more pronounced for males (0.22ng/ml in the most deprived quintile compared with 0.07ng/ml in the least deprived quintile).

These differences were also apparent when the geometric mean cotinine level of non-smokers in the most deprived 15% of areas was compared with that for the rest of Scotland. The geometric mean cotinine levels for both male and female non-smokers living in the 15% most deprived of areas in Scotland were significantly higher than for those living elsewhere (0.25ng/ml and 0.20ng/ml for male and female non-smokers in the most deprived 15% of areas compared with 0.10ng/ml for those living in the rest of Scotland).

Table 4.8

References and notes

- ¹ *National Performance Framework: Changes to the National Indicator Set*, Edinburgh: Scottish Government, 2012. [online] Available from: www.scotland.gov.uk/About/scotPerforms/NIchanges
See also: www.scotlandperforms.com
- ² See: www.scotland.gov.uk/About/Performance/scotPerforms/indicator/mortality
- ³ See: <http://www.scotpho.org.uk/behaviour/tobacco-use/key-points>
- ⁴ See: www.scotland.gov.uk/About/Performance/scotPerforms/indicator/smoking
- ⁵ Gray, L. and Leyland, A. (2009). Chapter 4: Smoking. In Bromley, C., Bradshaw, P. and Given, L. [eds.] *The 2008 Scottish Health Survey – Volume 1: Main Report*. Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2009/09/28102003/0
- ⁶ Miller, M. (2010). Chapter 4: Smoking. In Bromley, C., Given, L. and Ormston, R. [eds.] *The 2009 Scottish Health Survey – Volume 1: Main Report*. Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2010/09/23154223/0
- ⁷ Marryat, L. (2011). Chapter 4: Smoking. In Bromley, C. and Given, L. [eds.] *The 2010 Scottish Health Survey – Volume 1: Main Report*. Edinburgh, Scottish Government. www.scotland.gov.uk/Publications/2011/09/27084018/0
- ⁸ See: www.scotland.gov.uk/News/Releases/2011/03/09095505
- ⁹ See: www.scotland.gov.uk/News/Releases/2012/01/Smoking15012012
- ¹⁰ The consultation uses the term “standardised” packaging to reflect the fact that the proposals would not in fact introduce completely plain packaging, but would instead introduce standardised formats for brand names and coloured graphic health warnings. However, plain packaging is the term that has more commonly been used in the research literature and campaign materials to date.
- ¹¹ See: http://consultations.dh.gov.uk/tobacco/standardised-packaging-of-tobacco-products/consult_view
- ¹² Page v in: Moodie, C., Stead, M., Bauld, L., McNeill, A., Angus, K. Hinds, K. Kwan, I. Thomas, J., Hastings, G. and O’Mara-Eves, A. (2012). *Plain Tobacco Packaging: A Systematic Review*. Public Health Research Consortium. Available from: http://phrc.lshtm.ac.uk/project_2011-2016_006.html
- ¹³ The 2007 *Better Health, Better Care* action plan for improving health and health care in Scotland set out how NHS Scotland’s HEAT performance management system (based around a series of targets against which the performance of its individual Boards are measured) would feed into the Government’s overarching objectives. The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
- ¹⁴ See:
www.scotland.gov.uk/About/Performance/scotPerforms/partnerstories/NHSScotlandperformance/smokingcessation
- ¹⁵ *NHSScotland HEAT Targets due for delivery in 2010/11 – Summary of performance*. (2012). NHS Scotland Performance and Business management. Available from:
www.scotland.gov.uk/About/scotPerforms/partnerstories/NHSScotlandperformance/HT201011
- ¹⁶ Analyses of data from the Health Survey for England 1996-2004 demonstrated that the optimal thresholds (in terms of maximising both sensitivity - identifying smokers - and specificity - correctly identifying non-smokers) to distinguish smokers from non-smokers varied, depending on smoking prevalence, with a gradient from 8ng/ml to 18ng/ml with increasing social disadvantage. The

optimal threshold also varied by presence (18ng/ml) or absence (5ng/ml) of smoking in the home. Overall, the best threshold for general use was 12ng/ml.

- ¹⁷ *Scotland's People - Annual report: Result from the 2011 Scottish Household Survey.* (2012) Edinburgh: Scottish Government.
Available from: www.scotland.gov.uk/Topics/Statistics/16002/Publications
- ¹⁸ MacGregor, A. and Wardle, H. Chapter 2: Smoking. In Bromley, C., Shelton, N. and Sproston, K. (Eds.) (2003). *The Scottish Health Survey 2003 – Volume 2: Adults.* Edinburgh: Scottish Executive.
- ¹⁹ Geometric means can only be calculated for positive numbers. The cases in the dataset with values of zero were therefore converted to 0.05 prior to the calculation. 0.05ng/ml is the lowest value for cotinine detectable by the tests used in the survey.

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Table 4.1 Cigarette smoking status, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Cigarette smoking status	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
Current cigarette smoker^a									
1995	35	37	29	34	34	n/a	n/a	34	n/a
1998	37	39	36	34	32	20	n/a	36	n/a
2003	32	39	34	29	24	18	15	32	29
2008	28	36	31	26	25	17	10	29	27
2009	24	34	31	27	23	16	13	28	25
2010	25	34	32	30	23	15	12	29	26
2011	26	34	28	25	22	15	8	27	24
Ex-regular cigarette smoker									
1995	6	12	17	24	33	n/a	n/a	18	n/a
1998	4	13	18	23	38	52	n/a	18	n/a
2003	3	9	17	27	37	47	55	19	24
2008	4	15	18	24	33	46	53	19	24
2009	4	14	17	20	37	45	49	19	24
2010	6	12	17	19	33	50	54	18	24
2011	2	12	18	25	29	47	50	18	23
Never regular cigarette smoker/never smoked at all									
1995	59	51	54	42	33	n/a	n/a	49	n/a
1998	59	48	46	43	30	29	n/a	46	n/a
2003	65	51	49	44	39	35	30	49	47
2008	68	49	50	50	42	36	37	51	49
2009	72	52	52	52	40	39	38	53	51
2010	68	54	51	51	44	35	33	53	50
2011	72	54	54	50	49	39	41	55	52
Mean per current smoker per day									
1995	14.2	16.8	19.0	21.0	20.9	n/a	n/a	18.1	n/a
1998	12.2	16.8	18.6	20.7	20.7	16.5	n/a	17.6	n/a
2003	10.9	14.0	17.3	18.7	20.1	17.5	13.7	15.9	15.9
2008	9.3	12.6	17.7	20.6	17.6	17.9	14.1	15.6	15.7
2009	10.6	13.3	16.0	18.6	16.7	16.9	16.0	15.2	15.4
2010	9.0	12.5	16.5	16.7	17.0	16.4	16.5	14.6	14.8
2011	11.5	11.5	13.5	17.3	18.7	16.7	12.2	14.2	14.3
SE of the mean									
1995	0.58	0.63	0.61	0.75	0.74	n/a	n/a	0.31	n/a
1998	0.43	0.49	0.60	0.78	0.97	1.61	n/a	0.29	n/a
2003	0.74	0.64	0.62	0.84	1.08	0.93	1.51	0.35	0.33
2008	1.14	0.72	0.89	1.11	0.93	1.28	1.20	0.49	0.46
2009	1.07	0.90	0.74	1.01	0.85	0.92	1.29	0.44	0.41
2010	0.95	1.02	0.74	0.76	0.84	1.29	1.98	0.46	0.43
2011	0.86	0.65	0.80	0.67	0.86	1.11	1.17	0.38	0.35

Continued...

Table 4.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Cigarette smoking status	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Women									
Current cigarette smoker^a									
1995	33	39	34	37	34	n/a	n/a	36	n/a
1998	34	36	33	34	31	25	n/a	33	n/a
2003	29	35	33	29	26	22	12	31	28
2008	30	29	29	28	23	17	11	28	25
2009	29	26	28	30	24	19	10	27	25
2010	29	28	27	28	26	18	10	28	25
2011	26	25	25	25	27	15	8	26	22
Ex-regular cigarette smoker									
1995	7	14	16	21	22	n/a	n/a	16	n/a
1998	8	12	14	20	25	30	n/a	16	n/a
2003	6	14	15	20	31	28	29	17	20
2008	7	18	18	23	29	35	34	19	22
2009	5	17	16	21	23	31	30	17	20
2010	7	15	20	21	27	29	34	19	21
2011	6	14	17	18	26	33	32	17	20
Never regular cigarette smoker/never smoked at all									
1995	61	47	50	42	44	n/a	n/a	49	n/a
1998	58	52	53	46	43	45	n/a	51	n/a
2003	66	51	52	51	43	50	59	52	53
2008	63	54	54	49	49	48	55	53	53
2009	65	57	56	49	53	50	60	56	55
2010	64	56	53	51	48	53	56	54	54
2011	68	61	58	57	47	53	60	58	57
Mean per current smoker per day									
1995	12.3	15.2	16.4	17.0	15.4	n/a	n/a	15.4	n/a
1998	11.5	14.1	16.2	17.3	16.4	12.8	n/a	15.2	n/a
2003	10.5	12.3	16.5	16.9	17.2	14.6	14.3	14.8	14.7
2008	10.8	10.8	15.1	15.5	15.3	15.1	11.6	13.6	13.7
2009	10.2	11.7	13.6	16.1	14.6	14.5	10.9	13.5	13.4
2010	10.6	11.9	12.4	15.4	15.8	13.5	9.1	13.3	13.1
2011	9.8	10.5	13.3	16.3	15.2	14.3	12.8	13.2	13.3
SE of the mean									
1995	0.51	0.40	0.48	0.47	0.51	n/a	n/a	0.21	n/a
1998	0.44	0.44	0.46	0.57	0.71	0.59	n/a	0.24	n/a
2003	0.79	0.50	0.55	0.64	0.64	0.73	1.24	0.29	0.27
2008	0.53	0.60	0.79	0.65	0.71	0.95	1.09	0.33	0.31
2009	0.77	0.77	0.52	0.54	0.67	0.88	1.02	0.30	0.27
2010	0.65	0.57	0.55	0.61	0.62	0.87	1.10	0.29	0.27
2011	0.59	0.60	0.57	0.82	0.70	0.80	1.16	0.33	0.30

Continued...

Table 4.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Cigarette smoking status	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
All adults									
Current cigarette smoker^a									
1995	34	38	32	36	34	n/a	n/a	35	n/a
1998	35	37	34	34	32	23	n/a	35	n/a
2003	30	37	34	29	25	20	13	31	28
2008	29	32	30	27	24	17	10	29	26
2009	26	30	30	29	23	18	11	28	25
2010	27	31	29	29	24	16	11	28	25
2011	26	30	26	25	25	15	8	26	23
Ex-regular cigarette smoker									
1995	6	13	16	23	27	n/a	n/a	17	n/a
1998	6	13	16	21	31	40	n/a	17	n/a
2003	4	12	16	23	34	37	38	18	22
2008	5	16	18	23	31	40	41	19	23
2009	5	16	17	21	30	37	37	18	22
2010	7	14	19	20	30	39	42	18	23
2011	4	13	18	21	27	39	39	17	22
Never regular cigarette smoker/never smoked at all									
1995	60	49	52	42	39	n/a	n/a	49	n/a
1998	58	50	50	45	37	38	n/a	48	n/a
2003	65	51	51	48	41	43	49	51	50
2008	66	51	52	50	45	43	48	52	51
2009	69	55	54	51	47	45	52	54	53
2010	66	55	52	51	46	45	47	54	52
2011	70	58	56	54	48	46	53	57	55
Mean per current smoker per day									
1995	13.3	16.0	17.6	18.8	18.0	n/a	n/a	16.7	n/a
1998	11.9	15.5	17.5	19.0	18.4	14.2	n/a	16.4	n/a
2003	10.7	13.1	16.9	17.7	18.5	15.8	14.1	15.3	15.3
2008	10.1	11.8	16.4	17.8	16.4	16.3	12.6	14.6	14.7
2009	10.3	12.6	14.8	17.2	15.6	15.5	13.1	14.3	14.4
2010	9.9	12.2	14.5	16.0	16.3	14.7	12.1	13.9	13.9
2011	10.6	11.1	13.4	16.7	16.7	15.3	12.6	13.7	13.8
SE of the mean									
1995	0.39	0.37	0.38	0.44	0.46	n/a	n/a	0.19	n/a
1998	0.31	0.33	0.39	0.49	0.60	0.72	n/a	0.19	n/a
2003	0.62	0.42	0.43	0.53	0.65	0.60	0.96	0.26	0.24
2008	0.67	0.51	0.59	0.66	0.60	0.80	0.88	0.31	0.28
2009	0.65	0.68	0.45	0.55	0.56	0.65	0.87	0.29	0.26
2010	0.60	0.63	0.49	0.49	0.53	0.78	1.14	0.28	0.26
2011	0.54	0.46	0.54	0.54	0.58	0.68	0.82	0.28	0.26

Continued...

Table 4.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Cigarette smoking status Age	Age							Total 16-64	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
<i>Bases (weighted):</i>									
Men 1995	722	979	851	749	600	n/a	n/a	3901	n/a
Men 1998	695	953	903	779	607	469	n/a	3937	n/a
Men 2003	561	601	759	666	569	405	259	3156	3819
Men 2008	444	479	563	554	480	327	218	2520	3066
Men 2009	509	565	631	648	563	386	259	2916	3560
Men 2010	478	559	584	631	542	374	253	2795	3422
Men 2011	515	581	613	653	564	389	266	2926	3581
Women 1995	692	990	870	777	665	n/a	n/a	3994	n/a
Women 1998	655	940	913	798	661	583	n/a	3966	n/a
Women 2003	553	657	808	689	601	492	467	3307	4267
Women 2008	426	487	616	586	502	382	348	2618	3348
Women 2009	496	569	693	699	590	450	408	3047	3905
Women 2010	476	557	643	679	571	432	393	2925	3750
Women 2011	492	580	671	710	593	448	413	3045	3906
All adults 1995	1413	1969	1721	1527	1265	n/a	n/a	7895	n/a
All adults 1998	1349	1893	1816	1577	1268	1052	n/a	7903	n/a
All adults 2003	1114	1258	1567	1355	1169	897	726	6463	8086
All adults 2008	870	966	1179	1140	982	709	566	5138	6413
All adults 2009	1005	1134	1324	1347	1153	836	667	5962	7465
All adults 2010	954	1116	1227	1310	1113	806	647	5720	7173
All adults 2011	1007	1161	1284	1363	1156	837	679	5971	7487
<i>Bases (unweighted):</i>									
Men 1995	474	840	811	709	689	n/a	n/a	3523	n/a
Men 1998	391	763	826	693	683	572	n/a	3356	n/a
Men 2003	326	449	730	611	633	508	325	2749	3582
Men 2008	237	316	460	534	525	453	304	2072	2829
Men 2009	259	404	548	601	575	516	362	2387	3265
Men 2010	256	420	476	566	555	489	330	2273	3092
Men 2011	299	398	516	596	600	510	344	2409	3263
Women 1995	545	1160	992	825	884	n/a	n/a	4406	n/a
Women 1998	511	971	1008	896	808	889	n/a	4194	n/a
Women 2003	392	599	882	793	776	580	492	3442	4514
Women 2008	321	451	648	628	631	513	408	2679	3600
Women 2009	374	579	778	732	735	550	479	3198	4227
Women 2010	361	566	680	760	700	574	468	3067	4109
Women 2011	350	562	710	803	737	595	486	3162	4243
All adults 1995	1019	2000	1803	1534	1573	n/a	n/a	7929	n/a
All adults 1998	902	1734	1834	1589	1491	1461	n/a	7550	n/a
All adults 2003	718	1048	1612	1404	1409	1088	817	6191	8096
All adults 2008	558	767	1108	1162	1156	966	712	4751	6429
All adults 2009	633	983	1326	1333	1310	1066	841	5585	7492
All adults 2010	617	986	1156	1326	1255	1063	798	5340	7201
All adults 2011	649	960	1226	1399	1337	1105	830	5571	7506

a Current cigarette smoker excludes those who reported only smoking cigars or pipes.

Table 4.2 Self-reported cigarette smoking status, 2011, (age-standardised), by NS-SEC of household reference person and sex

Aged 16 and over

2011

Cigarette smoking status	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
	%	%	%	%	%
Men					
Current cigarette smoker ^a	16	20	17	28	37
Ex-regular cigarette smoker	23	17	24	28	23
Never regular cigarette smoker/never smoked at all	61	63	58	45	39
Mean per current smoker per day	13.0	14.4	16.0	14.0	15.7
Standard error of the mean	0.73	1.10	1.76	0.91	0.48
Women					
Current cigarette smoker ^a	13	22	17	26	35
Ex-regular cigarette smoker	20	23	18	20	21
Never regular cigarette smoker/never smoked at all	67	54	65	55	45
Mean per current smoker per day	11.7	11.1	13.6	12.3	14.6
Standard error of the mean	0.59	0.83	1.19	0.84	0.46
All adults					
Current cigarette smoker ^a	15	21	17	27	36
Ex-regular cigarette smoker	21	21	21	24	22
Never regular cigarette smoker/never smoked at all	64	58	62	49	42
Mean per current smoker per day	12.4	12.4	14.8	13.2	15.1
Standard error of the mean	0.49	0.72	1.22	0.65	0.35
<i>Bases (weighted):</i>					
<i>Men</i>	1388	280	365	472	966
<i>Women</i>	1461	394	343	412	1175
<i>All adults</i>	2849	674	708	884	2141
<i>Bases (unweighted):</i>					
<i>Men</i>	1207	243	362	440	925
<i>Women</i>	1508	425	393	463	1323
<i>All adults</i>	2715	668	755	903	2248

a Current cigarette smoker excludes those who reported only smoking cigars or pipes.

Table 4.3 Self-reported cigarette smoking status, 2011, (age-standardised), by equivalised household income and sex

Aged 16 and over

2011

Cigarette smoking status	Equivalised annual household income quintile				
	1 st (highest)	2 nd	3 rd	4 th	5 th (lowest)
	%	%	%	%	%
Men					
Current cigarette smoker ^a	14	20	25	30	41
Ex-regular cigarette smoker	24	27	25	25	18
Never regular cigarette smoker/never smoked at all	63	52	50	46	40
Mean per current smoker per day	14.6	14.6	14.1	13.6	16.1
Standard error of the mean	1.22	1.12	0.72	0.72	0.69
Women					
Current cigarette smoker ^a	14	15	21	32	39
Ex-regular cigarette smoker	19	21	23	19	20
Never regular cigarette smoker/never smoked at all	68	64	56	49	41
Mean per current smoker per day	13.4	12.2	13.1	14.0	13.8
Standard error of the mean	1.90	1.02	0.82	0.62	0.59
All adults					
Current cigarette smoker ^a	14	18	23	31	40
Ex-regular cigarette smoker	21	24	24	22	19
Never regular cigarette smoker/never smoked at all	65	58	53	48	41
Mean per current smoker per day	14.0	13.6	13.6	13.8	14.8
Standard error of the mean	1.14	0.87	0.57	0.49	0.50
<i>Bases (weighted):</i>					
<i>Men</i>	810	685	569	489	450
<i>Women</i>	751	709	625	612	528
<i>All adults</i>	1561	1393	1194	1101	978
<i>Bases (unweighted):</i>					
<i>Men</i>	705	604	541	486	433
<i>Women</i>	779	761	696	700	605
<i>All adults</i>	1484	1365	1237	1186	1038

a Current cigarette smoker excludes those who reported only smoking cigars or pipes.

Table 4.4 Self-reported cigarette smoking status, 2011, (age-standardised), by Scottish Index of Multiple Deprivation and sex

Aged 16 and over

2011

Cigarette smoking status	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Current cigarette smoker ^a	11	19	23	26	43	21	45
Ex-regular cigarette smoker	24	24	25	24	19	24	18
Never regular cigarette smoker/never smoked at all	65	57	52	50	38	55	37
Mean per current smoker per day	12.5	14.1	14.0	14.6	15.4	14.3	15.3
Standard error of the mean	1.13	0.97	0.76	0.79	0.58	0.41	0.63
Women							
Current cigarette smoker ^a	11	17	21	27	38	20	39
Ex-regular cigarette smoker	20	19	21	19	21	20	21
Never regular cigarette smoker/never smoked at all	69	65	59	54	41	61	40
Mean per current smoker per day	12.0	12.2	12.5	13.1	14.9	12.5	15.5
Standard error of the mean	0.91	1.10	0.59	0.43	0.54	0.32	0.63
All Adults							
Current cigarette smoker ^a	11	18	22	27	40	20	42
Ex-regular cigarette smoker	22	22	23	21	20	22	20
Never regular cigarette smoker/never smoked at all	67	61	56	52	39	58	38
Mean per current smoker per day	12.3	13.2	13.2	13.8	15.2	13.4	15.4
Standard error of the mean	0.82	0.83	0.51	0.46	0.42	0.28	0.47
<i>Bases (weighted):</i>							
<i>Men</i>	685	778	766	625	730	3035	547
<i>Women</i>	721	818	862	733	773	3326	581
<i>All adults</i>	1406	1595	1628	1357	1503	6361	1128
<i>Bases (unweighted):</i>							
<i>Men</i>	566	753	750	550	644	2768	495
<i>Women</i>	731	945	981	767	819	3612	631
<i>All adults</i>	1297	1698	1731	1317	1463	6380	1126

a Current cigarette smoker excludes those who reported only smoking cigars or pipes.

Table 4.5 Smoking prevalence estimates without and with saliva cotinine adjustment, 2008-2011 combined, by age and sex

Aged 16 and over with valid saliva cotinine measurement

2008-2011 combined

Smoking status	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Unadjusted self report: smoke cigarettes	27	33	27	28	23	14	9	24
Adjusted estimate, adding self reported non-smokers with saliva cotinine of 12ng/ml or over	33	35	29	30	27	20	15	28
Difference ^a	6	2	2	2	4	6	6	4
Women								
Unadjusted self report: smoke cigarettes	28	24	27	28	23	17	9	23
Adjusted estimate, adding self reported non-smokers with saliva cotinine of 12ng/ml or over	31	27	31	30	25	19	10	26
Difference ^a	3	3	4	2	2	2	1	3
All adults								
Unadjusted self report: smoke cigarettes	28	28	27	28	23	16	9	24
Adjusted estimate, adding self reported non-smokers with saliva cotinine of 12ng/ml or over	32	31	30	30	26	20	12	27
Difference ^a	4	3	3	2	3	4	3	3
<i>Bases (weighted):</i>								
<i>Men</i>	249	265	388	389	339	228	136	1994
<i>Women</i>	247	279	389	431	357	240	190	2133
<i>All adults</i>	496	544	777	820	696	469	325	4127
<i>Bases (unweighted):</i>								
<i>Men</i>	121	176	284	312	325	276	164	1658
<i>Women</i>	167	256	369	413	388	291	204	2088
<i>All adults</i>	288	432	653	725	713	567	368	3746

a Because of rounding, the actual differences shown may be different from the apparent difference between the two percentages.

Table 4.6 Non-smokers' exposure to second-hand smoke, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex^a

Non-smokers aged 16 and over

1998, 2003, 2008, 2009, 2010, 2011

Exposure to second-hand smoke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
Men									
In own home									
1998	33	16	15	16	16	13	n/a	18	n/a
2003	28	13	11	12	15	10	6	15	14
2008	25	5	6	11	10	6	6	10	10
2009	20	7	6	6	9	10	3	9	9
2010	19	6	4	6	11	6	3	9	8
2011	15	7	3	6	10	8	5	8	8
In other people's home									
1998	38	26	21	16	13	11	n/a	21	n/a
2003	28	19	18	12	11	8	4	16	15
2008	28	11	12	7	7	4	2	12	11
2009	18	17	10	8	5	4	2	10	9
2010	23	14	9	7	7	5	2	11	10
2011	22	13	7	7	6	4	1	10	9
On public transport									
1998	19	5	6	4	3	4	n/a	7	n/a
2003	12	7	4	5	3	4	1	6	6
2008	3	-	1	0	0	0	-	1	1
2009	1	1	-	1	-	-	-	1	0
2010	2	0	-	0	-	-	-	0	0
2011	1	-	-	0	-	-	0	0	0
In pubs									
1998	61	57	48	41	29	19	n/a	44	n/a
2003	55	55	40	43	32	24	11	42	39
2008	2	1	1	0	1	-	-	1	1
2009	3	2	1	1	0	-	-	1	1
2010	2	1	1	1	-	0	-	1	1
2011	3	1	1	1	-	0	-	1	1
In other public places									
1998	38	24	25	21	18	22	n/a	25	n/a
2003	39	23	23	21	27	22	16	26	25
2008	18	6	5	3	5	2	2	6	6
2009	13	7	3	3	4	4	1	5	5
2010	24	7	3	3	3	2	1	7	6
2011	25	9	5	3	3	3	1	8	7
At work									
1998	26	30	29	24	17	1	n/a	23	n/a
2003	19	21	20	20	10	3	1	16	15
2008	7	9	7	6	4	1	-	6	5
2009	9	8	6	8	2	1	0	6	5
2010	8	8	8	5	5	-	-	6	5
2011	5	8	7	6	4	1	0	5	5

Continued...

Table 4.6 - Continued

Non-smokers aged 16 and over

1998, 2003, 2008, 2009, 2010, 2011

Exposure to second-hand smoke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
In own or other's home									
1998	52	34	29	25	24	22	n/a	31	n/a
2003	44	28	23	20	21	15	10	24	24
2008	40	14	17	16	14	9	8	19	18
2009	33	21	17	13	13	13	5	18	17
2010	34	18	12	12	16	10	5	17	16
2011	33	17	9	12	14	12	5	16	15
In any public place^d									
1998	79	63	55	50	40	35	n/a	55	n/a
2003	72	62	45	50	45	36	24	52	49
2008	20	8	6	3	5	2	2	7	7
2009	16	8	4	4	4	4	1	7	6
2010	25	8	4	3	3	3	1	7	7
2011	27	10	6	4	3	3	1	8	8
Not exposed to smoke in these places^c									
1998	13	22	32	36	46	54	n/a	33	n/a
2003	16	28	40	37	44	56	68	37	39
2008	46	73	75	79	80	88	89	73	75
2009	55	71	77	79	81	82	93	74	76
2010	48	71	79	82	80	88	94	75	76
2011	51	70	81	81	81	85	93	75	77
Women									
In own home									
1998	34	14	14	18	21	13	n/a	18	n/a
2003	25	9	11	12	14	10	8	13	13
2008	20	10	7	9	9	5	6	10	9
2009	18	7	7	7	8	5	6	8	8
2010	19	3	5	8	8	8	5	8	8
2011	10	5	5	5	6	8	7	6	6
In other people's home									
1998	33	30	25	23	20	14	n/a	25	n/a
2003	41	23	20	18	14	10	7	21	19
2008	29	15	10	13	11	4	4	13	12
2009	29	15	11	14	7	6	3	13	12
2010	34	18	9	12	8	7	3	14	12
2011	21	9	10	8	7	5	4	10	9
On public transport									
1998	21	8	7	6	5	4	n/a	8	n/a
2003	15	6	5	5	4	3	2	6	5
2008	2	1	0	-	0	-	0	0	0
2009	2	0	1	0	0	0	0	1	1
2010	2	0	0	0	0	0	-	0	0
2011	2	1	0	0	0	0	0	0	0

Continued...

Table 4.6 - Continued

Non-smokers aged 16 and over

1998, 2003, 2008, 2009, 2010, 2011

Exposure to second-hand smoke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
In pubs									
1998	66	41	31	23	14	5	n/a	30	n/a
2003	60	46	29	34	14	11	2	32	28
2008	3	-	0	-	-	-	-	0	0
2009	5	1	-	-	-	-	-	1	1
2010	2	0	-	-	-	-	-	0	0
2011	3	0	-	0	0	-	-	1	0
In other public places									
1998	49	27	27	26	24	19	n/a	28	n/a
2003	48	26	23	26	22	25	16	28	26
2008	20	6	4	4	3	1	2	6	5
2009	18	7	4	3	3	3	1	6	5
2010	19	9	6	5	3	3	1	7	6
2011	22	7	6	5	4	4	1	7	7
At work									
1998	24	17	17	15	6	1	n/a	14	n/a
2003	19	10	9	9	6	1	-	9	8
2008	4	3	3	4	1	0	-	2	2
2009	5	4	3	4	2	-	-	3	3
2010	4	3	2	3	3	-	-	2	2
2011	6	2	2	3	1	-	-	3	2
In own or other's home									
1998	54	37	32	33	35	24	n/a	35	n/a
2003	52	28	27	25	23	18	14	29	27
2008	40	23	16	21	17	9	9	21	19
2009	38	20	16	18	14	11	9	19	18
2010	42	20	13	18	14	13	8	19	18
2011	26	13	15	12	12	11	10	14	14
In any public place^b									
1998	81	52	44	40	34	24	n/a	46	n/a
2003	77	54	40	45	30	29	18	46	42
2008	23	6	4	4	3	1	2	6	6
2009	20	8	5	3	3	3	2	7	6
2010	20	10	6	5	3	3	1	8	7
2011	25	7	6	5	4	4	2	8	7
Not exposed to smoke in these places^c									
1998	10	34	41	41	46	62	n/a	39	n/a
2003	13	35	48	44	55	58	72	43	47
2008	49	73	79	75	80	90	89	75	77
2009	50	73	78	76	82	87	90	75	77
2010	50	70	81	77	81	84	91	75	77
2011	53	81	78	82	85	86	89	78	79

Continued...

Table 4.6 - Continued

Non-smokers aged 16 and over

1998, 2003, 2008, 2009, 2010, 2011

Exposure to second-hand smoke	Age							Total 16+	
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
All adults									
In own or other's home									
1998	53	35	30	29	30	23	n/a	33	n/a
2003	49	28	25	23	22	17	13	27	25
2008	40	19	16	19	16	9	8	20	18
2009	35	20	17	16	14	12	7	19	17
2010	38	19	13	15	15	12	7	18	17
2011	30	15	12	12	13	12	8	15	14
In any public place^b									
1998	80	57	49	45	37	29	n/a	50	n/a
2003	75	58	43	48	38	32	20	48	45
2008	21	7	5	4	4	2	2	7	6
2009	18	8	4	4	4	3	1	7	6
2010	23	9	5	4	3	3	1	7	7
2011	26	8	6	4	4	3	2	8	8
Not exposed to smoke in these places^c									
1998	12	28	37	39	46	58	n/a	36	n/a
2003	14	32	44	40	50	57	71	40	43
2008	47	73	77	77	80	89	89	74	76
2009	52	72	78	77	81	85	91	75	76
2010	49	71	80	79	80	86	92	75	77
2011	52	76	80	81	83	85	91	77	78
<i>Bases (weighted):</i>									
<i>Men 1998</i>	<i>430</i>	<i>579</i>	<i>579</i>	<i>517</i>	<i>414</i>	<i>377</i>	<i>n/a</i>	<i>2897</i>	<i>n/a</i>
<i>Men 2003</i>	<i>377</i>	<i>366</i>	<i>496</i>	<i>471</i>	<i>433</i>	<i>332</i>	<i>219</i>	<i>2476</i>	<i>2695</i>
<i>Men 2008</i>	<i>309</i>	<i>295</i>	<i>369</i>	<i>383</i>	<i>340</i>	<i>254</i>	<i>186</i>	<i>1950</i>	<i>2137</i>
<i>Men 2009</i>	<i>389</i>	<i>376</i>	<i>436</i>	<i>471</i>	<i>434</i>	<i>324</i>	<i>226</i>	<i>2429</i>	<i>2655</i>
<i>Men 2010</i>	<i>357</i>	<i>367</i>	<i>399</i>	<i>442</i>	<i>418</i>	<i>319</i>	<i>222</i>	<i>2302</i>	<i>2524</i>
<i>Men 2011</i>	<i>383</i>	<i>382</i>	<i>439</i>	<i>490</i>	<i>439</i>	<i>331</i>	<i>243</i>	<i>2464</i>	<i>2707</i>
<i>Women 1998</i>	<i>435</i>	<i>606</i>	<i>616</i>	<i>528</i>	<i>454</i>	<i>438</i>	<i>n/a</i>	<i>3077</i>	<i>n/a</i>
<i>Women 2003</i>	<i>395</i>	<i>424</i>	<i>543</i>	<i>490</i>	<i>442</i>	<i>383</i>	<i>410</i>	<i>2677</i>	<i>3088</i>
<i>Women 2008</i>	<i>293</i>	<i>347</i>	<i>436</i>	<i>421</i>	<i>384</i>	<i>315</i>	<i>311</i>	<i>2197</i>	<i>2508</i>
<i>Women 2009</i>	<i>349</i>	<i>423</i>	<i>497</i>	<i>489</i>	<i>449</i>	<i>366</i>	<i>367</i>	<i>2574</i>	<i>2941</i>
<i>Women 2010</i>	<i>337</i>	<i>399</i>	<i>470</i>	<i>490</i>	<i>423</i>	<i>355</i>	<i>353</i>	<i>2474</i>	<i>2826</i>
<i>Women 2011</i>	<i>363</i>	<i>433</i>	<i>506</i>	<i>532</i>	<i>433</i>	<i>382</i>	<i>381</i>	<i>2648</i>	<i>3029</i>
<i>All adults 1998</i>	<i>865</i>	<i>1185</i>	<i>1196</i>	<i>1046</i>	<i>867</i>	<i>814</i>	<i>n/a</i>	<i>5973</i>	<i>n/a</i>
<i>All adults 2003</i>	<i>772</i>	<i>790</i>	<i>1039</i>	<i>962</i>	<i>875</i>	<i>715</i>	<i>630</i>	<i>5153</i>	<i>5783</i>
<i>All adults 2008</i>	<i>602</i>	<i>643</i>	<i>805</i>	<i>805</i>	<i>724</i>	<i>569</i>	<i>498</i>	<i>4147</i>	<i>4645</i>
<i>All adults 2009</i>	<i>738</i>	<i>798</i>	<i>933</i>	<i>960</i>	<i>883</i>	<i>689</i>	<i>593</i>	<i>5003</i>	<i>5596</i>
<i>All adults 2010</i>	<i>694</i>	<i>766</i>	<i>869</i>	<i>932</i>	<i>841</i>	<i>675</i>	<i>575</i>	<i>4776</i>	<i>5350</i>
<i>All adults 2011</i>	<i>746</i>	<i>815</i>	<i>945</i>	<i>1021</i>	<i>872</i>	<i>713</i>	<i>624</i>	<i>5111</i>	<i>5736</i>

Continued...

Table 4.6 - Continued

Non-smokers aged 16 and over

1998, 2003, 2008, 2009, 2010, 2011

Exposure to second-hand smoke	Age							Total 16-74	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
<i>Bases (unweighted):</i>									
Men 1998	235	454	525	443	448	447	n/a	2552	n/a
Men 2003	217	268	475	435	486	418	277	2299	2576
Men 2008	162	190	309	370	381	359	260	1771	2031
Men 2009	188	274	380	435	443	426	320	2146	2466
Men 2010	182	269	317	392	419	412	290	1991	2281
Men 2011	203	262	368	441	461	431	316	2166	2482
Women 1998	296	593	657	569	542	663	n/a	3321	n/a
Women 2003	269	374	604	565	577	461	434	2850	3284
Women 2008	211	312	464	450	490	426	371	2353	2724
Women 2009	256	424	564	512	557	451	435	2764	3199
Women 2010	245	391	495	545	517	474	422	2667	3089
Women 2011	245	412	529	605	546	507	448	2844	3292
All adults 1998	531	1047	1182	1012	990	1110	n/a	5872	n/a
All adults 2003	486	642	1079	1000	1063	879	711	5149	5860
All adults 2008	373	502	773	820	871	785	631	4130	4761
All adults 2009	444	698	944	947	1000	877	755	4910	5665
All adults 2010	427	660	812	937	936	886	712	4658	5370
All adults 2011	448	674	897	1046	1007	938	764	5010	5774

a Percentages add to more than 100% as the categories are not mutually exclusive.

b Any public place defined as on public transport, in pubs, or other public places.

c In own home, other people's homes, on public transport, in pubs, work, or other public places.

Table 4.7 Saliva cotinine levels among self-reported cotinine validated non-smokers, 2003, 2008/2009 combined, 2010/2011 combined, by age and sex

Self-reported non smokers aged 16 and over with valid saliva cotinine measurement^a

2003, 2008/2009 combined, 2010/2011 combined

Saliva cotinine level (ng/ml)	Age			Total
	16-44	45-64	65+	
Men				
2003				
Geometric mean saliva cotinine ^b	0.53	0.38	0.35	0.44
Confidence Intervals	(0.46-0.60)	(0.33-0.42)	(0.30-0.41)	(0.40-0.47)
2008/2009				
Geometric mean saliva cotinine ^b	0.12	0.11	0.11	0.11
Confidence Intervals	(0.10-0.15)	(0.09-0.13)	(0.09-0.13)	(0.10-0.13)
2010/2011				
Geometric mean saliva cotinine ^b	0.12	0.12	0.09	0.11
Confidence Intervals	(0.09-0.14)	(0.10-0.14)	(0.08-0.11)	(0.10-0.13)
Women				
2003				
Geometric mean saliva cotinine ^b	0.44	0.33	0.32	0.37
Confidence Intervals	(0.38-0.49)	(0.30-0.37)	(0.27-0.37)	(0.34-0.40)
2008/2009				
Geometric mean saliva cotinine ^b	0.12	0.09	0.09	0.10
Confidence Intervals	(0.10-0.14)	(0.08-0.11)	(0.08-0.11)	(0.09-0.11)
2010/2011				
Geometric mean saliva cotinine ^b	0.11	0.10	0.12	0.11
Confidence Intervals	(0.09-0.13)	(0.09-0.11)	(0.10-0.14)	(0.10-0.12)
All adults				
2003				
Geometric mean saliva cotinine ^b	0.48	0.35	0.33	0.40
Confidence Intervals	(0.44-0.53)	(0.32-0.39)	(0.30-0.37)	(0.38-0.43)
2008/2009				
Geometric mean saliva cotinine ^b	0.12	0.10	0.10	0.11
Confidence Intervals	(0.10-0.14)	(0.09-0.11)	(0.09-0.11)	(0.10-0.12)
2010/2011				
Geometric mean saliva cotinine ^b	0.11	0.11	0.11	0.11
Confidence Intervals	(0.10-0.13)	(0.09-0.12)	(0.09-0.12)	(0.10-0.12)

Continued...

Table 4.7 - Continued

Self-reported non smokers aged 16 and over with
valid saliva cotinine measurement^a

2003, 2008/2009 combined, 2010/2011 combined

Saliva cotinine level (ng/ml)	Age			Total
	16-44	45-64	65+	
<i>Bases (weighted):</i>				
Men 2003	716	508	288	1513
Men 2008/2009	335	240	142	717
Men 2010/2011	293	223	126	642
Women 2003	710	499	374	1583
Women 2008/2009	305	258	182	745
Women 2010/2011	295	237	168	700
All adults 2003	1426	1007	662	3096
All adults 2008/2009	640	498	324	1462
All adults 2010/2011	587	461	294	1342
<i>Bases (unweighted):</i>				
Men 2003	515	552	405	1472
Men 2008/2009	214	248	206	668
Men 2010/2011	192	238	168	598
Women 2003	631	682	433	1746
Women 2008/2009	280	314	231	825
Women 2010/2011	265	304	212	781
All adults 2003	1146	1234	838	3218
All adults 2008/2009	494	562	437	1493
All adults 2010/2011	457	542	380	1379

a To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine level lower than 12ng/ml.

b Geometric means have been presented for non-smokers as their cotinine data have a very skewed and exponential distribution. A geometric mean is an average calculated by multiplying the values of the cases in the sample and taking the nth root, where n is the number of cases. As 95% confidence intervals for geometric means are more complicated to calculate than for arithmetic means, these have been presented around the estimates rather than standard errors.

Table 4.8 Saliva cotinine levels among self-reported cotinine validated non-smokers, 2008-2011 combined, (age-standardised), by Scottish Index of Multiple Deprivation and sex

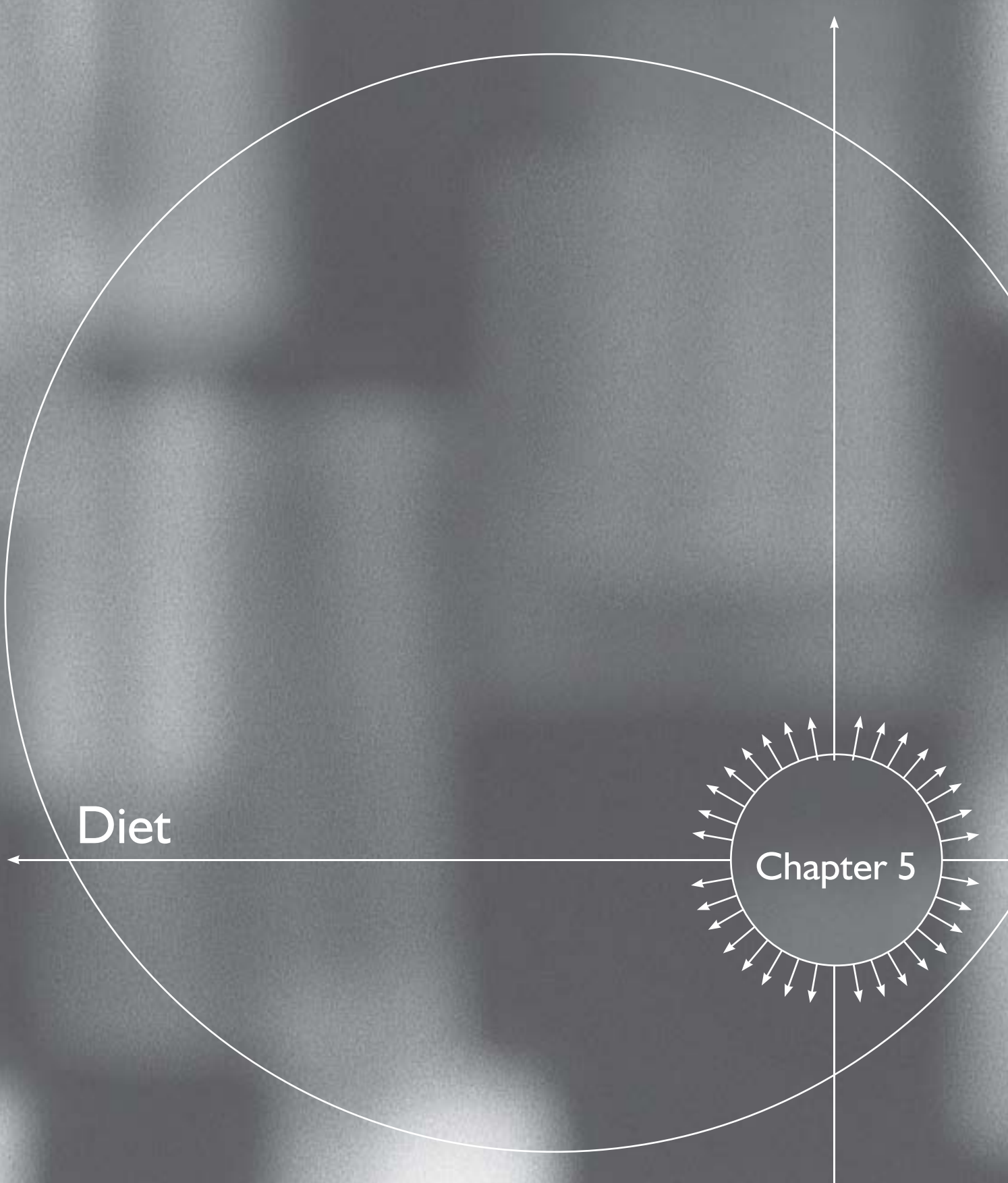
Self-reported non smokers aged 16 and over with valid saliva cotinine measurement^a

2008-2011 combined

Saliva cotinine level (ng/ml)	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
Men							
Geometric mean saliva cotinine ^b	0.07	0.10	0.11	0.14	0.22	0.10	0.25
Confidence Intervals	(0.07-0.08)	(0.09-0.12)	(0.09-0.13)	(0.12-0.18)	(0.15-0.31)	(0.10-0.11)	(0.16-0.39)
Women							
Geometric mean saliva cotinine ^b	0.08	0.09	0.11	0.12	0.19	0.10	0.20
Confidence Intervals	(0.07-0.08)	(0.08-0.10)	(0.09-0.12)	(0.10-0.14)	(0.15-0.24)	(0.09-0.10)	(0.15-0.26)
All adults							
Geometric mean saliva cotinine ^b	0.07	0.10	0.11	0.13	0.20	0.10	0.22
Confidence Intervals	(0.07-0.08)	(0.09-0.11)	(0.10-0.12)	(0.11-0.15)	(0.16-0.25)	(0.09-0.11)	(0.17-0.29)
<i>Bases (weighted):</i>							
<i>Men</i>	327	343	270	236	181	1228	130
<i>Women</i>	374	335	286	247	204	1291	154
<i>All adults</i>	701	679	556	483	385	2520	284
<i>Bases (unweighted):</i>							
<i>Men</i>	311	328	256	212	159	1160	106
<i>Women</i>	422	395	314	263	212	1448	158
<i>All adults</i>	733	723	570	475	371	2608	264

a To be included within this category, participants had to be both self-reported non-smokers and have a saliva cotinine level lower than 12ng/ml.

b Geometric means have been presented for non-smokers as their cotinine data have a very skewed and exponential distribution. See Table 4.7 footnote b for a description of geometric means.



