obesity

diet

accidents

physical activity

The Scottish Health Survey

Volume 2: Children

2011

mental health

A National Statistics Publication for Scotland

The Scottish Health Survey

Volume 2: Children

2011

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EDITORS' ACKNOWLEDGEMENTS

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

Catherine Bromley

OVERVIEW OF THE CHILDREN'S VOLUME

Policy context

This report provides an overview of some of the key information collected about children's health in the recent Scottish Health Surveys. Children and health feature strongly within the Scottish Government's National Performance Framework.[1,2] The national outcomes[3] of greatest relevance are:

- Our children have the best start in life and are ready to succeed.
- We have improved the life chances for children, young people and families at risk.
- We live longer, healthier lives.
- We have tackled the significant inequalities in Scottish society.

The National Performance Framework also includes objectives, targets and indicators that relate to the broader context within which children grow up, for example there are indicators about the quality of children's services and pre-school centres, increasing children's educational attainment, and reducing childhood deprivation. There are also indicators relating to more direct outcomes for children, such the target to increase the proportion of babies born with a healthy weight, and the proportion of children aged 2-15 with a healthy body mass index. The latter of these measures is monitored via the Scottish Health Survey (see chapter 5). More broadly, the survey's measures of children's physical health, mental wellbeing, and health-related behaviours such as diet and physical activity can be used to help assess the outcome "our children have the best start in life and are ready to succeed". Similarly, by looking at results over time, the outcome "we have improved the life chances for children, young people and families at risk" can also be assessed.

The Getting It Right for Every Child (GIRFEC) programme, launched in 2006, provides the supporting methodology for all Scottish Government policies concerning children. GIRFEC underpins the approach to child health, wellbeing and wider development that all agencies in Scotland have committed to follow.[4] In 2008, the Scottish Government and COSLA jointly published their Early Years Framework[5] which outlined a commitment to improving outcomes for children and young people. In the field of health, Scotland's Chief Medical Officer has been a vocal advocate for increasing the attention paid to the early years, stating that: "a healthy childhood is the foundation of a healthy life".[6]

Although each of the chapters in this report covers a distinct topic, it is clear from the above discussion that children's health and development cannot be compartmentalised like this, and that policies to improve outcomes in childhood require a combination of specifically targeted initiatives nested within a broader strategic framework. Each of the following chapters start with a brief introduction of relevant policy initiatives specific to that area, but these should be considered alongside the higher level policies noted above.

The Scottish Health Survey

Children were first included in the Scottish Health Survey (SHeS) in 1998 and the 1998 and 2003 survey reports presented detailed results for children. In 2008 the survey began running continuously, and a contract is currently in place to continue this until 2015. To allow for the more frequent rounds of data collection, the sample size each year was reduced. As a consequence, rather than report detailed results for children each year based on the reduced sample sizes, it was decided to only include results for a selection of key child measures each year and to produce more detailed reports on child health when more years of data had accrued. This report is the first since 2003 to present results for children together in one volume (rather than interspersed with adult data). Although it is not an exhaustive account of children's health, this report covers more topics, and provides more detailed analysis, than was possible in the 2008, 2009 or 2010 reports. [7,8,9]

The detailed history of the study series, and the technical aspects of its conduct can be found in the introduction to Volume 1 (adults) and in Volume 3 (technical report). The following provides a snapshot of key information relating to the children's questionnaire.

Topics

Each survey in the series consists of main questions and measurements (for example, height and weight), plus modules of questions on specific health conditions. The principal focus of the survey series has always been cardiovascular disease (CVD) and related risk factors. As noted in Volume 1, CVD is a significant cause of death among adults in Scotland and is the focus of a significant number of health policies. Although CVD is, of course, very rare in children, there is growing evidence that the risk factors for chronic diseases like CVD, as well as health inequalities more broadly, can be evident in early childhood, or even earlier. [10,11,12] So while the survey is not designed to measure the prevalence of chronic conditions in children in the same way it does for adults, it collects important information about behavioural risk factors for poor health, and other important aspects of children's wellbeing and development. 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.

Sample design

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 selected in each household; and an additional child boost sample in which up to two children in the selected households were eligible to be interviewed but adults were not. The child boost was included to increase the number of children included in the survey. The majority of results presented in this report are based on data from children in the main and child boost samples together. However, analyses that draw on parental data are restricted to the main sample as the child boost did not include questions about parents' health and behaviours.

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 13-15 were asked to complete a short paper questionnaire on more sensitive topics. Parents of any children aged 4-12 years 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. The results of these self-completion questionnaires are presented in Chapter 1.

Interviewers were also responsible for measuring the height and weight of children aged 2-15. These measurements are reported in Chapter 5.

Survey response and sample sizes

The following table sets out the numbers of participating households and children 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 2008-2010 surveys can be found in the previous SHeS reports. [10,11,12]

	2008	2009	2010	2011
Numbers participating:				
Participating households (main & health board boost sample)	4,139	4,872	4,776	5,010
Participating households (child boost sample)	345	711	252	299
Child interviews (main sample)	1,239	1,519	1,422	1,314
Child interviews (boost sample)	511	1,088	371	380
Response rates:				
% of all eligible households (main & health board boost sample)	61%	64%	63%	66%
% of all eligible households (child boost sample)	64%	69%	66%	65%
% of all eligible children	55%	61%	58%	59%

Data

Since addresses and individuals did not all have equal chances of selection, the data have to be weighted for analysis. The 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 (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; Volume 2 presents results for children and covers the topics listed below. 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. (www.scotland.gov.uk/scottishhealthsurvey).

Volume 2 contents: Children

1. General health and mental wellbeing
2. Accidents
3. Diet
4. Physical activity
5. Obesity

As in all previous SHeS reports, data for boys and girls are presented separately. Many of the measures are also reported for the whole child 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 six surveys in the Scottish Health Survey series that included children (1998, 2003, 2008, 2009, 2010 and 2011). In some cases trend data are restricted to those aged 2-15 (the child age range common to all six surveys), for some measures trends are available for the full 0-15 age range (common to the 2003 survey onwards).

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/NIchanges> See also: www.scotlandperforms.com

3   http://www.scotland.gov.uk/About/scotPerforms/outcome

4   See: <www.scotland.gov.uk/Topics/People/Young-People/childrensservices/girfec>

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10 See, for example: Marmot, M. (2010). *Fair Society, Healthy Lives - The Marmot Review*. London: Strategic Review of Health Inequalities in England post-2010. Available from: www.ucl.ac.uk/marmotreview

11 Claussen, B., Davey Smith, G. and Thelle, D. (2003). Impact of childhood and adulthood socio-economic position on cause specific mortality: the Oslo Mortality Study. *Journal of Epidemiology and Community Health*. 57: 40-45.

12 Ben-Shlomo, Y. and Kuh, D (2002) A life course approach to chronic disease epidemiology: conceptual models, empirical challenges and interdisciplinary perspectives. *International Journal of Epidemiology*. 31, 285-293.

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 Error 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 1

1   GENERAL HEALTH AND MENTAL WELLBEING

Susan Reid

SUMMARY

- The general health of most children aged 0-15 was reported to be 'good' or 'very good' (95%) in 2010/2011, with no significant difference between boys and girls. 67% of boys and 68% of girls were described as having 'very good' health with 14-15 year olds the least likely to report this (55% of boys and 52% of girls).

- The proportion of children with 'bad' or 'very bad' health has remained unchanged since 1998 (1% in 2010/2011). While the proportion reporting 'very good' health as opposed to 'good' health appears to have increased. In 1998 60% of boys and girls had 'very good' health and 34% had 'good' health. The equivalent figures in 2010/2011 were 68% and 28% respectively.

- 15% of children aged 0-15 had a long-term condition in the 2008-2011 period; 9% were non-limiting, while 7% were limiting. Long-term conditions were more common in boys (17%) than girls (14%).

- Children under 4 were the least likely to have a long-term condition. Non-limiting conditions were more common than limiting ones in boys aged under 10 years, and in girls under eight.

- Conditions relating to the respiratory system were the most common long-term condition among 0-15 year olds in the 2008-2011 period (62 per 1000 children). These were followed by mental and behavioural disorders (27 per 1000), and skin complaints (20 per 1000).

- Respiratory system conditions were more common among boys than girls (71 per 1000 compared with 52 per 1000).

- There was a significant relationship between the prevalence of long-term conditions and household income with children in the lowest income quintile most likely to have a long-term condition (20% compared with 11% in the highest income quintile).

- In the 2008-2011 period 66% of children aged 13-15 had a GHQ12 score of zero while 9% had a score of four or more. These figures were not significantly different from the 2003 figures.

- Girls were more likely than boys to have a GHQ12 score of four or more (11% compared with 7%) and less likely to have a score of zero (62% compared with 70%).

- Social, emotional and behavioural problems in children aged 4-12 in 2010/2011 (measured via the Strengths and Difficulties Questionnaire (SDQ)) were more common in boys (10%) than girls (5%). 86% of children had no such problems while 7% were assessed as borderline.

- Children with abnormal total difficulties scores on the SDQ were less likely than those with a normal score to report 'very good' or 'good' general health and were also more likely to have a long-term condition.

- Children who rated their health as 'fair', 'bad' or 'very bad' had significantly increased odds of having a borderline or abnormal SDQ score compared with those who rated their health as 'good' or 'very good' (odds of 5.75 for girls and 3.95 for boys).

1.1 INTRODUCTION

This chapter covers two interrelated aspects of children's health. The first is self-assessed general health and long-term conditions. The second topic focuses on children's mental health and wellbeing. To acknowledge the interrelationship between these topics the chapter also looks at the extent to which low levels of mental wellbeing are associated with poor physical health.

As noted in the introduction to this volume, health is a key component of the Scottish Government's National Performance Framework,[1,2] and a commitment to improving children's wellbeing and longer-term outcomes in life lies at the heart of many initiatives led by Scottish Government, local authorities and other bodies with an interest in children's lives.[3,4] The measures reported in this chapter are therefore important indicators of progress in this area. In recent years, the overall approach to mental health in Scotland has been guided by the policy and action plan for mental health improvement published in 2009 *Towards a Mentally Flourishing Scotland*.[5] The Scottish Government published its new mental health strategy on 13 August 2012.[6] The strategy makes a series of commitments in respect of children and young people's mental health, including faster access to specialist services, greater attention to infant mental health and improved services for looked after children.