Diet

Chapter 5

5 DIET

Rachel Whalley

SUMMARY

- In 2011, the mean number of portions of fruit and vegetables consumed per day by adults was 3.2. Mean daily consumption was significantly higher for women (3.3) than for men (3.1).
- One in five (22%) adults met the recommended daily intake of five or more portions of fruit and vegetables (20% of men and 23% of women). The proportion of adults meeting the recommendation has not changed significantly over time.
- Adults aged 16-24 consumed the fewest portions per day (2.6 portions) and were also the age group least likely to consume five or more portions a day (15%). 17% of 16-24 year olds did not consume any fruit and vegetables in the 24 hours prior to interview.
- Men had higher mean urinary sodium (119.4mmol/l) and potassium levels (65.3 mmol/l) than women in 2008-2011 (mean levels for women were 95.0 mmol/l and 58.1 mmol/l respectively).
- Urinary sodium levels decreased by age for both men and women. The mean level for those aged 16-44 was 122.0 mmol/l compared with a mean of 87.2 mmol/l for those aged 65 and over. Urinary potassium levels were also highest in the youngest age group (64.5 mmol/l).
- Between 2003 and 2008-2011 there was a significant decline in both the mean sodium level for adults (from 116.1 mmol/l to 106.9 mmol/l) and the mean creatinine level (from 12.2 mmol/l to 10.5 mmol/l). Urinary potassium levels remained unchanged over this same period.
- Over a quarter (27%) of women and a fifth (20%) of men took some type of vitamin or mineral supplement in 2008-2011. Consumption was lowest among those aged 16-24 (13%) and highest among those aged 65-74 (36%).
- The proportion of adults taking a dietary vitamin or mineral supplement was slightly lower in 2008-2011 than in 2003 (24% and 26% respectively).
- There was a significant association between supplement consumption and SIMD in 2008-2011. Consumption tended to decline as deprivation level increased with 28% of those living in the least deprived quintile taking a vitamin or mineral supplement compared with 17% of those living in the most deprived quintile.

5.1 INTRODUCTION

This chapter covers three areas related to dietary habits: self-reported fruit and vegetable consumption, direct measurement of sodium and potassium levels via urine samples vitamin supplement use. The dietary supplement and urine sample results have not been reported since the 2003 Scottish Health Survey (SHeS) report.^{1,2}

Scotland's unhealthy diet is widely cited as a factor in its poor health record. In particular, low consumption of fruit and vegetables is a risk factor for cardiovascular disease, cancer, hypertension, type 2 diabetes and obesity, while excess salt consumption has been linked to hypertension.

The World Health Organisation (WHO) recommends adults eat at least five varied portions – where a portion is defined as 80g – of fruit and vegetables a day. Detailed information about fruit and vegetable consumption (designed to measure adherence to the ‘5 a day’ recommendation) was first collected in the 2003 survey, and has been included every year since 2008.

Significant efforts have been taken in recent years to encourage the public to consume less salt, and industry to use less salt in food production (the majority of dietary sodium intake is derived from processed foods rather than its direct addition to food at the table). Sodium is a vital constituent of the body and thus an essential nutrient.¹ However, the relationship between salt intake and health, in particular cardiovascular disease, is well-established. Scientific evidence suggests that a high salt intake contributes to the development of high blood pressure and the Scientific Advisory Committee on Nutrition (SACN) concluded that reducing the average salt intake of the population is likely to decrease the burden of high blood pressure and improve public health.^{1,2,3} The Scottish Diet Action Plan,⁴ the Scottish Dietary Targets,⁵ and the 2008 action plan to combat obesity - *Healthy Eating, Active Living*⁶ - all share a common commitment to reduce population-level salt intake to no more than 6g per day (2.4g or 100mmol of sodium).⁷ The two most recent estimates for adults aged 19-64 in Scotland, based on follow-up studies of SHeS participants, showed that levels of salt intake were similar in 2006 (9.0g) and 2009 (8.8g), and were in excess of the recommended 6g.^{8,9} SHeS has collected urine samples to assess levels of salt intake (urinary sodium), potassium and creatinine since 2003.

While most people should be able to obtain all the nutrients required to maintain good health from a balanced diet, NHS Scotland recommends that additional vitamin and mineral supplements are necessary for adults in certain circumstances.¹⁰ These are: folic acid for women trying to conceive and in the first 12 weeks of pregnancy; vitamin D for all pregnant and breastfeeding women, people aged 65 and over, people with darker skins, and those who may not be exposed to much sunlight (e.g. housebound people). In addition, people with restricted diets and certain medical conditions may be advised by a clinician to take additional supplements. Following concern about possible vitamin D deficiency in the population, the UK’s four Chief Medical Officers reissued their guidance about vitamin D supplementation to remind health professionals about the recommendations outlined above.¹¹ Information about overall dietary supplement use was collected in the nurse visits in the 2003 and 2008-2011 surveys.

The equivalent dietary chapters in the 2008, 2009 and 2010 SHeS reports,^{12,13,14} provided overviews of the broader dietary policy context from the mid 1990s onwards, some of which has been mentioned above. They outlined a number of actions taken by the Government and NHS Scotland to improve diets in Scotland, including initiatives designed to encourage more fruit and vegetable consumption, in line with the recommendation to eat at least five portions of fruit and vegetables a day, and as already mentioned, to reduce salt consumption. These included:

- The Scottish Diet Action Plan,⁴ which outlined the Scottish Dietary Targets.⁵
- The White Paper *Towards a Healthier Scotland*.¹⁵
- The Scottish Executive's *Improving Health in Scotland – the Challenge* paper.¹⁶
- The Hungry for Success initiative.¹⁷
- A framework for implementing the Diet Action Plan: *Eating for health meeting the challenge*.¹⁸
- The Scottish Government's *Better Health, Better Care Action Plan*.¹⁹
- *Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity (2008-2011)*.⁶
- The Scottish Government's Obesity Route Map,²⁰ and associated *Obesity Route Map Action Plan*.²¹

Between 2008 and 2011 only a sub-sample of participants were invited to have an additional nurse interview. For this reason the analysis of urinary sodium and potassium, and of vitamin / mineral supplement use, presented here is based on either two or four years of nurse data combined. From 2012 the survey is no longer including a nurse visit and instead a sub-sample of adults will be asked to complete a new biological module, conducted by specially trained interviewers. Spot urine samples are part of this new module so the trends over time will be maintained. Questions about vitamin supplement have also been retained (as part of the main interview).

This chapter updates the trends in fruit and vegetable consumption among adults since 2003. Urinary sodium and potassium levels in 2003 are compared with the more recent figures for 2008-2011 combined. Consumption of vitamin or mineral supplements in 2003 is also compared with the 2008-2011 period, and the most recent figures are also presented by the Scottish Index of Multiple Deprivation (SIMD).

5.2 METHODOLOGY

5.2.1 Measures of eating habits

Two different modules of questions were used to assess eating habits. One of these assessed fruit and vegetable consumption, and was designed with the aim of providing sufficient detail to monitor the '5-a-day' policy effectively. This module was asked of all adults and children aged 2 and over every year between 2008 and 2011. The second module was asked of all children every year, and a sub-sample of adults in 2008 and 2010. It used a modified version of the Dietary Instrument of Nutrition Education (DINE) questionnaire developed by the Imperial Cancer Research Fund's General Practice Research Group to assess participants' usual intake of a wide range of nutrients, including protein, starch, fat and fibre.²² This chapter only reports the findings from the fruit and vegetable module for adults.

To determine the total number of portions that had been consumed in the 24 hours preceding the interview, the fruit and vegetable module

asked about the following food types: vegetables (fresh, frozen or canned); salads; pulses; vegetables in composites (e.g. vegetable chilli); fruit (fresh, frozen or canned); dried fruit; and fruit in composites (e.g. apple pie). A portion was defined as the conventional 80g of a fruit or vegetable. As 80g is difficult to visualise, a 'portion' was described using more everyday terms, such as tablespoons, cereal bowls and slices. Examples were given in the questionnaire to aid the recall process, for instance, tablespoons of vegetables, cereal bowls full of salad, pieces of medium sized fruit (e.g. apples) or handfuls of small fruits (e.g. raspberries). In spite of this, there may be some variation between participants' interpretation of 'a portion'. These everyday measures were converted back to 80g portions prior to analysis. The following table shows the definitions of the portion sizes used for each food item included in the survey:

Food item	Portion size
Vegetables (fresh, frozen or canned)	3 tablespoons
Pulses (dried)	3 tablespoons
Salad	1 cereal bowlful
Vegetables in composites, such as vegetable chilli	3 tablespoons
Very large fruit, such as melon	1 average slice
Large fruit, such as grapefruit	Half a fruit
Medium fruit, such as apples	1 fruit
Small fruit, such as plum	2 fruits
Very small fruit, such as blackberries	2 average handfuls
Dried fruit	1 tablespoon
Fruit in composites, such as stewed fruit in apple pie	3 tablespoons
Frozen fruit/canned fruit	3 tablespoons
Fruit juice	1 small glass (150 ml)

Since the '5-a-day' policy stresses both volume and variety, the number of portions of fruit juice, pulses and dried fruit was capped so that no more than one portion could contribute to the total number of portions consumed. Interviewers recorded full or half portions, but nothing smaller.

5.2.2 Urinary sodium and potassium

Dietary salt intake is assessed by measuring sodium excretion in urine. The studies on which the estimates in Section 5.1 were based on involved analyses of urine samples collected over a 24-hour period.^{8,9} 24 hour urine collection is accepted as being the most reliable method for assessing salt intake in the population.¹ A less burdensome measure, based on a spot sample collected at one point in time, has been included in the SHeS nurse interview since 2003. While the absolute level of sodium measured will differ between the spot and 24-hour samples, previous validation studies showed that spot urine samples could assess trends over time, and differentiate between population sub-groups, in the same way as 24-hour samples.^{23,24} As spot samples are less burdensome to collect than 24 hour samples the number of people asked to provide them is usually higher than in the

24-hour collection studies allowing for more detailed sub-group analyses to be conducted.

A spot urine sample was collected in all nurse interviews conducted between 2008 and 2011, and in a sub-sample of nurse interviews in the 2003 survey, to determine dietary sodium (Na). As discussed in the introduction there is a target to reduce population-level salt intake to no more than 6g per day (2.4g or 100mmol of sodium).²⁵

To aid the analysis of dietary sodium, spot urine samples were also assessed for potassium and creatinine. Potassium is important for digestion, metabolism and muscle tissue regulation and abnormally high levels of potassium are indicative of hyperkalaemia. Similarly abnormally low levels can be problematic. The usual range for adults with a regular diet is 25–125 (mmol/L). Creatinine (Cre), a product of creatine, was included because while large day-to-day variations occur in excretion of Na, K and water, Cre excretion is relatively constant from day-to-day (coefficient of variation 11%).²⁶ Therefore the ratio of Na and K excretion to creatinine excretion is normally used in the literature to correct for variability in urine dilution (random urine specimen). The association between Na/Cre ratios and blood pressure has been reported in several studies. Na/Cre and K/Cre ratios vary from day-to-day, however these ratios are less sensitive to incompleteness of urine specimens than the individual Na, K or Cre excretion. See Volume 3 (Technical Report) for further details of the measurement protocols for the urine samples.

5.2.3 Vitamin and/or mineral supplement consumption

In 2003 and 2008-2011, the nurse visit included the following question design to measure self-administered supplement use:

At present, are you taking any vitamins, fish oils, iron supplements, calcium, other minerals or anything else to supplement your diet or improve your health, other than those prescribed by your doctor?

Participants were presented with a list of possible supplement types on a card and asked to say which they used. The options were: vitamins, fish oils, iron supplements, calcium, other minerals, other supplements. The tables in this chapter report the total proportion who said they were taking supplements as well as the proportions taking each of the specific supplement-types asked about.

5.3 FRUIT AND VEGETABLE CONSUMPTION

5.3.1 Trends in adult consumption of fruit and vegetables since 2003

Information on the quantity of fruit and vegetables men and women aged 16 and over had consumed in the 24 hours prior to the interview is presented for 2003 onwards in Table 5.1. The table includes the mean and median number of portions consumed, as well as the proportions who met the daily recommended consumption of five or more portions.

In 2011, the mean number of portions of fruit and vegetables consumed by adults aged 16 and over was 3.2 – the same as in 2010. The separate figures for men and women were also identical in 2010 and 2011 (3.1 mean portions for men and 3.3 for women). This suggests that the small, but significant, increase from 3.1 portions in 2003 to 3.3 portions in 2008 did not constitute a meaningful sustained trend. It also highlights the problems of comparing single figures in a time series, rather than assessing underlying trends.

In line with the trend for mean consumption, the proportion of adults consuming the recommended five or more portions of fruit or vegetables a day did not change significantly over time. In both 2010 and 2011, 22% met the recommendation. This was preceded by 23% in 2009, 22% in 2008 and 21% of adults meeting the recommendation in 2003, which suggests an overall picture of trendless fluctuation. When examined separately, the recent consumption figures for men and women confirm this unchanging picture. The proportion of men meeting the recommended daily intake has remained noticeably static across recent years (22% in 2009 and 20% in all others, including 2011). The 2010 and 2011 results for women were the same (23%), which confirms that what appeared to be an upward trend in consumption between 2003 and 2009 (from 22% to 25%) has not been sustained.

Table 5.1

5.3.2 Portions of fruit and vegetables consumed by age and sex, 2011

More detailed figures for the quantity of fruit and vegetables consumed in the 24 hours prior to the interview for adults aged 16 and over in 2011 by age and sex are also presented in Table 5.1. In addition, figures 5A and 5B show the summary measures of five or more portions, no portions and the mean number, by age for men and women separately.

As noted above, adults consumed on average 3.2 portions of fruit and vegetables per day in 2011. While small, the difference between the mean number of portions consumed by men (3.1) and women (3.3) was statistically significant. Consumption varied with age, with the youngest adults (aged 16-24) consuming the lowest number of portions (2.6), and the figures for adults aged 25 and over ranging between 3.3 and 3.4 portions per day. As shown in Figures 5A and 5B, this pattern by age was evident for both men and women.

The proportion of adults who met the recommended daily intake of five or more portions of fruit and vegetables per day also varied significantly by gender. While 22% of all adults met the recommendation, women were more likely to do so than men (23% compared with 20%). The overall association between age and meeting the recommendation was not significant, but at 11%, the proportion of men aged 16-24 who ate five or more portions a day was significantly lower than for all other age groups (21%-23%).

Figure 5A, Figure 5B, Table 5.1

Figure 5A

Proportion of men (16+) eating five or more portions, no portions, and mean portions consumed, per day, by age, 2011

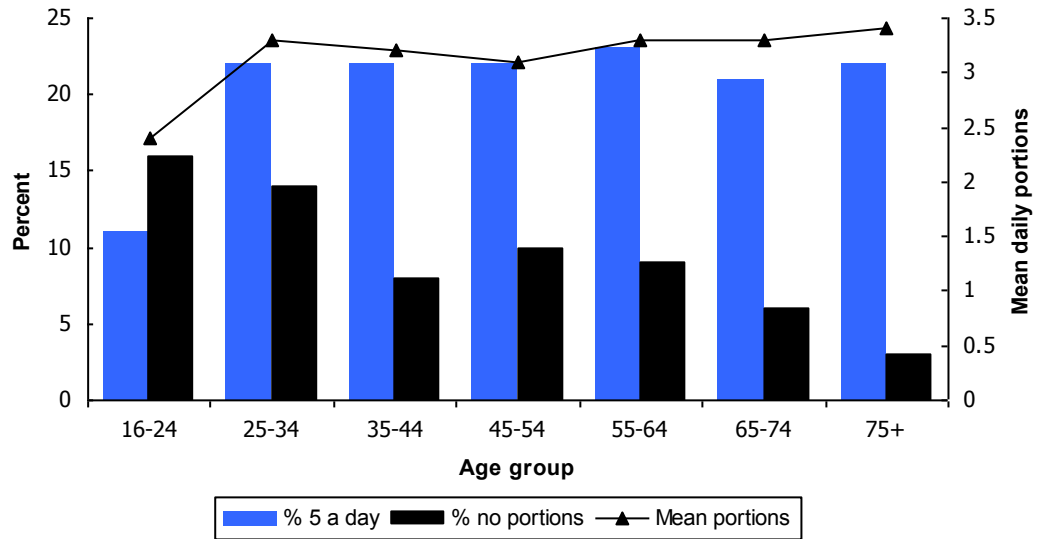
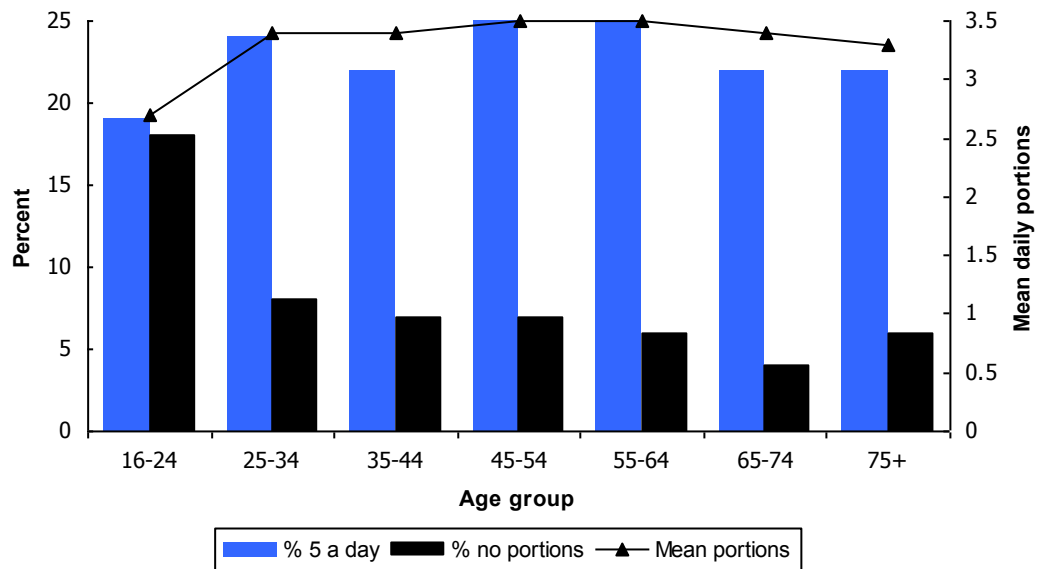


Figure 5B

Proportion of women (16+) eating five or more portions, no portions, and mean portions consumed, per day, by age, 2011



5.4 URINARY SODIUM, POTASSIUM AND CREATININE

5.4.1 Trends in urinary sodium, potassium and creatinine since 2003

Table 5.2 shows the levels of sodium (Na), potassium (K), creatinine (Cre) and the Na/Cre ratio and K/Cre ratio from spot urine samples in 2003 and 2008-2011 combined. Mean and median levels, as well as levels for the 5th, 10th, 90th and 95th percentile are presented by age and sex.

Between 2003 and 2008-2011 there was a statistically significant decline in the mean urinary sodium level for adults aged 16 and over from 116.1mmol/l to 106.9mmol/l. This decline brings the level closer to the population-level target of no more than 2.4g or 100mmol/l of sodium (6g of salt) per day. This reduction was reflected in the fact that levels of urinary sodium at the upper end of the distribution (the 95th percentile) were lower in 2008-2011 than in 2003 (213 mmol/l compared with 222 mmol/l). For a combination of reasons including differing methodologies, time periods and sample sizes, these results are not comparable with the results of the Scottish Salt Studies referenced in the introduction.^{8,9} It is also important to note that it is not uncommon for sodium concentrations in spot urine samples to be lower than the levels found in the 24 hour urine samples.

Creatinine levels followed a similar trend to urinary sodium, with a decrease in the mean level from 12.2 mmol/l to 10.5 mmol/l. In contrast, mean urinary potassium levels were broadly similar in 2003 (62.5 mmol/l) and 2008-2011 (61.6 mmol/l) with mean levels that fell within the range. The usual range for adults with a regular diet is 25–125 (mmol/l)

In line with these findings, the ratios of sodium to creatinine (Na/Cre) and potassium to creatinine (K/Cre) both increased over time. In 2003 Na/Cre was 12.2; in 2008-2011 it was 12.9. Similarly, the ratio for K/Cre in 2003 was 5.9 and increased to 6.8 in 2008-2011. **Table 5.2**

5.4.2 Urinary sodium, potassium and creatinine by age and sex, 2008-2011 combined

More detailed figures on urinary sodium and potassium levels by age and sex in 2008-2011 combined are presented in Table 5.2. The mean urinary sodium level in 2008-2011 was 106.9mmol/l. This is in excess of the population-level target of no more than 6g of salt per day (2.4g or 100mmol/l of sodium) for the adult population. In line with findings in 2003, men had significantly higher mean levels of sodium than women (119.4mmol/l compared with 95.0mmol/l). That the mean level was higher for men than for women is not unexpected. Once caloric intake adjustments are made, the target of 6g/day (2.4g or 100mmol/l of sodium) for adults represents 7g/day (2.7g or 115mmol sodium) for men and 5g/day (2.0g or 85mmol/l sodium) for women. Mean levels for men and women in 2008-2011 were both higher than these adjusted figures. Sodium levels varied significantly with age for both men and women with levels decreasing as age increased (from 122.0mmol/l in adults aged 16-44 to 87.2 mmol/l in those aged 65 and over). This varying pattern by age was noted in 2003.

Differences in urinary potassium levels were in keeping with those seen for sodium, with higher mean levels among men (65.3 mmol/l) than women (58.1 mmol/l). The usual range for adults with a regular diet is considered to be 25–125 (mmol/l). Levels varied by age and were higher among younger adults aged 16-44 (64.5mmol/l) compared with

those aged 65 and over (54.4mmol/l). The pattern by age differed for men and women, with levels declining successively across the three age groups among women but only declining between the two oldest age groups among men.

The ratios of sodium to creatinine (Na/Cre) and potassium to creatinine (K/Cre) both followed the same patterns as those for mean urinary sodium and potassium levels, with lower ratio levels for men than for women, and ratio levels increasing with age for both men and women. These patterns were consistent with the 2003 results. **Table 5.2**

5.5 CONSUMPTION OF VITAMIN AND MINERAL SUPPLEMENTS

5.5.1 Trends in vitamin and mineral supplement consumption since 2003

The proportion of men and women consuming vitamin and mineral supplements in 2003 and 2008-2011 combined is presented in Table 5.3. In addition to showing the proportion consuming any supplement, information on consumption of specific types of supplement such as fish oils, calcium and iron is also shown.

The proportion of adults who reported taking any dietary supplements was slightly lower in 2008-2011 than in 2003 and (24% and 26%, respectively). However, this overall figure masks the fact that among some sub-groups, most notably women aged 45-64, there was a much higher than average decrease in supplement use (of eight to ten percentage points). **Table 5.3**

5.5.2 Vitamin and mineral supplement consumption by age and sex, 2008-2011 combined

Although the questionnaire cannot be used to establish which types of vitamin or mineral people take, the results showed that only a minority of those aged 65 and over took vitamins or minerals regularly, indicating low adherence to the recommendation for vitamin D.

More detailed figures on vitamin and mineral supplement consumption by age and sex for 2008-2011 combined are presented in Table 5.3. In 2008-2011, a greater proportion of women (27%) than men (20%) took any type of supplement. This pattern was true for all but the youngest age group, so was not, therefore, caused by a higher prevalence of supplement use among women of child bearing age (for whom supplements are recommended before and during pregnancy). The pattern was also apparent for consumption of specific types of supplement, and was most pronounced for vitamins or minerals (14% of women compared with 10% of men) and other supplements (8% and 5% respectively).

Supplement consumption in 2008-2011 was lowest among those aged 16-24 (13%) and increased with age to a peak of 36% of those aged 65-74, before declining somewhat among those aged 75 and over

(33%). This pattern was largely similar for both men and women, although men's supplement use flattened out among the three oldest age groups, while women's use continued to increase until age 75 at which point it declined.

Table 5.3

5.5.3 Vitamin and mineral supplement consumption (age-standardised) by Scottish Index of Multiple Deprivation (SIMD), 2008-2011 combined

Table 5.4 presents vitamin and mineral supplement use by the SIMD. Two measures of SIMD are being used throughout this report. The first, which uses quintiles, enables comparisons to be drawn between the most and least deprived 20% of areas and the intermediate quintiles. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the "85% least deprived areas"). A description of SIMD is available in the Glossary at the end of this Volume). To ensure that the comparisons presented in this section are not confounded by the different age profiles of the SIMD sub-groups, the data have been age-standardised (age-standardisation is also described in more detail in the Glossary). Only the age-standardised data are presented in the tables in this section.

There was a significant association between supplement consumption and SIMD in 2008-2011. Supplement consumption was similar among those living in the 4th and 5th least deprived areas (27%-28%), dropped to 23% in the next two quintiles, before falling to a low of 17% among those living in the most deprived quintile. The gradient of the decline in consumption was a little steeper for women than men. A third of women (33%) living in the least deprived areas took supplements compared with a fifth (20%) of those in the most deprived areas. The equivalent figures for men were 22% and 14%, respectively.

Comparing consumption among those living in the 15% most deprived areas of Scotland with those living elsewhere confirms the significant association between consumption and deprivation. 17% of adults in the 15% most deprived areas consumed a supplement compared with 25% in the rest of Scotland and this difference was evident for both men and women.

Table 5.4

References and notes

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Table 5.1 Adult fruit and vegetable consumption, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Portions per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
2003								
None	15	13	13	8	8	6	8	11
5 portions or more	17	18	19	22	24	18	16	20
Mean	2.5	2.9	2.9	3.2	3.4	3.1	2.9	3
Standard error of the mean	0.15	0.14	0.11	0.13	0.11	0.09	0.13	0.06
Median	2.0	2.3	2.3	2.7	3.0	2.7	2.7	2.7
2008								
None	15	10	13	9	10	7	6	10
5 portions or more	14	20	19	20	24	25	18	20
Mean	2.5	3.0	3.1	3.2	3.4	3.4	3.1	3.1
Standard error of the mean	0.17	0.16	0.24	0.11	0.14	0.13	0.13	0.07
Median	2.0	2.3	2.3	3.0	3.0	3.0	2.8	2.7
2009								
None	18	15	10	11	7	6	4	11
5 portions or more	16	21	21	22	26	25	23	22
Mean	2.6	3.1	3.1	3.1	3.5	3.4	3.4	3.1
Standard error of the mean	0.17	0.15	0.11	0.11	0.11	0.12	0.12	0.05
Median	2.0	3.0	2.7	2.8	3.2	3.0	3.1	2.8
2010								
None	22	11	11	12	9	7	7	12
5 portions or more	16	21	19	20	21	25	22	20
Mean	2.6	3.1	2.9	3.1	3.3	3.3	3.2	3.1
Standard error of the mean	0.17	0.13	0.11	0.12	0.13	0.12	0.15	0.06
Median	2.0	2.7	2.7	2.7	3.0	3.0	2.7	2.7
2011								
None	16	14	8	10	9	6	3	10
Less than 1 portion	4	2	4	3	4	3	4	3
1 portion or more but less than 2	25	18	21	20	17	18	15	19
2 portions or more but less than 3	18	18	19	19	18	20	21	19
3 portions or more but less than 4	14	15	13	15	17	16	21	16
4 portions or more but less than 5	11	12	13	11	13	16	14	12
5 portions or more	11	22	22	22	23	21	22	20
Mean	2.4	3.3	3.2	3.1	3.3	3.3	3.4	3.1
Standard error of the mean	0.16	0.16	0.12	0.11	0.11	0.10	0.12	0.05
Median	2.0	2.7	2.7	2.7	3.0	3.0	3.0	2.7

Continued...

Table 5.1 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Portions per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
2003								
None	16	11	10	6	4	5	5	8
5 portions or more	18	24	21	27	27	18	18	22
Mean	2.7	3.2	3.1	3.5	3.6	3.0	3.0	3.2
Standard error of the mean	0.16	0.12	0.09	0.10	0.10	0.08	0.11	0.05
Median	2.0	2.7	2.8	3.2	3.3	2.7	2.7	3.0
2008								
None	9	9	8	7	7	4	4	7
5 portions or more	15	26	22	29	29	26	17	24
Mean	2.9	3.3	3.3	3.7	3.8	3.6	3.1	3.4
Standard error of the mean	0.17	0.13	0.10	0.13	0.12	0.12	0.12	0.06
Median	2.2	3.0	3.0	3.3	3.3	3.3	2.8	3
2009								
None	10	7	8	10	4	6	4	7
5 portions or more	19	25	23	23	30	27	26	25
Mean	3.0	3.4	3.4	3.3	3.9	3.5	3.5	3.4
Standard error of the mean	0.18	0.13	0.10	0.10	0.10	0.10	0.10	0.05
Median	2.3	2.8	3.0	3.0	3.3	3.3	3.3	3.0
2010								
None	16	10	9	8	7	5	5	9
5 portions or more	17	24	22	26	24	26	17	23
Mean	2.7	3.4	3.3	3.4	3.4	3.5	3.3	3.3
Standard error of the mean	0.14	0.14	0.10	0.10	0.11	0.11	0.09	0.05
Median	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
2011								
None	18	8	7	7	6	4	6	8
Less than 1 portion	6	3	4	4	3	4	4	4
1 portion or more but less than 2	24	19	15	17	15	18	16	18
2 portions or more but less than 3	13	17	18	17	20	16	18	17
3 portions or more but less than 4	12	16	18	18	19	19	20	17
4 portions or more but less than 5	8	13	16	12	12	16	13	13
5 portions or more	19	24	22	25	25	22	22	23
Mean	2.7	3.4	3.4	3.5	3.5	3.4	3.3	3.3
Standard error of the mean	0.20	0.12	0.09	0.09	0.09	0.10	0.09	0.05
Median	2.0	3.0	3.0	3.0	3.0	3.2	3.0	3.0

Continued...

Table 5.1 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Portions per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All adults								
2003								
None	15	12	11	7	6	5	6	9
5 portions or more	17	21	20	25	26	18	17	21
Mean	2.6	3.1	3.0	3.4	3.5	3.1	3.0	3.1
Standard error of the mean	0.12	0.10	0.08	0.09	0.09	0.07	0.09	0.05
Median	2.0	2.7	2.7	3.0	3.0	2.7	2.7	2.7
2008								
None	12	10	10	8	8	6	5	9
5 portions or more	14	23	21	25	27	25	17	22
Mean	2.7	3.2	3.2	3.5	3.6	3.5	3.1	3.3
Standard error of the mean	0.13	0.11	0.13	0.09	0.10	0.10	0.09	0.05
Median	2.0	2.7	2.7	3.0	3.2	3.2	2.8	3.0
2009								
None	14	11	9	10	5	6	4	9
5 portions or more	17	23	22	22	28	26	25	23
Mean	2.8	3.3	3.2	3.2	3.7	3.5	3.5	3.3
Standard error of the mean	0.12	0.11	0.08	0.08	0.09	0.09	0.09	0.04
Median	2.0	3.0	3.0	3.0	3.3	3.2	3.3	3.0
2010								
None	19	11	10	10	8	6	6	10
5 portions or more	17	23	21	23	23	25	19	22
Mean	2.6	3.2	3.1	3.3	3.3	3.4	3.2	3.2
Standard error of the mean	0.12	0.11	0.08	0.08	0.09	0.09	0.09	0.04
Median	2.0	3.0	2.8	3.0	3.0	3.0	3.0	3.0
2011								
None	17	11	7	9	7	5	5	9
Less than 1 portion	5	3	4	3	3	4	4	4
1 portion or more but less than 2	24	18	18	18	16	18	16	18
2 portions or more but less than 3	16	17	19	18	19	18	19	18
3 portions or more but less than 4	13	16	15	17	18	18	21	17
4 portions or more but less than 5	10	12	14	12	12	16	14	13
5 portions or more	15	23	22	23	24	22	22	22
Mean	2.6	3.4	3.3	3.3	3.4	3.4	3.3	3.2
Standard error of the mean	0.14	0.11	0.08	0.07	0.08	0.08	0.08	0.04
Median	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Continued...

Table 5.1 - Continued

Aged 16 and over

2003, 2008, 2009, 2010, 2011

Portions per day	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
Men 2003	580	610	761	670	569	406	260	3857
Men 2008	464	481	563	555	480	327	218	3087
Men 2009	536	568	634	649	563	387	259	3594
Men 2010	515	559	589	631	542	374	253	3465
Men 2011	535	583	613	655	564	390	266	3606
Women 2003	566	658	813	691	602	493	468	4291
Women 2008	444	487	616	591	504	383	350	3375
Women 2009	511	571	695	700	590	450	410	3926
Women 2010	494	557	644	681	571	432	396	3775
Women 2011	514	580	671	710	594	449	413	3931
All adults 2003	1142	1258	1568	1355	1169	897	726	8115
All adults 2008	908	968	1179	1146	983	710	568	6462
All adults 2009	1047	1138	1328	1349	1153	836	668	7520
All adults 2010	1009	1116	1233	1312	1114	806	649	7239
All adults 2011	1050	1163	1285	1365	1157	839	679	7537
<i>Bases (unweighted):</i>								
Men 2003	336	455	733	616	633	510	327	3610
Men 2008	246	317	460	535	525	453	304	2840
Men 2009	271	406	550	602	575	517	362	3283
Men 2010	274	420	478	566	555	489	330	3112
Men 2011	307	399	516	598	600	511	344	3275
Women 2003	404	600	887	795	778	581	493	4538
Women 2008	333	451	648	632	632	515	410	3621
Women 2009	383	580	780	733	735	550	480	4241
Women 2010	373	566	681	762	701	574	470	4127
Women 2011	364	562	711	803	738	596	486	4260
All adults 2003	737	1048	1613	1404	1409	1088	817	8116
All adults 2008	579	768	1108	1167	1157	968	714	6461
All adults 2009	654	986	1330	1335	1310	1067	842	7524
All adults 2010	647	986	1159	1328	1256	1063	800	7239
All adults 2011	671	961	1227	1401	1338	1107	830	7535

Table 5.2 Urinary sodium (Na), potassium (K) and creatinine (Cre), Na/Cre ratio, K/Cre ratio, 2003, 2008-2011 combined, by age and sex

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
Men				
2003				
Sodium (mmol/l)				
Mean	144.6	120.0	105.4	129.3
Standard error of the mean	5.87	4.34	4.05	3.69
5th percentile	33	37	33	34
10th percentile	60	50	44	51
Median	143	118	106	125
90th percentile	227	200	160	215
95th percentile	241	218	186	230
Potassium (mmol/l)				
Mean	70.2	68.2	56.2	67.1
Standard error of the mean	2.63	2.76	2.65	1.70
5th percentile	17	20	18	18
10th percentile	28	24	22	26
Median	69	61	54	63
90th percentile	114	125	92	115
95th percentile	128	134	103	129
Creatinine (mmol/l)				
Mean	15.3	14.4	11.4	14.3
Standard error of the mean	0.60	0.69	0.62	0.37
5th percentile	5.2	3.3	3.2	3.8
10th percentile	6.5	5.1	4.4	5.6
Median	14.7	14.0	10.5	13.9
90th percentile	24.8	23.2	19.8	23.5
95th percentile	28.6	27.5	23.4	27.5
Na/Cre ratio				
Mean	10.8	10.1	13.1	10.9
Standard error of the mean	0.49	0.56	1.95	0.42
5th percentile	3.7	3.5	3.3	3.5
10th percentile	4.9	4.1	4.9	4.7
Median	10.0	9.0	9.3	9.5
90th percentile	17.7	16.2	20.2	17.7
95th percentile	20.1	21.8	30.8	21.8
K/Cre ratio				
Mean	5.1	5.2	5.6	5.2
Standard error of the mean	0.19	0.21	0.28	0.13
5th percentile	1.8	2.4	2.8	2.0
10th percentile	2.3	2.8	3.1	2.6
Median	4.7	4.7	5.0	4.7
90th percentile	8.1	8.1	7.9	8.1
95th percentile	9.6	10.0	9.6	9.6

Continued...

Table 5.2 - Continued

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
2008-2011				
Sodium (mmol/l)				
Mean	132.1	112.4	98.9	119.4
Standard error of the mean	2.82	2.15	2.06	1.61
5th percentile	36	30	36	34
10th percentile	49	45	44	46
Median	134	107	96	115
90th percentile	210	186	161	196
95th percentile	230	208	175	216
Potassium (mmol/l)				
Mean	66.3	68.0	57.8	65.3
Standard error of the mean	1.73	1.44	1.39	1.00
5th percentile	15	18	19	17
10th percentile	22	26	25	23
Median	61	66	54	61
90th percentile	115	114	97	112
95th percentile	134	125	113	129
Creatinine (mmol/l)				
Mean	13.7	11.6	9.7	12.3
Standard error of the mean	0.33	0.25	0.26	0.19
5th percentile	3.4	2.6	2.6	2.8
10th percentile	4.5	3.6	3.6	3.9
Median	13.6	11.2	9.3	11.7
90th percentile	22.4	19.2	16.5	20.5
95th percentile	26.2	22.3	19.0	24.3
Na/Cre ratio				
Mean	11.5	11.7	12.7	11.8
Standard error of the mean	0.30	0.28	0.42	0.19
5th percentile	3.5	3.8	3.9	3.6
10th percentile	4.5	4.9	4.9	4.7
Median	10.6	10.4	10.9	10.6
90th percentile	18.8	19.6	21.8	20.0
95th percentile	22.9	23.7	27.9	23.9
K/Cre ratio				
Mean	5.3	6.5	6.5	5.9
Standard error of the mean	0.12	0.11	0.12	0.07
5th percentile	2.1	3.0	3.4	2.4
10th percentile	2.4	3.5	3.9	2.9
Median	4.9	6.1	6.0	5.5
90th percentile	9.0	10.1	9.6	9.6
95th percentile	10.6	11.5	11.2	11.0

Continued...

Table 5.2 - Continued

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
Women				
2003				
Sodium (mmol/l)				
Mean	118.7	93.3	90.9	104.3
Standard error of the mean	4.54	3.66	4.07	2.88
5th percentile	28	25	24	26
10th percentile	38	32	36	36
Median	113	83	88	97
90th percentile	206	176	149	189
95th percentile	236	195	182	214
Potassium (mmol/l)				
Mean	65.7	53.9	50.2	58.3
Standard error of the mean	2.99	2.05	2.48	1.57
5th percentile	13	16	14	14
10th percentile	17	19	18	19
Median	63	48	43	52
90th percentile	117	95	94	108
95th percentile	142	117	107	132
Creatinine (mmol/l)				
Mean	12.2	8.8	8.6	10.3
Standard error of the mean	0.56	0.37	0.45	0.30
5th percentile	2.4	2.0	2.1	2.2
10th percentile	3.6	2.4	2.7	2.8
Median	11.7	7.9	7.4	9.3
90th percentile	20.8	16.6	15.7	19.1
95th percentile	24.2	18.7	19.4	22.1
Na/Cre ratio				
Mean	11.9	13.4	15.8	13.3
Standard error of the mean	0.54	0.64	1.34	0.46
5th percentile	3.7	4.1	3.2	3.6
10th percentile	4.2	5.3	4.6	4.8
Median	10.9	11.6	11.9	11.3
90th percentile	19.8	22.2	26.9	22.2
95th percentile	23.9	26.4	40.4	27.3
K/Cre ratio				
Mean	5.9	7.2	6.7	6.5
Standard error of the mean	0.18	0.27	0.27	0.14
5th percentile	2.0	2.9	3.1	2.6
10th percentile	2.8	3.4	3.4	3.1
Median	5.5	6.4	6.1	6.0
90th percentile	9.5	12.2	10.1	10.5
95th percentile	10.5	13.3	12.7	12.5

Continued...

Table 5.2 - Continued

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
2008-2011				
Sodium (mmol/l)				
Mean	111.7	83.7	77.9	95.0
Standard error of the mean	2.46	1.83	2.00	1.40
5th percentile	25	19	23	23
10th percentile	34	27	29	30
Median	100	76	71	85
90th percentile	204	151	135	183
95th percentile	226	179	161	206
Potassium (mmol/l)				
Mean	62.7	55.9	51.8	58.1
Standard error of the mean	1.49	1.27	1.27	0.86
5th percentile	13	13	15	13
10th percentile	18	17	20	18
Median	56	49	46	51
90th percentile	117	103	93	109
95th percentile	135	123	111	128
Creatinine (mmol/l)				
Mean	10.3	7.8	7.5	8.9
Standard error of the mean	0.24	0.20	0.23	0.14
5th percentile	2.2	1.4	1.6	1.7
10th percentile	3.1	2.0	2.2	2.3
Median	9.6	6.7	6.6	7.8
90th percentile	18.3	15.6	13.9	16.6
95th percentile	21.0	17.0	16.9	19.4
Na/Cre ratio				
Mean	13.3	14.2	14.6	13.9
Standard error of the mean	0.32	0.35	0.62	0.23
5th percentile	3.7	3.4	2.7	3.4
10th percentile	5.0	5.0	4.3	4.9
Median	11.8	12.2	11.7	11.8
90th percentile	24.3	25.5	25.2	24.7
95th percentile	28.6	31.7	37.4	30.6
K/Cre ratio				
Mean	6.8	8.4	8.2	7.6
Standard error of the mean	0.13	0.14	0.19	0.09
5th percentile	2.4	3.7	3.8	3.0
10th percentile	3.1	4.3	4.2	3.7
Median	6.2	7.5	7.3	6.9
90th percentile	11.2	13.7	13.3	12.4
95th percentile	13.0	15.9	16.6	15.2

Continued...

Table 5.2 - Continued

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
All adults				
2003				
Sodium (mmol/l)				
Mean	131.3	106.8	96.6	116.1
Standard error of the mean	4.35	2.72	3.21	2.76
5th percentile	30	27	26	29
10th percentile	45	39	38	40
Median	125	101	94	110
90th percentile	220	184	157	202
95th percentile	238	208	186	222
Potassium (mmol/l)				
Mean	67.9	61.1	52.5	62.5
Standard error of the mean	1.86	1.71	1.80	1.13
5th percentile	14	17	15	16
10th percentile	22	21	20	21
Median	65	56	47	58
90th percentile	116	115	94	110
95th percentile	137	132	107	131
Creatinine (mmol/l)				
Mean	13.7	11.6	9.7	12.2
Standard error of the mean	0.44	0.40	0.35	0.25
5th percentile	2.8	2.3	2.2	2.4
10th percentile	4.7	3.1	3.2	3.6
Median	13.1	10.4	8.7	11.4
90th percentile	23.3	21.1	18.3	22.0
95th percentile	26.4	23.6	21.4	25.0
Na/Cre ratio				
Mean	11.4	11.7	14.7	12.2
Standard error of the mean	0.38	0.42	1.28	0.32
5th percentile	3.7	3.6	3.2	3.5
10th percentile	4.4	4.7	4.7	4.7
Median	10.6	10.2	11.2	10.4
90th percentile	19.0	20.2	24.1	20.2
95th percentile	23.3	24.0	33.3	25.4
K/Cre ratio				
Mean	5.5	6.2	6.3	5.9
Standard error of the mean	0.14	0.18	0.20	0.11
5th percentile	1.9	2.6	3.0	2.3
10th percentile	2.5	3.0	3.4	2.9
Median	5.2	5.3	5.5	5.3
90th percentile	9.0	10.7	9.6	9.6
95th percentile	10.1	12.5	12.6	11.3

Continued

Table 5.2 - Continued

Aged 16 and over with a valid urine sample

2003, 2008-2011 combined

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
2008-2011				
Sodium (mmol/l)				
Mean	122.0	97.7	87.2	106.9
Standard error of the mean	1.94	1.50	1.52	1.15
5th percentile	29	23	24	26
10th percentile	41	32	34	36
Median	117	92	83	99
90th percentile	206	172	148	190
95th percentile	227	194	169	213
Potassium (mmol/l)				
Mean	64.5	61.8	54.4	61.6
Standard error of the mean	1.20	1.03	0.98	0.70
5th percentile	14	15	16	15
10th percentile	20	20	22	20
Median	60	59	50	56
90th percentile	116	109	94	111
95th percentile	134	125	112	129
Creatinine (mmol/l)				
Mean	12.0	9.7	8.5	10.5
Standard error of the mean	0.22	0.17	0.18	0.13
5th percentile	2.5	1.8	1.8	2.0
10th percentile	3.6	2.5	2.5	2.9
Median	11.5	9.0	7.6	9.8
90th percentile	20.7	17.4	15.2	19.0
95th percentile	24.4	20.0	18.3	22.1
Na/Cre ratio				
Mean	12.4	13.0	13.7	12.9
Standard error of the mean	0.22	0.24	0.40	0.16
5th percentile	3.6	3.5	3.3	3.5
10th percentile	4.7	5.0	4.6	4.8
Median	11.1	11.1	11.4	11.2
90th percentile	21.9	22.4	24.0	22.5
95th percentile	26.8	28.2	30.0	27.8
K/Cre ratio				
Mean	6.0	7.4	7.5	6.8
Standard error of the mean	0.09	0.09	0.13	0.06
5th percentile	2.2	3.2	3.6	2.6
10th percentile	2.7	3.8	4.0	3.2
Median	5.5	6.8	6.6	6.2
90th percentile	10.1	11.9	11.8	11.1
95th percentile	11.8	14.1	14.7	13.0

Continued...