As discussed in the introductions to the general health and wellbeing chapters in the 2009 and 2010 Scottish Health Survey Reports,[7,8] in 2007 NHS Health Scotland published a set of national, sustainable indicators for monitoring adult mental health.[9] A parallel set of national mental health indicators for children and young people was launched in 2011,[10] following an extensive evidence review and consultation. There are 109 indicators in the framework, some of which draw on multiple measures, structured around two levels: high level constructs relating to the state of children's mental health and wellbeing, and contextual constructs spanning five domains that influence, and are influenced by, mental health. The five domains are: individual, family, the learning environment, community and structural (such as equality, social inclusion and discrimination). The SHeS will be used to monitor the following indicators (all of which are reported in this chapter):

- Percentage of children and young people aged 15 years and under whose health in general is perceived to be good or very good.
- Percentage of children and young people aged 15 years and under who have a long-standing physical condition or disability that has troubled them for at least 12 months, or is likely to affect them for at least 12 months.
- Percentage of children and young people aged 15 years and under who have a long-standing physical condition or disability that limits their daily activities.
- Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' total difficulties score on the Strengths and Difficulties Questionnaire (SDQ).
- Percentage of 4 to 12 year olds with a 'normal' score on the pro-social scale of the Strengths and Difficulties Questionnaire (SDQ).

- Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' score on the emotional symptoms scale of the Strengths and Difficulties Questionnaire (SDQ).
- Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' score on the conduct problems scale of the Strengths and Difficulties Questionnaire (SDQ).
- Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' score on the hyperactivity/inattention scale of the Strengths and Difficulties Questionnaire (SDQ).
- Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' score on the peer relationship problems scale of the Strengths and Difficulties Questionnaire (SDQ).

In addition to these measures of children's direct experiences, the survey will also be used to report on indicators of parental wellbeing, alcohol misuse, and limiting long-term conditions, which acknowledges the important influence of parental health and wellbeing on children's outcomes. These measures will be included in future reports.

Many of the measures discussed here have been included in the survey series since children were first included in 1998 so they not only provide important contemporary data for the national mental health indicator set, but they also allow historical comparisons to be made.

1.2 SELF-ASSESSED GENERAL HEALTH

1.2.1 Introduction

This section presents data on children's general health. Parents answered questions on behalf of children aged 0-12, while those aged 13-15 were asked to rate their own health status. The answer options presented were 'very good', 'good', 'fair', 'bad' or 'very bad'.[10] This question is part of the new mental health indicators set for children. The relevant indicator is: *"Percentage of children and young people aged 15 years and under whose health in general is perceived to be good or very good"*.

1.2.2 Trends in self-assessed general health since 1998

In 2010/2011, the general health of 95% of children aged 0-15 was reported as being either 'very good' or 'good'. This figure has been consistently high for both boys and girls, with very little variation, since it was first measured in 1998.[11] The proportions reported to be in 'bad' or 'very bad' health have also remained consistent over time, at just 1%. There has, however, been a shift in recent years in the composition of the very good/good category, with an increase in the proportion of children described as in 'very good' health (from 60% in 1998 to 67% in 2011) and a corresponding decrease in those reported to be in 'good' health (from 34% in 1998 to 29% in 2011). **Table 1.1**

1.2.3   Self-assessed general health, by age and sex, 2010/2011

In 2010/2011, boys and girls had very similar perceptions of their health in general. Two thirds (67% of boys and 68% of girls) were described as having 'very good' health, while 28% of boys and 27% of girls described it as 'good'. Just 1% of children described their health in general as 'bad' or 'very bad'.

When combined, the proportion of children with 'very good' or 'good' self-assessed health did not vary by age. However, the oldest children were less likely than their younger counterparts to have 'very good' health, and were more likely than them to report being in 'good' health. For example, 55% of boys aged 14-15 had 'very good' health while the figures for younger boys ranged from 66% to 74% with no clear pattern. Among girls, 52% of those aged 14-15, and 62% of those aged 12-13 had 'very good' health, compared with 66%-76% of younger girls. This difference between the oldest age groups and those younger than them could, in part, be explained by the change in interview methods at this age (children aged 13-15 answer the questions themselves).

Table 1.1

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 (as before, parents answered on behalf of children aged 0-12). 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 will have been subject to some distortion due to variation in individuals' perceptions. This question is part of the new mental health indicators set for children.[10] The relevant indicators are: "*Percentage of children and young people aged 15 years and under who have a long-standing physical condition or disability that has troubled them for at least 12 months, or is likely to affect them for at least 12 months*", and "*Percentage of children and young people aged 15 years and under who have a long-standing physical condition or disability that limits their daily activities*".

Questions about long-term conditions have been included since the survey began, however changes to the question wording in recent years mean that the trend data is only available from 2008. The tables are based on data from the 2008-2011 combined sample, which enables more robust figures to be presented for narrow age subgroups. The prevalence of long-term conditions is presented by age and sex, and then by three socio-economic measures: the National Statistics Socio-economic Classification (NS-SEC), household income and the Scottish Index of Multiple Deprivation (SIMD). This is the most detailed

presentation of long-term conditions in children since the 2003 SHeS Report.[12]

1.3.2 Prevalence of long-term conditions, 2008-2011 combined, by age and sex

The combined data for 2008 to 2011 showed that 15% of children aged 0-15 had a long-term health condition that had either lasted, or was likely to last, for at least 12 months. This was comprised of 7% with limiting conditions and 9% with non-limiting conditions. Boys were more likely than girls to have a long-term condition, 17% and 14% respectively. Although not large, this difference between the genders was statistically significant.

As Figure 1A illustrates, the prevalence of long-term health conditions increased with age for both boys and girls, most notably up to the age of nine. It then stabilised somewhat among boys but fluctuated more for girls. The figures for all children presented in Table 1.2 help illustrate the general pattern. The prevalence of long-term conditions doubled between the ages of 0-1 and 4-5 (from 7% to 14%), and then ranged from 16% to 20% among the older age groups. Non-limiting conditions were more common than limiting ones in boys aged under 10 years, and in girls under eight, after which the figures were broadly similar for both types of long-term condition.   **Figure 1A, Table 1.2**

Figure 1A
Prevalence of long-term conditions in children aged 0-15, by age and sex, 2008-2011 combined

Boys
Girls
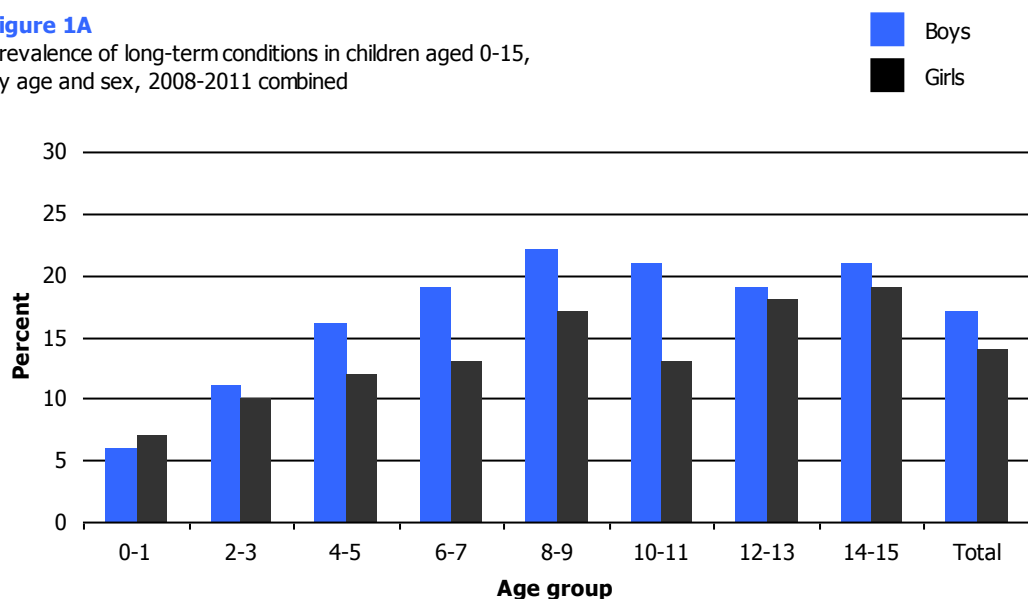
1.3.3 Rates of long-term conditions, 2008-2011 combined, by age and sex

Long-term conditions were classified using the International Classification of Diseases (ICD-10) coding schema.[13] Conditions were first coded by broad category and then aggregated into groups based on ICD-10 chapters. The classification of conditions was based solely on participants' definitions and self-reported symptoms. As a result the classification might not always correspond with a doctor's diagnosis. As

the prevalence for some of the conditions is very low, figures are presented in rates per 1000 children.

The most common long-term conditions for children aged 0-15 in the 2008 to 2011 period related to the respiratory system (62 per 1000) (Table 1.3). These were followed by mental and behavioural disorders (27 per 1000), and skin complaints (20 per 1000).

The overall pattern for types of conditions was generally similar for boys and girls, but there were some minor differences. Although respiratory system conditions were the most common for both boys and girls, rates were higher in boys than girls (71 versus 52 per 1000). Rates of mental and behavioural disorders were also higher in boys than girls (38 versus 15 per 1000). Mental and behavioural disorders were the second most common condition for boys, and were joint third most common for girls, alongside digestive conditions and musculoskeletal conditions. Rates for skin conditions were similar for boys and girls (at 20 and 19 per 1000, respectively).

Variation by age was dependent on condition type. For some, such as respiratory system conditions and mental and behaviour disorders, rates increased with age. In contrast, prevalence of conditions of blood and related organs and conditions of the heart and circulatory system did not vary by age group while prevalence of musculoskeletal conditions varied by age but with no clear pattern.   **Table 1.3**

1.3.4   Long-term conditions by socio-demographic characteristics

Tables 1.4 to 1.6 present the prevalence of long-term conditions 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). The figures presented are based on the 2008 to 2011 surveys combined.

Socio-economic classification (NS-SEC)

Overall, the proportion of children with limiting or non-limiting long-term conditions was not significantly associated with NS-SEC. However, when restricted to just those with limiting conditions, there was a significant association, though absolute differences were small in percentage point terms. The prevalence of limiting conditions increased from 5% among children living in managerial, professional and intermediate households to 8% among those in semi-routine and routine households.   **Table 1.4**

Equivalised household income

As Table 1.5 and Figure 1B illustrate, as household income decreased, the prevalence of long-term conditions increased significantly from 11% of children in the highest income quintile households to 20% for those in the lowest quintile. As was the case with NS-SEC, differences were particularly marked in relation to limiting long-term conditions with

prevalence increasing from 4% to 10% across the income quintiles.
This pattern was the same for both girls and boys. **Table 1.5**

Figure 1B

Prevalence of long-term conditions in children aged 0-15,
by equivalised household income quintile, 2008-2011 combined

Non-limiting conditions

Limiting conditions
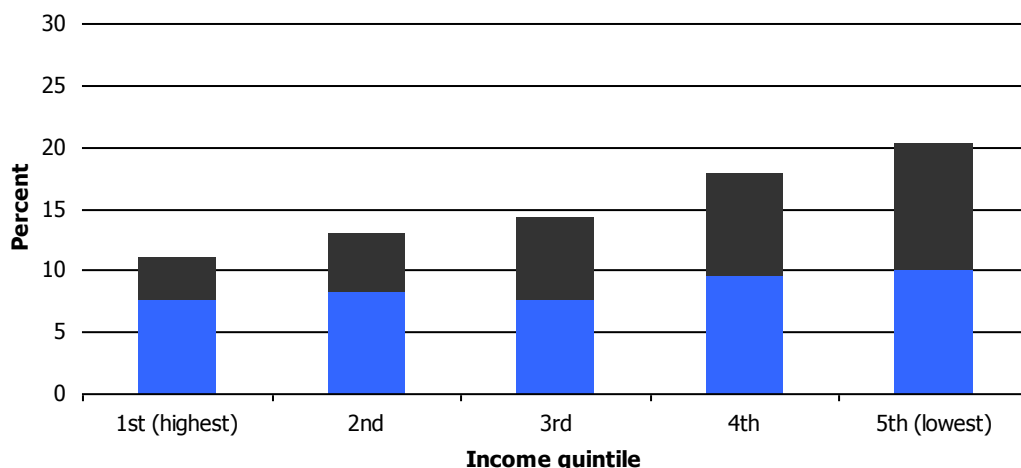
Scottish Index of Multiple Deprivation (SIMD)

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 15% most deprived areas with the rest of Scotland (described in the tables as the "85% least deprived areas").

A similar, but somewhat less steep, gradient was evident in relation to the association between SIMD quintiles and long-term conditions. The prevalence of long-term conditions increased in line with level of deprivation, from 12% in the least deprived quintile to 18% in the most. The pattern was evident for both boys and girls. Once again, the difference was largely driven by variations in the prevalence of limiting, rather than non-limiting, conditions. The proportion of children in the most deprived quintile with limiting conditions was double that in the least deprived quintile (10% versus 5%).

Differences between children in the most deprived 15% of areas and those in the rest of Scotland were small but, due to the relatively large sample size, were statistically significant. Overall, 18% of children living in the 15% most deprived areas in Scotland had a long-term condition compared with 15% of those living elsewhere. The equivalent figures for limiting conditions were 10% and 6%, respectively. **Table 1.6**

1.4 MENTAL HEALTH AND WELLBEING

1.4.1 Introduction

Wellbeing in children aged 13-15 has been measured via the GHQ12[14] since children were first included in SHeS in 1998. However, a recent investigation of the apparently large change in GHQ12 scores between 1998 and 2003 revealed an error in the labelling of the answer scale for one of the items in the 1998 survey. This resulted in a much higher prevalence of depression than would be expected. As a consequence the trend discussion in this section is limited to the 2003 - 2011 period.

GHQ12 is a widely used standard measure of mental distress and psychological ill-health consisting of 12 self-completion questions on concentration abilities, sleeping patterns, self-esteem, stress, despair, depression, and confidence in the previous few weeks. Children completed the questionnaire themselves. Responses to the GHQ12 items were 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 here to indicate the presence of a possible psychiatric disorder. GHQ12 measures deviations from people's usual functioning in the previous few weeks. It cannot, therefore, be used to detect chronic conditions. As the number of children aged 13-15 in the sample is fairly small, the most recent figures presented here are based on the 2008-2011 combined samples.

The social, emotional and behavioural development of children aged 4-12 has been measured via the Strengths and Difficulties Questionnaire (SDQ)[15] since 2003. The SDQ is a brief behavioural screening questionnaire designed for use with the 3-16 age group. The SDQ was completed by a parent on behalf of all children aged 4-12.

The SDQ comprises 25 questions covering themes such as consideration, hyperactivity, malaise, mood, sociability, obedience, anxiety, and unhappiness. It is used to measure five aspects of children's development: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and pro-social behaviour.

A score was calculated for each of the five aspects, as well as an overall 'total difficulties' score which was generated by summing the scores from all the domains except pro-social behaviour. The total difficulties score ranged from zero to forty with a higher score indicating greater evidence of difficulties. There are established thresholds indicating 'normal' (score of 13 or less), 'borderline' (14-16) or 'abnormal' scores (17 or above).

The total and individual SDQ domain scores all feature in the new mental health indicators set for children.[10] The indicators are the percentage of children with normal scores for the pro-social domain, and the percentages with abnormal/borderline scores in the other four domains and overall. All these figures are reported in the tables, although much of the discussion in this section focuses on the total difficulties score. It looks at patterns by age and sex, compares scores in 2003, 2008/2009 and 2010/11, and looks at scores by socio-economic factors, and by general health and long-term conditions. Finally, factors associated with borderline or abnormal total difficulties scores are also presented.

1.4.2 Trends in GHQ12 scores since 2003

GHQ12 scores were broadly similar in 2003 and the 2008-2011 period. For example, in 2003 69% of children aged 13-15 had a score of zero, as did 66% in 2008-2011. The respective figures for boys were 72% and 70%, while the figures for girls were 66% and 62%. There was no significant change in the proportion of children with a score of four or more (indicative of a possible disorder) between 2003 and 2008-2011 (8% and 9%, respectively). As noted above, the composite GHQ12 scores in 1998 cannot be compared over time. However, the results for the 11 individual scale items that are directly comparable were very similar at all three time points (data not shown).   **Table 1.7**

1.4.3 GHQ12 scores, 2008-2011 combined, by age and sex

GHQ12 scores were significantly associated with both age and sex in 2008-2011, with psychological distress more common in girls than boys, and in older rather than younger teenagers. Boys were more likely than girls to have a score of zero (70% versus 62%), and were less likely to have a score of four or more (7% versus 11%). The difference between boys and girls appeared after the age of 13. For example, the proportion of girls with a score of zero declined from 74% at age 13, to 57% at age 14 and 54% at age 15. The corresponding figures for boys showed a smaller steadier decline, from 75% to 70% and 65% across the three ages. The pattern with regards scores of four or more was similar, with girls aged 14 and 15 more than twice as likely as girls aged 13 to have a GHQ12 score of four or more (14%, 14% and 6% respectively). For boys, the difference occurred later: 6% of those aged 13 or 14 had a score of four or more compared with 11% at age 15.

Table 1.7

1.4.4 Trends in SDQ scores since 2003

There has been little change over time in the SDQ score of children aged 4-12. In 2003, 9% of children had an abnormal total difficulties score as did 8% in 2008/2009 and 2010/2011. A further 8% had borderline scores in 2003, and the figures for 2008/2009 (6%) and 2010/2011 (7%) were not significantly different from this. The figures for scores in the normal range were 83% in 2003 and 86% in the two most recent periods. Mean SDQ score have also been very similar over time: 8.2 in 2003 and 8.0 in both 2008/2009 and 2010/2011.

Although there appear to be small differences in the SDQ scores for girls between 2003 and the later periods, these were not statistically significant. Scores for boys have remained very stable across time.

Table 1.8

1.4.5 SDQ scores by age and sex, 2010/2011

Looking now in more detail at the 2010/2011 results, boys were more likely than girls to have SDQ scores indicative of problem behaviour or low wellbeing. For example, boys were twice as likely as girls to have an abnormal SDQ score (10% versus 5%). The mean score for boys was also significantly higher than for girls (8.6 versus 7.3).   **Table 1.8**

Significant differences between boys and girls were seen in the proportion who had abnormal scores in three of the five domains measured in the SDQ: peer problems (13% and 8%, respectively), hyperactivity (15% and 9%), and pro-social behaviour (3% and 1%).

The proportion of children with normal, borderline or abnormal total SDQ scores did not vary significantly by age. However, significant differences were present for the emotional symptoms scores, where the prevalence of problem scores increased with age. For example, 4% of boys aged 4-5 had an abnormal emotional symptoms score compared with 11% of those aged 10-12. The corresponding figures for girls were 5% and 11%, respectively.   **Table 1.9**

1.4.6 SDQ scores by general health and long-term conditions, 2008-2011 combined

Table 1.10 and Figures 1C and 1D use data from the 2008-2011 combined samples to present the prevalence of 'very good' or 'good' general health, and long-term conditions, among children with normal, borderline and abnormal SDQ scores. As illustrated in Table 1.3, mental and behavioural disorders were the second most common type of long-term condition for children so the SDQ, which is a direct measure of such conditions, should overlap with the long-term conditions measure.[16] This analysis makes it possible to assess the burden of limiting conditions and poor health experienced by children with behavioural or emotional difficulties.

Children with an abnormal total difficulties SDQ score were least likely to report 'very good' or 'good' general health and most likely to have a long-term health condition. Among children with a normal total difficulties SDQ score, 97% reported a very good/good level of general health, compared with 89% of those with borderline scores, and 83% of children with abnormal scores. This variation was largely explained by a difference in the proportions describing their health as 'very good' (this was 73% among those with a normal score and 46% for those with an abnormal score). 11%-16% of children with borderline or abnormal scores had 'fair' or 'bad' health compared with just 3% of those with normal scores.

A similar pattern was seen in relation to the prevalence of long-term conditions with a three-fold increase in prevalence between children with normal and abnormal scores (from 14% to 44%). The difference was even greater for limiting conditions: children with abnormal total difficulties scores were nearly six times as likely as those with normal scores to have a limiting long-term condition (29% versus 5%).

The same overall patterns were evident for both boys and girls. Although boys with an abnormal total difficulties score were more likely than girls with such a score to have a long-term condition (48% and 35%, respectively), the sample size for girls with abnormal scores was quite small so this is not a very precise estimate of the difference between groups. **Table 1.10**

Figure 1C
Prevalence of very good/good general health and long-term conditions in boys aged 4-12, by SDQ total difficulties scores, 2008-2011 combined

■ % very good/good general health
■ % with long-term condition
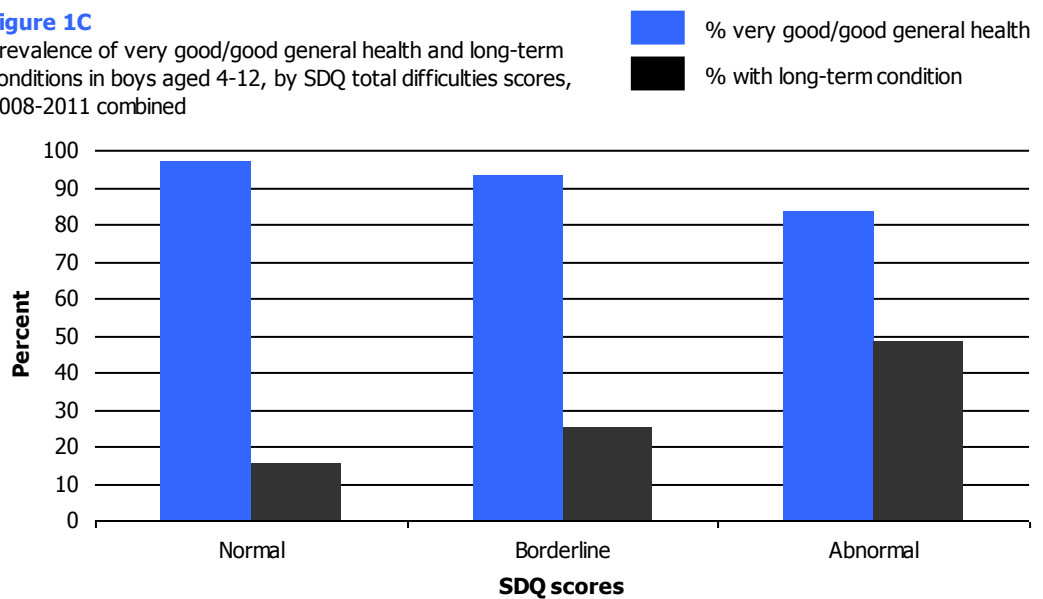
Figure 1D
Prevalence of very good/good general health and long-term conditions in girls aged 4-12, by SDQ total difficulties scores, 2008-2011 combined