Table 5.2 - Continued*Aged 16 and over with a valid urine sample**2003, 2008-2011 combined*

Urinary sodium, potassium, creatinine (mmol/l)	Age			Total
	16-44	45-64	65+	
<i>Bases (weighted):</i>				
<i>Men 2003</i>	256	188	91	535
<i>Men 2008-2011</i>	903	643	338	1884
<i>Women 2003</i>	269	183	142	594
<i>Women 2008-2011</i>	894	670	428	1992
<i>All adults 2003</i>	525	371	233	1129
<i>All adults 2008-2011</i>	1797	1313	766	3876
<i>Bases (unweighted):</i>				
<i>Men 2003</i>	193	197	118	508
<i>Men 2008-2011</i>	588	660	466	1714
<i>Women 2003</i>	256	235	149	640
<i>Women 2008-2011</i>	816	822	531	2169
<i>All adults 2003</i>	449	432	267	1148
<i>All adults 2008-2011</i>	1404	1482	997	3883

Table 5.3 Consumption of vitamin or mineral supplements, 2003, 2008-2011 combined, by age and sex

Aged 16 and over with a nurse visit

2003, 2008-2011 combined

Consumption of vitamin or mineral supplements	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
2003								
Vitamins / minerals	10	15	11	10	11	7	12	11
Fish oils	6	8	8	12	16	20	22	12
Iron supplements	1	1	1	1	1	0	1	1
Calcium	-	0	0	-	1	1	1	0
Other minerals	2	2	1	4	3	3	3	3
Other supplements	1	3	4	4	8	10	6	5
Total taking any supplement ^a	15	20	18	19	27	29	30	21
No supplements taken	85	80	82	81	73	71	70	79
2008-2011								
Vitamins / minerals	10	10	10	11	12	8	7	10
Fish oils	5	5	4	10	16	23	22	11
Iron supplements	0	0	1	2	1	1	0	1
Calcium	1	0	1	1	1	0	-	1
Other minerals	3	1	4	3	5	5	4	3
Other supplements	1	5	5	3	7	7	7	5
Total taking any supplement ^a	14	16	15	18	27	31	30	20
No supplements taken	86	84	85	82	73	69	70	80
Women								
2003								
Vitamins / minerals	12	16	15	19	17	11	9	14
Fish oils	4	4	8	19	26	21	23	14
Iron supplements	4	4	2	2	2	1	0	2
Calcium	0	1	1	3	5	3	3	2
Other minerals	1	4	5	11	10	4	3	6
Other supplements	5	5	8	18	21	12	9	11
Total taking any supplement ^a	17	22	25	37	44	35	32	30
No supplements taken	83	78	75	63	56	65	68	70
2008-2011								
Vitamins / minerals	7	15	15	17	15	15	11	14
Fish oils	3	4	6	12	18	24	22	12
Iron supplements	1	5	2	2	2	0	2	2
Calcium	0	0	1	3	2	3	1	2
Other minerals	1	4	5	7	7	8	6	5
Other supplements	5	5	5	9	13	13	6	8
Total taking any supplement ^a	12	23	23	29	34	41	34	27
No supplements taken	88	77	77	71	66	59	66	73

Continued...

Table 5.3 - Continued

Aged 16 and over

2003, 2008-2011 combined

Consumption of vitamin or mineral supplements	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All adults								
2003								
Vitamins / minerals	11	16	13	15	14	9	10	13
Fish oils	5	6	8	15	21	20	22	13
Iron supplements	2	3	1	1	1	0	1	1
Calcium	0	0	1	1	3	2	2	1
Other minerals	2	3	3	8	7	4	3	4
Other supplements	3	4	7	11	15	11	8	8
Total taking any supplement ^a	16	21	21	28	35	32	31	26
No supplements taken	84	79	79	72	65	68	69	74
2008-2011								
Vitamins / minerals	9	12	13	14	13	11	9	12
Fish oils	4	5	5	11	17	23	22	11
Iron supplements	1	3	1	2	1	1	1	1
Calcium	0	0	1	2	1	2	0	1
Other minerals	2	3	4	5	6	7	5	4
Other supplements	3	5	5	6	10	10	7	7
Total taking any supplement ^a	13	20	19	24	30	36	33	24
No supplements taken	87	80	81	76	70	64	67	76
<i>Bases (weighted):</i>								
<i>Men 2003</i>	<i>375</i>	<i>408</i>	<i>511</i>	<i>448</i>	<i>382</i>	<i>273</i>	<i>175</i>	<i>2572</i>
<i>Men 2008-2011</i>	<i>304</i>	<i>328</i>	<i>355</i>	<i>370</i>	<i>319</i>	<i>220</i>	<i>149</i>	<i>2045</i>
<i>Women 2003</i>	<i>373</i>	<i>441</i>	<i>547</i>	<i>463</i>	<i>404</i>	<i>330</i>	<i>315</i>	<i>2872</i>
<i>Women 2008-2011</i>	<i>292</i>	<i>327</i>	<i>387</i>	<i>399</i>	<i>336</i>	<i>255</i>	<i>233</i>	<i>2228</i>
<i>All adults 2003</i>	<i>748</i>	<i>849</i>	<i>1058</i>	<i>910</i>	<i>786</i>	<i>602</i>	<i>490</i>	<i>5444</i>
<i>All adults 2008-2011</i>	<i>596</i>	<i>655</i>	<i>742</i>	<i>769</i>	<i>655</i>	<i>475</i>	<i>382</i>	<i>4273</i>
<i>Bases (unweighted):</i>								
<i>Men 2003</i>	<i>178</i>	<i>278</i>	<i>463</i>	<i>421</i>	<i>452</i>	<i>366</i>	<i>243</i>	<i>2401</i>
<i>Men 2008-2011</i>	<i>133</i>	<i>201</i>	<i>305</i>	<i>345</i>	<i>365</i>	<i>312</i>	<i>196</i>	<i>1857</i>
<i>Women 2003</i>	<i>221</i>	<i>378</i>	<i>605</i>	<i>556</i>	<i>564</i>	<i>404</i>	<i>315</i>	<i>3043</i>
<i>Women 2008-2011</i>	<i>190</i>	<i>299</i>	<i>426</i>	<i>460</i>	<i>440</i>	<i>347</i>	<i>254</i>	<i>2416</i>
<i>All adults 2003</i>	<i>399</i>	<i>656</i>	<i>1068</i>	<i>977</i>	<i>1016</i>	<i>770</i>	<i>558</i>	<i>5444</i>
<i>All adults 2008-2011</i>	<i>323</i>	<i>500</i>	<i>731</i>	<i>805</i>	<i>805</i>	<i>659</i>	<i>450</i>	<i>4273</i>

^a May be less than the sum of those taking individual supplements as some participants were taking more than one type.

Table 5.4 Consumption of vitamin or mineral supplements, 2008-2011 combined, (age-standardised), by Scottish Index of Multiple Deprivation and sex

Aged 16 and over

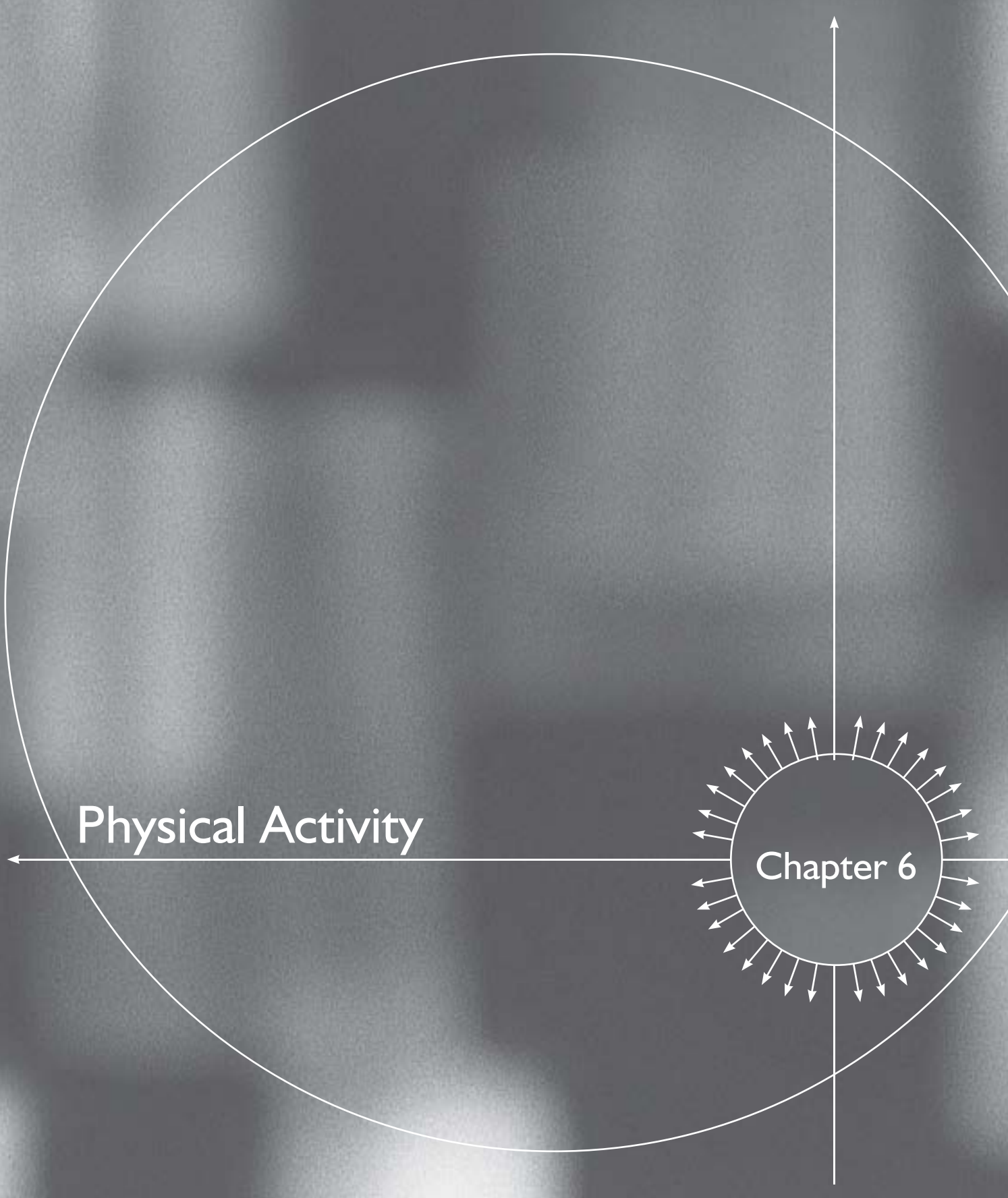
2008-2011 combined

Consumption of vitamin or mineral supplements	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Vitamins / minerals	13	12	10	8	6	10	7
Fish oils	14	10	10	10	8	11	7
Iron supplements	1	1	1	1	1	1	1
Calcium	0	0	1	0	1	0	2
Other minerals	3	3	5	6	1	4	1
Other supplements	5	6	6	4	3	5	2
Total taking any supplement ^a	22	23	19	21	14	21	14
No supplements taken	78	77	81	79	86	79	86
Women							
Vitamins / minerals	18	16	11	13	11	14	11
Fish oils	16	13	12	11	7	13	6
Iron supplements	1	4	2	3	1	2	1
Calcium	2	1	1	1	2	1	2
Other minerals	6	6	5	6	4	6	3
Other supplements	10	9	9	8	4	9	3
Total taking any supplement ^a	33	32	27	26	20	29	20
No supplements taken	67	68	73	74	80	71	80
All adults							
Vitamins / minerals	15	14	10	11	9	12	9
Fish oils	15	12	11	11	7	12	7
Iron supplements	1	2	1	2	1	2	1
Calcium	1	1	1	1	2	1	2
Other minerals	5	4	5	6	3	5	2
Other supplements	8	7	8	6	3	7	3
Total taking any supplement ^a	28	27	23	23	17	25	17
No supplements taken	72	73	77	77	83	75	83
<i>Bases (weighted):</i>							
<i>Men 2008-2011</i>	416	473	390	392	374	1753	291
<i>Women 2008-2011</i>	465	453	445	414	451	1881	348
<i>All adults 2008-2011</i>	881	926	835	805	825	3634	639
<i>Bases (unweighted):</i>							
<i>Men 2008-2011</i>	383	444	371	337	322	1617	240
<i>Women 2008-2011</i>	514	527	493	439	443	2077	339
<i>All adults 2008-2011</i>	897	971	864	776	765	3694	579

^a May be less than the sum of those taking individual supplements as some participants were taking more than one type.

Physical Activity

Chapter 6



6 PHYSICAL ACTIVITY

Tessa Hill

SUMMARY

- In 2011, 39% of adults aged 16 and over met the physical activity recommendations with men more likely than women to meet them (45% compared with 33%). Between 2008 and 2011, there was no significant change in the proportion meeting the recommendations.
- The proportions of men and women meeting the recommended activity levels varied significantly with age in 2011. Among men, the proportion meeting the recommendations fell from 63% of those aged 16-24 to 11% of those aged 75 and over. Among women, those aged 25-34 were most likely to meet the recommendation (45%), the proportion meeting it then declined by age to 6% for those aged 75 and over.
- 84% of men and 79% of women participated in at least 10 minutes of physical activity during the 4 weeks prior to being interviewed. Men were active on a mean of 16.2 days over that period compared with 13.2 days for women.
- In 2011, sports and exercise was the most popular type of physical activity for men (54%) and second most common for women (45%) after heavy housework (61%).
- 41% of men and 31% of women reported having walked at a brisk pace for at least 10 minutes in the 4 weeks prior to interview.
- Activity levels were related to household income, with those in higher income households more likely than those with less income to meet the recommended activity levels. For example, 38% of women in the highest income quintile met the recommendations compared with 27% in the lowest income quintile.
- Deprivation was strongly related to activity levels with adults living in the two most deprived SIMD quintiles least likely to meet the recommendations (34%-35%) compared with 42% in the highest two deprivation quintiles).

6.1 INTRODUCTION

The health benefits of a physically active lifestyle are well documented and there is abundant evidence that regular activity is related to a reduced incidence of chronic conditions of particular concern in Scotland, such as cardiovascular disease, obesity, and type 2 diabetes.¹ Physical activity is also associated with better health and cognitive function among older people, and can reduce the risk of falls in those with mobility problems.² In 2008, the World Health Organisation (WHO) estimated that 3.2 million deaths per year could be attributed to low physical activity levels.³

The introductions to the physical activity chapters in the three most recent Scottish Health Survey (SHeS) reports provided a comprehensive overview of the recent policy context.^{4,5,6} They outlined a number of actions being taken by the Government and NHS Scotland to promote physical activity as part of a healthy lifestyle, and initiatives designed to help adults increase their activity levels. These included:

- The 2003 Physical Activity Taskforce publication *Let's Make Scotland More Active: A strategy for physical activity*,⁷ and its five year review, conducted in 2008.⁸
- The Scottish Government's 2008 action plan *Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity (2008-2011)*.⁹
- The Scottish Government's *Route Map* for tackling obesity and associated *Obesity Route Map Action Plan*, published in 2011.¹⁰ The Scottish Health Survey's measures of the proportion of adults who meet the physical activity recommendations, and the time spent in front of a screen, are being used to monitor progress towards the Plan's intermediate-term goal to increase energy expenditure.¹¹
- The opportunities presented by the 2012 Olympics and 2014 Commonwealth Games to help accelerate progress towards making Scotland more active.

Allied to the above initiatives, the following adult physical activity target (set out in *Let's Make Scotland More Active*) is monitored by SHeS:

50% of adults should be meeting the current recommended levels of physical activity by the year 2022

In addition to this target, the revised National Performance Framework (NPF)¹² published by the Scottish Government in December 2011 includes the following new national indicator for adults, also measured via SHeS:¹³

Increase physical activity

As with the 2022 target, the new indicator is measured in relation to the proportion of adults meeting the recommended level of activity - adults are recommended to accumulate at least 30 minutes of moderate activity on most days of the week (i.e. on at least five), which can be accumulated in shorter bouts of as little as 10 minutes. The 2010 report outlined the more detailed recommendations for children's physical activity published jointly in July 2011 by the UK's four Chief Medical Officers.¹⁴ The new UK guidelines for adults are tailored to specific age groups across the lifecourse:¹⁵

- **Children and young people aged 5-18**
 - Should engage in moderate to vigorous activity for at least 60 minutes and up to several hours every day.
 - Vigorous activities, including those that strengthen muscles and bones, should be carried out on at least 3 days a week.
 - Extended periods of sedentary activities should be limited.
- **Adults aged 19-64**
 - Should be active daily.
 - Should engage in at least moderate activity for a minimum of 150 minutes a week (accumulated in bouts of at least 10 minutes) – for example by being active for 30 minutes on five days a week.
 - Alternatively, 75 minutes of vigorous activity spread across the week will confer similar benefits to 150 minutes of moderate activity (or a combination of moderate and vigorous activity).

- Activities that strengthen muscles should be carried out on at least two days a week.
- Extended periods of sedentary activities should be limited.
- **Adults aged 65 and over**
 - In addition to the guidance set out above for adults aged 19-64, older adults are advised that any amount of physical activity is better than none, and more activity provides greater health benefits.
 - Older adults at risk of falls should incorporate activities to improve balance and coordination on at least two days a week.

To help monitor these new recommendations the SHeS team worked with the *Scottish Physical Activity Research Collaboration* to design new questions about adult sporting activities to assess their muscle strengthening potential and, for those aged 65 and over, their balance improving potential. In addition, more questions about sedentary activity are being asked (from 2003 a question has been asked about hours spent in front of a screen, from 2012 other sedentary activities such as reading will also be included). Next year's report will present the results of these new measurements, and will assess adherence to the 150 minutes of moderate activity per week recommendation as well as the new alternative recommendation of 75 minutes of vigorous activity per week.

This chapter updates the trends presented in the three previous reports. It uses summary measures based on all types of activities reported by participants. It also presents figures on the prevalence of participation in different types of activities, including sports and exercise (the detailed breakdown of different sporting activities presented last year will be re-visited in future reports). Summary activity levels by socio-demographic group are also presented.

6.2 METHODS

6.2.1 The adult physical activity questionnaire

The adult physical activity module, included in the survey from 1998 onwards is based on the Allied Dunbar National Fitness Survey, a major study of physical activity among the adult population in England conducted in 1990.¹⁶ The module examined:

- The time spent being active
- The intensity of the activities undertaken, and
- The frequency with which activities are performed.

Changes to the adult physical activity module

Some changes to the way that adult physical activity is measured were introduced to the survey in 2008. These are outlined in full in the 2008 SHeS chapter and are not repeated here.⁴ The main change was that prior to 2008 activities were recorded if they lasted for at least 15 minutes; from 2008 onwards activities of 10-14 minutes duration were also included. The 2008 chapter concluded that the impact of this

change on the trend in the proportion of men and women meeting the physical activity recommendations was small overall.⁵ From this report onwards, all trends for adult physical activity include activities accumulated in bouts of 10 minutes or more, and the 2008 data are now the baseline for time series analysis.

6.2.2 Adult physical activity definitions

Types of activity covered

Four main types of physical activity were asked about:

- Home-based activities (housework, gardening, building work and DIY)
- Walking
- Sports and exercise, and
- Activity at work.

For the first three categories, participants were asked to report any activities lasting at least 10 minutes and to say on how many days in the past four weeks they had taken part in such activities. For walking, they were also asked on how many days they had taken more than one walk of at least 10 minutes. Where they had taken more than one walk, the total time spent walking for that day was calculated as twice the average reported walk time.

Those in full or part-time employment were also asked about activity at work. They were asked to rate how physically active they were in their job (options were: very physically active, fairly physically active, not very physically active and not at all physically active). Occupational activity was counted as 20 days in the last 4 weeks for full-time workers and 12 days for part-time workers.

Intensity level

Each of the activities mentioned were classified according to their intensity level. The four categories of 'intensity' of physical activity were:

- Vigorous
- Moderate
- Light, and
- Inactive.

The Scottish Government's physical activity target for adults focuses on engaging in at least moderate levels of physical activity for at least 30 minutes on most days of the week. Most of the discussion of adult physical activity in this chapter therefore focuses on **moderate** and **vigorous** intensity activities.

Home-based activities were classified as either 'moderate' or 'light' depending on their nature. Participants were given examples of types of housework, gardening, building work and DIY which were described as

either 'heavy' or 'light'. All cases of 'heavy' home-based activity were classified as being of 'moderate' physical intensity. Light gardening, building work and DIY were all classified as 'light' physical intensity. Due to its very low intensity, light housework was not included in the calculations of physical activity in this report.¹⁷

For walking, participants were asked to assess their usual walking pace as 'slow', 'steady average', 'fairly brisk' or 'fast – at least 4mph'. Walks of 10 minutes or more at a brisk or fast pace were classified as being of 'moderate' intensity. Walks at slow or steady average pace were classified as 'light'.

The intensity levels of different sports and exercises were determined according to a combination of the nature of the activity and the participant's assessment of the amount of effort it involved. For example, all instances of playing squash or running/jogging were counted as 'vigorous' intensity. However, other activities, like swimming or cycling, were counted as 'vigorous' only if the participant reported that the effort involved was enough to make them 'out of breath or sweaty'; if not, they were classified as 'moderate' intensity. Similarly, other activities, like dancing, counted as 'moderate' if they made the participant out of breath or sweaty, but 'light' if not.¹⁸

Activities at work were classified using a combination of (a) the participant's assessment of how active they are in their job (described above), and (b) the Standard Occupational Classification (SOC) code assigned to their job type. For example, if participants' jobs were among a short list of particularly strenuous occupations (including, for example, miners and construction workers) and they described themselves as 'very physically active' at work, then their jobs were classified as involving 'vigorous' activity. Those who described their jobs as 'very physically active' but whose jobs were not among the list of strenuous occupations were classified as 'moderately active' at work, as were those who considered themselves 'fairly physically active' but whose occupations were classed as either strenuous (see above) or involving heavy or moderate work (for example, plasterers or refuse collectors).¹⁹

6.3 SUMMARY PHYSICAL ACTIVITY LEVELS

6.3.1 Trends in summary physical activity levels since 2008

Table 6.1 presents adults' summary physical activity levels by age and sex for each year between 2008 and 2011. In 2011, 39% of adults met the physical activity recommendations. This is the same as the proportion that met them in 2008 and 2010 (the 2009 figure was not significantly different, at 37%). Similarly, the proportions of men and women meeting the targets have been largely static since 2008: 45% of men and 33% of women met the targets in 2011; both figures were within the range reported in recent years (43%-45% and 32%-33% respectively).

The proportion of men and women with low activity levels (30% and 35% respectively) showed little variation from previous years.

There was no variation over time in the proportions meeting the recommendations by age group for either men or women.

Table 6.1

6.3.2 Summary adult physical activity levels, 2011, by age and sex

Around half of all adults aged 16-44 (48%-53%) met the physical activity recommendations in 2011. This reduced from the age of 35-44 onwards to a low of 8% of those aged 75 and over meeting the recommendation.

As in previous years, across all age groups men were more likely than women to meet the recommendations. The difference between the sexes was widest in the youngest age group (age 16-24) with 63% of men in this age group meeting the target compared with 41% of women. The gender gap narrowed with increasing age up until the age of 45-54 largely as a result of a decline in the proportion of men meeting the targets (from 61% among those aged 25-34 to 48% among those aged 45-54). The comparative figures for women fluctuated (38%-45%). The proportion meeting the recommendations declined at a similar rate for men and women from the age of 55-64 onwards with 11% of men and 6% of women aged 75 and over meeting the recommendation.

The proportion of adults in the low activity group ranged between 17%-20% for those aged 16-44 and then rose steadily to 74% of those aged 75 and over. As Figures 6A and 6B illustrate, the pattern by age was similar for both sexes.

Figure 6A, Figure 6B, Table 6.1

Figure 6A

Men's summary physical activity levels by age group, 2011

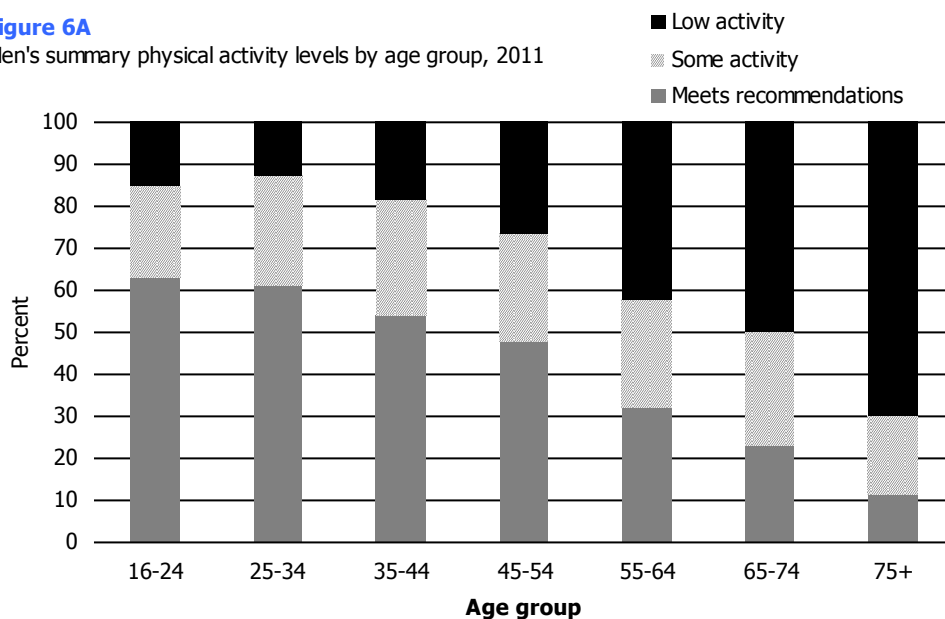
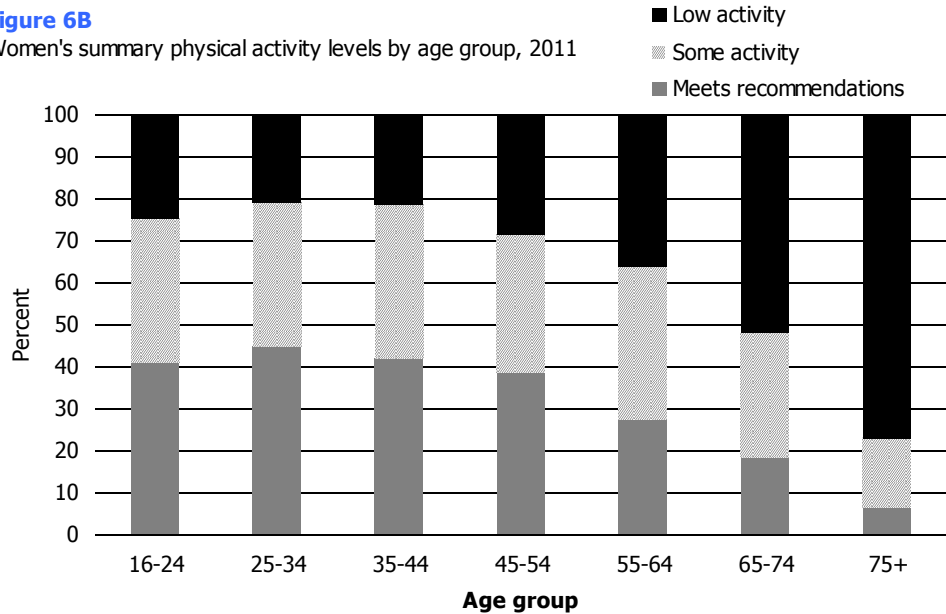


Figure 6B

Women's summary physical activity levels by age group, 2011



6.3.3 Participation in different types of activity in the past 4 weeks

Table 6.2 presents three different measures of participation for each of the four activity types covered in the interview (heavy housework; heavy manual work, gardening and DIY; brisk walking; sports and exercise) by age and sex. It summarises:

- the total proportion of adults participating in the activity type for at least 10 minutes at a time in the 4 weeks prior to the survey;
- the mean number of days in the previous 4 weeks on which they participated in this type of activity, and
- the mean number of hours per week they spent participating in this type of activity.

It also presents a summary measure based on those participating in *any* of the four types of physical activities.

These data were reported comprehensively in 2009⁵ so the following discussion just presents an overview of the main findings. There were no major differences between the 2009 and 2011 results. **Table 6.2**

Any activity

In 2011, 81% of adults (84% of men and 79% of women) participated in at least 10 minutes of physical activity during the 4 weeks prior to the survey. The mean number of days of activity during that 4 week period was 14.6 (16.2 for men and 13.2 for women). Adults were active for an average of 7.2 hours per week with men spending more time being active than women (8.7 compared with 5.8 hours).

For both men and women, levels of participation for both sexes were highest among those aged 16-54 and then declined in the older age groups. There was little difference in the figures between the sexes

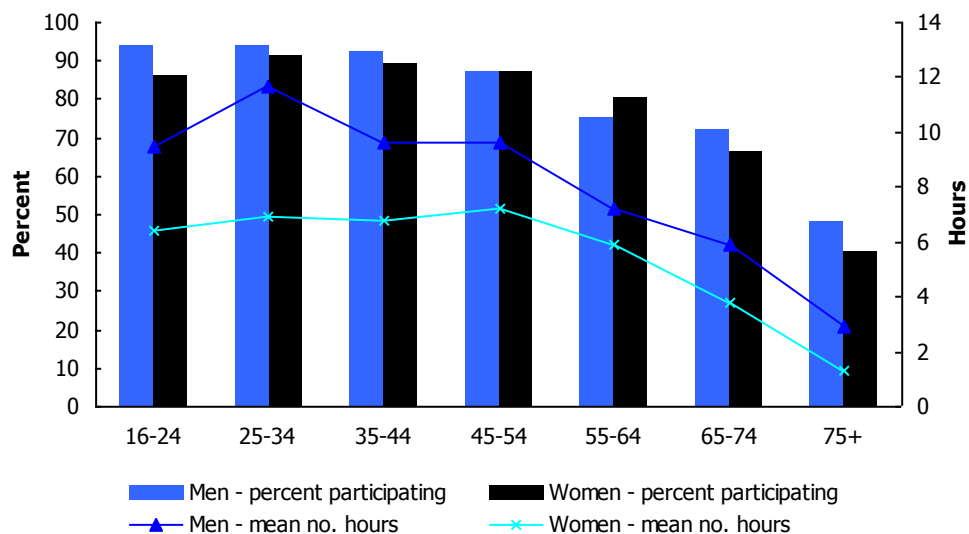
across all age categories. The proportions participating in at least ten minutes of physical activity ranged between 87%-94% for men and 86%-91% for women aged 16-54 then declined with each successive age category thereafter. However, the drop in the levels was greatest between two the oldest age categories (65-74 and 75 and over), from 72% to 48% of men, and from 66% to 40% of women, respectively, participating in any form of activity.

The pattern by age for women’s mean days of activity in the last 4 weeks was similar to that described above. The highest figures were among those aged 16-54 (14.8-16.5 days) but declined to a low of 4.0 days for those aged 75 and over. For men, there was a linear decline with age from an average of 21.2 days of activity in the last 4 weeks for those aged 16-24 to 6.7 days for those aged 75 and over.

The mean number of hours of participation per week in any activity in the 4 last weeks was highest between the ages of 16-54 for both sexes (9.5-11.7 hours for men and 6.4-7.2 hours for women). This declined with age to 2.9 hours for men and 1.3 hours for women aged 75 and over.

Table 6.2

Figure 6C
Percentage of adults participating in any physical activity in the last 4 weeks (for at least 10 minutes), and mean hours per week, by age and sex, 2011



Heavy housework

As reported in previous years, heavy housework was the most common form of physical activity for women, with the exception of those aged 16-24 who were more likely to participate in sport and exercise. Overall, 61% of women had participated in heavy housework in the last 4 weeks compared with 48% of men. The mean number of days of heavy housework in the last 4 weeks was also higher for women (3.7 days) than for men (2.4 days) as was the mean hours per week (1.7 and 0.8 hours, respectively).

All participation measures showed a bell-shaped pattern when compared across the age groups. For both men and women these measures peaked between the ages of 25-54 and declined with age thereafter. For heavy housework this pattern was more pronounced for women, with a peak of 75% aged 35-44 having done heavy housework compared with a peak of 57% for men aged 25-34. However, the age-related decline was sharper for women, as in the oldest age group both sexes reported similar amounts of heavy housework (28% participated, with averages of 1.2 – 1.5 days and 0.4 hours). **Table 6.2**

Heavy manual work, gardening or DIY

Participation in heavy manual work, gardening or DIY was by far the least common activity for both sexes; but, as in 2009, men were three times more likely than women to have participated in this type of activity (27% versus 9%). This difference was also apparent in the other measures. On average, in the last 4 weeks men participated on 1.4 days for 1.2 hours per week. The comparative figures for women were 0.4 days and 0.3 hours.

The pattern by age varied slightly for men and women. For men, each participation measure peaked among those aged 45-54 (37% participated, averages of 1.8 days and 1.9 hours). There was a decline with age but participation levels remained higher than those reported by the youngest age group (15% of men aged 75 and over participated, with averages of 1.2 days and 0.9 hours compared with 10% of men aged 16-24 with averages of 0.3 days and 0.2 hours).

For women, the peak in participation was in the 55-64 age group (15% participated, averages of 0.8 days and 0.5 hours). The youngest and the oldest age groups reported similar participation levels (4% of both age groups participated, averages of 0.1-0.2 days and 0.1 hours).

Table 6.2

Walking

Walking was the third most common activity for both sexes, though it was a minority pursuit with 41% of men and 31% of women having walked at a brisk pace for at least 10 minutes in the last 4 weeks. Men reported walking on more days in that period than women (7.6 versus 5.9 days) and spending more hours walking per week (2.5 versus 1.9 hours).

For men, all participation measures were highest among those aged 16-34 (58%-59% participated, averages of 11.0-11.6 days and 3.1-3.8 hours). These levels declined with age with the sharpest decline being seen in the oldest age group (to 11% of those aged 75 and over participating, with averages of 2.3 days and 0.5 hours).

For women, the highest figures for all measures were seen in the 16-24 age group (45% participated, average of 8.5 days and 2.7 hours). These figures dropped to a plateau between the ages of 25-44 (37%-40% participated, averages of 6.6-7.3 days and 2.1-2.2 hours) before

declining again in the older age groups (8% of those aged 75 and over participated, averages of 1.4 days and 0.4 hours). **Table 6.2**

Sport and exercise

Sport and exercise was the most popular type of physical activity for men, and the second most popular for women, with 54% of men and 45% of women having taken part in this type of activity at least once during the last 4 weeks. Men had participated on more days in the last 4 weeks than women (7.3 versus 5.1 days), and for twice as many hours per week on average (2.4 versus 1.2 hours).

For both sexes, all measures of participation were highest in the youngest age group as 78% of men aged 16-24 participated, with averages of 11.6 days and 4.0 hours. The corresponding figures for women aged 16-24 were 65%, 7.0 days and 1.9 hours. All measures declined successively with age, with the exception of men aged 55-64 and 65-74 who had similar levels of participation on all three indicators (37-38% participated, averages of 4.3-4.5 days and 1.4-1.8 hours).

Table 6.2

6.4 PHYSICAL ACTIVITY LEVELS BY SOCIO-DEMOGRAPHIC FACTORS

Tables 6.3 to 6.5 present the proportions of adults who met the physical activity recommendations of at least 30 minutes of activity on 5 or more days per week by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (descriptions of each of these measures are available in the Glossary at the end of this volume). To ensure that the comparisons presented in this section are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (age-standardisation is also described in the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only.

6.4.1 Adult summary activity levels, 2011 (age-standardised), by NS-SEC of household reference person and sex

The proportion of men and women meeting the recommendations varied significantly by NS-SEC but with different patterns for each sex. Men in lower supervisory and technical households were the most likely to meet the recommendations (51%) while those living in intermediate households were least likely to do so (39%).

Four in ten women living in small employer and own account worker households met the recommendations (40%). A third (36%) of those in managerial and professional households did so and the equivalent figures for the remaining household groups ranged between 30%-31%.

Table 6.3

6.4.2 Adult summary activity levels, 2011 (age-standardised), by equivalised household income and sex

As reported in 2008, there was a clear relationship between income and activity levels.⁴

As Figure 6D illustrates, around half of men in the three highest income quintiles met the recommendations (49%-50%), in contrast, 35%-44% of men in the lowest two income quintiles did so.

The pattern for women was different with a steady decline in the proportion meeting the recommendations from the highest to the lowest income quintiles (from 38% to 27%) (Figure 6E).

It is also clear from Figures 6D and 6E that the decline in the proportions meeting the recommendations by income coincided with a large increase in low activity levels (the proportions in the 'some activity' group did not increase as sharply).

Figure 6D, Figure 6E, Table 6.4

Figure 6D

Men's summary physical activity levels (age-standardised) by equivalised household income, 2011

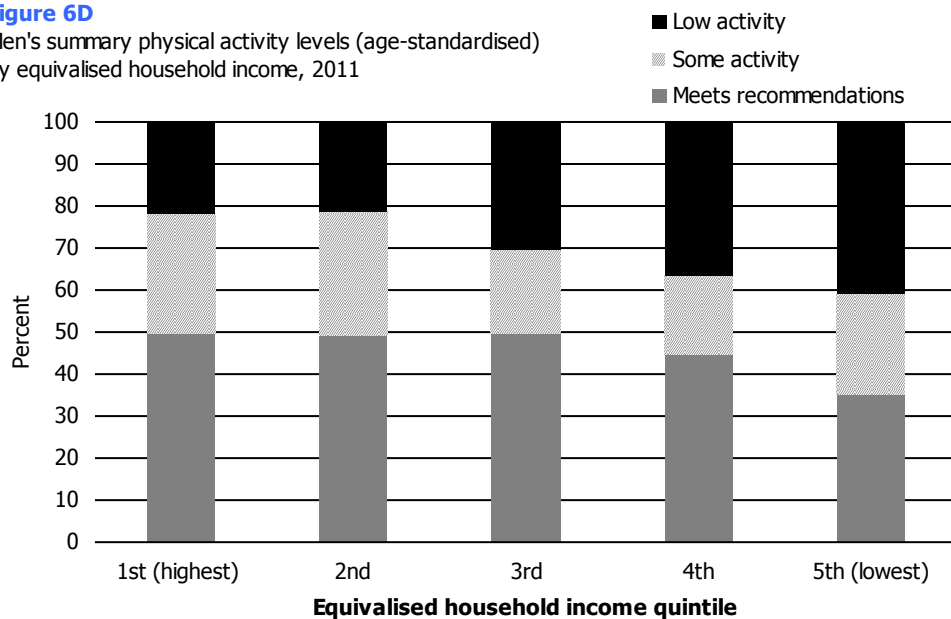
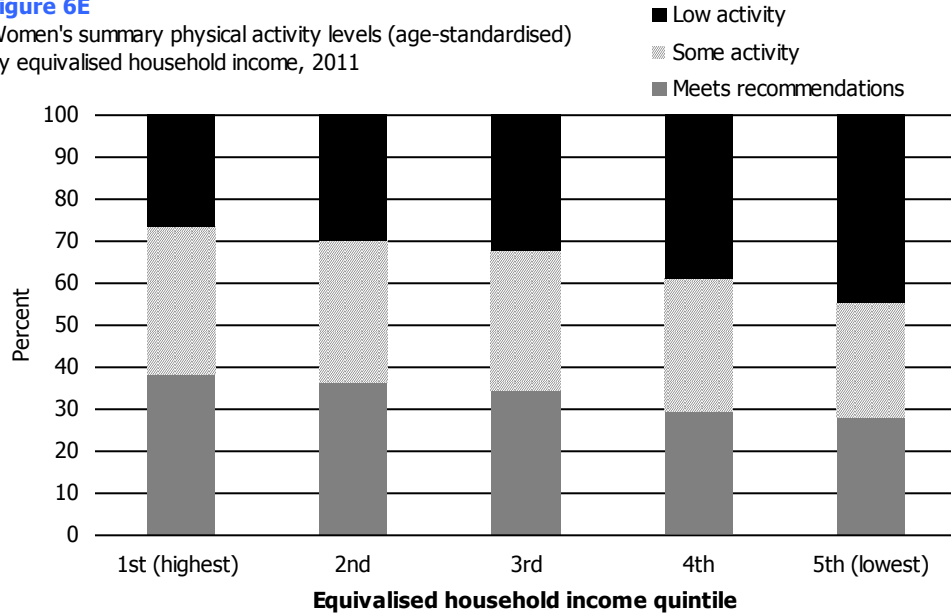


Figure 6E

Women's summary physical activity levels (age-standardised)
by equivalised household income, 2011



6.4.3 Adult summary activity levels, 2011 (age-standardised), by Scottish Index of Multiple Deprivation and sex

Two measures of SIMD are being used throughout this report. The first, which uses quintiles, enables comparisons to be drawn between the most and least deprived 20% of areas and the intermediate quintiles. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the “85% least deprived areas”).

As in 2008, there was a significant association between area deprivation and activity levels, although the pattern was clearer in 2011.⁴ For both men and women, those living in the two most deprived SIMD quintiles were the least likely to meet the recommendations (39%-42% of men and 29% of women). This was significantly lower than the proportions in the other three quintiles meeting the recommendations (47%-49% of men and 35%-36% of women). As was seen with income, the proportions in the ‘some activity’ category did not vary as much as the ‘low activity’ group which saw a 12-13 percentage point increase between those in the least and most deprived quintiles (from 25% to 38% in men, and from 30% to 42% in women).

Those in the 15% most deprived areas of Scotland were significantly less likely than those in the rest of the country to meet the recommendations (33% compared with 40%).

Table 6.5

References and notes

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See also: <www.scotlandperforms.com>
- ¹³ See: <www.scotland.gov.uk/About/scotPerforms/indicator/physicalactivity>
- ¹⁴ *Start Active, Stay Active – A report on physical activity for health from the four home countries' Chief Medical Officers*. (web only). UK Department of Health, July 2011. <www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_128209>
- ¹⁵ Note that young people aged 16-18 are treated as adults in SHeS and complete the adult version of the physical activity questionnaire. The different methods used to measure physical activity in adults and children mean that it is not appropriate to combine the data from young people aged 16-18 and those aged 5-15 to provide estimates for the 5-18 age group.
- ¹⁶ *Allied Dunbar National Fitness Survey*. London: Health Education Authority and Sports Council, 1992.

17

Home activities:

Examples of 'heavy' gardening or DIY work classified as *moderate* intensity:

Digging, clearing rough ground, building in stone/bricklaying, mowing large areas with a hand mower, felling trees, chopping wood, mixing/laying concrete, moving heavy loads, refitting a kitchen or bathroom or any similar heavy manual work.

Examples of 'heavy' housework classified as *moderate* intensity:

Walking with heavy shopping for more than 5 minutes, moving heavy furniture, spring cleaning, scrubbing floors with a scrubbing brush, cleaning windows, or other similar heavy housework.

Examples of 'light' gardening or DIY work classified as *light* intensity:

Hoeing, weeding, pruning, mowing with a power mower, planting flowers/seeds, decorating, minor household repairs, car washing and polishing, car repairs and maintenance.

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Sports and Exercise activities – Intensity:

Vigorous:

- a) All occurrences of running/jogging, squash, boxing, kick boxing, skipping, trampolining.
- b) Sports coded as vigorous intensity if they had made the participant breathe heavily or sweaty, but otherwise coded as moderate intensity including: cycling, aerobics, keep fit, gymnastics, dance for fitness, weight training, football, rugby, swimming, tennis, badminton.

Moderate:

- a) See 'vigorous' category b).
- b) All occasions of a large number of activities including: basketball, canoeing, fencing, field athletics, hockey, ice skating, lacrosse, netball, roller skating, rowing, skiing, volleyball.
- c) Sports coded as moderate intensity if they had made the participant breathe heavily or sweaty, but otherwise coded as light intensity, including: exercise (press-ups, sit-ups etc), dancing.

Light:

- a) See 'moderate' category c).
- b) All occasions of a large number of activities including: abseiling, baseball, bowls, cricket, croquet, darts, fishing, golf, riding, rounders, sailing, shooting, snooker, snorkelling, softball, table tennis, yoga.

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Work activities:

Vigorous:

Considers self very physically active in job and is in one of a small number of occupations defined as involving heavy work including:
fishermen/women, furnace operators, rollerman, smiths and forge workers, faceworking coal-miners, other miners, construction workers and forestry workers.

Moderate:

Considers self very physically active in job and is not in occupation groups listed above OR considers self fairly physically active in job and is one of a small number of occupations involving heavy or moderate work including:
any listed above OR fire service officers, metal plate workers, shipwrights, riveters, steel erectors, benders, fitters, galvanisers, tin platers, dip platers, plasterers, roofers, glaziers, general building workers, road surfacers, stevedores, dockers, goods porters, refuse collectors.

Light:

Considers self fairly physically active in job and is not in one of the occupation groups listed above.