■ % very good/good general health
■ % with long-term condition

20
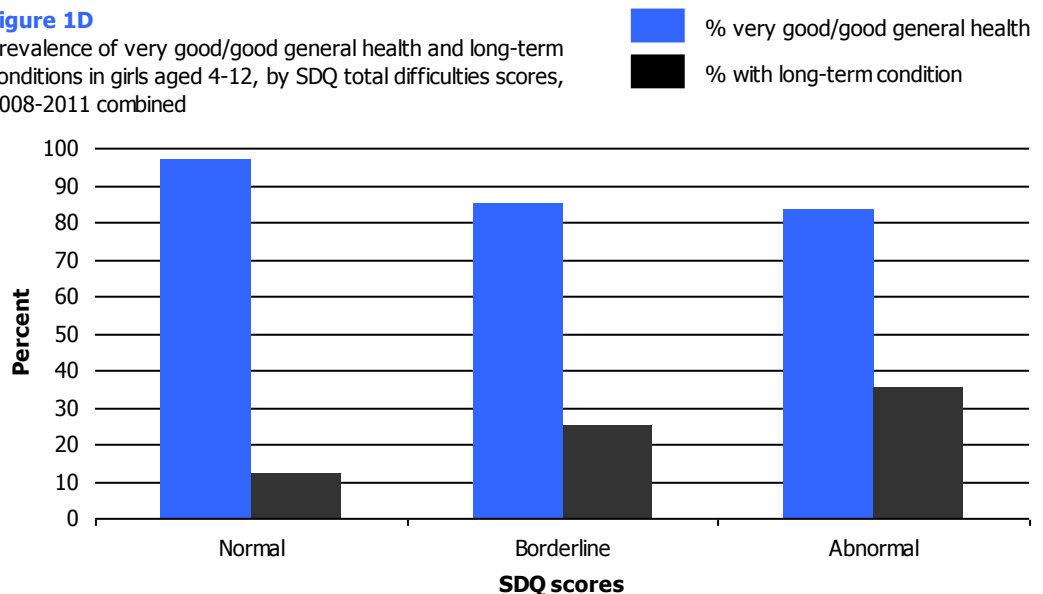
1.4.7 Factors associated with borderline or abnormal total difficulties scores on the SDQ

Using the 2008-2011 combined data, multivariate logistic regression was used to examine the independent effect of a range of socio-demographic factors associated with having a borderline (14-16) or abnormal (17-40) total difficulties score on the SDQ. Separate models were run for boys and girls with significant factors discussed below.

The odds ratios of having a borderline or abnormal total difficulties score are presented in Table 1.11. Boys and girls with a total score of 14 or above were classified as having a borderline/ abnormal score. In these analyses, the odds of a reference category (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 higher odds of having a borderline/ abnormal total difficulties score than the chosen reference category, and an odds ratio of less than 1 mean they have lower 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.

Self-assessed health was significantly associated with having a borderline or abnormal total difficulties score on the SDQ for both boys and girls. Compared with those who rated their health as 'good' or 'very good', those who rated their health 'fair', 'bad' or 'very bad' had significantly increased odds of having a borderline or abnormal score (odds ratio of 5.75 for girls and 3.95 for boys).

For boys, the other factors that were associated with having a borderline or abnormal SDQ score were area level deprivation (SIMD) and how physically active they were.

Boys living in the most deprived areas of Scotland (1st SIMD quintile) had significantly higher odds of having a borderline or abnormal total difficulties score than those living in the least deprived areas (odds ratio of 2.42). Compared with those meeting the physical activity guidelines, boys who had low activity levels had significantly higher odds of having borderline or abnormal total difficulties score (odds ratio of 2.17).

In addition to self-assessed health, the other factors that were significantly associated with girls having borderline or abnormal total difficulties scores on the SDQ were NS-SEC, household income and household composition.

Girls living in semi-routine and routine occupation households had increased odds (1.87) of having a borderline or abnormal total difficulties score compared with those living in managerial and professional households. Household income was also significantly related to SDQ scores for girls, with those living in the lowest household income quintile having significantly higher odds of a

borderline/abnormal score compared with those in the highest income quintile (odds ratio of 3.41).

Finally, when compared with girls that lived in a one child household, those living in two children households (aged 0 to 15) had decreased odds of having a borderline or abnormal total difficulties score (odds ratio of 0.61). **Table 1.11**

References and notes

1   *Scottish Budget Spending Review 2007*, Edinburgh: Scottish Government, 2007. [online] Available from: <www.scotland.gov.uk/Publications/2007/11/13092240/0>

2   *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>

3   Scottish Government/COSLA (2008). *The Early Years Framework*. Edinburgh: Scottish Government.

4   For example, the G*etting it Right for Every Child* framework: <www.scotland.gov.uk/Topics/People/Young-People/childrensservices/girfec>

5   *Towards a Mentally Flourishing Scotland*, Edinburgh: Scottish Government, 2009.

6   *Mental Health Strategy for Scotland: 2012-2015*, Edinburgh: Scottish Government, 2012.

7   Given, L. (2010). Chapter 1: General health and mental wellbeing. 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

8   McManus, S. (2010). Chapter 1: General health and mental wellbeing. In Bromley, C. and Given, L. [eds.] *The 2010 Scottish Health Survey – Volume 1: Main Report*. Edinburgh, Scottish Government. <www.scotland.gov.uk/Publications/2011/09/27084018/6>

9   Parkinson, J. (2007). *Establishing a core set of national, sustainable mental health indicators for adults in Scotland: Final report.* Glasgow: NHS Health Scotland.

10   Parkinson, J. (2012). *Establishing a core set of national, sustainable mental health indicators for children and young people in Scotland: Final report.* Glasgow: NHS Health Scotland.

11   Unlike the 2003 and 2008/2009 surveys, the 1998 survey did not include children aged 0-1. However, the overall proportions of children in good or very good health were the same for children aged 2-15 and all those aged 0-15. Therefore a separate category just for the 2-15 age group was not needed to enable comparisons over time.

12   Gray, L. and Leyland, A. (2005). Chapter 6: General and psychosocial health. In Bromley, C., Shelton, N. and Sproston, K. [Eds.] *The 2003 Scottish Health Survey – Volume 3: Children.* Edinburgh: Scottish Executive.

13   See: <http://apps.who.int/classifications/icd10/browse/2010/en>

14   Goldberg, D. and Williams, P.A. (1988). *Users Guide to the General Health* Questionnaire. Windsor: NFER-Nelson.

15   Goodman R (1997) The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*, 38, 581-586.

16   To assess this, additional analysis was conducted using a version of the long-term conditions measure that separates out physical health conditions from mental/behaviour disorders. This analysis confirmed that the association between SDQ scores and long-term conditions was much more pronounced for mental/behavioural disorders than physical conditions alone (data not shown).

Table list

Table 1.1 Self-assessed general health, 1998, 2003, 2008/2009 combined, 2010/1011 combined, by age and sex

Aged 0-15 *1998, 2003, 2008/2009 combined, 2010/2011 combined*

Self-assessed general health[a]	Age									Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	Total 2-15	
	%	%	%	%	%	%	%	%	%	%
Boys										
Very good										
1998	n/a	57	64	63	64	63	58	48	60	n/a
2003	69	63	58	64	66	64	57	53	61	62
2008/2009	76	73	72	69	66	67	66	60	68	69
2010/2011	72	66	68	69	74	68	67	55	67	67
Good										
1998	n/a	36	29	31	29	34	36	44	34	n/a
2003	26	30	33	27	28	27	34	39	31	31
2008/2009	21	24	26	25	28	27	28	34	27	27
2010/2011	22	28	26	28	22	26	31	40	29	28
Fair										
1998	n/a	6	8	5	5	2	6	8	6	n/a
2003	3	7	8	6	4	7	7	7	7	6
2008/2009	2	3	2	5	5	6	5	5	5	4
2010/2011	5	5	5	3	5	6	3	4	4	4
Bad										
1998	n/a	1	-	1	2	1	-	0	1	n/a
2003	2	1	1	2	2	1	1	0	1	1
2008/2009	1	-	-	1	-	-	1	1	0	0
2010/2011	1	1	0	0	-	0	-	0	0	0
Very bad										
1998	n/a	0	-	0	-	-	-	0	0	n/a
2003	0	0	1	1	0	1	0	2	1	1
2008/2009	1	-	0	-	0	-	0	-	0	0
2010/2011	-	0	-	-	-	-	-	0	0	0
Very good/good										
1998	*n/a*	*94*	*92*	*94*	*93*	*97*	*94*	*92*	*94*	*n/a*
2003	*95*	*92*	*91*	*91*	*94*	*91*	*92*	*91*	*92*	*92*
2008/2009	*97*	*97*	*98*	*94*	*95*	*94*	*94*	*94*	*95*	*95*
2010/2011	*94*	*94*	*94*	*96*	*95*	*94*	*97*	*96*	*95*	*95*
Very bad/bad										
1998	*n/a*	*1*	*0*	*2*	*2*	*1*	*0*	*1*	*1*	*n/a*
2003	*2*	*1*	*1*	*2*	*2*	*2*	*1*	*2*	*2*	*2*
2008/2009	*1*	*-*	*0*	*1*	*0*	*-*	*1*	*1*	*0*	*1*
2010/2011	*1*	*1*	*0*	*0*	*-*	*0*	*-*	*1*	*1*	*1*

Continued…

Table 1.1 *- Continued*

Self-assessed general health[a]	Age									Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	Total 2-15	
	%	%	%	%	%	%	%	%	%	%
Girls										
Very good										
1998	n/a	62	64	59	57	66	58	52	60	n/a
2003	81	72	62	70	70	73	56	47	64	66
2008/2009	72	72	76	67	67	66	57	53	65	66
2010/2011	76	66	73	69	70	73	62	52	67	68
Good										
1998	n/a	31	28	35	38	30	35	41	34	n/a
2003	15	24	31	26	25	22	35	46	30	28
2008/2009	25	24	20	27	27	30	38	39	29	29
2010/2011	22	29	24	26	25	24	34	39	28	27
Fair										
1998	n/a	6	6	5	2	4	7	6	5	n/a
2003	3	2	7	4	5	4	8	7	5	5
2008/2009	3	4	3	4	5	3	4	6	4	4
2010/2011	1	3	3	3	5	3	3	8	4	3
Bad										
1998	n/a	1	2	0	1	0	1	1	1	n/a
2003	1	1	0	0	0	0	0	1	0	0
2008/2009	-	-	1	2	0	1	-	1	1	1
2010/2011	1	2	0	2	-	0	1	1	1	1
Very bad										
1998	n/a	-	-	1	1	-	-	-	0	n/a
2003	0	0	0	0	0	0	1	0	0	0
2008/2009	-	-	-	-	-	-	-	0	0	0
2010/2011	-	-	-	-	1	1	-	-	0	0
Very good/good										
1998	*n/a*	*93*	*92*	*94*	*96*	*95*	*92*	*93*	*94*	*n/a*
2003	*96*	*96*	*93*	*96*	*95*	*95*	*91*	*93*	*94*	*94*
2008/2009	*97*	*96*	*96*	*94*	*94*	*95*	*96*	*92*	*95*	*95*
2010/2011	*97*	*96*	*97*	*95*	*95*	*96*	*96*	*91*	*95*	*95*
Very bad/bad										
1998	*n/a*	*1*	*2*	*1*	*2*	*0*	*1*	*1*	*1*	*n/a*
2003	*1*	*1*	*0*	*0*	*0*	*1*	*1*	*1*	*1*	*1*
2008/2009	*-*	*-*	*1*	*2*	*0*	*1*	*-*	*2*	*1*	*1*
2010/2011	*1*	*2*	*0*	*2*	*1*	*1*	*1*	*1*	*1*	*1*

Continued…

Table 1.1 *- Continued*

Self-assessed general health[a]	Age									Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	Total 2-15	
	%	%	%	%	%	%	%	%	%	%
All children										
Very good/good										
1998	n/a	93	92	94	94	96	93	93	94	n/a
2003	95	94	92	94	95	93	91	92	93	93
2008/2009	97	96	97	94	94	95	95	93	95	95
2010/2011	96	95	96	96	95	95	96	94	95	95
Very bad/bad										
1998	n/a	1	1	1	2	1	0	1	1	n/a
2003	1	1	1	1	1	1	1	1	1	1
2008/2009	1	-	1	1	0	1	0	1	1	1
2010/2011	1	2	0	1	0	1	1	1	1	1
Bases (weighted):										
Boys 1998	n/a	146	155	163	157	162	159	154	1096	n/a
Boys 2003	185	190	204	207	220	231	240	223	1515	1700
Boys 2008/2009	282	287	250	278	257	297	306	272	1946	2228
Boys 2010/2011	255	265	227	262	191	255	245	231	1677	1931
Girls 1998	n/a	139	149	156	149	153	153	147	1046	n/a
Girls 2003	174	195	187	226	178	238	220	204	1449	1623
Girls 2008/2009	280	250	253	240	269	295	282	259	1848	2128
Girls 2010/2011	246	238	241	207	218	261	232	203	1600	1846
All children 1998	n/a	286	305	319	306	315	312	301	2142	n/a
All children 2003	359	385	391	433	398	470	461	427	2964	3323
All children 2008/2009	562	537	503	518	526	592	588	531	3794	4356
All children 2010/2011	501	503	468	469	410	516	477	434	3277	3777
Bases (unweighted):										
Boys 1998	n/a	308	261	279	281	284	292	282	1987	n/a
Boys 2003	191	204	210	208	217	193	219	213	1464	1655
Boys 2008/2009	284	276	254	282	271	278	289	271	1921	2205
Boys 2010/2011	278	286	243	271	201	236	219	224	1680	1958
Girls 1998	n/a	268	272	264	259	296	275	271	1905	n/a
Girls 2003	200	205	191	227	184	239	216	206	1468	1668
Girls 2008/2009	295	269	267	229	248	288	287	267	1855	2150
Girls 2010/2011	272	262	250	189	199	233	212	202	1547	1819
All children 1998	n/a	576	533	543	540	580	567	553	3892	n/a
All children 2003	391	409	401	435	401	432	435	419	2932	3323
All children 2008/2009	579	545	521	511	519	566	576	538	3776	4355
All children 2010/2011	550	548	493	460	400	469	431	426	3227	3777

a Percentage of children reporting their health in general as 'good' or 'very good' is part of the national mental health indicator set for children.

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

Long-term conditions and limiting long-term conditions[a]	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
	%	%	%	%	%	%	%	%	%
Boys									
No long-term conditions	94	89	84	81	78	79	81	79	83
Limiting long-term conditions	2	3	5	8	8	11	11	10	7
Non-limiting long-term conditions	4	7	11	11	14	10	9	10	9
Total with conditions	*6*	*11*	*16*	*19*	*22*	*21*	*19*	*21*	*17*
Girls									
No long-term conditions	93	90	88	87	83	87	82	81	86
Limiting long-term conditions	2	4	3	5	8	6	9	11	6
Non-limiting long-term conditions	6	6	9	8	9	7	9	8	8
Total with conditions	*7*	*10*	*12*	*13*	*17*	*13*	*18*	*19*	*14*
All children									
No long-term conditions	93	90	86	84	81	83	81	80	85
Limiting long-term conditions	2	4	4	7	8	8	10	11	7
Non-limiting long-term conditions	5	7	10	9	11	8	9	9	9
Total with conditions	*7*	*10*	*14*	*16*	*19*	*17*	*19*	*20*	*15*
Bases (weighted):									
Boys	*535*	*553*	*479*	*541*	*446*	*551*	*550*	*501*	*4156*
Girls	*527*	*486*	*494*	*447*	*488*	*554*	*513*	*462*	*3972*
All children	*1062*	*1039*	*973*	*988*	*934*	*1104*	*1063*	*963*	*8128*
Bases (unweighted):									
Boys	*561*	*562*	*497*	*553*	*472*	*514*	*507*	*494*	*4160*
Girls	*566*	*531*	*517*	*418*	*447*	*521*	*499*	*468*	*3967*
All children	*1127*	*1093*	*1014*	*971*	*919*	*1035*	*1006*	*962*	*8127*

a Percentage of children reporting a long-standing physical condition or disability that limits their daily activities is part of the national mental health indicator set for children.

Table 1.3   Rate per 1000 children reporting long-term conditions, 2008-2011 combined, by age and sex

Long-term conditions and limiting long-term conditions	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
					Rate per 1000				
Boys									
I Infectious disease	-	-	-	-	-	-	-	-	-
II Neoplasms & benign growths	-	4	5	-	2	3	2	-	2
III Blood & related organs	1	-	2	2	6	5	-	-	2
IV Endocrine & metabolic	2	3	4	4	7	6	12	6	6
V Mental disorders	-	11	42	44	36	59	63	47	38
VI Nervous System	2	4	12	5	9	14	15	26	11
VII Eye complaints	6	7	12	9	7	7	6	4	7
VIII Ear complaints	2	10	7	16	12	5	4	4	7
IX Heart & circulatory system	3	3	-	5	9	8	2	4	4
X Respiratory system	11	46	59	79	98	91	78	115	71
XI Digestive system	8	13	16	23	31	20	23	14	18
XII Skin complaints	9	25	19	20	41	16	7	29	20
XIII Musculoskeletal system	7	2	10	16	12	10	18	19	12
XIV Genito-urinary system	7	5	2	4	4	7	11	5	6
Other complaints	2	2	2	4	4	-	-	4	2
Girls									
I Infectious disease	-	-	-	-	-	-	-	-	-
II Neoplasms & benign growths	-	-	2	-	4	2	4	2	2
III Blood & related organs	6	5	-	-	-	2	4	4	3
IV Endocrine & metabolic	-	2	8	5	4	6	18	5	6
V Mental disorders	2	5	3	23	20	19	22	28	15
VI Nervous System	6	13	-	11	15	11	16	14	11
VII Eye complaints	4	5	11	7	7	4	2	-	5
VIII Ear complaints	-	-	7	18	12	2	8	11	7
IX Heart & circulatory system	8	2	4	8	8	8	5	10	6
X Respiratory system	16	37	52	31	70	61	79	73	52
XI Digestive system	13	13	9	13	13	17	17	22	15
XII Skin complaints	17	18	22	21	30	13	14	18	19
XIII Musculoskeletal system	4	12	11	18	13	10	25	28	15
XIV Genito-urinary system	3	4	9	15	9	-	20	2	8
Other complaints	-	2	-	2	10	2	-	9	3

Continued…

Table 1.3 *- Continued*

Long-term conditions and limiting long-term conditions	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
					Rate per 1000				
All children									
I Infectious disease	-	-	-	-	-	-	-	-	-
II Neoplasms & benign growths	-	2	3	-	3	3	3	1	2
III Blood & related organs	3	2	1	1	3	3	2	2	2
IV Endocrine & metabolic	1	3	6	4	5	6	15	6	6
V Mental disorders	1	9	23	34	27	39	43	38	27
VI Nervous System	4	8	6	8	12	13	15	21	11
VII Eye complaints	5	6	11	8	7	5	4	2	6
VIII Ear complaints	1	5	7	17	12	3	6	8	7
IX Heart & circulatory system	6	2	2	6	8	8	3	7	5
X Respiratory system	14	42	55	58	83	76	78	95	62
XI Digestive system	11	13	12	18	22	18	20	18	16
XII Skin complaints	13	22	20	20	35	15	11	24	20
XIII Musculoskeletal system	5	7	10	17	13	10	21	24	13
XIV Genito-urinary system	5	5	5	9	7	4	15	4	7
Other complaints	1	2	1	3	7	1	-	7	3
Bases (weighted):									
Boys	*535*	*553*	*479*	*541*	*446*	*551*	*550*	*501*	*4156*
Girls	*527*	*486*	*494*	*447*	*488*	*554*	*513*	*462*	*3972*
All children	*1062*	*1039*	*973*	*988*	*934*	*1104*	*1063*	*963*	*8128*
Bases (unweighted):									
Boys	*561*	*562*	*497*	*553*	*472*	*514*	*507*	*494*	*4160*
Girls	*566*	*531*	*517*	*418*	*447*	*521*	*499*	*468*	*3967*
All children	*1127*	*1093*	*1014*	*971*	*919*	*1035*	*1006*	*962*	*8127*

Table 1.4   Prevalence of long-term conditions, 2008-2011 combined, by NS-SEC of household reference person and sex