Table list

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Table 6.4	Adult summary activity levels, 2011, (age-standardised), by equivalised household income quintile and sex
Table 6.5	Adult summary activity levels, 2011, (age-standardised), by Scottish Index of Multiple Deprivation (SIMD) and sex

Table 6.1 Adult summary activity levels, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

2008, 2009, 2010, 2011

Summary activity levels ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Meets recommendations								
2008	58	63	53	43	37	21	13	45
2009	61	54	50	43	37	21	11	43
2010	66	61	51	48	34	22	10	45
2011	63	61	54	48	32	23	11	45
Some activity								
2008	29	25	29	30	23	27	21	27
2009	19	26	30	31	28	31	22	27
2010	22	24	29	25	29	29	20	26
2011	22	26	28	26	26	27	19	25
Low activity								
2008	13	12	18	27	40	51	66	28
2009	20	20	20	26	36	48	66	30
2010	12	15	20	27	36	50	70	29
2011	15	13	19	27	42	50	70	30
Women								
Meets recommendations								
2008	42	42	43	37	29	20	4	33
2009	38	41	39	38	30	17	6	32
2010	37	42	45	40	30	17	7	33
2011	41	45	42	38	27	18	6	33
Some activity								
2008	33	37	37	36	35	33	17	34
2009	37	39	39	36	34	34	19	35
2010	39	36	35	36	33	31	17	33
2011	34	35	36	33	37	30	17	32
Low activity								
2008	25	21	20	27	35	46	78	33
2009	25	20	22	26	36	49	75	34
2010	25	22	19	24	36	52	76	33
2011	25	21	22	28	36	52	77	35

Continued...

Table 6.1 - Continued

Aged 16 and over

2008, 2009, 2010, 2011

Summary activity levels ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
All Adults								
Meets recommendations								
2008	50	53	47	40	33	21	8	39
2009	50	47	45	40	33	19	8	37
2010	52	51	48	44	32	19	8	39
2011	52	53	48	43	30	20	8	39
Some activity								
2008	31	31	34	33	29	31	19	30
2009	28	33	35	34	31	33	21	31
2010	30	30	32	31	31	30	18	30
2011	28	30	32	29	31	29	18	29
Low activity								
2008	19	16	19	27	37	49	74	31
2009	22	20	21	26	36	49	71	32
2010	18	19	20	26	36	51	73	31
2011	20	17	20	28	39	51	74	32
<i>Bases (weighted):</i>								
<i>Men 2008</i>	464	481	561	555	480	327	218	3085
<i>Men 2009</i>	538	568	634	647	561	387	257	3591
<i>Men 2010</i>	515	559	589	631	542	374	254	3466
<i>Men 2011</i>	534	583	613	656	564	390	266	3605
<i>Women 2008</i>	445	487	615	590	503	383	346	3369
<i>Women 2009</i>	511	570	693	700	590	450	408	3923
<i>Women 2010</i>	494	556	645	680	571	431	396	3772
<i>Women 2011</i>	513	580	671	708	594	449	409	3924
<i>All adults 2008</i>	909	968	1176	1145	983	710	565	6455
<i>All adults 2009</i>	1050	1138	1327	1347	1151	836	665	7514
<i>All adults 2010</i>	1009	1115	1234	1311	1113	805	650	7238
<i>All adults 2011</i>	1047	1163	1284	1364	1157	839	675	7529
<i>Bases (unweighted):</i>								
<i>Men 2008</i>	245	317	459	534	525	453	304	2837
<i>Men 2009</i>	272	406	550	600	574	517	359	3278
<i>Men 2010</i>	274	420	478	566	555	488	331	3112
<i>Men 2011</i>	306	399	516	599	600	511	343	3274
<i>Women 2008</i>	334	451	647	631	631	515	406	3615
<i>Women 2009</i>	383	579	779	733	735	550	479	4238
<i>Women 2010</i>	373	564	682	761	699	573	470	4122
<i>Women 2011</i>	363	562	710	801	738	596	483	4253
<i>All adults 2008</i>	579	768	1106	1165	1156	968	710	6452
<i>All adults 2009</i>	655	985	1329	1333	1309	1067	838	7516
<i>All adults 2010</i>	647	984	1160	1327	1254	1061	801	7234
<i>All adults 2011</i>	669	961	1226	1400	1338	1107	826	7527

a Meets recommendations= 30 minutes or more on at least 5 days a week; Some activity= 30 minutes or more on 1 to 4 days a week; Low activity= fewer than 30 minutes of moderate or vigorous activity a week (these categories were described in previous reports as "high", "medium" and "low", the labels have changed but the definitions for the categories remain the same).

Table 6.2 Adults' participation in different activity types for at least 10 minutes in the last 4 weeks, 2011, by age and sex

Aged 16 and over

2011

Participation for at least 10 minutes a time	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Heavy housework								
Any participation in last 4 weeks	41	57	55	52	46	44	28	48
Mean number of days in last 4 weeks ^a	1.9	3.3	2.6	2.9	2.2	2.0	1.5	2.4
Standard error of the mean	0.30	0.45	0.21	0.24	0.19	0.18	0.22	0.13
Mean number of hours per week ^a	0.5	1.1	1.1	0.9	1.0	0.6	0.4	0.8
Standard error of the mean	0.07	0.22	0.13	0.08	0.16	0.08	0.07	0.06
Heavy Manual / Gardening / DIY								
Any participation in last 4 weeks	10	26	36	37	31	27	15	27
Mean number of days in last 4 weeks ^a	0.3	1.4	1.5	1.8	1.7	1.6	1.2	1.4
Standard error of the mean	0.06	0.20	0.15	0.17	0.19	0.21	0.24	0.08
Mean number of hours per week ^a	0.2	1.2	1.3	1.9	1.5	1.3	0.9	1.2
Standard error of the mean	0.07	0.22	0.18	0.22	0.26	0.23	0.21	0.09
Walking (brisk/fast pace)								
Any participation in last 4 weeks	59	58	45	41	31	24	11	41
Mean number of days in last 4 weeks ^a	11.6	11.0	7.5	7.3	5.5	4.6	2.3	7.6
Standard error of the mean	0.92	0.71	0.53	0.48	0.47	0.44	0.41	0.26
Mean number of hours per week ^a	3.1	3.8	2.5	2.5	2.2	1.9	0.5	2.5
Standard error of the mean	0.34	0.67	0.36	0.35	0.30	0.26	0.12	0.16
Sports and Exercise								
Any participation in last 4 weeks	78	73	62	49	37	38	22	54
Mean number of days in last 4 weeks ^a	11.6	11.0	8.3	5.7	4.3	4.5	2.6	7.3
Standard error of the mean	0.72	0.63	0.51	0.41	0.37	0.37	0.42	0.23
Mean number of hours per week ^a	4.0	3.6	2.3	2.1	1.4	1.8	1.0	2.4
Standard error of the mean	0.44	0.38	0.18	0.17	0.15	0.18	0.16	0.12
Any physical activities								
Any participation in last 4 weeks	94	94	92	87	75	72	48	84
Mean number of days in last 4 weeks ^a	21.2	20.5	18.5	16.5	12.6	11.0	6.7	16.2
Standard error of the mean	0.75	0.56	0.53	0.50	0.54	0.51	0.60	0.26
Mean number of hours per week ^a	9.5	11.7	9.6	9.6	7.2	5.9	2.9	8.7
Standard error of the mean	0.69	0.94	0.50	0.48	0.48	0.46	0.34	0.26
Women								
Heavy housework								
Any participation in last 4 weeks	51	71	75	72	64	52	28	61
Mean number of days in last 4 weeks ^a	2.5	4.8	4.7	4.4	4.0	2.8	1.2	3.7
Standard error of the mean	0.26	0.29	0.24	0.23	0.25	0.25	0.14	0.10
Mean number of hours per week ^a	0.9	2.1	2.1	2.3	1.8	1.5	0.4	1.7
Standard error of the mean	0.10	0.21	0.14	0.23	0.13	0.19	0.07	0.08

Continued...

Table 6.2 - Continued

Aged 16 and over

2011

Participation for at least 10 minutes a time	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Women								
Heavy Manual / Gardening / DIY								
Any participation in last 4 weeks	4	6	12	13	15	10	4	9
Mean number of days in last 4 weeks ^a	0.1	0.2	0.4	0.5	0.8	0.5	0.2	0.4
Standard error of the mean	0.03	0.06	0.07	0.08	0.11	0.12	0.09	0.03
Mean number of hours per week ^a	0.1	0.2	0.2	0.5	0.5	0.3	0.1	0.3
Standard error of the mean	0.02	0.07	0.04	0.09	0.07	0.07	0.03	0.03
Walking (brisk/fast pace)								
Any participation in last 4 weeks	45	37	40	33	27	18	8	31
Mean number of days in last 4 weeks ^a	8.5	6.6	7.3	6.3	5.2	3.8	1.4	5.9
Standard error of the mean	0.68	0.48	0.45	0.38	0.38	0.38	0.26	0.19
Mean number of hours per week ^a	2.7	2.1	2.2	2.0	2.0	1.2	0.4	1.9
Standard error of the mean	0.47	0.27	0.20	0.20	0.30	0.17	0.11	0.11
Sports and Exercise								
Any participation in last 4 weeks	65	62	53	45	37	25	18	45
Mean number of days in last 4 weeks ^a	7.0	7.4	6.0	5.1	4.0	2.8	1.7	5.1
Standard error of the mean	0.52	0.47	0.36	0.33	0.32	0.31	0.23	0.17
Mean number of hours per week ^a	1.9	1.7	1.3	1.2	1.0	0.8	0.4	1.2
Standard error of the mean	0.21	0.13	0.10	0.10	0.10	0.13	0.06	0.05
Any physical activities								
Any participation in last 4 weeks	86	91	89	87	80	66	40	79
Mean number of days in last 4 weeks ^a	15.6	16.5	15.9	14.8	12.4	8.6	4.0	13.2
Standard error of the mean	0.69	0.54	0.46	0.40	0.44	0.47	0.34	0.21
Mean number of hours per week ^a	6.4	6.9	6.8	7.2	5.9	3.8	1.3	5.8
Standard error of the mean	0.50	0.37	0.32	0.33	0.34	0.31	0.17	0.15
All adults								
Any physical activity								
Any participation in last 4 weeks	90	92	91	87	77	69	43	81
Mean number of days in last 4 weeks ^a	18.4	18.5	17.1	15.6	12.5	9.7	5.1	14.6
Standard error of the mean	0.55	0.41	0.36	0.32	0.37	0.36	0.31	0.18
Mean number of hours per week ^a	8.0	9.3	8.1	8.3	6.5	4.8	1.9	7.2
Standard error of the mean	0.43	0.53	0.31	0.29	0.31	0.28	0.17	0.16
<i>Bases (weighted):</i>								
<i>Men</i>	535	583	613	656	564	390	266	3607
<i>Women</i>	514	580	671	708	593	449	412	3927
<i>All adults</i>	1050	1163	1284	1364	1156	839	678	7534
<i>Bases (unweighted):</i>								
<i>Men</i>	307	399	516	599	600	511	344	3276
<i>Women</i>	364	562	710	801	737	596	485	4255
<i>All adults</i>	671	961	1226	1400	1337	1107	829	7531

^a Means are based on all participants.

Table 6.3 Adult summary activity levels, 2011, (age-standardised), by NS-SEC of household reference person and sex

Aged 16 and over

2011

Summary activity levels ^a	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
	%	%	%	%	%
Men					
Meets recommendations	45	39	49	51	45
Some activity	30	28	21	21	21
Low activity	25	33	30	28	35
Women					
Meets recommendations	36	31	40	31	30
Some activity	35	34	32	31	29
Low activity	29	34	27	38	41
All adults					
Meets recommendations	40	35	45	42	37
Some activity	33	32	26	26	25
Low activity	27	34	29	32	38
<i>Bases (weighted):</i>					
<i>Men</i>	1397	282	366	472	979
<i>Women</i>	1465	395	346	412	1183
<i>All adults</i>	2862	677	712	884	2162
<i>Bases (unweighted):</i>					
<i>Men</i>	1211	243	364	439	931
<i>Women</i>	1511	426	394	463	1328
<i>All adults</i>	2722	669	758	902	2259

a Meets recommendations= 30 minutes or more on at least 5 days a week; Some activity= 30 minutes or more on 1 to 4 days a week; Low activity= fewer than 30 minutes of moderate or vigorous activity a week (these categories were described in previous reports as "high", "medium" and "low", the labels have changed but the definitions for the categories remain the same).

Table 6.4 Adult summary activity levels, 2011, (age-standardised), by equivalised household income quintile and sex

Aged 16 and over

2011

Summary activity levels ^a	Equivalised annual household income quintile				
	1 st (highest)	2 nd	3 rd	4 th	5 th (lowest)
	%	%	%	%	%
Men					
Meets recommendations	50	49	49	44	35
Some activity	29	29	20	19	24
Low activity	22	21	30	37	41
Women					
Meets recommendations	38	36	34	29	27
Some activity	36	34	33	32	28
Low activity	26	30	32	39	45
All adults					
Meets recommendations	44	43	41	36	31
Some activity	32	32	27	26	26
Low activity	24	26	31	38	43
<i>Bases (weighted):</i>					
<i>Men</i>	810	685	569	493	454
<i>Women</i>	749	711	628	615	537
<i>All adults</i>	1559	1395	1197	1109	991
<i>Bases (unweighted):</i>					
<i>Men</i>	706	604	541	489	437
<i>Women</i>	778	763	698	702	611
<i>All adults</i>	1484	1367	1239	1191	1048

a Meets recommendations= 30 minutes or more on at least 5 days a week; Some activity= 30 minutes or more on 1 to 4 days a week; Low activity= fewer than 30 minutes of moderate or vigorous activity a week (these categories were described in previous reports as "high", "medium" and "low", the labels have changed but the definitions for the categories remain the same).

Table 6.5 Adult summary activity levels, 2011, (age-standardised), by Scottish Index of Multiple Deprivation and sex

Aged 16 and over

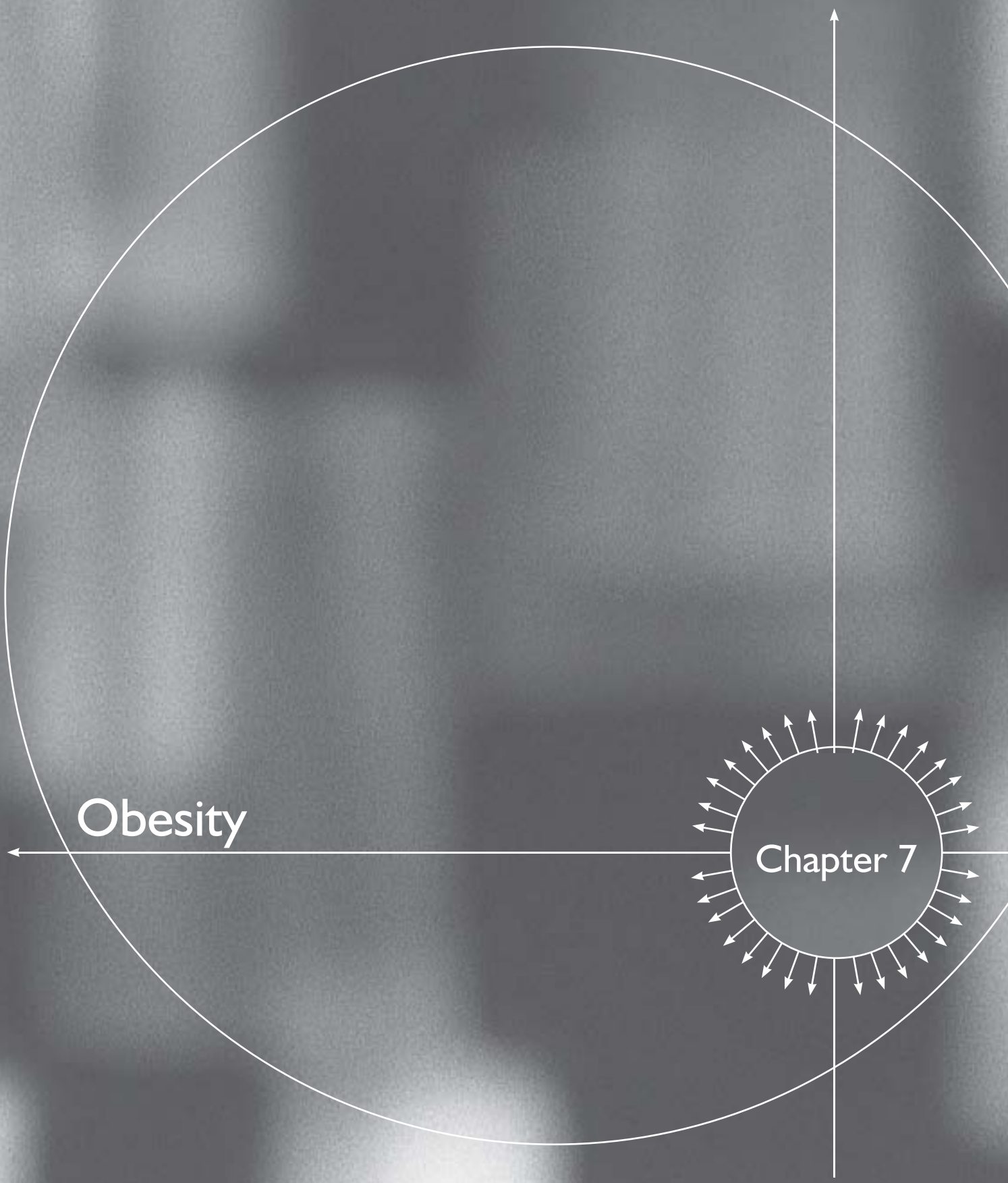
2011

Summary activity levels ^a	Scottish Index of Multiple Deprivation					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Meets recommendations	49	49	47	42	39	47	38
Some activity	27	26	23	26	23	25	23
Low activity	25	25	30	32	38	28	39
Women							
Meets recommendations	36	35	35	29	29	34	28
Some activity	34	35	31	34	30	33	29
Low activity	30	31	34	37	42	33	43
All adults							
Meets recommendations	42	42	41	35	34	40	33
Some activity	30	31	27	30	26	29	26
Low activity	27	28	32	35	40	31	41
<i>Bases (weighted):</i>							
<i>Men</i>	690	781	769	631	734	3055	551
<i>Women</i>	728	818	865	734	778	3336	587
<i>All adults</i>	1418	1600	1635	1365	1513	6392	1138
<i>Bases (unweighted):</i>							
<i>Men</i>	567	758	751	553	645	2778	496
<i>Women</i>	735	945	984	768	821	3619	634
<i>All adults</i>	1302	1703	1735	1321	1466	6397	1130

a Meets recommendations= 30 minutes or more on at least 5 days a week; Some activity= 30 minutes or more on 1 to 4 days a week; Low activity= fewer than 30 minutes of moderate or vigorous activity a week (these categories were described in previous reports as “high”, “medium” and “low”, the labels have changed but the definitions for the categories remain the same).

Obesity

Chapter 7



7 OBESITY

Linsay Gray and Alastair H Leyland

SUMMARY

- In 2011, over a quarter (27.7%) of adults aged 16 and over were obese (27.7% of men and 27.6% of women). Just under two-thirds (64.3%) were overweight or obese. Men were significantly more likely than women to be overweight or obese (69.2% compared with 59.6%).
- The mean Body Mass Index (BMI) in 2011 was 27.6 kg/m² for men and 27.5 kg/m² for women.
- Between 1995 and 2011, the proportion of adults aged 16-64 who were overweight or obese (BMI of 25 kg/m² and over) increased from 52.4% to 62.2%. Over this same period the prevalence of obesity (BMI of 30 kg/m² and over) among this age group also increased from 17.2% to 26.5%. The greatest increases were seen between 1995 and 2008 with figures remaining broadly stable since then.
- There was also an increase in mean BMI among adults aged 16-64 between 1995 and 2001 (from 25.8 kg/m² to 27.3 kg/m²). Again, the greatest increase occurred between 1995 and 2008 and has been largely stable since then.
- Obesity prevalence increased significantly with age in 2011, from 13.4% in those aged 16-24 to a peak of 35.4% in those aged 65-74. 16-24 year olds were least likely to be overweight including obese (36.0%) while those aged 65-74 were most likely to be (77.5%).
- In the 2010/2011 period, the mean waist circumference was 96.3cm for men and 89.0cm for women. Women were significantly more likely than men to have a raised waist circumference (49.1% compared with 31.7%).
- Based on a combination of their BMI and waist circumference measurements, women were more likely than men to be classified as being at high (or greater) risk of conditions like type 2 diabetes, hypertension and CVD (45.4% compared with 34.4% of men).
- Among men, the proportion at high (or greater) risk of such conditions increased with age up until age 55-64 at which point it levelled out. For women the proportion at high risk also increased with age but up until age 65-74 before dipping for those aged 75 and over.
- 15.7% of men were overweight according to their BMI but when the combined measure of BMI and waist circumference was used they were classified as being at *no increased risk* of obesity related diseases. The comparable figure for women was just 4.1%.
- There was a significant association between disease risk and both socio-economic classification and household income with clearer patterns observed for women than for men. Women living in semi-routine and routine households were the most likely to be classified as at a high (or greater) risk of obesity related disease whereas those in professional and managerial households were least likely to be (52.1% compared with 41.0%).
- Men living in the least deprived SIMD quintile were least likely to have health risks (49.1% had *no increased risk*, compared with 44.7%-46.6% of those living elsewhere. For women, the proportion at *no increased risk* decreased in line with deprivation (from 45.3% in the least deprived quintile to 29.8% in the most deprived).

- Age, economic status and physical activity levels were all independently significantly associated with being at high risk of disease for both men and women. For men, education level, marital status and self-assessed health status were also significant factors. For women, SIMD, parental NS-SEC, smoking status and presence of a long-standing illness were independently associated with being at high risk of disease.

7.1 INTRODUCTION

Obesity has a major impact on quality of life and health, increasing risk of type 2 diabetes, hypertension, cardiovascular disease, osteoarthritis and cancer.¹ Scotland has one of the worst obesity records amongst developed countries. The estimated cost to the NHS in Scotland of obesity and related illnesses in 2007/8 was in excess of £175 million.² With these economic and health costs, tackling obesity is a key priority for the public health sector in Scotland.

The introductions to the obesity chapters in the 2008,³ 2009⁴ and 2010⁵ Scottish Health Survey (SHeS) Reports provided a detailed overview of the recent policy context in Scotland. These included:

- The Scottish Government's *Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity*.⁶
- The Keep Well initiative.⁷
- The Scottish Government's *Route Map* for tackling obesity and the associated *Obesity Route Map Action Plan*, published in 2011.⁸ SHeS is the measurement tool for seven of the Route Map's indicators, including the following long-term goal: the majority of Scotland's adult population in normal weight throughout life.⁹
- The Scottish Intercollegiate Guidelines Network (SIGN) national clinical guideline on obesity management.¹⁰

In addition, a number of policy actions targeted specifically at improving diets (described in Chapter 5) and physical activity levels (described in Chapter 6) are also relevant in the context of tackling obesity. Furthermore, as outlined in the chapter on child obesity in Volume 2, much of the effort to tackle unhealthy weight in the population is targeted at children, reflecting evidence that many children who are overweight or obese continue to be so in adulthood. For example, there are National Performance Framework National Indicators around healthy birthweight¹¹ and child healthy weight.¹²

This chapter focuses on body mass index (BMI) and waist circumference, derived from the direct measurements of height and weight taken in the main interview, and the waist measurements taken as part of the nurse visit. Time trends in BMI and waist circumference over the 1995-2011 period are examined by age and sex. Previous reports have also included data on waist/hip ratio. However, due to space constraints, concerns about the usefulness of this ratio as an indicator of obesity, and the fact that hip circumference is not being measured from 2012 onwards, this chapter only reports waist circumference results.

Between 2008 and 2011 only a sub-sample of participants was invited to have an additional nurse visit. For this reason the analysis of waist circumference presented here is based on either two or four years of nurse data combined. From 2012 the survey is no longer including a nurse visit and instead a sub-sample of adults will be asked to complete a new biological module, conducted by specially trained interviewers. Waist circumference is part of this new module. A validation study has been conducted to assess the impact on the time series data of the change in methodology for measuring waist circumference.¹³ Future SHeS reports will discuss the implications in full.

The obesity chapter in the 2009 SHeS report included, for the first time, some analysis of disease risk using a measure recommended by the World Health Organisation, and endorsed in Scotland by SIGN, that takes into account both BMI and waist circumference.⁴ This chapter takes advantage of the larger sample provided by the 2008-2011 combined data to explore this further and presents disease risk by socio-economic classification, household income and the Scottish Index of Multiple Deprivation (SIMD).

7.2 METHODS AND DEFINITIONS OF MEASUREMENT

Full details of the protocols for carrying out the measurements are contained in Volume 3 of this report and are briefly summarised here.

7.2.1 Height

Height was measured using a portable stadiometer with a sliding head plate, a base plate and three connecting rods marked with a metric measuring scale. Participants were asked to remove shoes. One measurement was taken, with the participant stretching to the maximum height and the head positioned in the Frankfort plane.¹⁴ The reading was recorded to the nearest millimetre.

7.2.2 Weight

Weight was measured using Soehnle and Tanita electronic scales with a digital display. Participants were asked to remove shoes and any bulky clothing. A single measurement was recorded to the nearest 100g. Participants aged under 2 years, or who were pregnant, or chairbound, or unsteady on their feet were not weighed. Participants who weighed more than 130 kg were asked for their estimated weights because the scales are inaccurate above this level. These estimated weights were included in the analysis.

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

7.2.3 Body Mass Index (BMI)

The Body Mass Index (BMI), defined as weight (kg)/height (m²), is a widely accepted measure that allows for differences in weight due to

height. It has been used in each SHeS report to date. However, BMI has some limitations.^{15,16} It does not distinguish between mass due to body fat and mass due to muscular physique. It also does not take account of the distribution of fat.

BMI was calculated for all those participants for whom a valid height and weight measurement was recorded.

BMI classification

Adult participants were classified into the following BMI groups:¹⁷

BMI (kg/m²)	Description
Less than 18.5	Underweight
18.5 to less than 25	Normal
25 to less than 30	Overweight
30 to less than 40	Obese, excluding morbidly obese
40+	Morbidly obese

Other cut off points are also used in analyses of obesity, for example the World Health Organisation (WHO) cites evidence that chronic disease is an increasing risk in populations when BMI exceeds 21,¹⁸ while mortality rates do not necessarily correlate neatly with the categories presented here.¹⁹ However, meaningful comparisons of prevalence estimates between countries require agreed thresholds and these categories correspond with the WHO's recommended definitions for underweight, normal, overweight and obese (though they use three sub-classifications of obesity rather than the two presented here).²⁰ The tables by age and sex report both mean BMI and prevalence of the five categories outlined above. Although obesity has the greatest ill-health and mortality consequences, overweight is also a major public health concern, not least because overweight people are at high risk of becoming obese, while underweight also has negative health consequences. The trend tables present three measures: the proportion who is either overweight or obese (BMI of 25 kg/m² or more), the proportion who are obese (BMI of 30 kg/m² or more), and the proportion morbidly obese (BMI of 40 kg/m² or more). The latter group are at particularly high risk of morbidity and mortality.²¹

7.2.4 Waist measurements

Waist and hip measurements were conducted as part of the nurse interview. As noted in the introduction, only waist measurements are reported here.²² Waist was defined as the midpoint between the lower rib and the upper margin of the iliac crest. It was measured using a tape with an insertion buckle at one end. Each measurement was taken twice, using the same tape, and was recorded to the nearest even millimetre. Those participants whose two waist measurements differed by more than 3 cm had a third measurement taken.

For waist measurements, all those who reported that they had a colostomy or ileostomy, or were chairbound or pregnant, were excluded

from the measurement. All those with measurements considered unreliable by the nurse, for example due to excessive clothing or movement, were excluded from the analysis.

Raised waist circumference

It has been postulated that waist circumference (WC) may be a better measure than BMI to identify those with a health risk from being overweight. The definition of raised WC used is in accordance with the definition of abdominal obesity used by the National Institutes of Health (USA) ATP (Adult Treatment Panel) III.²³ A raised WC has been taken to be more than 102 cm in men and more than 88 cm in women. These levels identify people at risk of metabolic syndrome, a disorder characterised by increased risk of developing diabetes and cardiovascular disease. Abdominal obesity is reported as more highly correlated with metabolic risk factors (high levels of triglycerides, low HDL-cholesterol) than elevated BMI.²³

7.2.5 WHO combined classification of disease risk

As noted in the introduction, the SIGN guideline on obesity¹⁰ cites the WHO's recommendation that an individual's risk of conditions such as type 2 diabetes and CVD is better estimated using a combination of both BMI and waist circumference (WC). The table below sets out the classification categories SIGN suggest. SIGN also note that increased WC can be a marker for disease even among people of normal weight. The analysis presented in this chapter classified people with normal weight and very high WC as at increased risk of disease. This chapter uses the BMI data collected in the main interview in combination with the waist measures collected by the nurse to estimate the proportion of the Scottish population who fall into each of the risk categories. This combined classification designates those with a raised WC as 'very high' WC, while those towards the upper end of the 'not raised' WC range are designated 'high' WC. As the table below indicates, the health risk is similar for adults with very high WC and class I obesity and for adults with high WC and class II obesity.

Type 2 diabetes, hypertension and CVD risk relative to normal weight and waist circumference				
Classification	BMI (kg/m ²)	Class	'High' WC Men WC 94-102cm Women WC 80-88cm	'Very high' WC Men WC >102cm Women WC >88cm
Normal weight	18.5 - <25		-	-
Overweight	25 - <30		Increased	High
Obese				
Mild	30 - <35	I	High	Very high
Moderate	35 - <40	II	Very high	Very high
Extreme	40+	III	Extremely high	Extremely high

Source: based on Table 3, p11, in SIGN 115.¹⁰

7.3 RESPONSE TO ANTHROPOMETRIC MEASUREMENTS, BY AGE AND SEX

Response to height, weight, BMI, and waist and hip among adults (for 2008-2011 combined) is shown in Table 7.1. In previous reports the figures for single years have been presented, however since many of the data in this chapter are based on the 2008-2011 samples combined, the response figures are based on combined data also. A valid height measurement was obtained for 87% of men and 86% of women in this period. Response generally declined with age with the lowest levels among those aged 75 and over (74% of men and 70% of women aged 75 and over compared with 90% of those aged 16-24).

Valid weight measurements were provided by 86% of men and 84% of women. As with height, the proportions of men and women providing valid weight measurements were lowest for the oldest age group (75% of men and 72% of women). Proportions with known values for both height and weight, and thus derived BMI were similar to those for weight alone (85% of men and 83% of women), and followed similar patterns by age. Valid waist and hip measurements were obtained for almost all men (99%) and women (98%) who had a nurse visit; again response was slightly lower for those aged 75 and over (97% of men and 94% of women).

Table 7.1

7.4 TRENDS IN THE PREVALENCE OF OVERWEIGHT AND OBESITY SINCE 1995

This section presents figures for the prevalence of overweight including obese (BMI 25 kg/m² or more), obesity (BMI 30 kg/m² or more), morbid obesity (BMI 40 kg/m² or more) and mean BMI by age for each survey year to date. Figures are presented for all adults and for men and women separately. Changes to the sample composition in the earlier survey years mean trends since 1995 are based on all adults aged 16-64, while trends for all adults aged 16 and over are presented for 2003 onwards. Adults' BMI in 2011 is discussed in more detail in Section 7.5.

7.4.1 Obesity and morbid obesity

As shown in Table 7.2 and Figure 7A, prevalence of obesity (BMI 30 kg/m² or more) among adults aged 16-64 in Scotland has risen significantly over the last sixteen years. Between 1995 and 2011 there was around a ten percentage point increase in the proportion of adults aged 16-64 that were obese (from 17.2% to 26.5%). As the more detailed discussion below illustrates, most of this increase occurred between 1995 and 2008, with the more recent figures showing some evidence of stability.

The increase in obesity over time followed a similar pattern for both men and women. For men aged 16-64, prevalence increased from 15.9% in 1995 to 22.0% in 2003 and then again to 24.9% in 2008. Between 2008 and 2011 it was fairly stable, ranging from 24.9% to 26.7%. The greatest increase for women also occurred between 1995 and 2003 (17.3% to 23.8%), with the figures since 2008 again, remaining fairly stable (ranging from 26.4% to 28.1%). While obesity

prevalence in 2011 was significantly higher than in 1995-2003 it was not significantly different to levels in the 2008-2010 period.

The trend in obesity for all adults aged 16 and over since 2003 was similar to that discussed above for 16-64 year olds. A notable exception is that the increase in obesity for all adults was largely accounted for by rising levels among men with no significant increase among women. In 2003, 22.4% of men aged 16 and over were obese compared with 26.0%-27.7% from 2008 onwards. In contrast, the most recent figure for women (27.6%) was only a little higher than in 2003 (26.0%).

As noted in previous SHeS reports, morbid obesity prevalence (BMI of 40 kg/m² or more) is very low: just 2.9% of adults in 2011. However, this has also increased over time, from 1.2% of 16-64 year olds in 1995 to 2.7% in 2003, with levels fluctuating between 2.5% and 3.0% since 2008. The pattern for all adults aged 16 and over since 2003 was similar with prevalence fluctuating between 2.2% and 2.9%.

Figure 7A, Table 7.2

7.4.2 Overweight and obesity

There has also been an increase over time in the proportion of 16-64 year olds that were overweight including obese (BMI 25 kg/m² or more) (from 52.4% in 1995, to 62.2% in 2011). As with the patterns in obesity discussed above, there was a large increase between 1995 and 2003, with the more recent figures being broadly stable (ranging from 62.2% to 63.3% in the 2008-2011 period). Prevalence of overweight including obesity has fluctuated more over this period for women than for men – after rising from 47.2% in 1995 to 57.3% in 2003, prevalence was then a little higher between 2008 and 2010 (58.4%-60.3%), but fell again in 2011 to 57.1%. This may well be trendless fluctuation, or the drop in 2011 could be the start of a decline in overweight including obesity prevalence among women aged 16-64; the 2012 and 2013 figures will help to answer this. In contrast, in recent years the proportion of overweight or obese men aged 16-64 has remained stable.

The pattern for all adults aged 16 and over since 2003 was similar to that for 16-64 year olds. For men, there was a small increase in overweight including obese prevalence between 2003 and 2008 (from 65.4% to 68.5%) followed by relative stability. In contrast, the proportion of women who were overweight or obese fluctuated, with no obvious pattern, between 59.6% and 62.4% and the 2003 and 2011 figures were very similar.

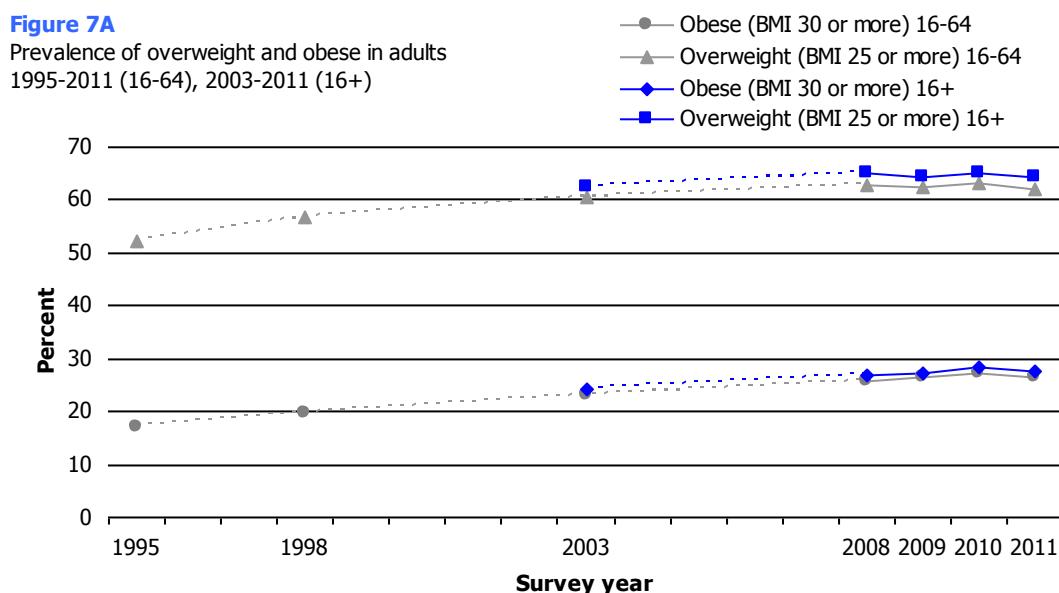
Figure 7A, Table 7.2

7.4.3 Mean BMI

Mean BMI for adults aged 16-64 increased from 25.8 kg/m² in 1995 to 27.2 kg/m² in 2008, and has remained at a similar level since then (for example, it was 27.3 kg/m² in 2011). Trends in mean BMI for men and women followed a very similar pattern in this period.

The mean BMI trend for those aged 16 and over was similar to the trend for 16-64 year olds and again, the pattern was similar for both sexes. In 2003, the mean BMI for men was 27.0 kg/m², this increased slightly to 27.4 kg/m² in 2008, and has remained at a similar level to this in recent years. The equivalent figures for women ranged from 27.2 kg/m² to 27.6 kg/m², though, as with men, the highest figures have been in the more recent years.

The 2010 SHeS Report discussed the difficulties of interpreting patterns in a time series that has uneven intervals between measures.⁵ However, the latest figures appear to support the suggestion that mean BMI, and the prevalence of overweight and obesity, have begun to stabilise following the larger increases evident between the earlier years of the survey. The continued annual monitoring of these measures in the 2012-2015 period will be hugely valuable. **Figure 7A, Table 7.2**



7.5 ADULT BMI, BY AGE AND SEX, 2011

Table 7.3 presents the 2011 prevalence figures for the five BMI groups outlined in Section 7.2.3 (from underweight to morbidly obese) as well as the summary measures of overweight including obese (BMI of 25 kg/m² and over) and obese (BMI of 30 kg/m² and over) discussed in the previous section. In 2011, 27.7% of adults aged 16 and over were obese (27.7% of men and 27.6% of women). As Figures 7B and 7C illustrate, obesity levels varied significantly by age. There was a linear increase in prevalence from 13.4% (14.1% of men and 12.7% of women) at age 16-24 to 35.4% (35.7% of men and 35.2% women) at age 65-74, followed by a drop to 29.4% for the oldest age group (28.4% of men and 30.0% of women).

Prevalence of overweight, including obese was 64.3% among all adults in 2011 and was significantly higher in men (69.2%) than women (59.6%). The differences by age followed a similar pattern to obesity with a particularly pronounced difference between the proportion of men aged 16-24 and 25-34

that were overweight or obese (35.2% compared with 62.0%). 1.7% of men and 2.0% of women were underweight with prevalence most common among the youngest age group (8.1% of men and 7.2% of women).

The mean BMI for adults in 2011 was 27.5 kg/m² and was very similar for men (27.6 kg/m²) and women (27.5 kg/m²). Mean BMI increased significantly with age from 24.3 kg/m² for men, and 24.7 kg/m² for women aged 16-24, to a peak at age 65-74 (28.8 kg/m² for men and 28.9 kg/m² for women) before dropping slightly among the oldest age group (to 27.9 kg/m² for men and 27.5 kg/m² for women aged 75 and over).

Figure 7B, Figure 7C, Table 7.3

Figure 7B

Prevalence of overweight and obese, by age (Men), 2011

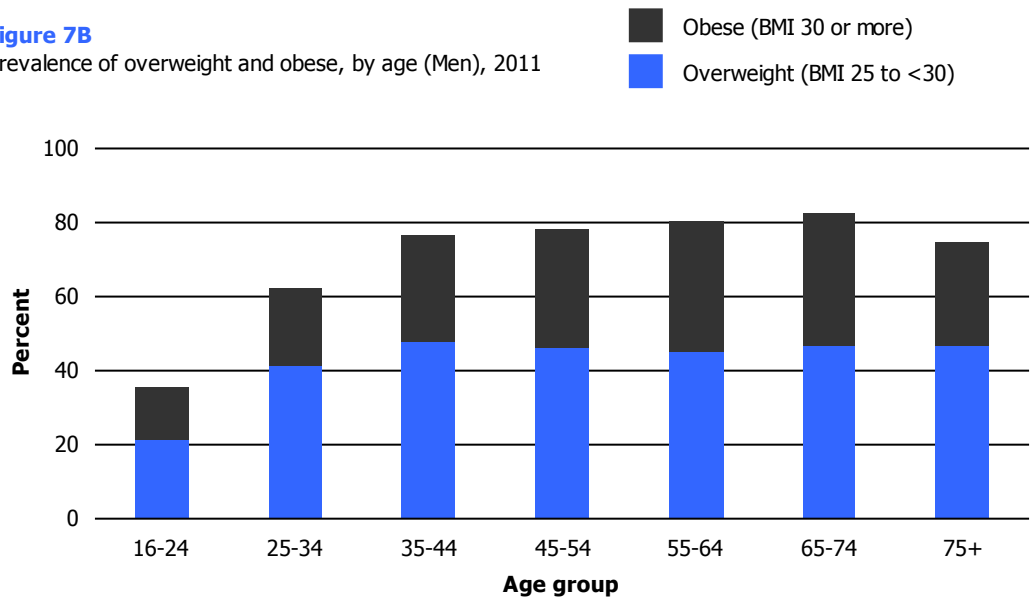
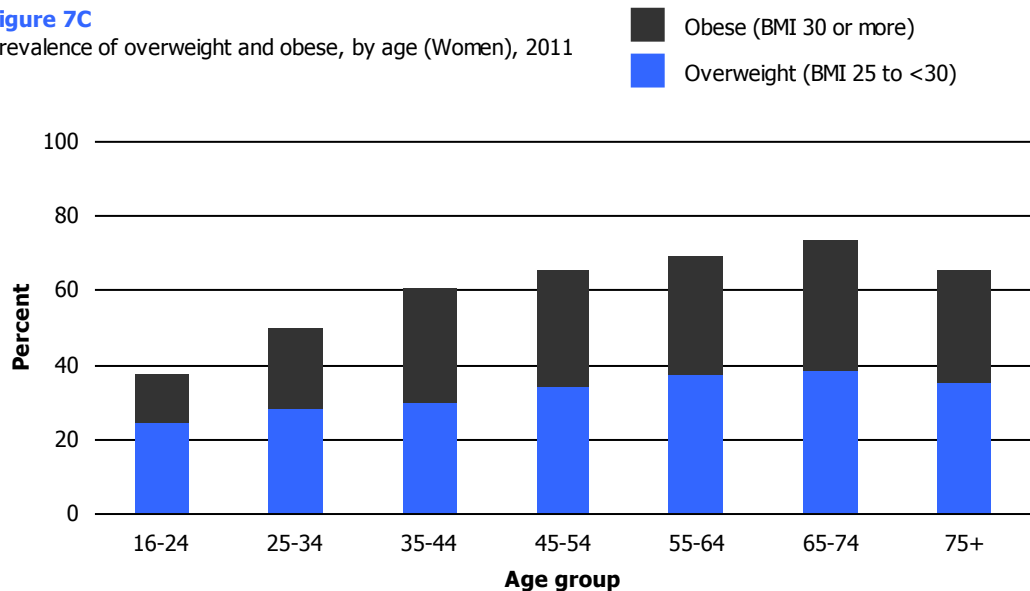


Figure 7C

Prevalence of overweight and obese, by age (Women), 2011



7.6 WAIST CIRCUMFERENCE

7.6.1 Trends in waist circumference (WC) since 1995

Table 7.4 shows both the trend for mean waist circumference (WC) and for prevalence of raised WC from 1995 for adults aged 16-64, as well as figures for all adults aged 16 and over since 2003. Combined 2008/2009 and 2010/2010 data was used to allow for more detailed sub-group analysis to be carried out. Since 1995 there has been a steady increase in the mean WC of men aged 16-64 from 90.2 to 95.3 cm in 2008/2009 and 95.1 cm in 2010/2011. Over this same period there was an even greater increase in the mean WC for women, rising from 78.5 cm in 1995 to 87.2 cm in 2008/09 and 87.9 cm in 2010/2011.

The figures for all adults aged 16 and over since 2003 confirm this upward trend. Between 2003 and 2010/2011 there was a significant increase in mean WC for men and women aged 16 and over (from 95.3 cm to 96.3 cm for men and from 86.3 cm to 89.0 cm for women). However, while the overall trend has been one of increase, between 2008/2009 and 2010/2011 there was no significant change in mean WC for either men or women.

Since 1995, there has also been a steady increase in the proportion of men and women with a raised WC (greater than 102 cm for men and greater than 88 cm for women). The greatest increases occurred between 1995 and 2008/2009 with at least a doubling in the proportion of men and women aged 16-64 with a raised WC in this period (from 14.3% to 29.2% in men, and from 19.1% to 42.0% in women). The equivalent figures in 2010/2011 were 28.1% for men, and 45.5% for women.

The figures for all adults (aged 16 and over) since 2003 also show an increase in waist measurements over time, but whereas the prevalence of raised WC in men increased between 2003 and 2008/2009 and then stabilised in 2010/2011 (27.9%, 33.0% and 31.7%, respectively), for women it continued to increase (38.9%, 45.3% and 49.1%, respectively).