2008-2011 combined

Long-term conditions and limiting long-term conditions	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi routine & routine
	%	%	%	%	%
Boys					
No long-term conditions	84	86	84	82	82
Limiting long-term conditions	6	5	7	8	9
Non-limiting long-term conditions	10	8	9	9	9
Total with conditions	*16*	*14*	*16*	*18*	*18*
Girls					
No long-term conditions	87	87	86	89	85
Limiting long-term conditions	5	4	6	5	7
Non-limiting long-term conditions	8	9	8	6	8
Total with conditions	*13*	*13*	*14*	*11*	*15*
All children					
No long-term conditions	86	87	85	86	83
Limiting long-term conditions	5	5	6	7	8
Non-limiting long-term conditions	9	9	9	8	8
Total with conditions	*14*	*13*	*15*	*14*	*17*
Bases (weighted):					
Boys	*1640*	*360*	*386*	*440*	*1194*
Girls	*1579*	*370*	*359*	*409*	*1128*
All children	*3218*	*730*	*745*	*849*	*2322*
Bases (unweighted):					
Boys	*1619*	*366*	*381*	*463*	*1203*
Girls	*1568*	*373*	*364*	*427*	*1121*
All children	*3187*	*739*	*745*	*890*	*2324*

Table 1.5   Prevalence of long-term conditions, 2008-2011 combined, by equivalised household income quintile and sex

Long-term conditions and limiting long-term conditions	Equivalised annual household income quintile				
	1st (highest)	2nd	3rd	4th	5th (lowest)
	%	%	%	%	%
Boys					
No long-term conditions	88	86	84	80	79
Limiting long-term conditions	4	5	7	9	12
Non-limiting long-term conditions	9	9	9	11	9
Total with conditions	*12*	*14*	*16*	*20*	*21*
Girls					
No long-term conditions	90	88	87	85	80
Limiting long-term conditions	3	4	6	7	9
Non-limiting long-term conditions	6	8	7	8	11
Total with conditions	*10*	*12*	*13*	*15*	*20*
All children					
No long-term conditions	89	87	86	82	80
Limiting long-term conditions	4	5	7	8	10
Non-limiting long-term conditions	8	8	8	10	10
Total with conditions	*11*	*13*	*14*	*18*	*20*
Bases (weighted):					
Boys	*702*	*782*	*711*	*754*	*770*
Girls	*653*	*767*	*714*	*686*	*736*
All children	*1355*	*1549*	*1425*	*1441*	*1506*
Bases (unweighted):					
Boys	*692*	*826*	*723*	*753*	*742*
Girls	*660*	*794*	*724*	*693*	*689*
All children	*1352*	*1620*	*1447*	*1446*	*1431*

Table 1.6   Prevalence of long-term conditions, 2008-2011 combined, by Scottish Index of Multiple Deprivation and sex

Aged 0-15   *2008-2011 combined*

Total difficulties score	Scottish Index of Multiple Deprivation Quintile					SIMD 85/15	
	5th (least deprived)	4th	3rd	2nd	1st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Boys							
No long-term conditions	87	85	84	82	80	84	80
Limiting long-term conditions	5	6	7	8	11	7	11
Non-limiting long-term conditions	9	9	9	10	9	9	9
Total with conditions	*13*	*15*	*16*	*18*	*20*	*16*	*20*
Girls							
No long-term conditions	89	88	85	86	84	87	83
Limiting long-term conditions	4	4	6	6	9	5	9
Non-limiting long-term conditions	7	8	8	8	7	8	8
Total with conditions	*11*	*12*	*15*	*14*	*16*	*13*	*17*
All children							
No long-term conditions	88	86	84	84	82	85	82
Limiting long-term conditions	5	5	7	7	10	6	10
Non-limiting long-term conditions	8	9	9	9	8	9	9
Total with conditions	*12*	*14*	*16*	*16*	*18*	*15*	*18*
Bases (weighted):							
Boys	*817*	*911*	*767*	*813*	*848*	*3505*	*651*
Girls	*818*	*882*	*752*	*708*	*812*	*3341*	*631*
All children	*1635*	*1793*	*1519*	*1521*	*1660*	*6846*	*1282*
Bases (unweighted):							
Boys	*761*	*926*	*798*	*788*	*887*	*3470*	*690*
Girls	*759*	*914*	*766*	*699*	*829*	*3306*	*661*
All children	*1520*	*1840*	*1564*	*1487*	*1716*	*6776*	*1351*

Table 1.7   GHQ12, 2003, 2008-2011 combined, by age and sex

Aged 13-15   *2003, 2008-2011 combined*

GHQ12 score	Age			Total
	13	14	15	
	%	%	%	%
Boys				
0				
2003	78	78	61	72
2008-2011	75	70	65	70
1-3				
2003	16	21	31	23
2008-2011	19	24	25	23
4 or more				
2003	6	1	8	5
2008-2011	6	6	11	7
Girls				
0				
2003	68	68	61	66
2008-2011	74	57	54	62
1-3				
2003	20	19	28	22
2008-2011	20	28	32	26
4 or more				
2003	11	13	11	12
2008-2011	6	14	14	11
All children				
0				
2003	74	73	61	69
2008-2011	74	64	60	66
1-3				
2003	18	20	30	22
2008-2011	20	26	28	24
4 or more				
2003	8	7	9	8
2008-2011	6	10	12	9
Bases (weighted):				
Boys 2003	*109*	*94*	*105*	*308*
Boys 2008-2011	*243*	*227*	*218*	*688*
Girls 2003	*94*	*103*	*87*	*284*
Girls 2008-2011	*238*	*217*	*195*	*650*
All children 2003	*202*	*197*	*192*	*592*
All children 2008-2011	*481*	*444*	*413*	*1338*
Bases (unweighted):				
Boys 2003	*103*	*92*	*102*	*297*
Boys 2008-2011	*226*	*220*	*219*	*665*
Girls 2003	*93*	*101*	*93*	*287*
Girls 2008-2011	*226*	*221*	*202*	*649*
All children 2003	*196*	*193*	*195*	*584*
All children 2008-2011	*452*	*441*	*421*	*1314*

a Scores range from 0-12. Scores of 4+ indicate the presence of a possible
   psychiatric condition.

Table 1.8   Children's total difficulties scores, 2003, 2008/2009 combined, 2010/2011 combined, by age and sex

Aged 4-12   *2003, 2008/2009 combined, 2010/2011 combined*

Total difficulties score[a]	Age				Total
	4-5	6-7	8-9	10-12	
	%	%	%	%	%
Boys					
Normal (0-13)					
2003	79	83	81	79	81
2008/2009	91	85	83	81	84
2010/2011	84	83	84	82	83
Borderline (14-16)					
2003	14	7	6	10	9
2008/2009	5	5	6	7	6
2010/2011	7	7	7	7	7
Abnormal (17-40)					
2003	7	10	12	11	10
2008/2009	4	11	11	12	10
2010/2011	9	10	9	11	10
Mean					
2003	9.0	8.4	8.2	8.7	8.6
2008/2009	7.8	8.7	8.9	8.7	8.5
2010/2011	8.9	8.5	8.9	8.3	8.6
SE Mean					
2003	0.38	0.47	0.52	0.34	0.23
2008/2009	0.33	0.40	0.42	0.35	0.21
2010/2011	0.38	0.39	0.45	0.37	0.21
Median					
2003	8.0	8.0	7.0	8.0	7.9
2008/2009	8.0	8.0	8.0	7.0	7.9
2010/2011	8.0	7.0	8.0	7.0	7.0
Girls					
Normal (0-13)					
2003	81	86	86	86	85
2008/2009	92	90	85	84	87
2010/2011	87	84	90	90	88
Borderline (14-16)					
2003	11	7	8	6	8
2008/2009	5	4	6	10	7
2010/2011	7	10	5	4	6
Abnormal (17-40)					
2003	8	6	6	8	7
2008/2009	3	5	8	6	6
2010/2011	5	6	5	6	5

Continued…

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Table 1.8   - Continued

Aged 4-12   *2003, 2008/2009 combined, 2010/2011 combined*

Total difficulties score[a]	Age				Total
	4-5	6-7	8-9	10-12	
	%	%	%	%	%
Mean					
2003	8.8	7.9	7.4	7.3	7.8
2008/2009	7.4	7.7	7.6	7.5	7.5
2010/2011	7.8	7.7	6.9	7.1	7.3
SE Mean					
2003	0.48	0.31	0.44	0.34	0.21
2008/2009	0.29	0.34	0.39	0.31	0.18
2010/2011	0.34	0.44	0.44	0.30	0.19
Median					
2003	8.0	7.0	6.0	6.0	7.0
2008/2009	7.0	7.0	7.0	6.0	7.0
2010/2011	7.0	6.0	6.0	7.0	6.5
All children					
Normal (0-13)					
2003	80	85	83	82	83
2008/2009	91	87	84	82	86
2010/2011	86	84	87	86	86
Borderline (14-16)					
2003	12	7	7	8	8
2008/2009	5	5	6	8	6
2010/2011	7	8	6	6	7
Abnormal (17-40)					
2003	7	8	10	9	9
2008/2009	4	8	10	9	8
2010/2011	7	8	7	8	8
Mean					
2003	8.9	8.1	7.8	8.0	8.2
2008/2009	7.6	8.2	8.2	8.1	8.0
2010/2011	8.3	8.1	7.8	7.7	8.0
SE Mean					
2003	0.31	0.28	0.36	0.25	0.17
2008/2009	0.22	0.28	0.29	0.23	0.14
2010/2011	0.25	0.28	0.33	0.25	0.15
Median					
2003	8.0	7.0	6.9	7.0	7.0
2008/2009	7.0	7.0	7.0	7.0	7.0
2010/2011	7.0	7.0	7.0	7.0	7.0

Continued…

Table 1.8   - Continued

Aged 4-12   *2003, 2008/2009 combined, 2010/2011 combined*

Total difficulties score[a]	Age				Total
	4-5	6-7	8-9	10-12	
Bases (weighted):					
Boys 2003	*192*	*203*	*211*	*333*	*939*
Boys 2008/2009	*231*	*267*	*241*	*422*	*1161*
Boys 2010/2011	*210*	*250*	*181*	*354*	*995*
Girls 2003	*180*	*216*	*167*	*316*	*878*
Girls 2008/2009	*238*	*225*	*248*	*418*	*1130*
Girls 2010/2011	*227*	*192*	*201*	*346*	*966*
All children 2003	*372*	*419*	*378*	*649*	*1817*
All children 2008/2009	*469*	*492*	*490*	*840*	*2291*
All children 2010/2011	*437*	*441*	*382*	*700*	*1961*
Bases (unweighted):					
Boys 2003	*200*	*202*	*209*	*285*	*896*
Boys 2008/2009	*236*	*271*	*254*	*402*	*1163*
Boys 2010/2011	*224*	*257*	*190*	*320*	*991*
Girls 2003	*184*	*218*	*173*	*318*	*893*
Girls 2008/2009	*252*	*215*	*230*	*414*	*1111*
Girls 2010/2011	*233*	*178*	*185*	*313*	*909*
All children 2003	*384*	*420*	*382*	*603*	*1789*
All children 2008/2009	*488*	*486*	*484*	*816*	*2274*
All children 2010/2011	*457*	*435*	*375*	*633*	*1900*

a Percentage of 4 to 12 year olds with a 'borderline' or 'abnormal' total difficulties score on the Strengths and Difficulties Questionnaire (SDQ) is part of the national mental health indicator set for children.

Table 1.9   Children's individual strengths and difficulties scores, 2010/2011 combined, by age and sex

Strengths and difficulties scores[a]	Age				Total
	4-5	6-7	8-9	10-12	
	%	%	%	%	%
Boys					
Conduct Problem Score					
Normal (0-2)	69	76	76	81	76
Borderline (3)	18	13	15	10	14
Abnormal (4-10)	13	11	10	9	10
Emotional Symptoms Score					
Normal (0-3)	91	85	85	83	85
Borderline (4)	5	7	7	7	6
Abnormal (5-10)	4	9	9	11	9
Peer Problems Score					
Normal (0-2)	83	80	75	74	78
Borderline (3)	8	8	13	10	10
Abnormal (4-10)	8	12	12	16	13
Hyperactivity Score					
Normal (0-5)	72	77	74	81	77
Borderline (6)	11	7	12	6	8
Abnormal (7-10)	17	16	14	14	15
Prosocial Behaviour Score					
Normal (6-10)	85	90	91	93	90
Borderline (5)	10	8	5	5	7
Abnormal (0-4)	5	2	4	2	3
Girls					
Conduct Problem Score					
Normal (0-2)	73	78	86	86	81
Borderline (3)	15	12	9	6	10
Abnormal (4-10)	12	11	5	8	9
Emotional Symptoms Score					
Normal (0-3)	91	87	84	80	85
Borderline (4)	4	6	9	8	7
Abnormal (5-10)	5	7	8	11	8
Peer Problems Score					
Normal (0-2)	83	86	85	81	83
Borderline (3)	9	7	7	10	9
Abnormal (4-10)	8	8	8	8	8
Hyperactivity Score					
Normal (0-5)	80	78	86	90	84
Borderline (6)	10	10	5	4	7
Abnormal (7-10)	10	12	9	6	9

Continued…

Table 1.9 *- Continued*

Strengths and difficulties scores[a]	Age				Total
	4-5	6-7	8-9	10-12	
	%	%	%	%	%
Prosocial Behaviour Score					
Normal (6-10)	93	95	96	95	95
Borderline (5)	5	4	3	4	4
Abnormal (0-4)	2	1	1	2	1
All children					
Conduct Problem Score					
Normal (0-2)	71	77	81	83	79
Borderline (3)	17	13	12	8	12
Abnormal (4-10)	12	11	7	8	10
Emotional Symptoms Score					
Normal (0-3)	91	86	84	82	85
Borderline (4)	5	6	8	8	7
Abnormal (5-10)	5	8	8	11	8
Peer Problems Score					
Normal (0-2)	83	82	80	77	80
Borderline (3)	9	8	10	10	9
Abnormal (4-10)	8	10	10	12	10
Hyperactivity Score					
Normal (0-5)	76	77	80	85	80
Borderline (6)	10	8	9	5	8
Abnormal (7-10)	13	15	11	10	12
Prosocial Behaviour Score					
Normal (6-10)	89	92	94	94	92
Borderline (5)	7	6	4	4	5
Abnormal (0-4)	4	2	2	2	2
Bases (weighted):					
Boys	*209*	*249*	*179*	*353*	*990*
Girls	*226*	*192*	*201*	*344*	*963*
All children	*435*	*441*	*380*	*697*	*1953*
Bases (unweighted):					
Boys	*223*	*256*	*188*	*319*	*986*
Girls	*232*	*178*	*185*	*311*	*906*
All children	*455*	*434*	*373*	*630*	*1892*

a Children's individual Strengths and Difficulties scores are part of the national mental health indicator set for children.

Table 1.10 Self-assessed general health and prevalence of long-term conditions, 2008-2011 combined, by strengths and difficulties scores

Long-term conditions and limiting long-term conditions	Total difficulties score			Total
	Normal (0-13)	Borderline (14-16)	Abnormal (17-40)	
	%	%	%	%
Boys				
Self-assessed general health				
Very good	72	57	47	69
Good	24	36	36	26
Fair	3	6	15	4
Bad	0	1	2	0
Very bad	0	-	1	0
Very good/good	*97*	*93*	*83*	*95*
Very bad/bad	*0*	*1*	*2*	*0*
Long-term conditions and limiting long-term conditions				
No long-term conditions	85	75	52	81
Limiting long-term conditions	5	11	34	9
Non-limiting long-term conditions	10	15	14	11
Total with conditions	*15*	*25*	*48*	*19*
Girls				
Self-assessed general health				
Very good	73	43	44	69
Good	24	41	39	26
Fair	3	12	10	4
Bad	0	3	6	1
Very bad				
Very good/good	*97*	*85*	*83*	*95*
Very bad/bad	*0*	*3*	*6*	*1*
Long-term conditions and limiting long-term conditions				
No long-term conditions	88	75	65	85
Limiting long-term conditions	4	13	21	6
Non-limiting long-term conditions	8	12	15	9
Total with conditions	*12*	*25*	*35*	*15*
All children				
Self-assessed general health				
Very good	73	50	46	69
Good	24	39	37	26
Fair	3	9	13	4
Bad	0	2	3	1
Very bad	0	-	0	0
Very good/good	*97*	*89*	*83*	*95*
Very bad/bad	*0*	*2*	*4*	*1*

Continued…

Table 1.10   - Continued

Long-term conditions and limiting long-term conditions	Total difficulties score			Total
	Normal (0-13)	Borderline (14-16)	Abnormal (17-40)	
	%	%	%	%
Long-term conditions and limiting long-term conditions				
No long-term conditions	86	75	56	83
Limiting long-term conditions	5	12	29	7
Non-limiting long-term conditions	9	13	15	10
Total with conditions	*14*	*25*	*44*	*17*
Bases (weighted):				
Boys	*1805*	*139*	*215*	*2159*
Girls	*1841*	*140*	*120*	*2101*
All children	*3646*	*279*	*334*	*4260*
Bases (unweighted):				
Boys	*1811*	*138*	*206*	*2155*
Girls	*1787*	*129*	*107*	*2023*
All children	*3598*	*267*	*313*	*4178*

Table 1.11   Estimated odds ratios for borderline/abnormal total difficulties scores, 2008-2011 combined, by associated risk factors and sex

| Independent variables	Boys			Girls		
	Base (weighted) 2159	Odds ratio	95% CI	Base (weighted) 2101	Odds ratio	95% CI
Equivalised annual household income quintile		(p=0.053)			(p=0.002)	
1st (highest)	337	1.0		335	1.0	
2nd	433	0.80	0.47, 1.35	418	1.38	0.65, 2.92
3rd	388	0.77	0.45, 1.32	348	3.05	1.51, 6.13
4th	415	0.99	0.58, 1.70	369	1.97	0.98, 3.96
5th (lowest)	404	1.42	0.81, 2.48	369	3.41	1.63, 7.15
Question not answered	179	1.31	0.74, 2.33	184	2.21	1.01, 4.83
NS-SEC of household reference person		(p=0.169)			(p=0.025)	
Managerial & professional	833	1.0		813	1.0	
Intermediate	187	1.07	0.63, 1.83	187	1.00	0.55, 1.83
Small employers & own account workers	209	1.08	0.64, 1.81	191	0.97	0.49, 1.92
Lower supervisory & technical	234	1.25	0.78, 1.99	223	1.38	0.79, 2.40
Semi-routine & routine	631	1.32	0.90, 1.93	557	1.87	1.23, 2.85
Question not answered	62	2.73	1.31, 5.70	52	2.31	1.05, 5.08
Scottish Index of Multiple Deprivation quintile		(p=<0.001)			(p=0.085)	
5th (least deprived)	398	1.0		406	1.0	
4th	477	0.98	0.59, 1.62	460	0.96	0.51, 1.81
3rd	424	1.84	1.14, 2.99	407	1.42	0.77, 2.62
2nd	416	1.85	1.12, 3.04	326	1.38	0.73, 2.60
1st (most deprived)	441	2.42	1.48, 3.96	424	1.90	1.03, 3.49
Number of children in household		(p=0.743)			(p=0.003)	
1	545	1.0		480	1.0	
2	1193	0.86	0.64, 1.16	1168	0.61	0.41, 0.90
3	333	0.98	0.65, 1.47	316	0.99	0.63, 1.56
4 or more	85	0.86	0.46, 1.62	59	1.69	0.88, 3.26
Self-assessed general health		(p=<0.001)			(p=<0.001)	
Very good[a]	1480	1.0		1394	1.0	
Good	576	1.76	1.32, 2.36	537	2.30	1.64, 3.24
Fair/Bad/Very bad	100	3.95	2.52, 6.20	92	5.75	3.46, 9.55
Summary physical activity (including school)		(p=<0.001)			(p=0.588)	
Meets recommendations[b]	1691	1.0		1515	1.0	
Some activity	299	1.59	1.09, 2.32	329	0.83	0.53, 1.29
Low activity	166	2.17	1.42, 3.33	179	1.12	0.67, 1.84

a This category includes 1 boy who did not answer the question.
b This category includes 25 boys and 36 girls who did not answer the question.