Table 7.4

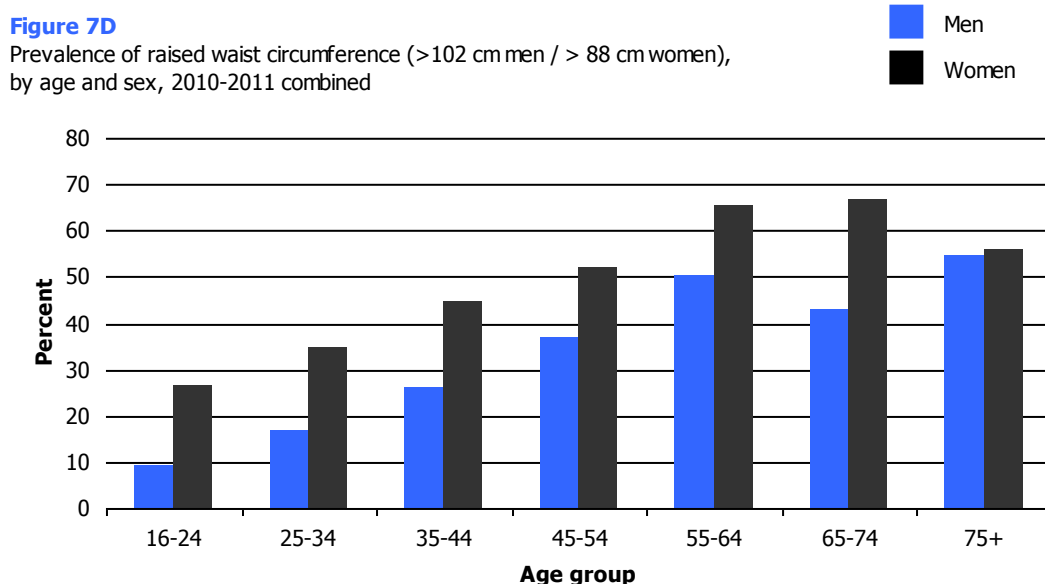
7.6.2 Waist circumference by age and sex, 2010 and 2011 combined

Mean waist circumference (WC) and prevalence of raised WC for adults aged 16 and over for 2010/2011 are shown in Table 7.4. Mean WC was 96.3 cm in men and 89.0 cm in women. There were significant differences in mean WC by age, with a linear increase up until age 55-64 for both sexes. For men, it ranged from 83.9 cm in those aged 16-24 to above 100 cm in those aged 55-64 and over (101.2 cm -103.2 cm). Among women, WC increased from 80.6 cm in the youngest age group to 93.2 cm for those aged 55-64, and then dipped slightly for the oldest group (91.9 cm).

Women were more likely than men to have a raised WC (49.1% compared with 31.7%) and, as Figure 7D illustrates, this was true

across all age groups. As with mean WC, the prevalence of raised WC also increased significantly with age. 9.2% of men aged 16-24 had a raised WC and, with the exception of a blip in men aged 65-74, this increased steadily to 54.6% of those aged 75 and over. For women, prevalence increased from 26.5% of women in the youngest age group to 66.4% of those aged 65-74 before dropping to 56.0% for women aged 75 and over.

Figure 7D, Table 7.4



7.7 DISEASE RISK BASED ON BMI AND WAIST CIRCUMFERENCE

7.7.1 Disease risk by age and sex, 2008-2011 combined

As described in Section 7.2.5, the WHO suggests that BMI and waist measures used in combination can provide a better estimate of adults' risk of disease. The SIGN guidelines¹⁰ on obesity management set out five risk categories: no increased risk, increased risk, high risk, very high risk and extremely high risk. Waist circumference (WC) determines the risk level (increased, high or very high) for people with a BMI between 25 and less than 35 kg/m², with a higher risk assigned to people with a higher WC. The risk level (very high and extremely high) for people with BMI levels of 35 kg/m² and above depends on BMI, regardless of WC. The inset table below and Table 7.4 show the proportions of adults in Scotland in the 2008-2011 period who were estimated to be in each of these risk categories, based on the BMI and waist measurements collected in the survey.

Risk level	Men	Women
	%	%
No increased risk	46.2	38.3
Increased risk	18.1	14.5
High risk	12.1	18.7
Very high risk	20.9	23.3
Extremely high risk	1.4	3.4

In addition to the aggregated health risk status figures for adults shown in the inset table above, a breakdown of risk status within each BMI group based on WC is also presented in Table 7.5.

The SIGN guidelines do not explicitly assign a risk status to people with a normal BMI and high or very high WC. However, in line with the advice in SIGN that this group of people can be at increased risk of some diseases, the small proportions of men (0.1%) and women (2.0%) with a normal BMI and very high WC were placed in the increased risk group.²⁴

Risk status varied by both sex and age. Men, for example, were more likely than women to fall into the no increased risk group (46.2% compared with 38.3%). 16-24 year olds were most likely to be at no increased risk of disease (72.9% and 59.7% for men and women respectively). The proportions of men in this risk group decreased with age until age 55-64 at which point it flattened out (27.0%-28.5%). For women, the decrease continued until the age of 65-74 (23.9%), before increasing again to 30.2%.

Based on their BMI and WC, 18.1% of men and 14.6% of women were classified as being at increased risk of disease. Men aged 45 and over and women aged 25 - 44 were most likely to have increased risk status while those in the youngest age group (16-24 year olds) stood out as being much less likely than other age groups to be classified as such (7.1% and 6.9% for men and women aged 16-24 respectively).

Women were more likely than men to fall into the high risk group (18.7% compared with 12.1%). For both sexes, the proportion at high risk increased steadily with age with 4.2% of men and 10.7% of women aged 16-24 were at high risk compared with 25.0% and 26.5% respectively for those aged 75 and over.

Around a fifth (20.9%) of men and a quarter (23.3%) of women were classified as being at a very high risk of disease with men aged 55-64 (32.5%) and women age 55-74 (32.2-32.3%) most likely to be classified as such. Few were classified as being at extremely high risk (1.4% of men and 3.4% of women) and while this did not vary greatly by age among men, women aged 45-54 and 65-74 were more likely to be at extremely high risk (5.1% and 5.0% respectively) than women of other ages.

The combined prevalence of those at high (or greater) risk (defined as high, very high or extremely high risk) is also shown by age and sex in

Table 7.5. As the figures for the separate risk categories discussed above indicated, women were more likely than men to be at high (or greater) risk of disease (45.4% compared with 34.4%), and this was true at all ages. Based on the preceding discussions of the BMI and waist measurement results, this difference in disease risk is largely due to the prevalence of increased WC being higher in women than men.

Table 7.5

According to their BMI, a significantly higher proportion of men (42.6%) than women (33.7%) were overweight (BMI 25 to <30). There were however, some striking differences in the risk status of men and women in this group. Despite having a BMI that classified them as being overweight, when examined in combination with WC, a significant proportion of overweight men (15.7%) were at no increased risk of disease. The equivalent figure for overweight women was just 4.1%. Conversely, half of overweight women were classified as being at high risk; almost double the proportion of overweight men that fell into this category. This delineation of health risk illustrates the public health importance of overweight status, particularly among women, as well as obesity.

Everyone who was obese was classified as increased risk or above. The proportion of obese men and women at increased risk was very small (just 0.4% for men and 0.1% for women).

Figure 7E, Figure 7F, Table 7.5

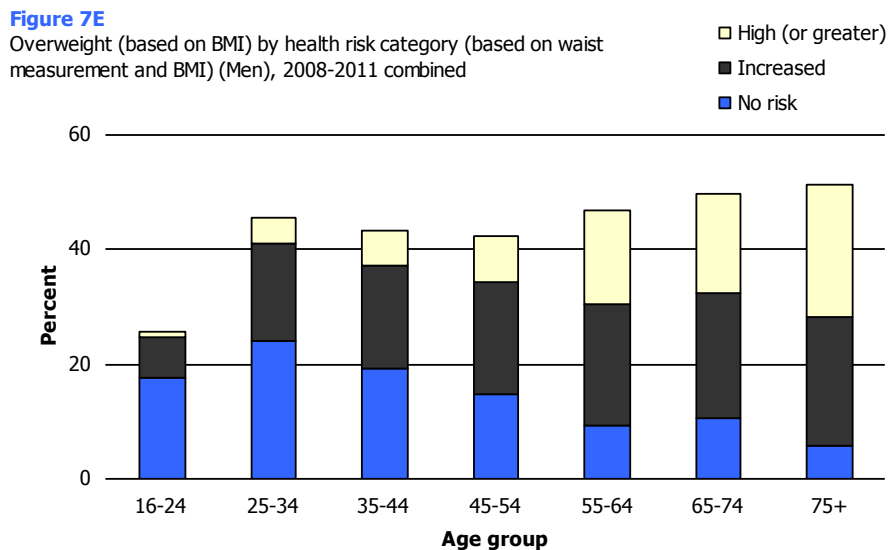
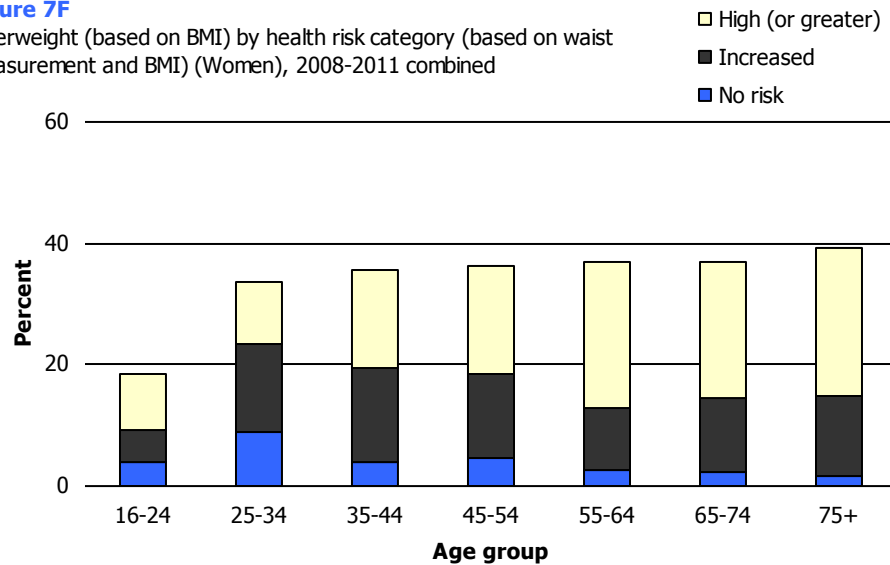


Figure 7F

Overweight (based on BMI) by health risk category (based on waist measurement and BMI) (Women), 2008-2011 combined



7.7.2 Disease risk by socio-demographic factors, 2008-2011 combined

Tables 7.6 to 7.8 present results for risk status by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (descriptions of each of these measures are available in the Glossary at the end of this volume) for the combined 2008-2011 samples. In addition to presenting the figures for all of the health risk categories separately (from no increased risk to extremely high risk) the tables also present summary rows both for those classified as at high (or greater) risk, and those at very / extremely high risk.

To ensure that the comparisons presented in this section are not confounded by the different age profiles of the sub-groups, the data have been age-standardised (for a description of age-standardisation please refer to the Glossary). On the whole, the differences between observed and age-standardised percentages are small. Therefore, the percentages and means presented are the standardised ones only.

Socio-economic classification (NS-SEC)

There was a significant association between health risk category and NS-SEC, but with no clear pattern. Men in lower supervisory and technical households were the most likely to be at no increased risk (51.8%), and, along with those in professional and managerial households, were the least likely to be at a high (or greater) risk (32.6%). The pattern was a little different for women. Those in professional and managerial households were the most likely to be in the no increased risk group (43.7%), while those in intermediate, and in semi-routine and routine households, were the least likely to (32.6%). Women in semi-routine and routine households were also the most

likely to be in the high (or greater) risk group (52.1%), with those in professional and managerial households the least likely (41.0%) to be.

Table 7.6

Equivalised household income

Health risk category varied by equivalised household income, but again with different patterns for men and women. Men living in households in the 4th income quintile were the most likely to be in the high (or greater) risk group (42.7%), and in the very / extremely high risk group (27.7%), and were least likely to be at no increased health risk (36.3%).

However, there was no clear pattern here as those in the 3rd income quintile had the *lowest* risk profile. The pattern for women was clearer: the proportion who were at no increased risk declined between the 1st and 4th income quintiles (from 44.1% to 34.2%), and was a little higher again for women in the 5th (lowest) quintile (36.5%). Conversely, the proportion of women in the high (or greater) risk group increased between the 1st and 4th quintiles (from 40.6% to 52.7%), and then declined (to 48.8%). The pattern for the very / extremely high risk group was similar to that for the high (or greater) risk group.

Table 7.7

Scottish Index of Multiple Deprivation (SIMD)

Two measures of SIMD are being used throughout this report. The first – which uses quintiles – enables comparisons to be drawn between the most and least deprived 20% of areas and the three intermediate quintiles. The second contrasts the most deprived 15% of areas with the 85% least deprived. Note that while SHeS was designed to provide robust data for the SIMD 15% areas after four years of data had been collected and combined (2008-2011), this was for the main interview sample and therefore does not apply to the nurse sub-sample which the figures in Table 7.8 and discussion below are based on.

Table 7.8 shows estimates of being in the various health risk categories by SIMD. There was some variation in risk levels across deprivation quintiles, and as with income, the pattern was slightly clearer for women than for men.

Men in the least deprived quintile were least likely to be at risk of obesity related disease - 49.1% had no increased risk, compared to 44.7%-46.6% of those in the remaining four quintiles. The patterns for the high (or greater) risk group and the very / extremely high risk group, were similar, but rather inconsistent. For example, men in the least deprived quintile and in the 3rd quintile were equally likely to be in the high (or greater) risk group (31.0%-31.6%), while men in the most deprived quintile were the most likely to be in the high (or greater) risk group (38.8%). As Figure 7G shows, there was a more obvious gradient in the association between risk profile and area deprivation among women. The proportion at no increased risk generally declined as deprivation increased (from 45.3% in the least deprived quintile to 29.8% in the most deprived). Conversely, the proportion in the high (or greater) risk group generally increased in line with deprivation, while the

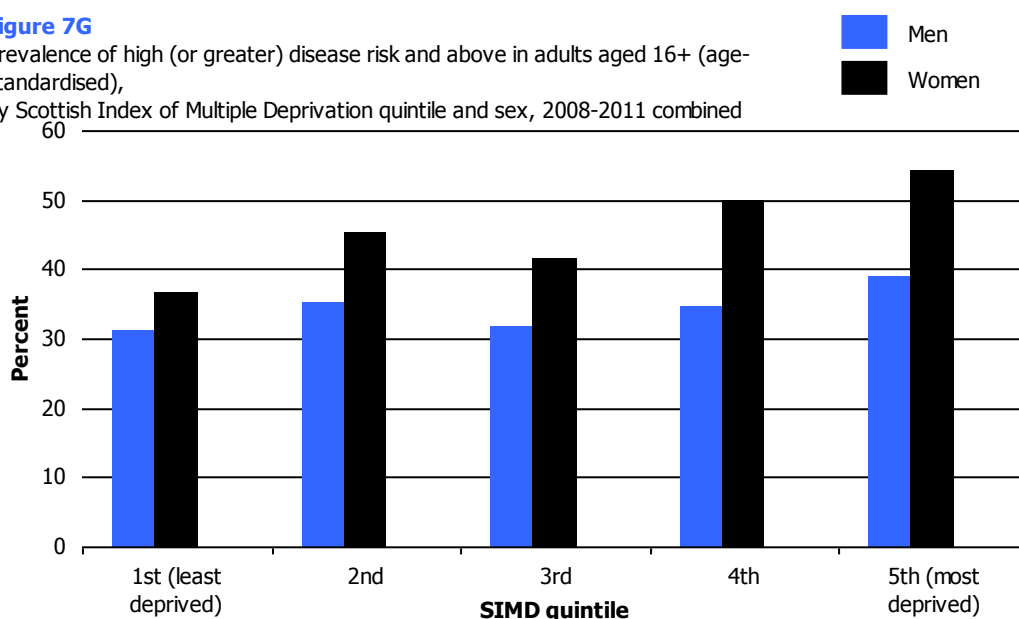
proportion of women in the very / extremely high risk group doubled between the least and most deprived quintiles (from 17.7% to 35.6%).

As the quintile patterns suggest, the difference between the health risk profiles of people living in the 15% most deprived areas in Scotland and the rest of the country was more pronounced for women than for men. For example, the proportion of men in the 15% most deprived areas that were at no increased risk was similar to that for the rest of Scotland (47.5% and 46.1%, respectively). In contrast, there was a 10 percentage point difference between these groups for women (29.9% and 40.0%, respectively). Similar magnitudes of difference were seen across the other risk groups.

Figure 7G, Table 7.8

Figure 7G

Prevalence of high (or greater) disease risk and above in adults aged 16+ (age-standardised), by Scottish Index of Multiple Deprivation quintile and sex, 2008-2011 combined



7.8 FACTORS ASSOCIATED WITH HIGH (OR GREATER) DISEASE RISK

Multivariate logistic regression was used to examine the independent effect of a range of socio-demographic and behavioural factors associated with adults' disease risk. The classification, endorsed by SIGN in their guideline on obesity,¹⁰ has been used in this analysis. It uses combination of both BMI and WC to better estimate an individual's risk of conditions like type 2 diabetes, hypertension and CVD risk. A fuller discussion of the classification of disease risk used in this analysis can be found in Sections 7.2.5 and 7.7.1.

The regression explored factors independently associated with high (or greater) risk of disease. High (or greater) is defined as those classified as at high, very high or extremely high risk according to the SIGN classification.¹⁰ In the discussion that follows this group is referred to as 'high' risk.

The factors investigated included a number of the behavioural characteristics explored in other chapters in this report, such as cigarette smoking, physical activity and alcohol consumption, as well as the key socio-demographic factors of age, SIMD, equivalised household income and both parental and household

NS-SEC. Regressions models were run on combined 2008-2011 data for men and women separately.

The odds ratios of being at high risk of disease are presented in Table 7.9. In these analyses, the odds of a reference group (shown in the table with a value of 1) are compared with that of the other categories for each of the individual factors. In this example, an odds ratio of greater than 1 indicates that the group in question has increased odds of having high risk of disease compared with the reference category, and an odds ratio of less than 1 mean they have decreased odds. By simultaneously controlling for a number of factors, the independent effect each factor has on the variable of interest can be established. For more information about logistic regression models and how to interpret their results see the glossary at the end of this volume.

The factors found to be associated with high disease risk for both men and women were: age, economic status and physical activity. Additionally, educational attainment, marital/partnership status and self-assessed health were significant factors for men while SIMD, parental NS-SEC, smoking status and longstanding illness were also significant for women.

When compared with women aged 16-24, women aged 45 and over had increased odds of being at high risk of disease (odds ratios of 1.78 to 3.06). The odds of being at high risk of disease were highest for those aged 55-64 (3.06 times higher than for the youngest age group). Overall, age was associated significantly with high disease risk for men, but the nature of the relationship was not clear.

For both men and women, economic status was independently associated with being at high risk of disease but the nature of the relationship differed slightly. Men in education had lower odds of being at high risk than those in the reference group - men in paid employment, self-employed, on government training or doing something else (odds ratio of 0.10). For women, those who were retired or looking after home/family had decreased odds when compared to the reference group (odds ratio of 0.66).

Physical activity levels were also associated with disease risk for both men and women. Three levels of physical activity were examined: high (meeting the recommended level of 30 minutes or more at least 5 days a week); medium (30 minutes or more on 1 to 4 days a week); and low (fewer than 30 minutes of activity a week). Compared with those in the high physical activity group, those with medium and low activity levels had significantly increased odds of being classified as at high risk of disease with those who were least active (low) having the greatest odds (the odds ratios for men were 1.89 for the medium activity level group and 2.41 for the low activity group, equivalent figures for women were 1.72 and 2.56 respectively).

Educational attainment was associated with being at high risk of disease for men: with those with no qualifications or who did not supply information of their education having significantly higher odds of being at increased health risk than those with degree or higher qualifications (odds ratio of 1.64). Marital status was also a significant factor for men, with single, separated/divorced and widowed

men all having lower odds of being at high risk when compared with men that were married or living as married (odds ratios of 0.63, 0.52 and 0.54 respectively).

When compared with men who had never smoked cigarettes, those who smoked had decreased odds of being at high disease risk (odds ratio of 0.66). Overall, self-assessed health was also significantly associated with high disease risk among men but with no clear pattern ($p=0.027$). Neither smoking status nor self-assessed health were significant factors for women.

For women, SIMD was also associated with being at high risk of disease. Those living in the 2nd, 4th and 5th (most deprived) quintiles had significantly increased odds of being at high risk when compared with those living in the least deprived quintile (odds ratios of 1.43, 1.74 and 1.93 respectively).

Parental socio-economic classification (NS-SEC) was also independently associated with high risk of disease for women. Women with semi-routine or routine backgrounds had significantly increased odds of being at high disease risk when compared with those whose parents worked in managerial and professional occupations (odds ratio of 1.34).

Overall, cigarette smoking status and presence of a longstanding illness were significantly associated with being at high risk of disease for women but the nature of these relationships was unclear ($p=0.016$ and $p=0.036$, respectively).

Table 7.9

References and notes

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- ¹⁰ Scottish Intercollegiate Guidelines Network. *Management of obesity. A national clinical guideline. SIGN guideline no. 115*. Edinburgh: SIGN, 2010.
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- ¹³ Rutherford, L. and Purdon, S. *Scottish Health Survey Waist and Blood Pressure Validation Study*, Edinburgh: Scottish Government, Publication forthcoming.
- ¹⁴ The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye. Participants' heads are positioned with the Frankfort Plane in a horizontal position when height is measured using a stadiometer as a means of ensuring that, as far as possible, the measurements taken are standardised.
- ¹⁵ For a full review of obesity measures see: National Institute of Health and Clinical Excellence (2006). *CG43 Obesity: full guideline, section 2: Identification and Classification*. [online] Available from: www.nice.org.uk/guidance/index.jsp?action=download&o=38295
- ¹⁶ Romero-Corral, A. *et al* (2008). Accuracy of body mass index in diagnosing obesity in the adult general population. *International Journal of Obesity*. 32, 959–966.
- ¹⁷ These cut-offs differ to those used in the previous surveys. In 1995 and 1998 the normal weight range was defined as 20-25 kg/m², in 2003 it was changed to 18.5-25 kg/m². From 2008 onwards the ranges will be defined as set out below. This brings the definition in line with WHO recommendations. The impact of the change of definition is very marginal as very few people have a BMI measurement that is exactly 18.5, 25, 30 or 40 kg/m².

	2003	2008 onwards
Underweight	18.5 or under	Less than 18.5
Normal weight	Over 18.5 – 25	18.5 to less than 25
Overweight	Over 25 – 30	25 to less than 30
Obese	Over 30 – 40	30 to less than 40
Morbidly obese	Over 40	40+

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- ²⁰ World Health Organisation. (2000). *The problems of overweight and obesity*. In: WHO. *Obesity: preventing and managing the global epidemic. Report of a WHO consultation*. WHO Technical Report Series 894. Geneva: WHO. [online] Available from: [http://whqlibdoc.who.int/trs/WHO_TRS_894_\(part1\).pdf](http://whqlibdoc.who.int/trs/WHO_TRS_894_(part1).pdf)
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- ²⁴ People with a BMI in the normal range and a low WC, or with a normal BMI and high WC were assigned to the “no increased risk” group, as per the SIGN recommendations.

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Table 7.1 Adult response to anthropometric measurements (height, weight and BMI), 2008-2011 combined, by age and sex

<i>Aged 16 and over</i>		<i>2008-2011 combined</i>						
Proportion providing valid measurement	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Height	90	90	88	88	86	86	74	87
Weight	90	88	87	86	85	86	75	86
BMI	89	88	87	86	84	85	72	85
Waist and hip	99	100	100	99	99	99	97	99
Women								
Height	90	89	89	87	85	83	70	86
Weight	86	87	86	84	83	82	72	84
BMI	86	87	85	84	83	81	68	83
Waist and hip	98	99	99	98	96	99	94	98
<i>Bases (weighted):</i>								
<i>Men</i>								
<i>Height, weight, BMI (interviewed)</i>	2047	2201	2386	2493	2148	1481	1002	13759
<i>Waist and hip</i>	304	327	355	370	319	220	149	2044
<i>Women</i>								
<i>Height, weight, BMI (interviewed, not pregnant)</i>	1960	2202	2606	2679	2260	1714	1565	14987
<i>Waist and hip</i>	286	307	382	399	336	255	233	2196
<i>Bases (unweighted):</i>								
<i>Men</i>								
<i>Height, weight, BMI (interviewed)</i>	1098	1539	2005	2303	2253	1970	1342	12510
<i>Waist and hip</i>	133	200	305	345	365	312	196	1856
<i>Women</i>								
<i>Height, weight, BMI (interviewed, not pregnant)</i>	1453	2158	2818	2926	2803	2234	1845	16237
<i>Waist and hip</i>	185	282	420	460	440	347	254	2388

Table 7.2 Mean BMI, prevalence of overweight and obesity, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over with both valid height and weight measurements

1995, 1998, 2003, 2008, 2009, 2010, 2011

BMI (kg/m ²)	Age							Total 16+	
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
25 and over^a									
1995	22.6	49.6	65.2	70.9	73.8	n/a	n/a	55.6	n/a
1998	28.4	58.5	66.9	75.4	75.9	72.7	n/a	61.0	n/a
2003	30.4	60.1	69.2	76.9	80.1	76.3	66.0	64.0	65.4
2008	34.9	61.3	74.5	77.3	81.8	81.9	75.1	66.3	68.5
2009	34.6	57.1	75.5	78.1	83.5	79.3	71.2	66.2	67.9
2010	29.9	60.5	76.5	79.1	80.8	76.0	75.9	66.1	67.8
2011	35.2	62.0	76.4	78.1	79.8	82.2	74.8	67.1	69.2
30 and over^b									
1995	4.5	14.4	18.9	21.9	21.0	n/a	n/a	15.9	n/a
1998	7.3	15.4	19.9	28.8	23.0	26.6	n/a	18.8	n/a
2003	7.5	16.2	24.4	27.5	33.3	27.3	18.0	22.0	22.4
2008	8.0	17.1	30.3	30.3	38.1	36.4	23.5	24.9	26.0
2009	11.2	16.7	31.6	34.8	37.6	30.0	23.9	26.7	26.9
2010	9.2	19.4	31.7	34.1	37.3	34.5	25.8	26.6	27.4
2011	14.1	21.1	29.1	32.2	35.2	35.7	28.4	26.7	27.7
40 and over^c									
1995	-	0.7	0.5	0.8	0.3	n/a	n/a	0.5	n/a
1998	0.4	0.7	0.7	1.9	0.9	0.3	n/a	0.9	n/a
2003	0.8	0.5	2.1	3.1	2.0	1.0	0.5	1.8	1.6
2008	-	0.5	1.8	1.5	3.3	1.8	-	1.4	1.4
2009	1.0	0.6	0.8	1.1	1.3	1.6	0.5	1.0	1.0
2010	0.9	0.8	3.1	2.8	0.9	0.9	0.5	1.7	1.6
2011	1.4	2.5	0.7	2.7	1.9	1.5	0.4	1.8	1.7
Mean									
1995	23.0	25.8	26.8	27.3	27.3	n/a	n/a	26.0	n/a
1998	23.6	26.2	27.0	27.9	27.5	27.5	n/a	26.4	n/a
2003	23.7	26.3	27.5	28.2	28.6	27.9	26.6	26.9	27.0
2008	23.9	26.4	28.1	28.2	29.0	28.9	27.7	27.2	27.4
2009	24.3	26.4	28.1	28.8	29.1	28.4	27.2	27.4	27.5
2010	23.7	26.3	28.5	28.8	28.9	28.4	27.8	27.3	27.5
2011	24.3	26.8	28.1	28.7	28.7	28.8	27.9	27.4	27.6
SE of the mean									
1995	0.13	0.13	0.14	0.15	0.15	n/a	n/a	0.07	n/a
1998	0.16	0.14	0.14	0.16	0.18	0.18	n/a	0.07	n/a
2003	0.28	0.24	0.23	0.24	0.24	0.22	0.31	0.12	0.12
2008	0.35	0.25	0.29	0.23	0.26	0.25	0.27	0.13	0.12
2009	0.35	0.28	0.23	0.21	0.22	0.22	0.26	0.13	0.12
2010	0.37	0.26	0.28	0.25	0.24	0.25	0.27	0.15	0.13
2011	0.40	0.29	0.21	0.24	0.24	0.23	0.31	0.14	0.12

Continued...

Table 7.2 - Continued

Aged 16 and over with both valid height and weight measurements

1995, 1998, 2003, 2008, 2009, 2010, 2011

BMI (kg/m ²)	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Women									
25 and over^a									
1995	30.0	37.6	47.5	55.7	68.2	n/a	n/a	47.2	n/a
1998	30.6	43.3	53.7	63.0	71.6	68.5	n/a	52.2	n/a
2003	38.9	49.7	57.8	64.8	73.0	74.3	63.7	57.3	59.7
2008	41.5	50.0	61.2	65.5	76.0	73.1	67.0	59.6	61.8
2009	37.0	50.5	61.1	64.0	73.8	72.9	69.1	58.4	61.0
2010	38.0	49.6	66.1	67.7	75.0	71.9	68.7	60.3	62.4
2011	36.9	49.5	60.3	65.0	68.8	73.2	65.0	57.1	59.6
30 and over^b									
1995	9.0	13.7	17.0	20.8	27.3	n/a	n/a	17.3	n/a
1998	7.7	19.0	20.4	26.0	31.5	30.5	n/a	20.9	n/a
2003	13.4	20.5	25.5	26.4	31.9	40.5	26.7	23.8	26.0
2008	18.3	19.1	27.1	29.0	36.9	35.1	27.1	26.5	27.5
2009	15.4	24.2	29.4	28.5	31.4	35.4	28.0	26.4	27.6
2010	17.7	20.9	30.6	30.0	39.2	31.7	32.8	28.1	28.9
2011	12.7	21.7	30.6	31.3	31.6	35.2	30.0	26.3	27.6
40 and over^c									
1995	0.3	0.9	0.9	2.2	2.5	n/a	n/a	1.3	n/a
1998	0.2	2.2	2.2	2.5	2.7	2.0	n/a	2.0	n/a
2003	1.3	2.3	4.5	4.5	5.0	3.8	0.3	3.6	3.4
2008	2.9	2.3	3.6	3.8	4.7	2.5	3.2	3.5	3.4
2009	2.0	2.2	3.4	4.9	4.4	2.8	3.8	3.5	3.5
2010	2.6	2.5	5.5	4.3	3.3	1.7	0.5	3.7	3.2
2011	2.4	2.7	4.8	5.9	4.7	4.9	2.3	4.2	4.1
Mean									
1995	23.6	24.9	25.8	26.6	27.6	n/a	n/a	25.7	n/a
1998	23.7	25.7	26.4	27.4	28.3	27.9	n/a	26.3	n/a
2003	24.6	26.1	27.3	27.7	28.6	29.0	27.0	26.9	27.2
2008	25.3	26.0	27.6	28.0	29.0	28.4	27.6	27.3	27.4
2009	24.7	26.4	27.8	27.7	28.5	28.6	27.7	27.2	27.4
2010	25.0	26.4	28.1	28.1	29.0	28.2	27.8	27.4	27.6
2011	24.7	26.5	27.9	28.5	28.3	28.9	27.5	27.3	27.5
SE of the mean									
1995	0.17	0.16	0.17	0.19	0.21	n/a	n/a	0.08	n/a
1998	0.17	0.18	0.18	0.20	0.22	0.23	n/a	0.09	n/a
2003	0.33	0.27	0.27	0.27	0.23	0.26	0.29	0.14	0.14
2008	0.42	0.30	0.27	0.29	0.28	0.29	0.35	0.15	0.13
2009	0.35	0.29	0.24	0.26	0.26	0.27	0.32	0.14	0.12
2010	0.33	0.30	0.27	0.23	0.25	0.26	0.31	0.14	0.12
2011	0.32	0.28	0.29	0.27	0.25	0.29	0.32	0.14	0.12

Continued...

Table 7.2 - Continued

Aged 16 and over with both valid height and weight measurements

1995, 1998, 2003, 2008, 2009, 2010, 2011

BMI (kg/m ²)	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
All adults 25 and over^a									
1995	26.6	45.1	57.3	63.9	71.2	n/a	n/a	52.4	n/a
1998	29.4	51.2	60.3	69.3	73.7	70.4	n/a	56.7	n/a
2003	34.5	54.8	63.4	70.8	76.5	75.2	64.6	60.6	62.4
2008	38.0	55.8	67.5	71.2	78.9	77.2	70.3	62.9	65.1
2009	35.7	53.9	68.1	71.1	78.5	75.9	70.0	62.4	64.4
2010	33.8	55.4	71.3	73.3	77.9	73.9	71.7	63.3	65.1
2011	36.0	56.0	68.3	71.3	74.3	77.5	68.8	62.2	64.3
30 and over^b									
1995	6.6	14.7	18.2	22.4	25.2	n/a	n/a	17.2	n/a
1998	7.5	17.2	20.1	27.5	27.4	28.8	n/a	19.8	n/a
2003	10.4	18.4	24.9	27.0	32.6	34.4	23.4	23.0	24.2
2008	12.8	18.1	28.6	29.6	37.5	35.7	25.7	25.7	26.8
2009	13.1	20.3	30.5	31.6	34.4	32.8	26.3	26.5	27.2
2010	13.3	20.1	31.1	32.0	38.3	33.0	29.9	27.4	28.2
2011	13.4	21.4	29.9	31.7	33.4	35.4	29.4	26.5	27.7
40 and over^c									
1995	0.2	1.2	1.0	2.0	1.7	n/a	n/a	1.2	n/a
1998	0.3	1.4	1.4	2.2	1.8	1.2	n/a	1.4	n/a
2003	1.1	1.4	3.3	3.8	3.5	2.5	0.4	2.7	2.5
2008	1.4	1.4	2.7	2.7	4.0	2.2	1.9	2.5	2.4
2009	1.5	1.4	2.1	3.0	2.9	2.2	2.4	2.2	2.2
2010	1.7	1.6	4.3	3.5	2.1	1.3	0.5	2.7	2.4
2011	1.8	2.6	2.7	4.4	3.3	3.3	1.5	3.0	2.9
Mean									
1995	23.3	25.3	26.3	27.0	27.5	n/a	n/a	25.8	n/a
1998	23.7	25.9	26.7	27.7	27.9	27.7	n/a	26.4	n/a
2003	24.1	26.2	27.4	28.0	28.6	28.5	26.9	26.9	27.1
2008	24.6	26.2	27.8	28.1	29.0	28.6	27.7	27.2	27.4
2009	24.5	26.4	27.9	28.2	28.8	28.5	27.5	27.3	27.4
2010	24.3	26.4	28.3	28.5	29.0	28.3	27.8	27.4	27.5
2011	24.5	26.6	28.0	28.6	28.5	28.9	27.7	27.3	27.5
SE of the mean									
1995	0.10	0.10	0.11	0.12	0.13	n/a	n/a	0.05	n/a
1998	0.12	0.11	0.11	0.13	0.15	0.16	n/a	0.06	n/a
2003	0.21	0.20	0.19	0.18	0.19	0.18	0.22	0.10	0.09
2008	0.26	0.20	0.21	0.20	0.20	0.20	0.25	0.11	0.10
2009	0.26	0.21	0.16	0.18	0.17	0.18	0.22	0.10	0.09
2010	0.27	0.21	0.21	0.18	0.18	0.19	0.21	0.11	0.10
2011	0.27	0.21	0.19	0.19	0.18	0.19	0.24	0.11	0.10

Continued...

Table 7.2 - Continued

Aged 16 and over with both valid height and weight measurements

1995, 1998, 2003, 2008, 2009, 2010, 2011

BMI (kg/m ²)	Age							Total 16-64	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
<i>Bases (weighted):</i>									
Men 1995	700	920	790	698	564	n/a	n/a	3672	n/a
Men 1998	660	894	834	735	550	408	n/a	3673	n/a
Men 2003	495	505	647	563	492	335	180	2702	3217
Men 2008	430	432	481	483	412	285	166	2238	2689
Men 2009	499	489	552	578	479	333	197	2598	3129
Men 2010	453	507	529	548	451	321	183	2487	2992
Men 2011	450	501	538	546	477	315	175	2513	3003
Women 1995	637	866	796	726	606	n/a	n/a	3632	n/a
Women 1998	603	830	837	710	592	502	n/a	3572	n/a
Women 2003	473	533	687	574	510	385	297	2776	3458
Women 2008	378	407	536	509	426	322	249	2257	2828
Women 2009	419	454	595	583	502	370	285	2553	3208
Women 2010	419	446	527	573	468	354	257	2435	3046
Women 2011	415	461	542	585	475	348	274	2478	3100
All adults 1995	1384	1896	1706	1520	1252	n/a	n/a	7757	n/a
All adults 1998	1263	1724	1670	1446	1142	909	n/a	7245	n/a
All adults 2003	967	1038	1334	1137	1002	720	477	5478	6675
All adults 2008	809	840	1017	992	837	608	414	4495	5517
All adults 2009	918	943	1147	1161	981	703	482	5151	6335
All adults 2010	872	953	1057	1121	919	676	440	4922	6038
All adults 2011	866	963	1079	1131	952	663	449	4991	6103
<i>Bases (unweighted):</i>									
Men 1995	459	793	753	655	643	n/a	n/a	3303	n/a
Men 1998	373	707	764	647	619	499	n/a	3110	n/a
Men 2003	286	380	629	523	550	421	227	2368	3016
Men 2008	225	281	396	468	452	401	231	1822	2454
Men 2009	251	356	480	533	487	440	270	2107	2817
Men 2010	245	381	429	497	468	416	238	2020	2674
Men 2011	266	355	453	506	512	421	232	2092	2745
Women 1995	492	1021	916	768	808	n/a	n/a	4005	n/a
Women 1998	470	867	921	804	721	760	n/a	3783	n/a
Women 2003	336	486	752	666	668	459	317	2908	3684
Women 2008	281	374	554	550	534	440	286	2293	3019
Women 2009	315	467	667	612	617	443	328	2678	3449
Women 2010	317	456	558	643	579	468	306	2553	3327
Women 2011	298	448	581	668	601	473	320	2596	3389
All adults 1995	989	1921	1784	1525	1557	n/a	n/a	7776	n/a
All adults 1998	843	1574	1685	1451	1340	1259	n/a	6893	n/a
All adults 2003	622	866	1381	1189	1218	880	544	5276	6700
All adults 2008	506	655	950	1018	986	841	517	4115	5473
All adults 2009	566	823	1147	1145	1104	883	598	4785	6266
All adults 2010	562	837	987	1140	1047	884	544	4573	6001
All adults 2011	564	803	1034	1174	1113	894	552	4688	6134

a 25 and over = overweight / obese / morbidly obese.

b 30 and over = obese / morbidly obese.

c 40 and over = morbidly obese.

Table 7.3 Adult body mass index (BMI), 2011, by age and sex*Aged 16 and over with both valid height and weight measurements*

2011

BMI (kg/m ²)	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
Less than 18.5	8.1	0.9	0.1	0.5	1.0	0.2	0.8	1.7
18.5 to less than 25	56.7	37.1	23.5	21.4	19.1	17.6	24.4	29.1
25 to less than 30	21.1	40.8	47.2	45.9	44.6	46.5	46.4	41.5
30 to less than 40	12.7	18.6	28.5	29.5	33.3	34.2	28.1	26.0
40+	1.4	2.5	0.7	2.7	1.9	1.5	0.4	1.7
<i>All 25 and over^a</i>	35.2	62.0	76.4	78.1	79.8	82.2	74.8	69.2
<i>All 30 and over^b</i>	14.1	21.1	29.1	32.2	35.2	35.7	28.4	27.7
Mean	24.3	26.8	28.1	28.7	28.7	28.8	27.9	27.6
Standard error of the mean	0.40	0.29	0.21	0.24	0.24	0.23	0.31	0.12
Women								
Less than 18.5	7.2	1.9	0.6	0.9	0.9	0.8	2.5	2.0
18.5 to less than 25	55.9	48.6	39.1	34.1	30.3	26.0	32.4	38.4
25 to less than 30	24.2	27.8	29.7	33.7	37.2	38.0	35.0	32.0
30 to less than 40	10.3	19.0	25.8	25.4	26.8	30.3	27.8	23.5
40+	2.4	2.7	4.8	5.9	4.7	4.9	2.3	4.1
<i>All 25 and over^a</i>	36.9	49.5	60.3	65.0	68.8	73.2	65.0	59.6
<i>All 30 and over^b</i>	12.7	21.7	30.6	31.3	31.6	35.2	30.0	27.6
Mean	24.7	26.5	27.9	28.5	28.3	28.9	27.5	27.5
Standard error of the mean	0.32	0.28	0.29	0.27	0.25	0.29	0.32	0.12
All Adults								
<i>All 25 and over^a</i>	36.0	56.0	68.3	71.3	74.3	77.5	68.8	64.3
<i>All 30 and over^b</i>	13.4	21.4	29.9	31.7	33.4	35.4	29.4	27.7
Mean	24.5	26.6	28.0	28.6	28.5	28.9	27.7	27.5
Standard error of the mean	0.27	0.21	0.19	0.19	0.18	0.19	0.24	0.10
<i>Bases (weighted):</i>								
<i>Men</i>	450	501	538	546	477	315	175	3003
<i>Women</i>	415	461	542	585	475	348	274	3100
<i>All adults</i>	866	963	1079	1131	952	663	449	6103
<i>Bases (unweighted):</i>								
<i>Men</i>	266	355	453	506	512	421	232	2745
<i>Women</i>	298	448	581	668	601	473	320	3389
<i>All adults</i>	564	803	1034	1174	1113	894	552	6134

a 25 and over = overweight (including obese).

b 30 and over = obese.

Table 7.4 Mean and raised waist circumference (WC), 1995, 1998, 2003, 2008/2009 combined, 2010/2011 combined, by age and sex

Aged 16 and over with valid waist measurements

1995, 1998, 2003, 2008/2009 combined, 2010/2011 combined

WC	Age							Total 16-64	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
Men									
Mean WC									
1995	80.7	88.9	92.1	94.1	96.1	n/a	n/a	90.2	n/a
1998	82.6	89.7	92.8	96.3	97.3	97.6	n/a	91.8	n/a
2003	83.6	92.7	95.9	98.3	100.2	100.2	98.1	94.2	95.3
2008/2009	84.8	91.0	98.2	99.5	101.7	102.9	100.5	95.3	96.5
2010/2011	83.9	91.3	96.8	99.8	102.3	101.2	103.2	95.1	96.3
SE of the mean									
1995	0.36	0.36	0.36	0.40	0.44	n/a	n/a	0.19	n/a
1998	0.42	0.39	0.38	0.44	0.49	0.58	n/a	0.21	n/a
2003	0.85	0.78	0.66	0.74	0.68	0.72	0.78	0.43	0.38
2008/2009	1.92	0.90	1.03	1.04	0.88	0.92	1.10	0.67	0.58
2010/2011	1.60	1.22	1.21	1.10	1.05	0.98	0.98	0.67	0.59
% with WC > 102cm^a									
1995	2.3	10.7	13.8	20.9	26.6	n/a	n/a	14.3	n/a
1998	5.5	11.6	15.7	28.6	29.7	35.6	n/a	18.0	n/a
2003	3.7	17.0	27.3	34.5	41.3	44.0	35.3	25.2	27.9
2008/2009	8.8	11.0	39.2	36.6	47.3	54.5	45.3	29.2	33.0
2010/2011	9.2	16.7	26.0	36.7	50.3	42.6	54.6	28.1	31.7
Women									
Mean WC									
1995	72.2	76.3	78.9	81.2	84.4	n/a	n/a	78.5	n/a
1998	73.9	78.9	80.9	83.6	86.9	87.6	n/a	80.9	n/a
2003	79.3	82.9	85.2	86.7	90.3	92.0	89.3	84.9	86.3
2008/2009	80.1	84.8	86.1	90.2	93.6	93.1	90.7	87.2	88.3
2010/2011	80.6	84.7	88.7	90.5	93.2	93.1	91.9	87.9	89.0
SE of the mean									
1995	0.42	0.38	0.42	0.48	0.52	n/a	n/a	0.21	n/a
1998	0.43	0.43	0.45	0.48	0.55	0.57	n/a	0.22	n/a
2003	1.07	0.83	0.61	0.78	0.66	0.74	0.81	0.40	0.35
2008/2009	1.54	1.19	0.74	1.19	0.96	1.15	1.08	0.56	0.48
2010/2011	1.53	1.19	1.20	0.91	1.02	1.13	1.08	0.55	0.47
% with WC > 88cm^a									
1995	7.0	13.6	20.0	24.6	31.7	n/a	n/a	19.1	n/a
1998	7.8	18.8	23.8	32.0	41.1	46.7	n/a	24.7	n/a
2003	20.4	28.1	33.4	38.4	49.9	56.5	52.5	34.3	38.9
2008/2009	27.6	28.7	38.9	48.7	63.1	59.0	54.9	42.0	45.3
2010/2011	26.5	34.7	44.5	51.8	65.4	66.4	56.0	45.5	49.1

Continued...

Table 7.4 - Continued

Aged 16 and over with valid waist measurements

1995, 1998, 2003, 2008/2009 combined, 2010/2011 combined

WC	Age							Total 16-64	Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
<i>Bases (weighted):</i>									
<i>Men 1995</i>	622	865	752	660	528	<i>n/a</i>	<i>n/a</i>	3426	<i>n/a</i>
<i>Men 1998</i>	555	746	745	668	526	398	<i>n/a</i>	3240	<i>n/a</i>
<i>Men 2003</i>	370	405	506	442	377	269	165	2099	2532
<i>Men 2008/2009</i>	160	168	191	191	165	113	74	875	1061
<i>Men 2010/2011</i>	142	157	162	175	150	104	71	787	962
<i>Women 1995</i>	574	768	766	673	548	<i>n/a</i>	<i>n/a</i>	3329	<i>n/a</i>
<i>Women 1998</i>	512	712	735	666	526	460	<i>n/a</i>	3150	<i>n/a</i>
<i>Women 2003</i>	347	401	512	430	388	311	290	2077	2679
<i>Women 2008/2009</i>	152	155	208	205	168	132	114	888	1134
<i>Women 2010/2011</i>	128	147	170	186	153	119	106	785	1010
<i>Bases (unweighted):</i>									
<i>Men 1995</i>	399	736	706	619	601	<i>n/a</i>	<i>n/a</i>	3061	<i>n/a</i>
<i>Men 1998</i>	308	598	682	588	586	488	<i>n/a</i>	2761	<i>n/a</i>
<i>Men 2003</i>	175	274	459	413	444	361	230	1765	2356
<i>Men 2008/2009</i>	64	103	164	171	197	172	99	699	970
<i>Men 2010/2011</i>	68	96	139	170	163	137	92	636	865
<i>Women 1995</i>	440	903	870	713	735	<i>n/a</i>	<i>n/a</i>	3661	<i>n/a</i>
<i>Women 1998</i>	389	747	806	747	655	695	<i>n/a</i>	3340	<i>n/a</i>
<i>Women 2003</i>	204	343	567	521	544	381	290	2179	2850
<i>Women 2008/2009</i>	101	138	236	210	234	188	117	919	1224
<i>Women 2010/2011</i>	81	140	180	242	187	155	122	830	1107

a A raised WC is more than 102 cm for men and more than 88 cm for women.

Table 7.5 Health risk category associated with overweight and obesity based on Body Mass Index (BMI) and waist circumference, 2008-2011 combined, by age and sex

Aged 16 and over with valid height, weight and waist measurements^a 2008-2011 combined

Waist circumference ^b and BMI classification ^c	Health risk category ^d	Age							Total
		16-24	25-34	35-44	45-54	55-64	65-74	75+	
		%	%	%	%	%	%	%	%
Men									
Underweight									
Low WC	Not applicable	7.3	0.6	-	0.4	0.3	0.2	-	1.3
High WC	Not applicable	-	-	-	-	-	-	-	-
Very high WC	Not applicable	-	-	-	-	-	-	-	-
<i>All underweight</i>		7.3	0.6	-	0.4	0.3	0.2	-	1.3
Normal									
Low WC	Not applicable	55.3	41.0	22.2	21.0	14.8	14.4	14.6	27.7
High WC	Not applicable	-	1.5	4.4	2.6	3.2	3.5	6.5	2.8
Very high WC	Increased	-	-	-	-	0.2	0.9	-	0.1
<i>All normal</i>		55.3	42.5	26.6	23.6	18.3	18.8	21.1	30.6
Overweight									
Low WC	No increased risk	17.7	24.2	19.4	14.6	9.3	10.6	5.9	15.7
High WC	Increased	7.1	16.9	17.7	19.7	21.3	21.8	22.3	17.6
Very high WC	High	0.8	4.5	6.2	8.2	16.4	17.4	23.0	9.3
<i>All overweight</i>		25.6	45.6	43.2	42.5	47.0	49.8	51.2	42.6
Obesity I									
Low WC	Increased	-	0.6	0.4	1.2	-	-	-	0.4
High WC	High	3.4	1.4	2.8	5.8	0.9	2.2	2.0	2.8
Very high WC	Very high	4.7	6.3	22.4	18.3	25.5	22.3	22.3	16.8
<i>All obese I</i>		8.1	8.3	25.7	25.3	26.5	24.4	24.3	20.0
Obesity II									
Low WC	Very high	-	-	-	-	-	-	-	-
High WC	Very high	-	-	-	-	-	-	-	-
Very high WC	Very high	2.3	1.7	2.8	6.3	6.9	6.1	3.0	4.2
<i>All obese II</i>	<i>Very high</i>	2.3	1.7	2.8	6.3	6.9	6.1	3.0	4.2
Obesity III									
Low WC	Extremely high	-	-	-	-	-	-	-	-
High WC	Extremely high	-	-	-	-	-	-	-	-
Very high WC	Extremely high	1.5	1.3	1.7	2.0	1.1	0.6	0.5	1.4
<i>All obese III</i>	<i>Extremely high</i>	1.5	1.3	1.7	2.0	1.1	0.6	0.5	1.4
Men – Overall risk^d									
	Not applicable	7.3	0.6	-	0.4	0.3	0.2	-	1.3
	No increased	72.9	66.7	46.0	38.2	27.4	28.5	27.0	46.2
	Increased	7.1	17.5	18.1	20.9	21.5	22.7	22.3	18.1
	High	4.2	5.9	9.0	14.1	17.3	19.5	25.0	12.1
	Very high	7.0	8.0	25.3	24.6	32.5	28.4	25.2	20.9
	Extremely high	1.6	1.3	1.7	2.0	1.1	0.6	0.5	1.4
<i>High/very high/extremely high risk</i>		12.8	15.2	35.9	40.6	50.9	48.6	50.7	34.4
<i>Very/extremely high risk</i>		8.5	9.3	26.9	26.6	33.6	29.0	25.7	22.3

Continued...

Table 7.5 - Continued

Aged 16 and over with valid height, weigh and waist measurements^a 2008-2011 combined

Waist circumference ^b and BMI classification ^c	Health risk category ^d	Age							Total
		16-24	25-34	35-44	45-54	55-64	65-74	75+	
		%	%	%	%	%	%	%	%
Women									
Underweight									
Low WC	Not applicable	6.0	2.4	0.6	1.3	0.4	0.9	0.6	1.7
High WC	Not applicable	-	-	-	-	-	-	-	-
Very high WC	Not applicable	-	-	-	-	-	-	-	-
<i>All underweight</i>		<i>6.0</i>	<i>2.4</i>	<i>0.6</i>	<i>1.3</i>	<i>0.4</i>	<i>0.9</i>	<i>0.6</i>	<i>1.7</i>
Normal									
Low WC	Not applicable	48.3	29.8	25.3	21.5	12.4	10.6	12.6	23.7
High WC	Not applicable	7.6	11.5	11.6	8.1	10.3	10.8	16.0	10.5
Very high WC	Increased	1.4	2.5	1.1	2.1	3.1	2.5	1.4	2.0
<i>All normal</i>		<i>57.3</i>	<i>43.8</i>	<i>38.0</i>	<i>31.7</i>	<i>25.8</i>	<i>24.0</i>	<i>30.0</i>	<i>36.2</i>
Overweight									
Low WC	No increased	3.8	8.8	3.8	4.5	2.5	2.4	1.6	4.1
High WC	Increased	5.5	14.6	15.7	14.1	10.2	12.2	13.2	12.4
Very high WC	High	9.3	10.2	16.1	17.5	24.2	22.4	24.4	17.2
<i>All overweight</i>		<i>18.6</i>	<i>33.5</i>	<i>35.6</i>	<i>36.1</i>	<i>36.9</i>	<i>37.0</i>	<i>39.1</i>	<i>33.7</i>
Obesity I									
Low WC	Increased	-	-	0.7	-	-	-	-	0.1
High WC	High	1.4	1.2	2.1	1.7	0.8	0.9	2.2	1.5
Very high WC	Very high	6.8	8.5	12.9	15.6	22.5	26.2	20.0	15.5
<i>All obese I</i>		<i>8.2</i>	<i>9.8</i>	<i>15.7</i>	<i>17.3</i>	<i>23.3</i>	<i>27.2</i>	<i>22.2</i>	<i>17.1</i>
Obesity II									
Low WC	Very high	0.3	-	-	-	-	-	-	0.0
High WC	Very high	-	-	-	-	-	-	-	-
Very high WC	Very high	8.2	7.3	7.1	8.6	9.9	6.0	6.3	7.8
<i>All obese II</i>	<i>Very high</i>	<i>8.5</i>	<i>7.3</i>	<i>7.1</i>	<i>8.6</i>	<i>9.9</i>	<i>6.0</i>	<i>6.3</i>	<i>7.8</i>
Obesity III									
Low WC	Extremely high	-	-	-	-	-	-	-	-
High WC	Extremely high	-	-	-	-	-	-	-	-
Very high WC	Extremely high	1.4	3.2	3.0	5.1	3.8	5.0	1.8	3.4
<i>All obese III</i>	<i>Extremely high</i>	<i>1.4</i>	<i>3.2</i>	<i>3.0</i>	<i>5.1</i>	<i>3.8</i>	<i>5.0</i>	<i>1.8</i>	<i>3.4</i>
Women – Overall risk^d									
	Not applicable	6.0	2.4	0.6	1.3	0.4	0.9	0.6	1.7
	No increased	59.7	50.1	40.6	34.1	25.2	23.9	30.2	38.3
	Increased	6.9	17.1	17.6	16.2	13.3	14.7	14.5	14.6
	High	10.7	11.4	18.2	19.2	25.0	23.3	26.5	18.7
	Very high	15.4	15.9	20.0	24.2	32.3	32.2	26.3	23.3
	Extremely high	1.4	3.2	3.0	5.1	3.8	5.0	1.8	3.4
<i>High/very high/extremely high risk</i>		<i>27.5</i>	<i>30.4</i>	<i>41.2</i>	<i>48.5</i>	<i>61.2</i>	<i>60.6</i>	<i>54.6</i>	<i>45.4</i>
<i>Very/extremely high risk</i>		<i>16.8</i>	<i>19.1</i>	<i>23.0</i>	<i>29.3</i>	<i>36.1</i>	<i>37.2</i>	<i>28.1</i>	<i>26.7</i>

Continued...

Table 7.5 - Continued

Aged 16 and over with valid height, weight and waist measurements^a 2008-2011 combined

Waist circumference ^b and BMI classification ^c	Health risk category ^d	Age							Total
		16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>									
<i>Men</i>		286	309	337	338	289	194	124	1877
<i>Women</i>		268	291	357	357	290	228	165	1957
<i>Bases (unweighted):</i>									
<i>Men</i>		125	188	288	316	333	278	164	1692
<i>Women</i>		172	265	393	413	383	313	185	2124

a Percentages and bases in this table are based on those who have a valid measurement for waist circumference, in addition to valid measurements of height and weight.

b Waist circumference categories according to WHO/SIGN guidelines (115): low: <94cm for men and <80cm for women; high: ≥94cm and <102cm for men, ≥80cm and <88cm for women; very high: ≥102cm for men and ≥88cm for women.

c BMI categories according to WHO guidelines: Underweight: Less than 18.5kg/m², Normal: 18.5 to less than 25kg/m², Overweight: 25 to less than 30kg/m², Obesity I: 30 to less than 35kg/m², Obesity II: 35 to less than 40kg/m², Obesity III: 40kg/m² or more.

d Health risk category according to SIGN guidelines (115).

Table 7.6 Health risk category, 2008-2011 combined (age-standardised), by NS-SEC of household reference person and sex

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

2008-2011 combined

Health risk category ^a	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
	%	%	%	%	%
Men					
Not applicable	2.3	-	0.3	1.6	1.4
No increased	44.6	41.3	42.3	51.8	44.5
Increased	20.5	17.8	22.1	13.9	17.6
High	11.0	16.7	13.9	10.2	12.4
Very high	20.9	23.1	19.1	18.9	22.4
Extremely high	0.8	1.1	2.3	3.6	1.7
<i>High/very high/extremely high risk</i>	<i>32.6</i>	<i>40.9</i>	<i>35.3</i>	<i>32.6</i>	<i>36.5</i>
<i>Very/extremely high risk</i>	<i>21.7</i>	<i>24.2</i>	<i>21.4</i>	<i>22.4</i>	<i>24.1</i>
Women					
Not applicable	1.8	1.6	2.9	2.0	1.8
No increased	43.7	32.6	41.8	34.9	32.6
Increased	13.5	19.0	13.0	16.3	13.5
High	18.1	16.1	19.5	15.2	21.2
Very high	20.7	24.6	19.1	28.0	26.4
Extremely high	2.3	6.2	3.7	3.6	4.5
<i>High/very high/extremely high risk</i>	<i>41.0</i>	<i>46.8</i>	<i>42.4</i>	<i>46.9</i>	<i>52.1</i>
<i>Very/extremely high risk</i>	<i>22.9</i>	<i>30.8</i>	<i>22.8</i>	<i>31.6</i>	<i>30.9</i>
<i>Bases (weighted):</i>					
<i>Men</i>	<i>798</i>	<i>143</i>	<i>170</i>	<i>229</i>	<i>494</i>
<i>Women</i>	<i>803</i>	<i>191</i>	<i>153</i>	<i>196</i>	<i>569</i>
<i>Bases (unweighted):</i>					
<i>Men</i>	<i>710</i>	<i>119</i>	<i>159</i>	<i>216</i>	<i>458</i>
<i>Women</i>	<i>870</i>	<i>209</i>	<i>172</i>	<i>218</i>	<i>607</i>

a Health risk category according to SIGN guidelines (115). See Table 7.5 for full details of the categories.

Table 7.7 Health risk category, 2008-2011 combined (age-standardised), by equivalised household income quintile and sex

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

2008-2011 combined

Health risk category ^a	Equivalised annual household income quintile				
	1 st (highest)	2 nd	3 rd	4 th	5 th (lowest)
	%	%	%	%	%
Men					
Not applicable	1.3	2.6	-	0.1	2.3
No increased	46.3	42.5	53.8	36.3	48.2
Increased	20.7	19.0	16.9	21.0	12.7
High	10.0	13.3	8.9	15.0	12.5
Very high	21.3	21.1	18.8	25.3	22.4
Extremely high	0.5	1.5	1.6	2.4	1.9
<i>High/very high/extremely high risk</i>	31.7	35.9	29.3	42.7	36.7
<i>Very/extremely high risk</i>	21.8	22.6	20.4	27.7	24.3
Women					
Not applicable	1.0	1.6	3.1	1.2	2.0
No increased	44.1	39.9	37.9	34.2	36.5
Increased	14.4	14.9	15.3	11.9	12.8
High	18.2	17.9	18.1	17.2	20.2
Very high	20.8	21.5	23.5	31.2	24.1
Extremely high	1.6	4.2	2.1	4.4	4.5
<i>High/very high/extremely high risk</i>	40.6	43.6	43.7	52.7	48.8
<i>Very/extremely high risk</i>	22.3	25.7	25.6	35.6	28.6
<i>Bases (weighted):</i>					
<i>Men</i>	471	376	360	266	227
<i>Women</i>	404	350	343	339	301
<i>Bases (unweighted):</i>					
<i>Men</i>	405	341	321	269	214
<i>Women</i>	433	397	378	373	320

a Health risk category according to SIGN guidelines (115). See Table 7.5 for full details of the categories.

Table 7.8 Health risk category, 2008-2011 combined (age-standardised), by Scottish Index of Multiple Deprivation and sex

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

2008-2011 combined

Health risk category ^a	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5 th (least deprived)	4 th	3 rd	2 nd	1 st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Men							
Not applicable	0.6	0.2	2.2	2.7	1.5	1.3	1.7
No increased	49.1	44.9	46.0	44.7	46.6	46.1	47.5
Increased	19.3	19.7	20.2	17.9	13.1	19.0	13.3
High	13.2	12.5	12.0	10.7	11.5	12.1	11.9
Very high	17.6	22.1	19.0	20.6	24.9	20.4	23.5
Extremely high	0.3	0.6	0.6	3.4	2.5	1.2	2.2
<i>High/very high/extremely high risk</i>	<i>31.0</i>	<i>35.3</i>	<i>31.6</i>	<i>34.7</i>	<i>38.8</i>	<i>33.7</i>	<i>37.5</i>
<i>Very/extremely high risk</i>	<i>17.9</i>	<i>22.7</i>	<i>19.6</i>	<i>24.0</i>	<i>27.3</i>	<i>21.6</i>	<i>25.7</i>
Women							
Not applicable	2.9	0.4	1.1	2.1	2.1	1.8	1.4
No increased	45.3	39.6	41.8	34.9	29.8	40.0	29.9
Increased	15.2	14.6	15.6	13.1	13.9	14.5	14.4
High	18.9	21.4	16.4	17.9	18.8	18.6	19.9
Very high	16.6	21.7	22.0	25.6	30.7	21.8	29.9
Extremely high	1.1	2.4	3.1	6.5	4.9	3.3	4.5
<i>High/very high/extremely high risk</i>	<i>36.6</i>	<i>45.4</i>	<i>41.4</i>	<i>50.0</i>	<i>54.3</i>	<i>43.7</i>	<i>54.4</i>
<i>Very/extremely high risk</i>	<i>17.7</i>	<i>24.0</i>	<i>25.0</i>	<i>32.0</i>	<i>35.6</i>	<i>25.1</i>	<i>34.4</i>
<i>Bases (weighted):</i>							
<i>Men</i>	<i>385</i>	<i>446</i>	<i>359</i>	<i>339</i>	<i>346</i>	<i>1607</i>	<i>271</i>
<i>Women</i>	<i>407</i>	<i>408</i>	<i>390</i>	<i>353</i>	<i>397</i>	<i>1648</i>	<i>312</i>
<i>Bases (unweighted):</i>							
<i>Men</i>	<i>347</i>	<i>417</i>	<i>341</i>	<i>291</i>	<i>296</i>	<i>1470</i>	<i>222</i>
<i>Women</i>	<i>451</i>	<i>474</i>	<i>434</i>	<i>376</i>	<i>389</i>	<i>1821</i>	<i>303</i>

a Health risk category according to SIGN guidelines (115). See Table 7.5 for full details of the categories.

Table 7.9 Estimated odds ratios for high (or greater)^a disease risk, 2008-2011 combined, by associated risk factors and sex

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

2008-2011 combined

Independent variables	Men			Women		
	Base (weighted) 1877	Odds ratio	95% CI ^b	Base (weighted) 1957	Odds ratio	95% CI ^b
Age		(p<0.001)			(p<0.001)	
16-24	286	1.00		268	1.00	
25-34	309	0.46	0.21, 1.04	291	0.97	0.56, 1.68
35-44	337	1.12	0.52, 2.42	357	1.46	0.85, 2.53
45-54	338	1.35	0.62, 2.98	357	1.78	1.03, 3.07
55-64	289	1.86	0.85, 4.04	290	3.06	1.69, 5.55
65-74	194	1.64	0.67, 4.02	228	2.87	1.48, 5.56
75+	124	1.65	0.63, 4.29	165	2.10	1.02, 4.32
Scottish Index of Multiple Deprivation quintile		(p=0.326)			(p=0.002)	
1st (least deprived)	382	1.00		406	1.00	
2 nd	446	1.18	0.82, 1.68	407	1.43	1.05, 1.95
3 rd	359	0.91	0.62, 1.34	390	1.18	0.86, 1.63
4 th	343	1.21	0.80, 1.83	355	1.74	1.24, 2.45
5th (most deprived)	346	1.32	0.85, 2.04	398	1.93	1.34, 2.79
Highest education qualification		(p=0.038)			(p=0.442)	
Degree or higher	532	1.00		545	1.00	
HNC/D or equiv	225	1.36	0.88, 2.11	212	1.07	0.74, 1.56
Higher grade or equiv	322	0.85	0.54, 1.35	318	1.17	0.84, 1.64
Standard grade or equiv	374	1.37	0.89, 2.10	356	1.15	0.84, 1.59
Other school level	108	1.52	0.94, 2.48	146	1.43	0.94, 2.17
No qualifications/missing information	316	1.64	1.10, 2.46	379	0.96	0.70, 1.33
Economic status		(p=0.005)			(p=0.018)	
In education	155	0.10	0.03, 0.39	139	0.56	0.29, 1.07
In paid employment, self-employed or on gov't training/doing something else	1164	1.00		1059	1.00	
Permanently unable to work/Looking for/intending to look for paid work	196	1.05	0.67, 1.63	103	0.96	0.56, 1.67
Retired/Looking after home/family	362	0.77	0.50, 1.20	656	0.66	0.49, 0.90
Parental NS-SEC		(p=0.820)			(p=0.078)	
Managerial & professional	514	1.00		486	0.73	0.49, 1.10
Intermediate	140	0.89	0.55, 1.42	152	1.21	0.82, 1.78
Small employers & own account workers	161	0.92	0.59, 1.43	188	1.10	0.79, 1.53
Lower supervisory & technical	253	1.00	0.69, 1.45	265	1.34	1.01, 1.76
Semi-routine & routine	485	0.85	0.60, 1.19	579	1.03	0.70, 1.52
Not applicable	324	0.72	0.42, 1.24	287		

Continued...

Table 7.9 - Continued

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

2008-2011 combined

Independent variables	Men			Women		
	Base (weighted) 1877	Odds ratio	95% CI ^b	Base (weighted) 1957	Odds ratio	95% CI ^b
Cigarette smoking status		(p=0.121)			(p=0.016)	
Never smoked cigarettes at all	932	1.00		978	1.00	
Used to smoke cigarettes occasionally	80	0.83	0.45, 1.53	107	0.69	0.43, 1.10
Used to smoke cigarettes regularly	409	1.01	0.76, 1.35	393	1.24	0.97, 1.59
Current cigarette smoker	456	0.66	0.46, 0.96	479	0.81	0.61, 1.07
Physical activity levels		(p<0.001)			(p<0.001)	
High ^c	847	1.00		667	1.00	
Medium	522	1.89	1.40, 2.55	675	1.72	1.35, 2.20
Low	508	2.41	1.72, 3.36	615	2.56	1.96, 3.34
Marital status		(p=0.005)			(p=0.348)	
Married/civil partnership	968	1.00		954	1.00	
Living as married	225	0.84	0.54, 1.30	223	0.92	0.64, 1.33
Single	506	0.63	0.41, 0.96	410	0.77	0.54, 1.10
Married/civil partnership – separated/ Divorced/dissolved civil partnership	112	0.52	0.35, 0.79	180	0.78	0.56, 1.07
Widowed/surviving civil partner	65	0.54	0.31, 0.93	189	0.82	0.58, 1.18
Self-assessed health		(p=0.027)			(p=0.590)	
Very good/good	1463	1.00		1530	1.00	
Fair	308	1.61	1.14, 2.29	300	1.15	0.84, 1.56
Bad/very bad	106	1.33	0.79, 2.25	126	1.22	0.76, 1.97
Longstanding illness		(p=0.749)			(p=0.036)	
Limiting longstanding illness	418	1.00		529	1.00	
Non limiting longstanding illness	319	1.16	0.79, 1.68	308	1.22	0.88, 1.69
No longstanding illness	1140	1.08	0.77, 1.52	1119	0.85	0.64, 1.14

a High (or greater) is composed of those classified as at 'high', 'very high' or 'extremely high' risk according to the disease risk classification system endorsed in the SIGN guidelines on obesity management (SIGN 115).

b Confidence interval.

c High= 30 minutes or more on at least 5 days a week (this group represents those who meet the current physical activity recommendations); Medium= 30 minutes or more on 1 to 4 days a week; Low= fewer than 30 minutes of moderate or vigorous activity a week.

Cardiovascular disease,
diabetes and hypertension

Chapter 8

8 CARDIOVASCULAR DISEASE, DIABETES AND HYPERTENSION

Catherine Bromley and Jennifer Mindell

SUMMARY

- In 2011, 15.6% of men and 13.8% of women had cardiovascular disease (CVD).
- CVD or diabetes prevalence was also higher for men than for women (19.2% and 17.0%, respectively) in 2011 and increased markedly with age for both sexes from 6.3% of men and 7.0% of women under 25 to 57.0% of men and 43.4% of women aged 75 and over.
- Rates of ischaemic heart disease (IHD) for men and women were 7.5% and 4.9% respectively, while 9.4% of men and 6.7% of women had IHD or stroke. Prevalence of these conditions also increased with age for both men and women.
- Between 1995 and 2011 there was a significant increase in the proportion of men aged 16-64 with CVD or diabetes (from 9.4% to 12.7%). This was largely accounted for by an increase in the prevalence of diabetes. There was no clear trend in the figures for women over this same period.
- In 2011, 6.1% of men and 4.9% of women aged 16 and over had doctor diagnosed diabetes.
- 2.4% of adults (2.6% of men and 2.1% of women) had a glycated haemoglobin level consistent with undiagnosed diabetes (HbA1C \geq 6.5%) in the 2008-2011 period-an increase from 1.1% in 2003.
- In 2010/2011, a third of men (33%) and women (32%) aged 16 and over had hypertension.
- Hypertension rates increased significantly by age for men and women.
- In 2010/2011, almost one in five (18.5%) men and one in six (15.7%) women had untreated hypertension.
- Between 1995 and 2008-2011 mean total cholesterol in men aged 16-64 declined from 5.6 to 5.2 mmol/l. The equivalent figures for women were 5.6mmol/l and 5.3 mmol/l. Most of this decline occurred between 1995 and 1998. As these figures include people taking lipid lowering drugs such as statins it is likely that the decline is almost entirely due to the increased use of such drugs.
- There was no change in mean HDL cholesterol of adults between 2003 and 2008-2011. Levels were lower in men than in women (mean of 1.3 mmol/l compared with 1.6mmol/l).
- There was an increase in mean fibrinogen levels for 16-74 year olds between 1998 and 2008-2011 (from 2.6g/l to 2.9g/l in men, and from 2.8g/l to 3.1g/l in women). The figure for all adults from 2003 onwards has been more stable.
- There was no significant difference in the fibrinogen levels of men and women in 2008-2011, but levels did increase by age for both sexes.
- Women had higher mean C-reactive protein (CRP) levels than men (3.4 mg/l compared with 2.9mg/l) in 2008-2011 and levels for both sexes generally increased with age.
- The mean CRP for men aged 16-74 has not varied significantly since 1998, but there was an increase in the proportion of men in the bottom two CRP quintiles between 1998 and 2008-2011 (from 20.7% to 27.0%). For women the

mean declined (from 3.8mg/l in 2003 to 3.3mg/l in 2008-2011) but there were no notable changes in the proportions in each quintile group over this period.

8.1 INTRODUCTION

This chapter covers three related topics: cardiovascular disease (CVD), diabetes and hypertension. In addition, it presents results for a number of blood analytes measured in the Scottish Health Survey (SHeS) that can be used to assess diabetes status and CVD risk. As in the three most recent SHeS reports, the combined prevalence of CVD and diabetes is also reported, reflecting the status of these two conditions as major health burdens for individuals and the NHS.^{1,2,3} Additionally, people with diabetes are at particularly high risk for CVD, hence the inclusion of estimates of the burden of probable undiagnosed diabetes in the population.

CVD is one of the leading contributors to the global disease burden. Its main components are ischaemic heart disease (IHD) and stroke. In this chapter, the term IHD is used interchangeably with CHD (coronary heart disease). IHD is the second most common cause of death in Scotland after cancer; in 2011, 14% of deaths were attributed to it and a further 9% were caused by stroke.⁴ Prevalence of CVD is higher in lower social classes and in deprived areas.⁵ A number of the Scottish Government's National Performance Framework (NPF) national indicators⁶ are linked to key CVD risk factors (such as the smoking,⁷ physical activity⁸ and obesity⁹ indicators described in chapters 4, 6 and 7 respectively). In addition, the revised NPF, published in December 2011,¹⁰ now includes a target to reduce premature mortality (deaths from all causes in those aged under 75).¹¹ CVD is described as one of the key 'big killer' diseases around which action must be taken if the target is to be met.

NHS Scotland's HEAT¹² performance management system is based around a series of targets against which the performance of its individual Health Boards are measured. In 2007, the Scottish Government published *Better Health, Better Care*,¹³ outlining its action plan for improving health and health care in Scotland. This set out how NHS Scotland's HEAT¹² system would feed into the Government's overarching objectives. As reported in last year's SHeS report,³ a HEAT target to achieve 23,579 inequalities-targeted cardiovascular Health Checks during 2010/11 was far exceeded via the delivery of 41,107 checks.¹⁴ The target for 2011/12 was for 26,682 checks to be carried out. This too was exceeded with 47,776 checks carried out in the year ending March 2012.

There are also HEAT targets addressing primary care of people with acute and chronic conditions. For example, the quality of acute care in the immediate aftermath of a stroke is an important factor in people's recovery rate and subsequent quality of life. A HEAT target exists to improve performance in this area: by March 2013, 90% of patients admitted with a stroke should be admitted to a specialist stroke unit within one day of admission.¹⁵ In 2011, 78% of stroke patients were admitted to a specialist stroke unit within one day of their admission, up from 67% in 2010 and 61% in 2009.

The introductions to the equivalent chapters in the 2008, 2009 and 2010 SHeS reports^{1,2,3} outlined the recent policy context for this topic in more detail,

covering a number of strategies and initiatives that have been introduced by the Scottish Government and NHS Scotland to help reduce the prevalence of these conditions and improve their management in primary care. These included:

- The Scottish Government's *Better Heart Disease and Stroke Care Action Plan*,¹⁶ launched in June 2009, which built on the *Coronary Heart Disease and Stroke Strategy for Scotland* published in 2002, and updated in 2004.¹⁷
- The Quality and Outcomes Framework¹⁸ and initiatives such as the *Keep Well* programme.¹⁹
- The SIGN Guidelines on cardiovascular health²⁰ published in 2007, which include a risk assessment tool (ASSIGN) to calculate a person's future risk of cardiovascular disease.
- The revised SIGN guidelines on diabetes²¹ published in March 2010.
- The revised *Diabetes Action Plan*, published in August 2010.²²
- The roll-out of the "Life begins at 40" programme which invites all those turning 40 to participate in a health assessment delivered by NHS 24 via telephone or online.²³

This chapter takes advantage of the nurse data collected throughout the 2008-2011 period and reports on the direct measures of blood pressure and a number of blood analytes that act as useful biomarkers of diabetes status and CVD risk. As only a sub-sample of participants were invited to have a nurse interview between 2008 and 2011, results based on the nurse data use either two or four years of nurse data combined.

This is the first time since the 2003 SHeS report that many of these blood analytes have been reported in detail.²⁶ From 2012 the survey is no longer including a nurse visit and instead a sub-sample of adults will be asked to complete a new biomeasures module, conducted by specially trained interviewers. The use of dried blood spot samples, collected via finger-pricks, is currently under investigation (as opposed to the venous blood samples collected until the end of 2011). As yet, no decision has been taken about their use, and it is also conceivable that venous samples could be collected again in future, should funding become available. In contrast, interviewers began taking blood pressure readings in 2012, using the same equipment and measurement protocols that the nurses used. A validation study has been conducted to assess the impact on the time series data of the change in personnel for measuring blood pressure.²⁴ Future SHeS reports will discuss the implications in full.

8.2 METHODS AND DEFINITIONS

8.2.1 Methods

CVD conditions

Participants were asked whether they suffered from any of the following conditions: angina, heart attack, stroke, heart murmur, irregular heart rhythm, 'other heart trouble', and (if they responded affirmatively) whether they had ever been told they had the condition by a doctor. For

the purpose of this report, participants were classified as having a particular condition only if they reported that the diagnosis was confirmed by a doctor. Those participants who reported having a particular condition were also asked if they had had it in the last 12 months.

Diabetes

Participants were asked whether they suffered from diabetes and, if so, whether they had ever been told they had the condition by a doctor. Only those who reported that the diagnosis was confirmed by a doctor were classified as having diabetes. Women whose diabetes occurred only during pregnancy were excluded from the classification. No distinction was made between type 1 and type 2 diabetes in the interview. In some previous SHeS reports, rates for each type were estimated by examining the age of onset of the condition and whether a participant was on insulin therapy at the time of interview.²⁵ However, with increasing rates of type 2 diabetes in younger age groups, and increasing use of insulin to treat it, this classification method is no longer considered appropriate.

Hypertension

There have been significant changes to both the definition and measurement of blood pressure since the survey began in 1995. These were discussed in detail in the 2003 survey report and are not repeated here.²⁶

The 2008 to 2011 surveys used the same measurement equipment (the Omron HEM 907) as in 2003. The protocol for the measurement of blood pressure in adults remained the same as in all previous years; blood pressure was measured in participants aged 16 and over who took part in the nurse interview. Three blood pressure readings were taken at one minute intervals, on the right arm where possible, with the participant in a seated position, after a five minute rest. Blood pressure of pregnant women was not measured. The detailed protocol for blood pressure measurement is contained in Volume 3 of this report.

The blood pressure levels reported in this chapter are derived from the means of the second and third measurements obtained and are restricted to those participants who had not eaten, drunk alcohol, smoked or exercised in the 30 minutes before the measurement and for whom three readings were successfully obtained.

Blood samples

The table below shows the numbers of men and women from whom a non-fasting blood sample was obtained in each of the 2008 to 2011 surveys. Pregnant women, anyone with a history of fitting or convulsions, and those taking anti-coagulant medicines (such as warfarin) were excluded from giving a blood sample. Further exclusions (due to problems in the laboratory or the use of prescription medication

that interferes with the analyte) further reduce the sample sizes available for analysis.

Blood samples obtained, 2008-2011

	2008	2009	2010	2011
Men	415	387	372	333
Women	488	498	471	392
<i>All aged 16+</i>	<i>903</i>	<i>885</i>	<i>843</i>	<i>725</i>

Full details of the response to the blood samples in 2008 and 2009 were published in the 2009 technical report,²⁷ and in the respective technical reports for the 2010²⁸ and 2011 surveys (Volume 3 of this report).

Although blood samples have been collected since the survey began in 1995, changes over the years to the laboratory, the analysis methods used, or the analytes tested for, mean that trends do not necessarily start in 1995.

8.2.2 Summary measures of cardiovascular disease and diabetes

Any CVD condition / Any CVD condition or diabetes

Participants were classified as having any CVD condition if they reported ever having any of the following conditions confirmed by a doctor: angina, heart attack, stroke, heart murmur, abnormal heart rhythm, or 'other heart trouble'.²⁹ A second category that includes diabetes as well as the above CVD conditions is also presented in the tables as 'any CVD condition or diabetes' so that the total combined prevalence of these conditions can be seen. The trend table reports the prevalence of any CVD, and any CVD or diabetes from 1995 onwards.

Ischaemic heart disease

Participants were classified as having IHD if they reported ever having angina or a heart attack, confirmed by a doctor.

Ischaemic heart disease or stroke

Participants were classified as having IHD or stroke if they reported ever having angina, or a heart attack, or a stroke, confirmed by a doctor.

8.2.3 Classification of blood pressure levels

Blood pressure has a normal distribution within a population and thresholds to indicate the point at which someone has a level that is definitely clinically significant do not exist. The most recent NICE guidelines (developed jointly with the British Hypertension Society) cite evidence suggesting that with each 2mmHg increase in systolic blood pressure, risk of mortality from IHD increases by 7% and by 10% for stroke.³⁰ Those guidelines recommend that antihypertensive therapy should be initiated in people with sustained clinic levels of systolic blood pressure (SBP) >160 mmHg or diastolic blood pressure (DBP) >100

mmHg. They also recommend that treatment should be initiated for people aged below 80 (who have CVD, diabetes, other target organ damage (e.g. kidney), or an estimated CVD risk $\geq 20\%$ over 10 years) and who have sustained clinic levels of SBP between 140 and 159 mmHg and/or DBP between 90 and 99 mmHg. The guidance also advocates the use of ambulatory blood pressure monitoring, or home blood pressure monitoring before making the diagnosis. The most recent guidance from SIGN concurs with the guidance for treating those with existing or high risk of CVD,³¹ while separate SIGN guidance recommends the use of antihypertensive medication for people with a previous stroke or transient ischaemic attack (TIA, like a stroke but lasting less than 24 hours) regardless of BP level.³²

These guidelines are not universally accepted.³³ For example, the United States uses guidelines that are more restrictive so that 140/90 mmHg (irrespective of risk factor) is considered the threshold for treatment and target to achieve.³⁴ In 2003 the European Society of Hypertension and the European Society of Cardiology jointly recommended a threshold of 140/90 mmHg for those without diabetes and 130/80 mmHg for those with diabetes.³⁵

This report continues to use the blood pressure definition that was introduced in the 1998 SHeS (140/90 mmHg), in accordance with the 1999 British Hypertension Society guidelines.³⁶

Based on their systolic (SBP) and diastolic (DBP) blood pressure and current use of anti-hypertensive medications, adult participants were classified into one of four groups as follows:

Normotensive	SBP<140 mmHg and DBP<90 mmHg, not currently taking any drug specifically prescribed to treat high blood pressure
Hypertensive controlled	SBP<140 mmHg and DBP<90 mmHg, currently taking a drug specifically prescribed to treat high blood pressure
Hypertensive uncontrolled	SBP \geq 140 mmHg or DBP \geq 90 mmHg, currently taking a drug specifically prescribed to treat high blood pressure
Hypertensive untreated	SBP \geq 140 mmHg or DBP \geq 90 mmHg, not currently taking a drug specifically prescribed to treat high blood pressure

For the purpose of this report, the term 'hypertensive' is applied to those in the last three categories.

8.2.4 Blood analytes

Glycated haemoglobin

Glycated haemoglobin (HbA_{1C}) reflects the level of glucose in the blood over the preceding two to three months, and is therefore a better indicator of diabetic control than a random glucose sample, which is affected by recent food or drink intake. Elevated glycated haemoglobin in people without diabetes is associated with increased mortality following acute myocardial infarction.³⁷ Elevated levels are seen in people with undiagnosed diabetes. In June 2009, an international expert committee recommended using levels of 6.5% or more to diagnose diabetes.³⁸ Levels of 5.7% or more have been proposed as a screening test for diabetes.³⁹ The UK National Screening Committee is due to review its policy on diabetes screening in 2012/13.

The latest SIGN guidelines for diabetes set <7% as the HbA_{1C} target for good glycaemic control in people with diabetes,²¹ consistent with indicator DM 23 within the Quality and Outcomes Framework (QOF) for 2009/2010. DM 23, which replaces DM 20, gives GPs the target of 40-50% of their diabetic patients having HbA_{1C} <7%, a reduction from <7.5% within DM 20.^{40,41} The Task Force on Diabetes and Cardiovascular Diseases of the European Society of Cardiology (ESC) and of the European Association for the Study of Diabetes (EASD) recommends that HbA_{1C} be kept <6.5% to reduce cardiovascular risk.⁴² For the purpose of this survey, a glycated haemoglobin value of 6.5% or above in people with no existing diabetes diagnosis was taken to indicate possible undiagnosed diabetes. The sample size for people with a diabetes diagnosis was too small to assess whether their condition is being adequately controlled so the chapter only looks at people with no such diagnosis.

HbA_{1C} figures for participants with no self-reported diagnosis of diabetes are presented for 2003 and 2008-2011 combined.

Total cholesterol

Prospective studies have identified an increased risk of coronary disease associated with raised cholesterol concentration. A meta-analysis of all randomised trials of more than two years duration showed that lowering serum cholesterol confers clinical benefit as expressed in lower CHD mortality and total mortality risk, with the magnitude of benefit directly related to the degree of cholesterol reduction.⁴³ Lipid-lowering drugs (statins) are effective in primary prevention⁴⁴ as well as in people with established disease, and also reduce the risk of stroke.⁴⁵

For the purpose of this survey, cholesterol was considered to be raised at a level of 5.0 mmol/l or over. In 2000, the National Service Framework for Coronary Heart Disease suggested a total cholesterol target below 5.0 mmol/l for all patients with arterial heart disease or significant cardiovascular risk.⁴⁶ The QOF target for GPs relates to the percentage of patients with coronary heart disease whose total

cholesterol is 5.0 mmol/l or below.⁴⁷ In 2005, the recommendations for defining and treating hypercholesterolaemia were superseded by the second guidance from the Joint British Societies, JBS2.⁴⁸ European guidance is based on assessing cardiovascular risk, using the SCORE tool,⁴⁹ while in Scotland the ASSIGN risk assessment tool has been developed to take better account of the risks associated with social deprivation and family history of CVD.³¹ SIGN guidance advises the use of statins in people with pre-existing cardiovascular disease, diabetes, or estimated 10-year CVD risk of 20% or above, regardless of cholesterol level, or in those with total cholesterol of 8.0mmol/l or above.^{20,31,32} The Scottish Government's 2009 *Better Heart Disease and Stroke Care Action Plan* also covers Familial Hypercholesterolaemia, a genetic condition in which affected people have very high cholesterol levels and high risk of premature cardiovascular disease.¹⁶

Total cholesterol figures, which include participants who were taking lipid-lowering drugs, are presented for 1995, 1998, 2003, and 2008-2011 combined.⁵⁰

High-density lipoprotein cholesterol

Studies have shown that high-density lipoprotein cholesterol (HDL-cholesterol) is inversely and independently associated with the risk of developing CHD.^{51,52} Furthermore, low levels of HDL-cholesterol are associated with a worse prognosis after myocardial infarction.⁵³ Protection against CVD by HDL-cholesterol is conferred in at least two ways. The first is that it transports cholesterol back from organs such as arteries to the liver for elimination, thus protecting the arteries from further atheromatous plaque formation. The second is by acting as an antioxidant. Increasing physical activity, drinking alcohol,⁵⁴ quitting cigarette smoking and losing weight can elevate HDL-cholesterol. Attention is generally recommended for HDL-cholesterol concentrations <1 mmol/l. HDL-cholesterol levels are generally higher in women than men.

Total: HDL cholesterol ratio

Total cholesterol has been criticised as a measure because it can be raised when the (beneficial) HDL fraction is high. LDL- (low density lipoprotein) cholesterol, the component that is directly associated with increased atherosclerosis (hardening of the arteries), is harder to measure and is generally considered to require fasting blood samples. Although LDL-cholesterol levels can be estimated by calculating 'non-HDL-cholesterol', and numerous other lipid-related measures have been suggested, the measure found to be most highly associated with CVD outcomes is the ratio of total to HDL-cholesterol,⁵⁵ which is better than either total or HDL-cholesterol alone for predicting IHD.⁵⁶

Canadian guidelines recommend treatment with statins for low risk individuals with a total: HDL cholesterol ratio above 6.0, and for individuals at moderate CVD risk (10 year CVD risk of 10-19%) with a ratio above 5.0.⁵⁷ An American study found that secondary prevention

targets in high risk individuals can be monitored using this ratio, aiming at levels below 3.0.⁵⁸ However, no country within the UK routinely uses total: HDL-cholesterol ratio in its lipid-lowering guidance.

HDL-cholesterol and total: HDL cholesterol ratio figures and are presented for 2003 and for 2008-2011 combined. The figures presented include participants who were taking lipid-lowering drugs.

C-reactive protein

C-reactive protein (CRP) is an acute-phase reactant which is synthesised in the liver in response to the pro-inflammatory protein interleukin 6 (IL-6). It is therefore a sensitive marker of inflammation. Levels of these acute phase proteins have been related to risk of coronary heart disease (CHD). Elevated levels of CRP are associated with increased risk of myocardial infarction (MI) or sudden death among those with stable and unstable angina pectoris,⁵⁹ as well as with coronary heart disease in the elderly and coronary mortality among high-risk patients. The follow-up of the Multiple Risk Factor Intervention Trial (MRFIT) has documented a strong relationship between levels of CRP and subsequent risk of CHD deaths among cigarette smokers.⁶⁰

However, it is more likely that these associations are due to confounding, with CRP unlikely to be causally related to CHD.^{61,62} Although an American study raised the possibility that assessment of CRP may also provide a method of determining risk of future MI among apparently low-risk individuals, including non-smokers,⁶³ a review in 31 studies found that CRP was generally no more effective than the classical Framingham score in predicting CHD.⁶⁴ In the US, the first set of guidelines endorsing use of high-specificity CRP (hsCRP) in risk factor screening for CVD were produced in 2003,⁶⁵ but CRP is not currently included in screening in the UK,⁴⁸ nor is there a recommended CRP threshold in the UK.

CRP figures are presented for 1998, 2003 and 2008-2011 combined.

Fibrinogen

Fibrinogen is a major blood glycoprotein that plays an essential role in haemostasis (coagulation) and the maintenance of blood viscosity. High fibrinogen is a cardiovascular risk factor, being important in the cascade leading to thrombotic events. Epidemiological observations indicate that high plasma fibrinogen levels are strongly correlated with the incidence of two major thrombotic complications of atherosclerosis: stroke and myocardial infarction. The Scottish Heart Health Study confirmed that plasma fibrinogen is not only a risk factor for coronary heart disease and stroke, but is also raised with family history of premature heart disease and with personal history of hypertension, diabetes, and presence of intermittent claudication.⁶⁶ Fibrinogen levels are higher in more deprived groups (even among non-smokers)⁶⁷ and in smokers,⁶⁸ and levels fall after quitting smoking.⁶⁸ This may explain part of the excess CVD risk among smokers and those in lower socio-economic

groups. However, fibrinogen is not used clinically for individual patients in determining cardiovascular risk.

Fibrinogen figures are presented for 1998, 2003 and 2008-2011 combined. As per the convention in all previous SHeS reports, and in contrast to the cholesterol measures, the fibrinogen figures exclude participants who were taking prescription medications that would affect fibrinogen levels (lipid lowering drugs and beta blockers).

8.3 PREVALENCE OF CARDIOVASCULAR CONDITIONS AND DIABETES

This section examines trends in the prevalence of: any CVD, any CVD or diabetes, IHD, stroke, and IHD or stroke from 1995 onwards. Changes to the sample composition over the first three years of the survey mean that discussion of the trend between 1995 and 2011 is based on those aged 16-64, while the trend for all adults aged 16 and over from 2003 onwards is also included.

8.3.1 Any CVD, and CVD or diabetes, IHD, stroke and IHD and stroke by age and sex, 2011

Figures for the prevalence of any CVD, any CVD or diabetes, IHD, stroke, IHD and stroke in 2011 are presented in Table 8.1 and summarised below. Rates were higher for men than women with particularly pronounced differences for IHD and IHD or stroke rates. The proportion of adults with these conditions increased markedly with age. For example, fewer than one in ten men or women under 45 had any CVD conditions or diabetes, whereas 57.0% of men and 43.4% of women aged 75 and over had at least one of these conditions.

Table 8.1

	Stroke	IHD	IHD or stroke	Any CVD	Any CVD or diabetes
Men (%)	2.9	7.5	9.4	15.6	19.2
Women (%)	2.7	4.9	6.7	13.8	17.0

8.3.2 Trends in any CVD, and CVD or diabetes since 1995

The prevalence of any CVD in men aged 16-64 was 8.4% in 1995, 8.1% in 1998 and then increased significantly to 9.7% in 2003. The figure in 2011, 9.8%, was similar to that reported in the three previous survey years (9.5% to 10.5%) which suggests that prevalence has been fairly static since 2003. Prevalence of any CVD in women aged 16-64 has shown small fluctuations over time but with no obvious pattern; the 2011 figure (8.4%) was very similar to that in 1998 (8.5%).

Until 2010, the prevalence of CVD or diabetes among men aged 16-64 increased by a small amount each year (from 9.4% in 1995 to 13.6% in

2010). The 2011 and 2009 figures were identical (12.7%). As noted in previous reports, the overall upward trend in any CVD or diabetes is largely accounted for by increasing levels of diabetes over time (rather than increased rates of CVD conditions). However, it is not possible to establish whether this trend represents an overall increase in the incidence of CVD and/or diabetes among men and/or improved diagnostic or survival rates for these conditions.

In contrast, the level of any CVD or diabetes among women has not followed such a consistent pattern. The rate fluctuated between 9.6% and 10.2% in the three earliest surveys, peaked in 2008 (12.8%), and has sat at around 11% since then (11.2%-10.8%). **Table 8.1**

8.3.3 Trends in IHD, stroke, and IHD or stroke since 1995

The proportion of men aged 16-64 with IHD has been similar across the survey years (ranging between 3.2% and 4.1%) with no significant trend. However, there has been a decrease in IHD prevalence among particular age groups of men: there was a seven percentage point drop in IHD among those aged 55-64 between 1995 and 2011, and a four point decline for those aged 65-74 between 1998 and 2011. This may well contribute to declining rates of IHD in the future (assuming that IHD onset has been avoided rather than just delayed for these cohorts of men).

The prevalence of stroke among men has also been fairly static: it ranged from 0.7% and 1.2% between 1995 and 2009, was somewhat higher in 2010 (1.8%), but was lower again in 2011 at 1.3%. The combined prevalence of IHD or stroke in men has remained relatively unchanged across the survey years (4.2%-5.0%).

For women aged 16-64, there was a slight decrease in IHD prevalence between 1995 (2.9%) and 2008 (2.2%), with little change since then (1.9% in 2009, 2.2% in 2010 and 1.8% in 2011). As was for the case for men, those aged 55-64 and 65-74 saw larger decreases in IHD prevalence than any other age group. The most recent figures for stroke prevalence for women (0.9%-1.2%) have all been a little higher than in the 1995-2003 period (0.5%-0.7%). With the exception of the 2009 and 2011 figures (2.4% and 2.6%, respectively), the rates of IHD or stroke in women have remained fairly constant over time at 3.0%-3.2%.

Table 8.1

8.4 DOCTOR-DIAGNOSED AND UNDIAGNOSED DIABETES

8.4.1 Trends in doctor-diagnosed diabetes since 1995

There has been an increase over time in doctor-diagnosed diabetes among adults aged 16-64 (Table 8.2). Prevalence doubled between 1995 and 2008, from 1.5% to 3.1%, and was a little higher in the three most recent survey years (3.6%-3.8%). The increase between 1995 and 2008 was slightly steeper for men (from 1.5% to 3.3%) than for women (from 1.5% to 2.8%), and while prevalence increased further in men

from 2009 onwards (4.0%-4.7%), for women it remained fairly stable (2.8%-3.2%).

The figures for all those aged 16 and over are available from 2003 onwards and the trend shows a similar pattern to that for adults aged 16-64, with prevalence between 2003 and the three most recent survey years increasing from 3.8% to 6.1-6.3% for men, and from 3.7% to 4.4%-4.9% for women. **Table 8.2**

8.4.2 Trends in undiagnosed diabetes since 2003

As described in Section 8.2.4, levels of glycated haemoglobin (measured in the blood samples collected in the nurse interview) can be used to estimate the prevalence of undiagnosed diabetes in the population. Levels of glycated haemoglobin are reported in three groups in Table 8.3: 6.5% or above (a level consistent with undiagnosed diabetes), 6.0- $<$ 6.5% (a level that could indicate a high risk of developing diabetes), and $<$ 6.0% (low risk). Participants who reported that they had doctor-diagnosed diabetes have been excluded from the table. As only a sub-sample of participants was eligible for the nurse interview each year in the 2008-2011 period, the data for these years have been combined to provide more robust estimates.

Between 2003 and 2008-2011, the proportion of adults with undiagnosed diabetes increased from 1.1% to 2.4% (1.2% to 2.6% for men, 1.0% to 2.1% for women). **Table 8.3**

In the table below the self-reported doctor-diagnosed diabetes figures collected in the survey are combined with the glycated haemoglobin results (presented in Table 8.3), to estimate prevalence of the total 'true' level of diabetes (both diagnosed and undiagnosed) in the population. Note that the diagnosed diabetes figures here are based on the 2008-2011 combined data, so differ slightly to those presented in Table 8.2. The table below also provides an estimate of the proportion of all diabetes that is undiagnosed. Based on these figures, just under a third (32%) of all cases of diabetes in adults are undiagnosed.

Prevalence of diagnosed and undiagnosed diabetes, 2008-2011 combined

	Men	Women	All adults
	%	%	%
Doctor-diagnosed diabetes ^a	6.0	4.5	5.2
Glycated haemoglobin $\geq 6.5\%$ but no diagnosed diabetes (i.e. undiagnosed diabetes) ^b	2.6	2.1	2.4
<i>All diabetes</i>	<i>8.6</i>	<i>6.6</i>	<i>7.6</i>
Undiagnosed diabetes as a percentage of all diabetes	30%	32%	32%

a Among those interviewed

b Among those providing a blood sample in the nurse interview

There has been a much more notable increase in the prevalence of glycated haemoglobin levels of 6.0- $<6.5\%$ in adults without diagnosed diabetes, from 2.7% to 11.8% between 2003 and 2008-2011. The scale of the increase was similar for men and women. The Health Survey for England has also been measuring glycated haemoglobin over time, using the same blood collection technique and analysis laboratory as SHeS. In 2003, 3.4% of adults in England without diabetes had a glycated haemoglobin level of 6.0- $<6.5\%$, by 2009 (the most recent comparable year for which data are available) it had increased to 10.9% (data not shown). Like Scotland, England also experienced a small increase in the prevalence of glycated haemoglobin levels of 6.5% or above, from 1.4% in 2003 to 2.5% in 2009 (data not shown).⁶⁹

It is important to note that, as is always the nature with risk estimates, only some people in the group classified as being at high risk of developing diabetes will actually progress to the point of meeting the diagnostic threshold for the condition, while some people with levels currently below 6.0% will develop it, so these figures are simply an estimate of the possible future burden of diabetes. Studies have shown a very small increase in diabetic retinopathy with increasing glycated haemoglobin until a threshold at 6.5%, after which it climbs steeply; this has therefore been taken as the best threshold for diagnosing diabetes.⁷⁰ Although there is no specific level at which risk of developing diabetes clearly begins, the International Expert Committee report on the use of glycated haemoglobin to diagnose diabetes suggested that those with glycated haemoglobin levels of 6.0% to $<6.5\%$ are at higher risk and should receive effective lifestyle interventions. For example, they recommend that those at risk of developing diabetes should be advised as a minimum to control their weight and be more physically active; and suggest such individuals may also benefit from formal assessment of other cardiovascular risk factors, such as blood pressure.⁷⁰

Table 8.3

8.5 HYPERTENSION

8.5.1 Trends in blood pressure levels since 1998

The four levels used to classify hypertension (presented in Table 8.4) draw a distinction between people with normal blood pressure who are not receiving any treatment for hypertension, and those with normal levels who are taking anti-hypertensive medication. They also distinguish between people with raised blood pressure who are receiving treatment, and those who are not. These latter two categories are important target groups in the population. The first (those with raised blood pressure who are receiving treatment) includes people with poorly managed hypertension, while the second provides an estimate of the prevalence of potentially undiagnosed cases of this condition. It should be noted, when considering this last category, that not everyone with a one-off raised blood pressure measurement actually has hypertension on repeated measurement; the definition of hypertension is 'sustained raised BP'. Nor does everyone with a blood pressure of 140-159/90-99mmHg warrant treatment, which is indicated for people aged under 80 with existing CVD, diabetes, damage from raised blood pressure (e.g. kidney disease) or at high risk of developing CVD.

Blood pressure levels from 1998 onwards are presented in Table 8.4. The blood pressure categories use information about prescribed medications. As questions about medications were first included in SHeS in 1998, the trends in blood pressure levels exclude 1995. Since adults aged 75 and over were not included in the 1998 survey, the discussion on the trend since 1998 is based on those aged 16-74. The figures for all adults aged 16 and over from 2003 onwards are also included in the table.

Prevalence of hypertension has changed over time, though it is worth noting, as previous reports have, that the change in the measurement equipment used between 1998 and 2003 might have contributed to some of this change.²⁶ Between 1998 and 2003 the proportion of men aged 16-74 with hypertension increased from 22.3% to 29.5%; the 2008/2009 and 2010/2011 figures were similarly high (31.9% and 29.9%, respectively). The increase occurred across each of the three separate hypertensive categories.

Table 8.4

A similar, but less pronounced, increase was observed among women; a significant increase between 1998 and 2003 with prevalence in more recent years remaining at this higher level. In 1998, 21.2% of women aged 16-74 had hypertension compared with 26.7% in 2003, 26.5% in 2008/2009 and 26.6% in 2010/2011. As seen with men, prevalence increased in each of the hypertensive categories.

The pattern for adults aged 16 and over, from 2003 onwards, was very similar to that described for the 16-74 year old population. In 2010/2011, the total proportions of men and women aged 16 and over with hypertension (33.0% and 32.0%, respectively) were similar to the 2008/2009 and 2003 figures.

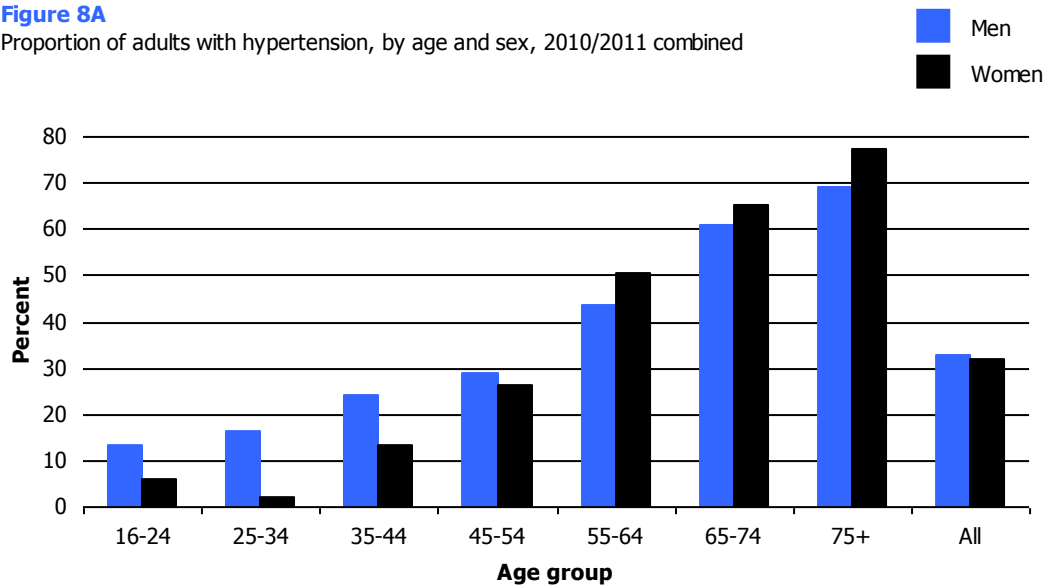
8.5.2 Blood pressure levels by age and sex, 2010/2011 combined

In 2010/2011 the prevalence of hypertension (blood pressure of $\geq 140/90$ mmHg and/or taking anti-hypertensive medication) was not significantly different in men (33.0%) and women (32.0%) and the proportions of men and women in each of the three hypertensive categories were very similar. As Figure 8A shows, increasing age is a major risk factor for hypertension, though patterns differ between men and women. In 2010/2011, prevalence of hypertension among men doubled between the ages of 16-24 and 45-54 (from 13.6% to 29.1%), and again between the ages of 45-54 and 65-74 (to 61.0%), and was highest (69.4%) among those aged 75 and over. Women had lower hypertension rates than men up until the age of 55-64, after which point rates were higher than for men. Rates fluctuated among younger women before showing a steady increase. Prevalence rose from 13.2% of those aged 35-44, to 26.3% and 50.8% in the next two age groups, and reached a peak of 77.2% among women aged 75 and over.

Figure 8A, Table 8.4

Figure 8A

Proportion of adults with hypertension, by age and sex, 2010/2011 combined



Almost one in five men and one in six women had untreated hypertension in 2010/2011: for both sexes this was the most common category of hypertension among those aged 16-74 (controlled hypertension was more common for men aged 75 and over, while uncontrolled hypertension was more common for women of this age). As the inset table below shows, untreated hypertension accounted for around half (52%) of all hypertension detected in the survey. Its contribution to total hypertension prevalence decreased with age, as prevalence of both uncontrolled and controlled hypertension increased.

Table 8.4

Prevalence of treated and untreated hypertension, 2010/2011 combined

	Men	Women	All adults
	%	%	%
Untreated hypertension ^a	18.5	15.7	17.0
Treated hypertension (controlled and uncontrolled) ^b	14.5	16.4	15.5
<i>All hypertension</i>	<i>33.0</i>	<i>32.0</i>	<i>32.5</i>
Untreated hypertension as a percentage of all hypertension	56%	49%	52%

a Not taking drugs prescribed to treat high blood pressure and with SBP of ≥ 140 mmHg or DBP ≥ 90 mmHg.

b Taking drugs prescribed to treat high blood pressure with any BP level.

8.6 BLOOD ANALYTES

8.6.1 Total cholesterol

Between 1995 and 2008-2011 the mean level of total cholesterol in men aged 16-64 declined from 5.6 to 5.2 mmol/l. This was accompanied by a notable decline in the proportion of men with a total cholesterol level of 5.0 mmol/l or above (from 69.8% to 57.8%). The greatest decrease occurred between 1995 and 1998. The proportion of men with a total cholesterol level of 5.0 mmol/l or above was lower in every age group in 2008-2011 compared with 1995.

Among women aged 16-64, the overall trend between 1995 and 2008-2011 was also one of decline both for mean cholesterol (from 5.6 mmol/l to 5.3 mmol/l) and for the proportion with levels of 5.0 mmol/l or above (from 67.8% to 59.9%). As with men, most of the decline occurred between 1995 and 1998 with little change in the figures since then.

The more recent trend, for all adults aged 16 and over from 2003 onwards, also showed a decline on both measures, largely driven by a particularly pronounced drop among men aged 75 and over (for example, the proportion of men aged 75 and over with levels of 5.0 mmol/l or above halved between 2003 and 2008-2011). Women aged 65 and over also saw large declines (of 14-17 percentage points) in the proportions with levels of 5.0 mmol/l or above. These figures include people taking lipid lowering drugs (LLD) such as statins, so the decline in total cholesterol will almost entirely be due to the increased use of such drugs. As the inset table below indicates, between 2003 and 2008-2011, there was a significant increase in LLD use among men and women particularly among those aged those aged 65 and over, to the extent that in 2008-2011, 44% of men, and 38% of women aged 65 and over took such drugs (compared with 25% and 20%, respectively, in 2003).

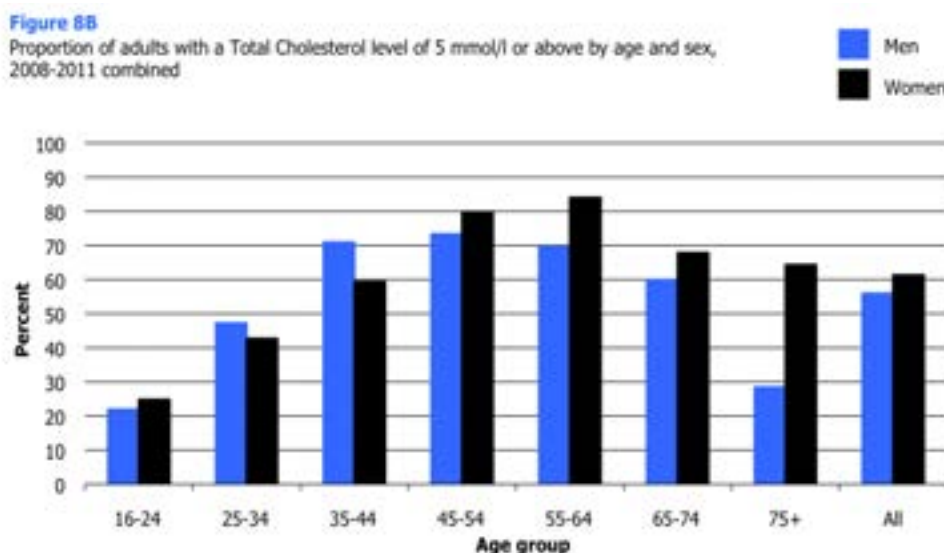
Prevalence of lipid lowering drug use, 2003 and 2008-2011 combined

	Aged 16-44	Aged 45-64	Aged 65 and over	All aged 16 and over
	% (95% CI) ^a	% (95% CI)	% (95% CI)	% (95% CI)
Men 2003	1 (0.3-1.7)	12 (10-14)	25 (21-28)	9 (8-10)
Men 2008-2011	1 (0.4-1.8)	20 (17-23)	44 (40-49)	15 (14-17)
Women 2003	1 (0.3-1.3)	7 (5-9)	20 (17-24)	7 (6-8)
Women 2008-2011	0 (0.1-1.0)	12 (10-15)	38 (34-42)	13 (11-14)

^a 95% confidence intervals are shown to help interpret the trend (sample sizes= 5,444 in 2003 and 4,273 in 2008-2011)

Table 8.5 and Figure 8B show that, in 2008-2011, prevalence of a total cholesterol level of 5.0 mmol/l or above increased notably with age among men, from 21.9% of those aged 16-24 to 69.6%-73.3% of those aged 35-64, before declining to 59.9% at age 65-74, and further to 28.4% of those aged 75 and over. For women, the peak occurred at age 55-64 (84.0%) and the decline thereafter was much less pronounced so that a majority of women aged 75 and over (64.3%) had a total cholesterol level of 5.0 mmol/l or above. SIGN's recommendations for statin treatment are based on CVD risk and cholesterol levels, but they advise statins for anyone with a total cholesterol level of 8.0 mmol/l or above; in the 2008-2011 period just 1.4% of adults fell into this group (data not shown).

Figure 8B, Table 8.5



8.6.2 HDL cholesterol and total: HDL cholesterol ratio

Mean HDL cholesterol levels were the same in 2003 and 2008-2011 for both men (1.3 mmol/l) and women (1.6 mmol/l)⁵⁰ and varied little by age. Men were more likely than women to have low levels of HDL cholesterol. While the proportion of men with HDL levels below 1.0 mmol/l increased between 2003 and 2008-2011 (from 7.7% to 10.8%),

the figures for women were very similar (2.0% and 3.1%, respectively). The proportion of men with HDL cholesterol levels below 1.0 mmol/l varied with age in both 2003 and 2008-2011, but with no consistent pattern. In contrast, in 2003 the proportion of women with levels below 1 mmol/l was lowest among those aged 35-74, whereas in 2008-2011 it was broadly similar across all age groups.

As discussed in Section 8.2.4, the ratio of total cholesterol to HDL cholesterol is a stronger indicator of cardiovascular risk than either measure alone. The mean ratios were very similar in 2003 and 2008-2011 (4.2 and 4.1 respectively for men, 3.6 in both years for women). Ratios in 2008-2011 showed a similar inverted U-shaped distribution with age to that shown in Figure 8B for men's total cholesterol. For both men and women, ratios increased with age from 3.5 and 3.1, respectively, at age 16-24 to peaks of 4.7 in men aged 45-54, and 4.0 in women aged 55-64, before dropping to 3.5 for both men and women aged 75 and over.

Table 8.6

8.6.3 Fibrinogen

Between 1998 and 2008-2011, mean fibrinogen levels in adults aged 16-74 increased from 2.6 g/l to 2.9 g/l in men, and from 2.8 g/l to 3.1 g/l in women. In contrast, the figures for adults aged 16 and over from 2003 onwards were more stable, for both sexes. Fibrinogen levels did not differ significantly by sex and increased with age among both men and women. For example, for men in 2008-2011 they increased from 2.7g/l at age 16-24 to 3.3g/l at age 75 and over. The equivalent figures for women were 2.9 g/l and 3.3 g/l in respectively.

Table 8.7

8.6.4 C-reactive protein (CRP)

Mean CRP levels (measured as mg/l) from 1998 onwards are presented in Table 8.8. As CRP is not normally distributed (most people had very low levels of CRP so it was very skewed to the right), mean values are not a good measure of levels in the population. Instead, quintile distributions have been presented and are discussed to help illustrate the pattern over time, and between men, women and different age groups.

The 1998 CRP thresholds have been applied to the 2003 and 2008-2011 data to enable comparisons in quintile distributions over time to be made. Any analyses based on a single point in time would, of course, need to apply the quintile thresholds applicable to those data.

Although the mean CRP for men aged 16-74 changed little over time, there was some change in the proportions in the bottom two quintiles. Between 1998 and 2008-2011, the proportion in the bottom CRP quintile increased from 20.7% to 27.0%. This was coupled with a decrease (from 22.1% to 17.7%) in the proportion in the second quintile. The increase over time in the proportion of men in the lowest CRP quintile was greatest for men aged 55-64 (a doubling from 7.8% to 15.3%). However, in absolute terms, it was men aged 25-34 who

experienced the largest percentage point increase (from 25.9% to 40.0%).

The pattern among women was a little different: the mean CRP level for those aged 16-74 was significantly lower in 2008-2011 (3.3 mg/l) than in 2003 (3.8mg/l) and lower, but not significantly, than in 1998 (3.6mg/l). The only notable changes in the proportions in each of the quintile groups between 1998 and 2008-2011 were a small decrease in the proportion in the highest quintile (from 20.0% to 17.3%), and a small increase in the overall proportions in the second to fourth quintiles (from 80.1% in 1998 to 82.7% in 2008-2011).

In every survey year, CRP levels were higher for women than for men, and levels for both sexes generally increased with age. For example, in 2008-2011, the proportion of men with a CRP level in the highest quintile increased from 9.4%-10.5% for those aged 16-34 to 19.9%-24.5% for those aged 55-74. The pattern for women fluctuated more, with those aged 55-74 also the most likely to have a CRP level in the highest quintile.

Table 8.8

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- ⁶ *Scottish Budget Spending Review 2007*, Edinburgh: Scottish Government, 2007. [online] Available from: <www.scotland.gov.uk/Publications/2007/11/13092240/0> See also: <www.scotlandperforms.com>
- ⁷ See: <www.scotland.gov.uk/About/Performance/scotPerforms/indicator/smoking>
- ⁸ See: <www.scotland.gov.uk/About/scotPerforms/indicator/physicalactivity>
- ⁹ See: <www.scotland.gov.uk/About/scotPerforms/indicator/healthyweight>
- ¹⁰ *National Performance Framework: Changes to the National Indicator Set*, Edinburgh: Scottish Government, 2012. [online] Available from: <www.scotland.gov.uk/About/scotPerforms/Nlchanges> See also: <www.scotlandperforms.com>
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- ¹² The HEAT targets derive their name from the four strands in the performance framework: the Health of the population; Efficiency and productivity, resources and workforce; Access to services and waiting times; and Treatment and quality of services.
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measured after point this being on average 0.1 mmol/l higher than was the case with the previous equipment, while the HDL cholesterol concentrations were 0.1 mmol/l lower. As the tables report data from the whole 2008-2011 period, and the impact was minimal, no adjustments were made to the data presented in this chapter.

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Table 8.1 Any CVD, any CVD or diabetes, IHD, stroke, IHD or stroke, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Any CVD / any CVD or diabetes / IHD / stroke / IHD or stroke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
Any CVD									
1995	3.5	3.2	5.7	10.7	23.8	n/a	n/a	8.4	n/a
1998	1.3	4.3	5.6	11.3	21.7	36.9	n/a	8.1	n/a
2003	2.9	5.2	8.0	10.3	23.3	35.9	45.4	9.7	14.9
2008	4.9	5.9	6.8	10.3	22.0	35.8	45.0	9.9	15.1
2009	3.9	3.0	5.3	11.7	23.7	36.1	49.4	9.5	15.2
2010	5.2	4.1	8.1	12.2	23.0	37.9	49.4	10.5	16.3
2011	4.0	6.7	5.1	12.9	20.1	36.4	49.6	9.8	15.6
Any CVD or diabetes									
1995	3.9	3.4	6.5	12.4	26.2	n/a	n/a	9.4	n/a
1998	2.1	5.2	6.9	13.6	24.7	40.8	n/a	9.7	n/a
2003	3.4	5.7	9.1	11.1	27.3	41.2	49.6	11.1	16.8
2008	5.7	6.0	7.3	13.3	29.1	42.2	52.5	12.2	18.2
2009	3.9	4.5	6.8	16.5	31.3	42.8	55.4	12.7	19.0
2010	5.2	4.9	10.6	16.3	30.7	44.8	56.5	13.6	20.1
2011	6.3	7.5	6.1	17.7	25.8	42.6	57.0	12.7	19.2
IHD									
1995	-	0.2	1.1	6.0	17.0	n/a	n/a	4.0	n/a
1998	-	0.1	0.8	6.6	16.1	27.3	n/a	4.0	n/a
2003	-	0.8	0.9	4.9	15.3	25.3	31.7	4.1	8.2
2008	-	-	0.5	3.0	13.1	21.9	26.8	3.2	6.9
2009	-	0.3	0.4	4.1	13.3	22.4	27.9	3.6	7.4
2010	-	0.5	0.9	4.4	11.0	22.6	31.0	3.4	7.5
2011	0.6	-	0.3	5.6	10.4	23.0	30.7	3.4	7.5
Stroke									
1995	-	0.2	0.1	1.7	3.9	n/a	n/a	1.0	n/a
1998	-	0.3	0.3	0.9	2.1	6.4	n/a	0.7	n/a
2003	0.2	-	0.7	0.9	4.6	5.9	11.3	1.2	2.4
2008	-	-	1.3	0.8	3.3	5.8	13.6	1.1	2.5
2009	-	0.0	0.6	1.5	3.4	8.1	13.0	1.1	2.7
2010	0.1	0.4	1.2	1.5	5.8	8.5	12.7	1.8	3.3
2011	-	0.6	-	1.5	4.5	7.8	13.3	1.3	2.9
IHD or stroke									
1995	-	0.2	1.2	7.2	19.0	n/a	n/a	4.6	n/a
1998	-	0.4	1.0	7.2	17.1	31.0	n/a	4.4	n/a
2003	0.2	0.8	1.4	5.8	18.1	28.4	37.3	5.0	9.6
2008	-	-	1.8	3.8	15.8	25.9	35.9	4.2	8.7
2009	-	0.3	1.0	5.3	15.6	28.5	37.7	4.4	9.4
2010	0.1	1.0	1.9	5.4	15.5	27.9	38.8	4.8	9.8
2011	0.6	0.6	0.3	6.4	13.7	26.7	39.6	4.3	9.4

Continued...

Table 8.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Any CVD / any CVD or diabetes / IHD / stroke / IHD or stroke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Women									
Any CVD									
1995	5.1	4.1	7.4	10.5	20.2	n/a	n/a	8.9	n/a
1998	2.9	3.8	7.6	11.3	18.9	27.1	n/a	8.5	n/a
2003	4.4	5.3	6.5	11.5	17.5	31.0	36.6	8.9	14.5
2008	6.4	5.7	8.8	12.9	18.9	30.9	35.5	10.7	15.5
2009	4.2	6.7	9.3	9.5	14.5	24.5	37.2	9.0	13.7
2010	5.1	7.3	8.1	10.1	15.3	28.2	33.4	9.3	14.0
2011	7.0	4.0	5.7	11.6	13.1	28.5	37.5	8.4	13.8
Any CVD or diabetes									
1995	5.9	4.8	8.5	11.7	22.6	n/a	n/a	10.1	n/a
1998	3.5	4.2	8.4	11.9	22.5	29.8	n/a	9.6	n/a
2003	4.6	5.6	8.4	12.4	20.5	35.4	40.6	10.2	16.4
2008	8.1	7.0	10.8	15.2	22.4	34.9	40.8	12.8	18.2
2009	4.5	8.4	10.6	12.2	19.3	30.2	41.9	11.2	16.5
2010	5.5	8.1	9.7	12.8	19.6	33.0	38.8	11.3	16.7
2011	7.0	4.5	7.7	14.9	19.2	35.1	43.4	10.8	17.0
IHD									
1995	0.3	0.4	1.0	3.4	11.4	n/a	n/a	2.9	n/a
1998	-	0.2	0.6	3.8	10.7	17.3	n/a	2.7	n/a
2003	-	0.4	0.6	3.6	8.7	17.7	22.9	2.6	6.5
2008	-	-	1.1	2.4	7.4	15.9	20.2	2.2	5.6
2009	0.2	0.2	0.8	2.0	6.2	12.8	21.8	1.9	5.2
2010	-	0.5	1.0	2.6	6.9	15.1	16.8	2.2	5.2
2011	0.5	0.2	0.2	3.1	4.9	13.0	19.2	1.8	4.9
Stroke									
1995	-	0.2	0.2	0.7	1.8	n/a	n/a	0.5	n/a
1998	-	0.1	0.1	0.5	2.6	5.5	n/a	0.6	n/a
2003	-	0.2	0.9	0.5	2.1	5.0	8.3	0.7	2.1
2008	0.0	-	0.6	1.9	3.2	7.1	10.4	1.2	2.8
2009	0.2	0.2	0.7	1.0	2.2	5.4	8.8	0.9	2.2
2010	-	0.1	1.4	0.8	3.3	5.7	9.3	1.1	2.5
2011	-	0.2	0.8	1.2	2.7	6.8	10.4	1.0	2.7
IHD or stroke									
1995	0.3	0.4	1.1	3.9	12.4	n/a	n/a	3.2	n/a
1998	-	0.3	0.7	4.1	11.9	20.9	n/a	3.0	n/a
2003	-	0.6	1.4	3.9	10.4	21.1	28.9	3.2	8.0
2008	0.0	-	1.6	3.9	9.7	20.1	26.7	3.1	7.5
2009	0.4	0.3	1.4	2.7	7.1	16.7	27.9	2.4	6.7
2010	-	0.6	1.9	3.3	9.3	18.5	23.6	3.1	7.0
2011	0.5	0.4	1.0	4.0	6.6	17.1	25.6	2.6	6.7

Continued...

Table 8.1 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Any CVD / any CVD or diabetes / IHD / stroke / IHD or stroke	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
<i>Bases (weighted):</i>									
Men 1995	722	979	850	748	599	n/a	n/a	3898	n/a
Men 1998	708	953	904	780	607	469	n/a	3953	n/a
Men 2003	580	610	761	668	569	405	260	3188	3857
Men 2008	464	481	564	554	480	327	217	2542	3086
Men 2009	538	568	635	652	563	387	259	2955	3601
Men 2010	515	560	589	630	542	374	254	2837	3465
Men 2011	536	583	613	656	564	389	266	2953	3608
Women 1995	693	988	867	777	663	n/a	n/a	3988	n/a
Women 1998	677	940	913	798	661	583	n/a	3989	n/a
Women 2003	566	658	811	690	602	492	468	3327	4291
Women 2008	444	486	616	591	503	383	350	2640	3372
Women 2009	515	571	693	700	589	450	408	3068	3926
Women 2010	494	556	645	681	571	432	396	2947	3774
Women 2011	514	579	671	710	595	449	413	3069	3931
<i>Bases (unweighted):</i>									
Men 1995	474	840	810	708	688	n/a	n/a	3520	n/a
Men 1998	399	763	828	694	683	571	n/a	3367	n/a
Men 2003	336	455	733	614	633	509	327	2771	3610
Men 2008	246	317	462	534	525	453	303	2084	2840
Men 2009	272	406	551	604	575	517	362	2408	3287
Men 2010	274	421	478	565	555	488	331	2293	3112
Men 2011	308	399	516	599	601	510	344	2423	3277
Women 1995	546	1158	989	824	880	n/a	n/a	4397	n/a
Women 1998	528	973	1008	896	807	888	n/a	4212	n/a
Women 2003	404	600	885	794	778	580	493	3461	4538
Women 2008	333	450	648	632	631	514	410	2694	3618
Women 2009	385	580	779	733	734	550	478	3211	4239
Women 2010	373	565	682	762	701	574	470	3083	4127
Women 2011	364	561	711	803	739	597	486	3178	4261

Table 8.2 Prevalence of doctor-diagnosed diabetes, 1995, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Doctor-diagnosed diabetes	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
1995	0.4	0.2	1.0	2.8	4.3	n/a	n/a	1.5	n/a
1998	0.8	0.9	1.9	2.8	5.5	8.3	n/a	2.2	n/a
2003	0.5	0.8	1.3	3.1	7.0	10.3	10.1	2.4	3.8
2008	0.8	0.3	0.5	4.1	11.1	13.2	16.1	3.3	5.3
2009	-	1.8	1.9	7.0	12.8	13.2	12.6	4.7	6.2
2010	-	1.0	2.9	5.4	13.2	15.1	13.5	4.5	6.3
2011	2.3	0.8	1.1	6.5	9.3	13.3	18.4	4.0	6.1
Women									
1995	0.8	0.7	1.3	1.7	3.3	n/a	n/a	1.5	n/a
1998	0.7	0.5	0.8	1.4	4.7	5.8	n/a	1.8	n/a
2003	0.8	0.3	2.2	1.6	5.1	10.5	8.7	2.0	3.7
2008	1.7	1.5	2.6	2.7	5.5	8.4	9.1	2.8	4.1
2009	0.2	1.6	1.8	3.5	7.1	9.4	10.4	2.9	4.5
2010	0.4	1.1	2.2	3.5	6.6	9.2	10.7	2.8	4.4
2011	-	0.7	2.3	3.9	8.4	11.7	10.8	3.2	4.9
All adults									
1995	0.6	0.4	1.2	2.2	3.8	n/a	n/a	1.5	n/a
1998	0.7	0.7	1.3	2.1	5.1	6.9	n/a	1.8	n/a
2003	0.6	0.6	1.8	2.3	6.0	10.4	9.2	2.2	3.7
2008	1.2	0.9	1.6	3.4	8.2	10.6	11.8	3.1	4.6
2009	0.1	1.7	1.9	5.2	9.9	11.2	11.3	3.8	5.3
2010	0.2	1.1	2.5	4.4	9.8	11.9	11.8	3.7	5.3
2011	1.2	0.7	1.7	5.2	8.8	12.4	13.8	3.6	5.5

Continued...

Table 8.2 - Continued

Aged 16 and over

1995, 1998, 2003, 2008, 2009, 2010, 2011

Doctor-diagnosed diabetes	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
<i>Bases (weighted):</i>									
Men 1995	723	979	851	749	600	n/a	n/a	3902	n/a
Men 1998	708	953	902	779	607	469	n/a	3949	n/a
Men 2003	580	610	761	670	569	406	260	3190	3857
Men 2008	464	481	564	555	480	327	218	2543	3088
Men 2009	538	568	635	652	563	387	259	2955	3601
Men 2010	515	560	589	631	542	374	255	2838	3468
Men 2011	536	583	613	657	565	390	266	2954	3610
Women 1995	695	990	870	777	665	n/a	n/a	3998	n/a
Women 1998	675	940	913	795	660	582	n/a	3983	n/a
Women 2003	566	658	813	691	602	493	468	3330	4291
Women 2008	445	487	616	591	504	384	350	2643	3377
Women 2009	515	571	695	700	590	450	410	3070	3930
Women 2010	494	557	645	682	571	432	397	2949	3777
Women 2011	514	580	671	710	595	449	413	3070	3932
All adults 1995	1418	1969	1721	1527	1265	n/a	n/a	7900	n/a
All adults 1998	1384	1896	1817	1578	1270	1054	n/a	7946	n/a
All adults 2003	1147	1268	1574	1360	1171	899	729	6520	8147
All adults 2008	909	968	1180	1146	983	711	568	5186	6465
All adults 2009	1053	1138	1330	1352	1153	836	669	6025	7531
All adults 2010	1009	1117	1234	1313	1114	806	652	5787	7245
All adults 2011	1051	1163	1285	1366	1159	839	679	6024	7542
<i>Bases (unweighted):</i>									
Men 1995	475	840	811	709	689	n/a	n/a	3524	n/a
Men 1998	399	763	826	693	683	571	n/a	3364	n/a
Men 2003	336	455	733	616	633	510	327	2773	3610
Men 2008	246	317	462	535	525	453	304	2085	2842
Men 2009	272	406	551	604	575	517	363	2408	3288
Men 2010	274	421	478	566	555	489	332	2294	3115
Men 2011	308	399	516	600	602	511	344	2425	3280
Women 1995	547	1160	992	825	884	n/a	n/a	4408	n/a
Women 1998	526	972	1007	894	806	885	n/a	4205	n/a
Women 2003	404	600	887	795	778	581	493	3464	4538
Women 2008	334	451	648	632	632	516	410	2697	3623
Women 2009	385	580	780	733	735	550	480	3213	4243
Women 2010	373	566	682	763	701	574	471	3085	4130
Women 2011	364	562	711	803	739	597	486	3179	4262
All adults 1995	1022	2000	1803	1534	1573	n/a	n/a	7932	n/a
All adults 1998	927	1738	1836	1590	1492	1463	n/a	7583	n/a
All adults 2003	740	1055	1620	1410	1411	1091	820	6236	8147
All adults 2008	580	768	1110	1167	1157	969	714	4782	6465
All adults 2009	657	986	1331	1337	1310	1067	843	5621	7531
All adults 2010	647	987	1160	1329	1256	1063	803	5379	7245
All adults 2011	672	961	1227	1403	1341	1108	830	5604	7542

Table 8.3 Glycated haemoglobin levels in people with no diabetes diagnosis, 2003, 2008-2011 combined, by age and sex

Aged 16 and over and with a valid glycated haemoglobin measurement

2003, 2008-2011 combined

Glycated haemoglobin level	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
<6.0%								
2003	100.0	100.0	98.6	96.7	96.2	86.8	86.9	96.4
2008-2011	100.0	97.0	92.9	81.1	81.5	71.2	56.9	86.2
6.0-<6.5%								
2003	-	-	1.4	2.4	2.7	7.1	8.1	2.3
2008-2011	-	2.4	5.5	15.1	14.2	22.7	38.1	11.1
≥6.5%								
2003	-	-	-	0.9	1.1	6.0	5.0	1.2
2008-2011	-	0.5	1.5	3.7	4.3	6.1	5.0	2.6
Women								
<6.0%								
2003	100.0	100.0	98.7	98.5	92.5	87.6	88.6	96.0
2008-2011	98.5	99.1	96.0	87.4	77.9	66.6	56.2	85.4
6.0-<6.5%								
2003	-	-	0.7	1.0	4.9	10.4	9.6	3.1
2008-2011	1.5	0.9	3.5	11.3	20.2	25.5	37.3	12.5
≥6.5%								
2003	-	-	0.6	0.6	2.6	2.0	1.7	1.0
2008-2011	-	-	0.6	1.3	1.9	7.9	6.5	2.1
All adults								
<6.0%								
2003	100.0	100.0	98.6	97.6	94.2	87.2	88.0	96.2
2008-2011	99.3	98.0	94.5	84.4	79.7	68.7	56.4	85.8
6.0-<6.5%								
2003	-	-	1.1	1.7	3.9	8.8	9.1	2.7
2008-2011	0.7	1.7	4.5	13.1	17.2	24.2	37.6	11.8
≥6.5%								
2003	-	-	0.3	0.7	1.9	3.9	2.9	1.1
2008-2011	-	0.3	1.0	2.5	3.1	7.1	6.0	2.4

Continued...

Table 8.3 - Continued

*Aged 16 and over and with a valid
glycated haemoglobin measurement*

2003, 2008-2011 combined

Glycated haemoglobin level	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
<i>Men 2003</i>	284	306	385	326	266	192	119	1877
<i>Men 2008-2011</i>	220	239	253	264	223	142	95	1437
<i>Women 2003</i>	271	331	397	341	291	213	211	2054
<i>Women 2008-2011</i>	221	236	272	293	235	174	156	1587
<i>All adults 2003</i>	554	636	782	667	557	404	330	3931
<i>All adults 2008-2011</i>	441	475	525	557	459	317	251	3024
<i>Bases (unweighted):</i>								
<i>Men 2003</i>	121	209	377	334	341	259	159	1800
<i>Men 2008-2011</i>	93	145	239	260	276	205	121	1339
<i>Women 2003</i>	127	247	442	427	409	258	201	2111
<i>Women 2008-2011</i>	108	200	304	345	319	236	157	1669
<i>All adults 2003</i>	248	456	819	761	750	517	360	3911
<i>All adults 2008-2011</i>	201	345	543	605	595	441	278	3008

Table 8.4 Blood pressure level, 1998, 2003, 2008/2009 combined, 2010/2011 combined, by age and sex

Aged 16 and over and with a valid blood pressure reading and data on medication

1998, 2003, 2008/2009 combined, 2010/2011 combined

Blood pressure level	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
Men									
Normotensive									
1998	94.7	92.8	88.6	74.5	55.2	42.9	n/a	77.7	n/a
2003	88.4	85.5	79.2	73.1	48.4	39.4	23.0	70.6	67.0
2008/2009	[90.6]	87.1	77.8	67.8	47.2	28.1	33.4	68.1	65.5
2010/2011	86.4	83.7	75.6	70.9	56.3	39.0	30.6	70.1	67.0
Hypertensive controlled									
1998	-	0.1	1.4	4.9	6.5	7.2	n/a	3.0	n/a
2003	0.7	-	2.5	4.0	13.7	13.7	13.5	5.3	5.9
2008/2009	-	0.4	1.7	7.3	19.1	20.9	18.1	7.6	8.4
2010/2011	3.6	-	2.0	6.1	12.5	14.6	28.8	6.0	7.8
Hypertensive uncontrolled									
1998	-	0.3	1.0	2.8	8.8	14.2	n/a	3.7	n/a
2003	-	0.3	0.5	5.7	7.3	17.3	29.1	4.5	6.3
2008/2009	-	-	3.0	7.6	5.8	23.9	19.4	5.9	6.9
2010/2011	-	-	0.8	5.0	13.6	18.3	18.8	5.7	6.7
Hypertensive untreated									
1998	5.3	6.7	9.0	17.8	29.4	35.7	n/a	15.6	n/a
2003	10.9	14.2	17.9	17.1	30.6	29.6	34.5	19.6	20.7
2008/2009	[9.4]	12.5	17.6	17.3	27.9	27.1	29.1	18.4	19.2
2010/2011	10.0	16.3	21.6	18.1	17.7	28.1	21.8	18.2	18.5
Total with hypertension									
1998	5.3	7.7	11.3	25.5	44.8	57.0	n/a	22.3	n/a
2003	11.9	14.8	20.8	27.1	51.4	60.4	77.0	29.5	33.0
2008/2009	[9.4]	12.9	22.2	32.2	52.8	71.9	66.6	31.9	34.5
2010/2011	13.6	16.3	24.4	29.1	43.7	61.0	69.4	29.9	33.0

Continued...

Table 8.4 - Continued

Aged 16 and over and with a valid blood pressure reading and data on medication

1998, 2003, 2008/2009 combined, 2010/2011 combined

Blood pressure level	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
Women									
Normotensive									
1998	98.9	98.2	93.5	76.6	53.2	37.4	n/a	78.8	n/a
2003	98.1	94.5	83.4	72.4	50.9	31.9	22.8	73.3	67.3
2008/2009	99.3	95.0	89.1	69.1	52.4	33.3	29.1	73.5	68.6
2010/2011	94.0	97.8	86.8	73.7	49.2	34.9	22.8	73.4	68.0
Hypertensive controlled									
1998	0.2	0.3	2.1	4.6	12.4	9.3	n/a	4.4	n/a
2003	-	-	1.6	6.4	12.6	18.6	15.3	6.0	7.2
2008/2009	-	-	2.2	9.1	11.5	20.1	21.4	7.0	8.6
2010/2011	-	0.6	0.5	4.5	14.3	18.4	22.0	6.1	7.8
Hypertensive uncontrolled									
1998	-	0.3	-	2.8	10.0	14.8	n/a	4.0	n/a
2003	-	-	0.9	3.8	12.6	22.5	31.7	5.9	9.0
2008/2009	-	-	-	4.9	11.1	19.6	29.3	5.6	8.2
2010/2011	-	-	2.0	4.2	9.8	21.1	32.1	5.8	8.6
Hypertensive untreated									
1998	0.9	1.2	4.4	16.1	24.4	38.7	n/a	12.8	n/a
2003	1.9	5.5	14.1	17.4	23.8	27.0	30.2	14.8	16.6
2008/2009	0.7	5.0	8.7	16.9	25.0	27.0	20.2	14.0	14.7
2010/2011	6.0	1.7	10.7	17.6	26.7	25.6	23.1	14.8	15.7
Total with hypertension									
1998	1.1	1.8	6.5	23.4	46.7	62.8	n/a	21.2	n/a
2003	1.9	5.5	16.6	27.4	49.1	68.1	77.2	26.7	32.7
2008/2009	0.7	5.0	10.9	30.9	47.6	66.7	70.9	26.5	31.4
2010/2011	6.0	2.2	13.2	26.3	50.8	65.1	77.2	26.6	32.0
<i>Bases (weighted):</i>									
Men 1998	491	685	692	612	489	387	n/a	3356	n/a
Men 2003	294	296	403	350	314	226	149	1883	2032
Men 2008/2009	122	150	159	154	146	101	67	831	899
Men 2010/2011	117	138	133	139	133	91	64	751	815
Women 1998	466	650	680	610	491	432	n/a	3329	n/a
Women 2003	315	348	440	373	340	285	281	2101	2383
Women 2008/2009	123	143	165	183	155	119	110	889	998
Women 2010/2011	113	129	143	157	139	106	93	785	879
<i>Bases (unweighted):</i>									
Men 1998	273	549	636	541	549	470	n/a	3018	n/a
Men 2003	142	209	369	328	377	301	207	1726	1933
Men 2008/2009	48	91	137	140	178	154	91	748	839
Men 2010/2011	54	84	113	137	144	121	83	653	736
Women 1998	353	677	741	684	607	647	n/a	3709	n/a
Women 2003	181	299	493	454	478	351	282	2256	2538
Women 2008/2009	81	125	189	188	217	170	114	970	1084
Women 2010/2011	71	124	156	208	170	140	109	869	978

Table 8.5 Total cholesterol, 1995, 1998, 2003, 2008-2011 combined, by age and sex

Aged 16 and over and with a valid total cholesterol measurement

1995, 1998, 2003, 2008-2011 combined

Total cholesterol	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
Men									
1995									
Mean	4.4	5.4	5.9	6.1	6.1	-	-	5.6	n/a
Standard error of the mean	0.03	0.04	0.04	0.04	0.05	-	-	0.02	n/a
10th percentile	3.4	4.2	4.5	4.8	4.8	-	-	4.2	n/a
90th percentile	5.5	6.7	7.4	7.6	7.5	-	-	7.3	n/a
% ≥5 mmol/l	26.4	65.3	81.4	86.9	86.1	-	-	69.8	n/a
1998									
Mean	4.3	5.1	5.6	5.9	5.8	5.6	-	5.4	n/a
Standard error of the mean	0.04	0.04	0.04	0.05	0.06	0.05	-	0.02	n/a
10th percentile	3.4	3.9	4.3	4.6	4.4	4.3	-	3.9	n/a
90th percentile	5.4	6.2	7.1	7.3	7.0	6.7	-	6.8	n/a
% ≥5 mmol/l	21.8	53.0	69.7	82.1	76.0	71.5	-	62.0	n/a
2003									
Mean	4.3	5.2	5.6	5.9	5.7	5.5	5.1	5.4	5.4
Standard error of the mean	0.09	0.08	0.06	0.06	0.07	0.08	0.08	0.04	0.04
10th percentile	3.3	3.9	4.4	4.7	4.2	4.0	3.8	3.9	3.9
90th percentile	5.6	6.5	6.9	7.2	7.1	6.9	6.6	6.9	6.9
% ≥5 mmol/l	21.7	58.7	71.5	82.6	75.4	67.1	55.5	63.3	63.2
2008-2011									
Mean	4.3	4.9	5.5	5.6	5.5	5.2	4.4	5.2	5.2
Standard error of the mean	0.10	0.08	0.07	0.09	0.07	0.07	0.09	0.04	0.04
10th percentile	3.3	3.8	4.4	4.1	4.0	3.8	3.2	3.8	3.7
90th percentile	5.5	6.1	6.7	7.1	6.8	6.6	6.0	6.6	6.6
% ≥5 mmol/l	21.9	47.2	70.9	73.3	69.6	59.9	28.4	57.8	55.9
Women									
1995									
Mean	4.7	5.1	5.4	6.1	6.5	-	-	5.6	n/a
Standard error of the mean	0.04	0.04	0.04	0.04	0.05	-	-	0.02	n/a
10th percentile	3.8	4.0	4.3	4.8	5.1	-	-	4.2	n/a
90th percentile	5.8	6.3	6.7	7.5	8.0	-	-	7.2	n/a
% ≥5 mmol/l	34.3	53.7	68.4	86.5	92.0	-	-	67.8	n/a
1998									
Mean	4.4	4.9	5.1	5.8	6.1	6.3	-	5.3	n/a
Standard error of the mean	0.04	0.04	0.03	0.04	0.05	0.06	-	0.02	n/a
10th percentile	3.6	3.8	4.1	4.6	4.8	5.0	-	3.9	n/a
90th percentile	5.6	6.1	6.3	7.1	7.5	7.7	-	6.7	n/a
% ≥5 mmol/l	23.1	44.2	57.9	78.8	88.5	91.5	-	59.6	n/a

Continued...

Table 8.5 - Continued

Aged 16 and over and with a valid total cholesterol measurement

1995, 1998, 2003, 2008-2011 combined

Total Cholesterol	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-64	
	%	%	%	%	%	%	%	%	%
2003									
Mean	4.5	5.0	5.4	5.9	6.3	6.1	6.0	5.5	5.6
Standard error of the mean	0.09	0.07	0.05	0.05	0.06	0.08	0.08	0.04	0.03
10th percentile	3.5	3.8	4.1	4.6	4.8	4.6	4.4	4.0	4.1
90th percentile	5.6	6.3	6.8	7.2	7.8	7.8	7.6	7.1	7.2
% ≥5 mmol/l	26.2	46.4	65.3	83.0	88.2	84.3	78.5	62.9	67.0
2008-2011									
Mean	4.5	4.8	5.2	5.7	6.0	5.7	5.5	5.3	5.4
Standard error of the mean	0.09	0.08	0.06	0.05	0.06	0.08	0.10	0.04	0.03
10th percentile	3.5	3.7	4.2	4.6	4.6	4.2	3.9	3.9	4.0
90th percentile	5.6	6.1	6.4	6.9	7.5	7.2	7.1	6.8	6.8
% ≥5 mmol/l	24.8	42.7	59.3	79.8	84.0	67.8	64.3	59.9	61.3
<i>Bases (weighted):</i>									
<i>Men 1995</i>	540	801	721	628	494	n/a	n/a	3185	n/a
<i>Men 1998</i>	445	613	670	588	460	342	n/a	2776	n/a
<i>Men 2003</i>	285	311	386	339	292	208	133	1612	1953
<i>Men 2008-2011</i>	220	244	256	280	243	162	111	1243	1517
<i>Women 1995</i>	435	696	712	643	500	n/a	n/a	2986	n/a
<i>Women 1998</i>	375	588	620	588	438	375	n/a	2610	n/a
<i>Women 2003</i>	274	336	411	348	302	244	235	1671	2150
<i>Women 2008-2011</i>	217	239	285	296	251	192	171	1288	1651
<i>Bases (unweighted):</i>									
<i>Men 1995</i>	342	676	671	584	558	n/a	n/a	2831	n/a
<i>Men 1998</i>	244	497	601	509	511	408	n/a	2362	n/a
<i>Men 2003</i>	123	211	380	345	367	281	178	1426	1885
<i>Men 2008-2011</i>	93	148	242	274	300	232	137	1057	1426
<i>Women 1995</i>	338	811	804	673	674	n/a	n/a	3300	n/a
<i>Women 1998</i>	277	599	670	650	545	572	n/a	2741	n/a
<i>Women 2003</i>	129	251	455	435	426	294	223	1696	2213
<i>Women 2008-2011</i>	106	204	317	350	339	257	170	1316	1743

Table 8.6 HDL cholesterol and Total: HDL cholesterol ratio, 2003, 2008-2011 combined, by age and sex

Aged 16 and over and with a valid HDL-cholesterol measurement and a valid total cholesterol measurement

2003, 2008-2011 combined

HDL-cholesterol (mmol/l) ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Men								
2003								
HDL cholesterol								
Mean	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3
Standard error of the mean	0.04	0.02	0.02	0.02	0.02	0.02	0.03	0.01
10th percentile	0.9	1.0	1.0	1.1	1.0	1.0	1.0	1.0
90th percentile	1.7	1.6	1.8	1.8	1.8	1.9	1.8	1.8
% < 1mmol/l	10.6	7.1	8.4	5.7	7.4	8.5	6.2	7.7
Total: HDL cholesterol ratio								
Mean	3.5	4.1	4.4	4.4	4.4	4.2	3.8	4.2
Standard error of the mean	0.08	0.08	0.07	0.06	0.06	0.06	0.08	0.03
2008-2011								
HDL cholesterol								
Mean	1.3	1.3	1.3	1.3	1.4	1.4	1.3	1.3
Standard error of the mean	0.04	0.02	0.02	0.02	0.02	0.03	0.03	0.01
10th percentile	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9
90th percentile	1.6	1.6	1.7	1.7	1.9	1.8	1.7	1.7
% < 1mmol/l	12.2	6.9	10.9	14.9	10.5	7.7	11.1	10.8
Total: HDL cholesterol ratio								
Mean	3.5	4.0	4.5	4.7	4.2	4.0	3.5	4.1
Standard error of the mean	0.11	0.10	0.10	0.10	0.08	0.09	0.08	0.04
Women								
2003								
HDL cholesterol								
Mean	1.5	1.6	1.6	1.7	1.6	1.6	1.6	1.6
Standard error of the mean	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.01
10th percentile	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.1
90th percentile	1.9	2.0	2.0	2.2	2.2	2.1	2.1	2.1
% < 1mmol/l	3.3	3.5	1.2	1.5	1.6	0.4	2.6	2.0
Total: HDL cholesterol ratio								
Mean	3.2	3.3	3.6	3.7	4.0	3.9	3.8	3.6
Standard error of the mean	0.07	0.07	0.05	0.06	0.06	0.06	0.07	0.03
2008-2011								
HDL cholesterol								
Mean	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6
Standard error of the mean	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.01
10th percentile	1.1	1.0	1.1	1.1	1.1	1.1	1.2	1.1
90th percentile	1.8	1.9	2.1	2.2	2.1	2.1	2.2	2.1
% < 1mmol/l	3.1	3.0	3.2	2.7	3.2	3.3	3.0	3.1
Total: HDL cholesterol ratio								
Mean	3.1	3.4	3.6	3.7	4.0	3.7	3.5	3.6
Standard error of the mean	0.08	0.09	0.06	0.06	0.07	0.07	0.08	0.03

Continued...

Table 8.6 - Continued

Aged 16 and over and with a valid HDL-cholesterol measurement and a valid total cholesterol measurement

2003, 2008-2011 combined

HDL-cholesterol (mmol/l) ^a	Age							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
<i>Bases (weighted):</i>								
<i>Men 2003</i>	285	311	386	339	292	208	133	1954
<i>Men 2008-2011</i>	220	244	256	280	243	162	111	1517
<i>Women 2003</i>	274	336	411	348	302	244	235	2150
<i>Women 2008-2011</i>	217	239	285	296	251	192	171	1651
<i>Bases (unweighted):</i>								
<i>Men 2003</i>	123	211	381	345	367	281	178	1886
<i>Men 2008-2011</i>	93	148	242	274	300	232	137	1426
<i>Women 2003</i>	129	251	455	435	426	294	223	2213
<i>Women 2008-2011</i>	106	204	317	350	339	257	170	1743

a Including those taking lipid lowering drugs

Table 8.7 Fibrinogen 1998, 2003 and 2008-2011 combined, by age and sex

Aged 16 and over and with a valid fibrinogen measurement

1998, 2003, 2008-2011 combined

Fibrinogen (g/l)	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
Men									
1998									
Mean	2.2	2.4	2.5	2.7	2.9	3.1	n/a	2.6	n/a
Standard error of the mean	0.03	0.02	0.02	0.03	0.04	0.05	n/a	0.01	n/a
2003									
Mean	2.4	2.6	2.8	2.9	3.1	3.3	3.5	2.7	2.8
Standard error of the mean	0.07	0.04	0.05	0.04	0.05	0.07	0.09	0.03	0.03
2008-2011									
Mean	2.7	2.7	2.9	3.1	3.1	3.2	3.3	2.9	2.9
Standard error of the mean	0.06	0.04	0.04	0.05	0.04	0.06	0.08	0.02	0.02
Women									
1998									
Mean	2.6	2.6	2.7	2.8	3.1	3.2	n/a	2.8	n/a
Standard error of the mean	0.04	0.03	0.03	0.03	0.04	0.04	n/a	0.01	n/a
2003									
Mean	2.7	2.9	3.0	3.1	3.3	3.4	3.7	3.0	3.1
Standard error of the mean	0.06	0.05	0.04	0.04	0.04	0.05	0.08	0.02	0.02
2008-2011									
Mean	2.9	3.0	3.0	3.2	3.2	3.2	3.3	3.1	3.1
Standard error of the mean	0.06	0.04	0.03	0.04	0.04	0.05	0.06	0.02	0.02
<i>Bases (weighted):</i>									
<i>Men 1998</i>	425	596	632	523	382	257	n/a	2814	n/a
<i>Men 2003</i>	283	296	358	299	214	129	85	1450	1664
<i>Men 2008-2011</i>	216	233	243	233	173	87	45	1184	1230
<i>Women 1998</i>	352	570	581	537	366	296	n/a	2703	n/a
<i>Women 2003</i>	276	316	372	309	234	154	150	1508	1812
<i>Women 2008-2011</i>	211	232	266	253	192	101	95	1255	1351
<i>Bases (unweighted):</i>									
<i>Men 1998</i>	233	485	567	458	422	315	n/a	2480	n/a
<i>Men 2003</i>	121	199	356	306	271	180	115	1253	1548
<i>Men 2008-2011</i>	92	140	228	232	207	121	58	1020	1078
<i>Women 1998</i>	258	581	638	593	455	455	n/a	2980	n/a
<i>Women 2003</i>	128	239	412	388	330	189	144	1497	1830
<i>Women 2008-2011</i>	102	197	295	301	260	135	95	1290	1385

Table 8.8 C-reactive protein 1998, 2003 and 2008-2011 combined, by age and sex

Aged 16 and over and with a valid C-reactive protein measurement 1998, 2003, 2008-2011 combined

C-reactive protein mg/l	Age							Total 16+	Total 16-74
	16-24	25-34	35-44	45-54	55-64	65-74	75+		
	%	%	%	%	%	%	%	%	%
Men									
1998									
Mean	1.4	2.1	2.4	2.6	4.0	5.2	n/a	2.8	n/a
Standard error of the mean	0.17	0.17	0.21	0.18	0.25	0.45	n/a	0.10	n/a
% in bottom quintile (≤ 0.40) ^a	44.8	25.9	21.6	13.3	7.8	7.8	n/a	20.7	n/a
% in second quintile (0.41-0.90)	27.3	25.9	21.2	24.3	15.7	14.8	n/a	22.1	n/a
% in middle quintile (0.91-1.70)	10.7	18.8	22.1	21.5	17.3	16.8	n/a	18.4	n/a
% in fourth quintile (1.71-3.50)	8.5	16.1	17.3	24.4	26.9	22.5	n/a	19.1	n/a
% in top quintile (≥ 3.51)	8.7	13.4	17.8	16.4	32.3	38.0	n/a	19.7	n/a
2003									
Mean	2.5	2.1	2.8	2.9	3.4	4.6	5.3	2.9	3.1
Standard error of the mean	0.63	0.30	0.36	0.22	0.37	0.51	0.69	0.16	0.16
% in bottom quintile (≤ 0.40) ^a	47.9	36.5	20.7	16.2	15.4	10.9	n/a	24.9	n/a
% in second quintile (0.41-0.90)	13.3	25.1	21.2	20.1	16.1	10.8	n/a	18.4	n/a
% in middle quintile (0.91-1.70)	14.7	12.5	23.5	22.2	21.0	20.7	n/a	19.3	n/a
% in fourth quintile (1.71-3.50)	13.0	12.9	19.5	18.1	23.5	26.6	n/a	18.5	n/a
% in top quintile (≥ 3.51)	11.1	13.0	15.2	23.3	24.0	31.0	n/a	18.9	n/a
2008-2011									
Mean	2.4	1.5	2.5	3.6	2.9	4.0	4.1	2.8	2.9
Standard error of the mean	0.66	0.22	0.31	0.41	0.25	0.47	0.57	0.16	0.16
% in bottom quintile (≤ 0.40) ^a	46.9	40.0	25.2	19.1	15.3	14.8	n/a	27.0	n/a
% in second quintile (0.41-0.90)	14.0	17.6	21.7	15.0	19.9	18.0	n/a	17.7	n/a
% in middle quintile (0.91-1.70)	13.0	21.5	19.1	23.1	25.1	18.8	n/a	20.3	n/a
% in fourth quintile (1.71-3.50)	15.7	11.5	18.6	19.9	19.8	23.9	n/a	18.0	n/a
% in top quintile (≥ 3.51)	10.5	9.4	15.4	23.0	19.9	24.5	n/a	16.9	n/a
Women									
1998									
Mean	2.9	3.1	2.7	3.6	4.3	5.6	n/a	3.6	n/a
Standard error of the mean	0.36	0.29	0.21	0.27	0.32	0.50	n/a	0.13	n/a
% in bottom quintile (≤ 0.40) ^a	39.5	28.2	29.1	20.7	12.3	8.2	n/a	23.5	n/a
% in second quintile (0.41-0.90)	16.6	19.6	22.6	21.6	16.1	12.0	n/a	18.8	n/a
% in middle quintile (0.91-1.70)	19.0	15.0	17.6	17.5	20.4	20.6	n/a	18.0	n/a
% in fourth quintile (1.71-3.50)	11.3	21.3	15.7	20.1	24.9	26.0	n/a	19.8	n/a
% in top quintile (≥ 3.51)	13.7	15.7	15.0	20.2	26.2	33.3	n/a	20.0	n/a
2003									
Mean	2.2	3.1	3.6	3.7	4.9	5.7	6.6	3.8	4.1
Standard error of the mean	0.31	0.45	0.33	0.46	0.47	0.54	0.93	0.18	0.19
% in bottom quintile (≤ 0.40) ^a	37.8	25.2	25.6	21.2	10.6	7.8	n/a	21.9	n/a
% in second quintile (0.41-0.90)	14.9	20.9	18.7	19.2	16.0	14.6	n/a	17.7	n/a
% in middle quintile (0.91-1.70)	22.7	24.1	21.8	22.7	23.2	22.0	n/a	22.7	n/a
% in fourth quintile (1.71-3.50)	12.3	16.5	13.7	18.6	22.9	21.7	n/a	17.4	n/a
% in top quintile (≥ 3.51)	12.4	13.3	20.1	18.3	27.4	33.8	n/a	20.4	n/a

Continued...

Table 8.8 - Continued

Aged 16 and over and with a valid C-reactive protein measurement

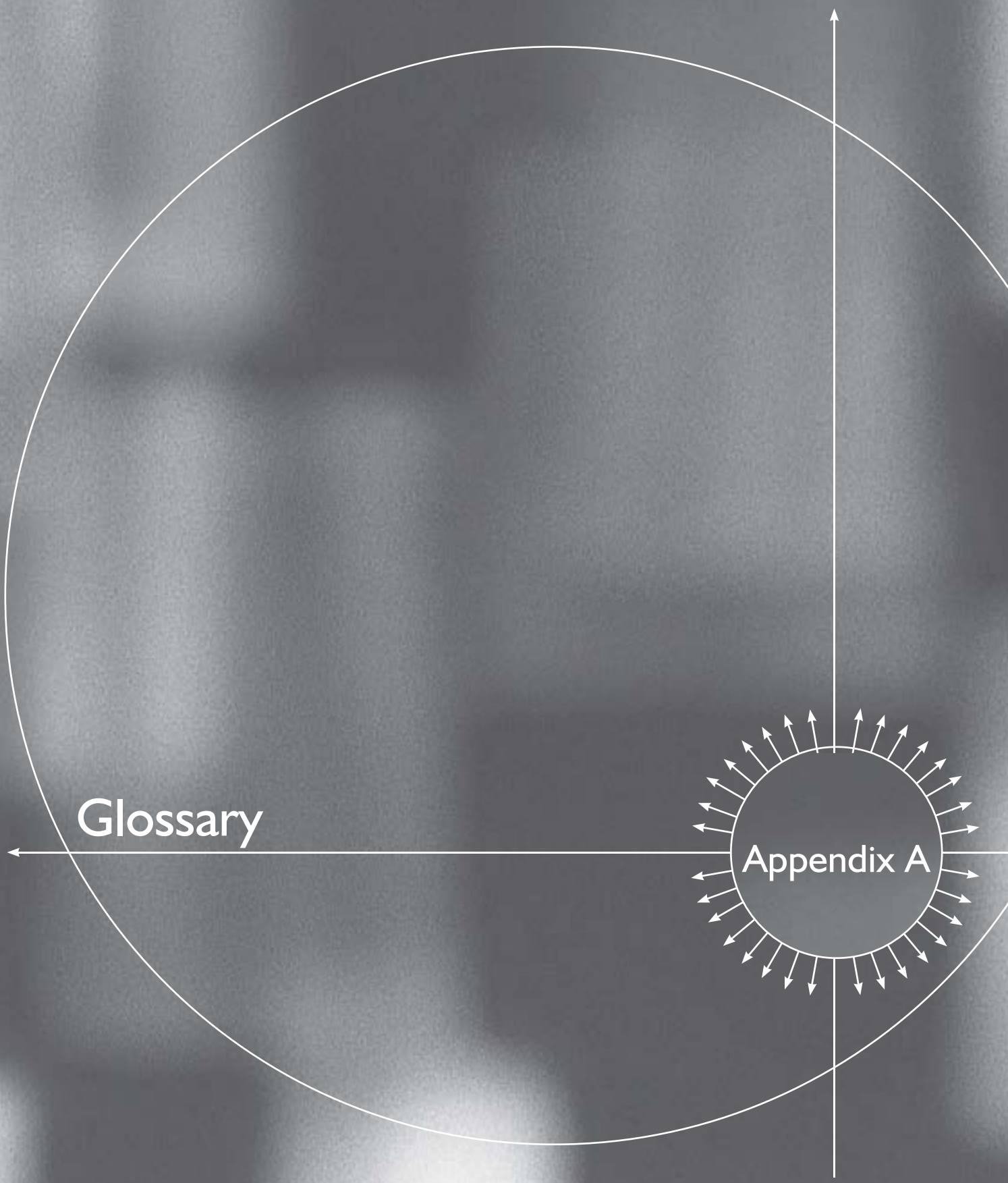
1998, 2003, 2008-2011 combined

C-reactive protein mg/l	Age								Total 16+
	16-24	25-34	35-44	45-54	55-64	65-74	75+	Total 16-74	
	%	%	%	%	%	%	%	%	%
2008-2011									
Mean	2.6	3.5	2.8	3.1	4.0	4.0	4.1	3.3	3.4
Standard error of the mean	0.38	0.58	0.27	0.24	0.34	0.51	0.44	0.16	0.15
% in bottom quintile (≤ 0.40) ^a	36.0	27.1	23.1	18.0	11.7	12.7	n/a	21.4	n/a
% in second quintile (0.41-0.90)	16.0	19.7	21.0	21.0	19.4	17.7	n/a	19.3	n/a
% in middle quintile (0.91-1.70)	17.5	21.1	25.1	22.5	26.4	28.5	n/a	23.5	n/a
% in fourth quintile (1.71-3.50)	17.1	14.8	17.0	20.1	21.1	21.4	n/a	18.5	n/a
% in top quintile (≥ 3.51)	13.5	17.3	13.8	18.4	21.3	19.8	n/a	17.3	n/a
<i>Bases (weighted):</i>									
<i>Men 1998</i>	439	607	649	573	452	324	n/a	3044	n/a
<i>Men 2003</i>	285	311	386	339	288	208	133	1816	1949
<i>Men 2008-2011</i>	220	244	256	280	243	162	111	1406	1517
<i>Women 1998</i>	369	579	603	572	434	370	n/a	2926	n/a
<i>Women 2003</i>	274	334	410	345	299	243	231	1905	2137
<i>Women 2008-2011</i>	219	239	285	298	251	192	171	1485	1655
<i>Bases (unweighted):</i>									
<i>Men 1998</i>	242	495	590	498	498	397	n/a	2720	n/a
<i>Men 2003</i>	123	211	381	345	364	280	178	1704	1882
<i>Men 2008-2011</i>	93	148	242	274	300	232	137	1289	1426
<i>Women 1998</i>	272	593	661	643	536	563	n/a	3268	n/a
<i>Women 2003</i>	129	250	454	432	421	292	220	1978	2198
<i>Women 2008-2011</i>	107	204	317	351	339	257	170	1575	1745

a Quintiles are calculated for 'total men' and 'total women' separately.

Glossary

Appendix A



APPENDIX A: GLOSSARY

This glossary explains terms used in the report, other than those fully described in particular chapters.

Age

standardisation Age standardisation has been used in order to enable groups to be compared after adjusting for the effects of any differences in their age distributions.

When different sub-groups are compared in respect of a variable on which age has an important influence, any differences in age distributions between these sub-groups are likely to affect the observed differences in the proportions of interest.

Age standardisation was carried out, using the direct standardisation method. The standard population to which the age distribution of sub-groups was adjusted was the mid-2011 population estimates for Scotland. All age standardisation has been undertaken separately within each sex.

The age-standardised proportion p^* was calculated as follows, where p_i is the age specific proportion in age group i and N_i is the standard population size in age group i :

$$p^* = \frac{\sum_i N_i p_i}{\sum_i N_i}$$

Therefore p^* can be viewed as a weighted mean of p_i using the weights N_i . Age standardisation was carried out using the age groups: 16-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75 and over. The variance of the standardised proportion can be estimated by:

$$\text{var}(p^*) = \frac{\sum_i (N_i^2 p_i q_i / n_i)}{(\sum_i N_i)^2}$$

where $q_i = 1 - p_i$.

Anthropometric measurements See **Body mass index (BMI)** and **Waist-hip ratio**

Arithmetic mean See **Mean**

Blood analytes See **Cholesterol (total and HDL), Fibrinogen, C-reactive protein, Glycated Haemoglobin, vitamin D.**

Blood pressure Systolic (SBP) and diastolic (DBP) blood pressure were measured using a standard method (see Volume 3, Appendix B for measurement protocol). In adults, high blood pressure is defined as SBP ≥ 140 mmHg or DBP ≥ 90 mmHg or on antihypertensive drugs.

Body mass index Weight in kg divided by the square of height in metres. Adults (aged 16 and over) can be classified into the following BMI groups:

<i>BMI (kg/m²)</i>	<i>Description</i>
Less than 18.5	Underweight
18.5 to less than 25	Normal
25 to less than 30	Overweight
30 to less than 40	Obese
40 and above	Morbidly obese

Cardiovascular Disease

Participants were classified as having cardiovascular disease (CVD) if they reported ever having any of the following conditions diagnosed by a doctor: angina, heart attack, stroke, heart murmur, irregular heart rhythm, 'other heart trouble'. For the purpose of this report, participants were classified as having a particular condition only if they reported that the diagnosis was confirmed by a doctor. No attempt was made to assess these self-reported diagnoses objectively. There is therefore the possibility that some misclassification may have occurred, because some participants may not have remembered (or not remembered correctly) the diagnosis made by their doctor.

Cholesterol (Total and HDL)

Cholesterol is a fat-like substance (lipid) that is present in cell membranes and is a precursor of bile acids and steroid hormones. Cholesterol is essential for the body in small amounts. It is made in the liver and some is obtained from the diet. Serum total cholesterol concentration is positively associated with the risk of coronary heart disease (CHD).

In this study, raised total cholesterol has been defined as ≥ 5.0 mmol/l.

In a normal individual, high density lipoprotein (HDL) constitutes approximately 20-30% of total plasma cholesterol. Studies have demonstrated a strong direct relationship between coronary heart disease and low HDL-cholesterol.

HDL-cholesterol was considered low at a level of less than 1.0 mmol/l.

- Cotinine** Cotinine is a metabolite of nicotine. It is one of several biological markers that are indicators of smoking. In this survey, it was measured in saliva. It has a half-life in the body of between 16 and 20 hours, which means that it will detect regular smoking (or other tobacco use such as chewing) but may not detect occasional use if the last occasion was several days ago. In this report, anyone with a salivary cotinine level of 12 nanograms per millilitre or more was judged highly likely to be a tobacco user. In previous reports the threshold for detecting tobacco use was set 15 nanograms per millilitre or more of cotinine. Chapter 4 in this report explains the reasoning for the threshold change. Saliva samples were collected during the nurse visit.
- C-reactive protein** C-reactive protein is the major protein indicating inflammation activity in acute illness in humans. It is also a marker of cardiovascular risk.
- Creatinine** This is excreted in urine and unlike sodium and potassium is relatively stable over time. Therefore in the analysis of urinary salt, the ratio of sodium to creatinine and of potassium to creatinine are analysed as proxy measures for dietary sodium and potassium. See also **Urine, Sodium, Potassium**.
- Demi-span** Demi-span is an alternative to height as a measure of skeletal size in older people. It is defined as the distance between the mid-point of the sternal notch and the finger roots with the arm outstretched laterally. Demi-span measurements were collected for those aged 65 or over at the stage 2 nurse visit.
- Diastolic blood** When measuring blood pressure the diastolic arterial pressure is the lowest pressure at the resting phase of the cardiac cycle. See also **Blood pressure, Systolic blood pressure**.
- Equivalised Household income** Making precise estimates of household income, as is done for example in the Family Resources Survey, requires far more interview time than was available in the Health Survey. Household income was thus established by means of a card (see Volume 3, Appendix A) on which banded incomes were presented. Information was obtained from the household reference person (HRP) or their partner. Initially they were asked to state their own (HRP and partner) aggregate gross income, and were then asked to estimate the total household income including that of any other persons in the household. Household income can be used as an analysis variable, but

there has been increasing interest recently in using measures of equivalised income that adjust income to take account of the number of persons in the household. Methods of doing this vary in detail: the starting point is usually an exact estimate of net income, rather than the banded estimate of gross income obtained in the Health Survey. The method used in the present report was as follows. It utilises the widely used McClements scoring system, described below.

1. A score was allocated to each household member, and these were added together to produce an overall household McClements score. Household members were given scores as follows.

First adult (HRP)	0.61	
Spouse/partner of HRP	0.39	
Other second adult		0.46
Third adult	0.42	
Subsequent adults	0.36	
Dependant aged 0-1	0.09	
Dependant aged 2-4	0.18	
Dependant aged 5-7	0.21	
Dependant aged 8-10	0.23	
Dependant aged 11-12	0.25	
Dependant aged 13-15	0.27	
Dependant aged 16+	0.36	

2 The equivalised income was derived as the annual household income divided by the McClements score.

3 This equivalised annual household income was attributed to all members of the household, including children.

4 Households were ranked by equivalised income, and quintiles q1- q5 were identified. Because income was obtained in banded form, there were clumps of households with the same income spanning the quintiles. It was decided not to split clumps but to define the quintiles as 'households with equivalised income up to q1', 'over q1 up to q2' etc.

5 All individuals in each household were allocated to the equivalised household income quintile to which their household had been allocated. Insofar as the mean number of persons per household may vary between tertiles, the numbers in the quintiles will be unequal. Inequalities in numbers are also introduced by the clumping referred to above, and by the fact that in any sub-group analysed the proportionate distribution across quintiles will differ from that of the total sample.

Reference: McClements, D. (1977). Equivalence scales for children. *Journal of Public Economics*. 8: 191-210.

- Fibrinogen** Fibrinogen is a soluble protein involved in the blood clotting mechanism. Prospective population studies have established that fibrinogen is an independent predictor for ischaemic heart disease and stroke.
Reference: Maresca, G., Di Blasio, A., Marchioli, R. and Di Minno, G. (1999). Measuring plasma fibrinogen to predict stroke and myocardial infarction. *Arteriosclerosis, Thrombosis and Vascular Biology*. 19:1368-1377.
- Frankfort plane** The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye. Informants' heads are positioned with the Frankfort Plane in a horizontal position when height is measured using a stadiometer as a means of ensuring that, as far as possible, the measurements taken are standardised.
- Geometric mean** The geometric mean is a measure of central tendency. It is sometimes preferable to the arithmetic mean, since it takes account of positive skewness in a distribution. An arithmetic mean is calculated by summing the values for all cases and dividing by the number of cases in the set. The geometric mean is instead calculated by multiplying the values for all cases and taking the n th root, where n is the number of cases in the set. For example, a dataset with two cases would use the square root, for three cases the cube root would be used, and so on. The geometric mean of 2 and 10 is 4.5 ($2 \times 10 = 20$, $\sqrt{20} = 4.5$). Geometric means can only be calculated for positive numbers so zero values need to be handled before geometric means are calculated. See also **Arithmetic mean**.
- GHQ12** The General Health Questionnaire (GHQ12) is a scale designed to detect possible psychiatric morbidity in the general population. It was administered to informants aged 13 and above. The questionnaire contains 12 questions about the informant's general level of happiness, depression, anxiety and sleep disturbance over the past four weeks. Responses to these items are scored, with one point given each time a particular feeling or type of behaviour was reported to have been experienced 'more than usual' or 'much more than usual' over the past few weeks. These scores are combined to create an overall score of between zero and twelve. A score of four or more (referred to as a 'high' GHQ12 score) has been used in this report to indicate the presence of a possible psychiatric disorder.
Reference: Goldberg D, Williams PA. *User's Guide to the General Health Questionnaire*. NFER-NELSON, 1988.

Glycated Haemoglobin	The percentage of glycated haemoglobin is the percentage of haemoglobin in the circulation to which glucose is bound. Glycated haemoglobin (HbA _{1c}) concentration is an indicator of average blood glucose concentration over three months and has been suggested as a diagnostic or screening tool for diabetes. Diabetic patients with elevated glycated haemoglobin are at increased risk of microvascular and macrovascular events. In this report, a glycated haemoglobin value of 6.5% or above in people with no existing diabetes diagnosis was taken to indicate possible undiagnosed diabetes.
HDL-Cholesterol	See Cholesterol
High blood pressure	See Blood pressure
Household	A household was defined as one person or a group of people who have the accommodation as their only or main residence and who either share at least one meal a day or share the living accommodation.
Household Reference Person	The household reference person (HRP) is defined as the householder (a person in whose name the property is owned or rented) with the highest income. If there is more than one householder and they have equal income, then the household reference person is the oldest.
Income	See Equivalised household income
Ischaemic heart disease	Participants were classified as having ischaemic heart disease (IHD) if they reported ever having angina or a heart attack diagnosed by a doctor.
Logistic regression	<p>Logistic regression was used to investigate the effect of two or more independent or predictor variables on a two-category (binary) outcome variable. The independent variables can be continuous or categorical (grouped) variables. The parameter estimates from a logistic regression model for each independent variable give an estimate of the effect of that variable on the outcome variable, adjusted for all other independent variables in the model.</p> <p>Logistic regression models the log 'odds' of a binary outcome variable. The 'odds' of an outcome is the ratio of the probability of it occurring to the probability of it not occurring. The</p>

parameter estimates obtained from a logistic regression model have been presented as odds ratios for ease of interpretation.

For *continuous* independent variables, the odds ratio gives the change in the odds of the outcome occurring for a one unit change in the value of the predictor variable.

For *categorical* independent variables one category of the categorical variable has been selected as a baseline or reference category, with all other categories compared to it. Therefore there is no parameter estimate for the reference category and odds ratios for all other categories are the ratio of the odds of the outcome occurring between each category and the reference category, adjusted for all other variables in the model.

The statistical significance of independent variables in models was assessed by the likelihood ratio test and its associated p value. 95% confidence intervals were also calculated for the odds ratios. These can be interpreted as meaning that there is a 95% chance that the given interval for the sample will contain the true population parameter of interest. In logistic regression a 95% confidence interval which does not include 1.0 indicates the given parameter estimate is statistically significant.

Reference: Hosmer, D.W. Jr. and Lemeshow. S. (1989). *Applied logistic regression*. New York: John Wiley & Sons.

Long-term conditions & limiting long-term conditions

Long-term conditions were defined as a long-standing physical or mental condition or disability that has troubled the participant for at least 12 months, or that is likely to affect them for at least 12 months. Note that prior to 2008 these were described as long-standing illnesses. Long-term conditions were coded into categories defined in the International Classification of Diseases (ICD), but it should be noted that the ICD is used mostly to classify conditions according to the cause, whereas SHeS classifies according to the reported symptoms. A long-term condition was defined as limiting if the respondent reported that it limited their activities in any way.

Mean

Means in this report are **Arithmetic means** (the sum of the values for cases divided by the number of cases).

Median

The value of a distribution which divides it into two equal parts such that half the cases have values below the median and half the cases have values above the median.

Morbid obesity

See **Body mass index**.

NHS Health Board The National Health Service (NHS) in Scotland is divided up into 14 geographically-based local NHS Boards and a number of National Special Health Boards. Health Boards in this report refers to the 14 local NHS Boards. (See Volume 3: Appendix C)

NS-SEC The National Statistics Socio-economic Classification (NS-SEC) is a social classification system that attempts to classify groups on the basis of employment relations, based on characteristics such as career prospects, autonomy, mode of payment and period of notice. There are fourteen operational categories representing different groups of occupations (for example higher and lower managerial, higher and lower professional) and a further three 'residual' categories for full-time students, occupations that cannot be classified due to lack of information or other reasons. The operational categories may be collapsed to form a nine, eight, five or three category system. This report mostly uses the five category system in which participants are classified as managerial and professional, intermediate, small employers and own account workers, lower supervisory and technical, and semi-routine and routine occupations. In some instances where there were insufficient numbers to use the five category classification, the three category system was used instead. In analyses presented in this report it is the NS-SEC of the household reference person which is used. NS-SEC was introduced in 2001 and replaced Registrar General's Social Class (which had been used in the 1995 and 1998 surveys) as the main measure of socio-economic status.

Obesity See **Body mass index**

Odds ratio See **Logistic regression**

Overweight See **Body mass index**

Percentile The value of a distribution which partitions the cases into groups of a specified size. For example, the 20th percentile is the value of the distribution where 20 percent of the cases have values below the 20th percentile and 80 percent have values above it. The 50th percentile is the median.

PEF Peak Expiratory Flow: the maximal flow in litres per minute recorded during a forced expiration. In healthy subjects this index reflects the calibre of central airways and the force exerted by the expiratory muscles.

Potassium The intake of potassium (K) can be estimated by measuring urinary excretion. This is collected in the nurse visit using a

spot urine sample. See also **Urine, Sodium, Creatinine**. There is an inverse association between potassium intake and blood pressure.

p value

A p value is the probability of the observed result occurring due to chance alone. A p value of less than 5% is conventionally taken to indicate a statistically significant result ($p < 0.05$). It should be noted that the p value is dependent on the sample size, so that with large samples differences or associations which are very small may still be statistically significant. Results should therefore be assessed on the magnitude of the differences or associations as well as on the p value itself. The p values given in this report take into account the clustered sampling design of the survey.

Quintile

Quintiles are percentiles which divide a distribution into fifths, i.e., the 20th, 40th, 60th and 80th percentiles.

Scottish Index of Multiple Deprivation

The Scottish Index of Multiple Deprivation (SIMD) is the Scottish Government's official measure of area based multiple deprivation. It is based on 37 indicators across 7 individual domains of current income, employment, housing, health, education, skills and training and geographic access to services and telecommunications. SIMD is calculated at data zone level, enabling small pockets of deprivation to be identified. The data zones are ranked from most deprived (1) to least deprived (6505) on the overall SIMD index. The result is a comprehensive picture of relative area deprivation across Scotland.

This report uses the SIMD 2009.

<http://www.scotland.gov.uk/Topics/Statistics/SIMD>

Sodium

The intake of sodium (Na) can be estimated by measuring urinary excretion. This was collected in the nurse visit using a spot urine sample. There is an association between sodium intake and blood pressure. See also **Urine, Potassium, Creatinine**.

- Standard deviation** The standard deviation is a measure of the extent to which the values within a set of data are dispersed from, or close to, the mean value. In a normally distributed set of data 68% of the cases will lie within one standard deviation of the mean, 95% within two standard deviations and 99% will be within 3 standard deviations. For example, for a mean value of 50 with a standard deviation of 5, 95% of values will lie within the range 40-60.
- Standard error** The standard error is a variance estimate that measures the amount of uncertainty (as a result of sampling error) associated with a survey statistic. All data presented in this report in the form of means are presented with their associated standard errors (with the exception of the WEMWBS scores which are also presented with their standard deviations). Confidence intervals are calculated from the standard error; therefore the larger the standard error, the wider the confidence interval will be.
- Standardisation** In this report, standardisation refers to standardisation (or 'adjustment') by age (see **Age standardisation**).
- Systolic blood** When measuring blood pressure, the systolic arterial pressure is pressure defined as the peak pressure in the arteries, which occurs near the beginning of the cardiac cycle. See also **Blood pressure, Diastolic blood pressure**.
- Unit of alcohol** Alcohol consumption is reported in terms of units of alcohol. A unit of alcohol is 8 gms or 10ml of ethanol (pure alcohol). See Chapter 3 of volume 1 of this Report for a full explanation of how reported volumes of different alcoholic drinks were converted into units. The method for doing this has undergone significant change since the report of the 2003 SHeS was published, these are also detailed in Chapter 3.
- Urine analysis** A spot urine sample was collected from participants in the nurse visit. This was used for the analysis of dietary **Sodium, Potassium** and **Creatinine**. Epidemiological, clinical and animal-experimental evidence shows a direct relationship between dietary electrolyte consumption and blood pressure (BP).

Vitamin D

Vitamin D is a fat-soluble vitamin. It is mainly produced in the skin in response to sunlight, but is also available from dietary sources and supplements. Vitamin D deficiency causes the bone diseases rickets and osteomalacia. The blood samples were tested for 25 hydroxy-vitamin D (25(OH)D) and were commissioned by the Food Standards Agency in Scotland and the Scottish Government Directorate for Chief Medical Officer, Public Health and Sport.

Waist-Circumference

Waist circumference is a measure of deposition of abdominal fat. It was measured during the nurse visit. A raised waist circumference has been defined as more than 102cm in men and more than 88cm in women.

Waist-hip ratio

Waist-hip ratio (WHR) was defined as the waist circumference divided by the hip circumference, i.e. waist girth (m)/ hip girth (m). WHR is a measure of deposition abdominal fat. Unlike BMI there is no consensus to define cut-off point for WHR. For consistency the cut-off values as in the 1995, 1998 and 2003 reports have been used. A raised WHR has been taken to be 0.95 or more in men and 0.85 or more in women.

Reference: Molarius A, Seidell JC. *Selection of anthropometric indicators for classification of abdominal fatness - a critical review*. Int J Obes 1998; 22:719-727

WEMWBS

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was developed by researchers at the Universities of Warwick and Edinburgh, with funding provided by NHS Health Scotland, to enable the measurement of mental well-being of adults in the UK. It was adapted from a 40 item scale originally developed in New Zealand, the Affectometer 2. The WEMWBS scale comprises 14 positively worded statements with a five item scale ranging from '1 - None of the time' to '5 - All of the time'. The lowest score possible is therefore 14 and the highest is 70. The 14 items are designed to assess positive affect (optimism, cheerfulness, relaxation); and satisfying interpersonal relationships and positive functioning (energy, clear thinking, self-acceptance, personal development, mastery and autonomy).

References:

Kammann, R. and Flett, R. (1983). *Sourcebook for measuring well-being with Affectometer 2*. Dunedin, New Zealand: Why Not? Foundation.

The briefing paper on the development of WEMWBS is available online from: <www.wellscotland.info/indicators.html>

A NATIONAL STATISTICS PUBLICATION FOR SCOTLAND

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