Accidents

Chapter 2
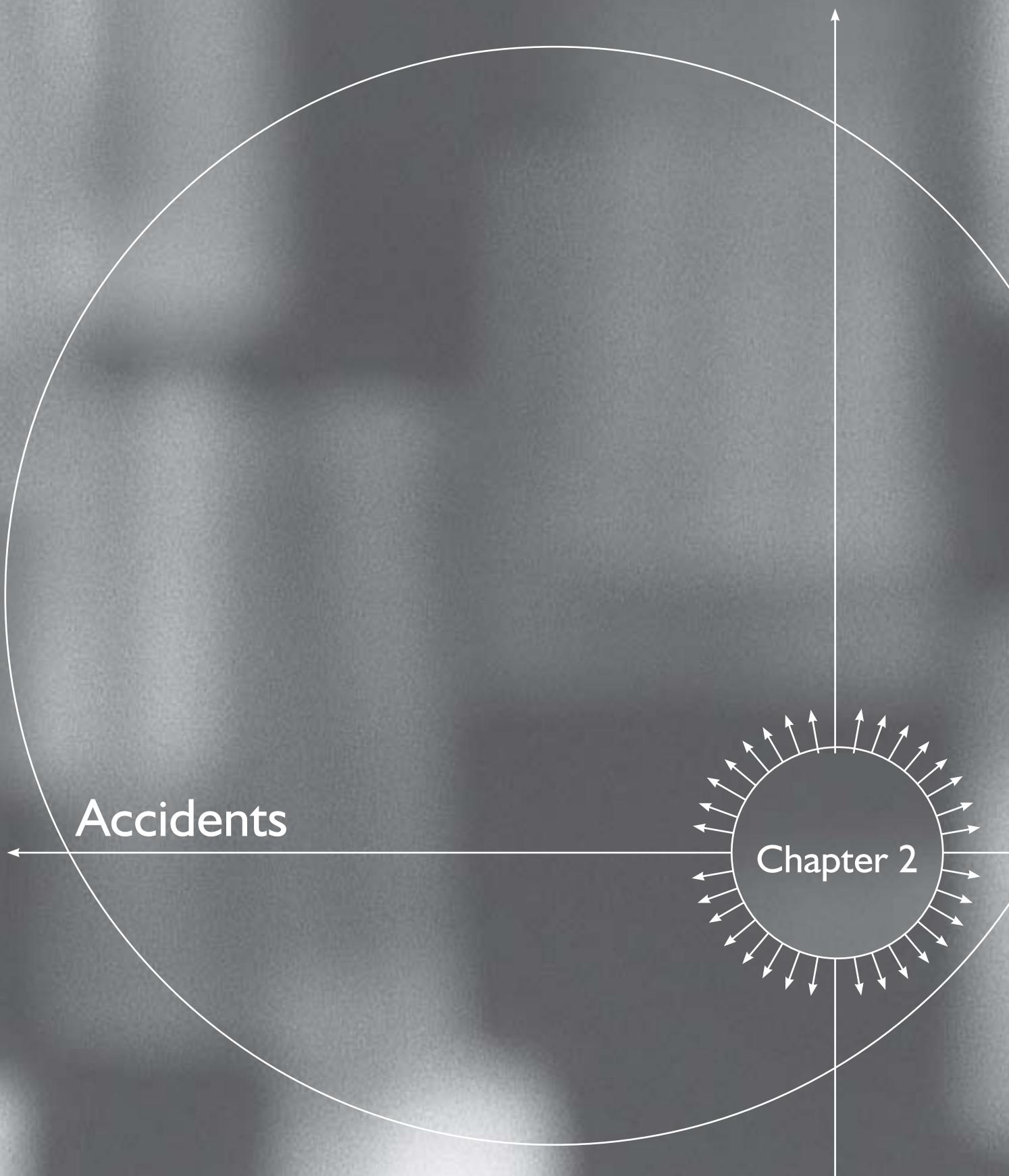
2   ACCIDENTS

Paul Bradshaw

SUMMARY

- In 2009/2011 combined 16% of boys and 12% of girls aged 0-15 reported having had at least one accident in the previous year where advice was sought from a doctor, nurse or other health professional, or which required a visit to hospital, or time to be taken off school.
- Boys had a significantly higher accident rate than girls in the 2009/2011 period (20 per 100 persons compared with 14 per 100 persons).
- There was a significant reduction in the accident rate for children aged 2-15 between 1998 and 2009/2011 from 21 per 100 to 18 per 100.
- Accident rates were not significantly associated with socio-economic classification, equivalised household income or Scottish Index of Multiple Deprivation.
- The most common cause of accidents for boys and girls was a fall, slip or trip (52%). These were particularly common for children aged 0-7 (67%).
- 38% of accidents to children occurred in the home or garden. This was a particularly likely accident location for children aged 0-7 (62%).
- The most commonly mentioned injuries were swelling or tenderness in some part of the body (30% of accidents); cuts or grazes (27%) and bruising, pinching or crushing (23%).
- Children aged 8-15 were more likely than those aged 0-7 to have experienced broken bones (27% compared with 11%), while the youngest age group were more than twice as likely as the oldest to have experienced cutting or grazing (41% compared with 18%).
- Boys were more likely than girls to have suffered broken bones (23% compared with 18%), whereas girls were more likely to have suffered bruising, pinching or crushing (25% compared with 21%).

2.1   INTRODUCTION

Figures for hospital admissions and deaths caused by accidents are reported by ISD Scotland.[1] In 2009/10, there were 8,511 emergency hospital admissions among children in Scotland as a result of accidents, accounting for one in seven of all emergency admissions for those aged under 16 years.[2] At all ages, boys are more likely than girls to have an emergency hospital admission following an accident. Deaths from accidents are thankfully rare - 16 were recorded in 2010 (the most recent year for which figures are available) - and administrative statistics suggest both deaths and hospital admissions caused by accidents have reduced in the last ten years. For example, compared with 2009/10, in 2002/03 there were almost twice as many deaths (31) and around 2,500 more emergency hospital admissions among children under 16 resulting from accidental injury.[3] However, accidents constitute a more common cause of death in children than in adults. Figures based on the 2002-2006 period showed that injuries were the leading cause of deaths among children aged 5-9 and 10-14, and among all children aged 1-14 in Scotland.[4] Deaths from accidents among children in Scotland also show marked socio-economic inequalities. In

the 2006-2010 period, the standardised mortality ratio was 54.7 in the least deprived area quintile compared with 119.3 in the most deprived quintile.[2]

The 2008 report of the Ministerial Taskforce on Health Inequalities *Equally Well* included a recommendation to target children from disadvantaged areas who are at greater risk of road traffic accidents.[5] Initiatives to reduce the incidence and severity of accidents in childhood focus on multiple settings, including the home (e.g. recent campaigns raising awareness of the risks of blind cords), outdoor play spaces, and roads and pavements. The Scottish Government works with a number of partner agencies to reduce accidents (the Royal Society for the Prevention of Accidents, the Child Accident Prevention Trust, Scottish Accident Prevention Council), and supports an annual child safety week to disseminate messages about accident prevention.

This chapter presents trends over time in accident rates, since 1998. It then looks in more detail at differences in accident rates by age and sex, and by socio-demographic characteristics. Participants were asked to report information about the cause, location and resulting injury (if any) of their most recent accident; figures on these aspects are also presented.

2.2   METHODS AND DEFINITIONS OF MEASUREMENT

2.2.1   Accident classification and recall period

The term 'accident' covers a very broad range of events from the extremely serious through to the relatively trivial. In order to concentrate on events which are most salient to those monitoring health in Scotland, the definition of 'accident' used in the Scottish Health Survey (SHeS) is any accident where advice was sought from a doctor, nurse or other health professional, or which caused time to be taken off school.

Participants were asked to recall any accidents they had had in the 12 months prior to the interview which fitted this definition.[6] Accident rates, however, are based only on those accidents about which advice was sought from a doctor or which required a visit to hospital.

All those who reported having at least one accident of this kind were then asked detailed questions about the nature and cause of the most recent accident. The reference period of 12 months before the interview was chosen so as to be sufficiently long to generate details of enough accidents for analysis, yet short enough for participants to be able to remember accurate details about their most recent accident.

2.2.2   Coverage of accidents

The survey covers most, but not all, accidents to children. Since SHeS collects data directly from participants, fatal accidents are excluded. In addition, there will be under-representation of accidents that lead to long-term hospitalisation. For these reasons, the accident rates presented in this chapter can best be described as non-fatal accident rates for the household population. These rates will be slight under-

estimates of the true accident rates for children because of the exclusions. However, since the great majority of accidents do not lead to long-term stays in hospitals, the downward bias should be small.

2.2.3 Accident rates and weighting to compensate for selection bias

The incidence of accidents to children is presented in terms of 'annual accident rates per 100 persons'. That is, the mean number of accidents over a 12 month period multiplied by 100.

Although participants were asked to specify the total number of accidents they had had over the period 12 months before the interview, detailed information was collected for only the most recent accident. This selection process leads to the over-representation of accidents occurring to children for whom accidents are relatively uncommon events, and this over-representation could, in principle at least, bias the survey estimates. For example, a child who had three accidents in the last year would contribute only as much information as a child who had just one accident. To avoid such bias, analyses that use the detailed data on the most recent accident use an additional 'accident weight', which is multiplied to the more general survey weight. The 'accident weight' per child is calculated as equal to the total number of accidents reported by that child in the 12 month reference period. In practice relatively few children reported having had two or more accidents, so the impact of the accident weight on estimates is fairly small.

2.2.4 Data collection years

The same information about accidents was collected in the 1998 and 2003 surveys. From 2008, the accidents module was asked biennially, and was included in the 2009 and 2011 surveys. It is next due to be asked in 2013. As many of the figures are based only on those children who had an accident, to increase the sample size available for analysis data from the 2009 and 2011 surveys have been combined to enable more robust estimates to be presented.

2.3 TRENDS IN ACCIDENT RATES SINCE 1998

Accident rates per 100 persons for 1998, 2003 and 2009/2011 combined, by age and sex are shown in Table 2.1. As infants aged 0-1 were not included in the 1998 survey, comparisons between the years are restricted to children aged 2-15.

Between 1998 and 2009/2011 combined, there was a significant reduction in the accident rate for children aged 2-15 from 21 per 100 persons to 18 per 100. The rate remained largely unchanged between 1998 and 2003, before reducing slightly in 2009/2011. The apparent reductions since 1998, in the accident rate for boys and girls separately were not statistically significant. In each survey year, the accident rate for girls has been lower than for boys.

The significant decline in accidents among children aged 2-15 reflects reductions in deaths and emergency hospital admissions among children under

16 resulting from accidental injury as seen in administrative health and population statistics between 2002/03 and 2009/10.[1,7]   **Table 2.1**

2.4 ACCIDENTS IN THE PREVIOUS YEAR, 2009 AND 2011 COMBINED BY AGE AND SEX

The remainder of this chapter focuses on accidents in 2009/2011 combined among children aged 0-15. Both the number of accidents and accident rates by age and sex are shown in Table 2.2.

In 2009/2011, 16% of boys and 12% of girls reported having had at least one accident where advice was sought from a doctor, nurse or other health professional, or which caused time to be taken off school. Just 3% of boys and 1% of girls had two or more accidents in the previous 12 months. Boys had a significantly higher accident rate than girls (20 per 100 persons compared with 14 per 100) and the highest accident rates were for boys aged 14-15 (37 per 100).   **Table 2.2**

2.5 ACCIDENT RATES BY SOCIO-DEMOGRAPHIC FACTORS

Tables 2.3 to 2.5 present accident rates for all children aged 0-15 by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (SIMD) (descriptions of each of these measures are available in the Glossary at the end of this volume).

2.5.1 Socio-economic classification (NS-SEC)

2009/2011 accident rates by NS-SEC are shown in Table 2.3. There was no clear relationship with NS-SEC and the accident rate for children living in managerial and professional households was the same as for those living in semi-routine and routine households (17 per 100 persons).   **Table 2.3**

2.5.2 Equivalised household income

The 2009/2011 accident rates by equivalised household income quintile are shown in Table 2.4. As with NS-SEC, there was no significant relationship between accident rates and household income. Indeed, the accident rate was very similar across all the income groups and the rate for children aged 0-15 in the lowest household income quintile was the same as that for those in the highest quintile (16 per 100 persons).
            Table 2.4

2.5.3 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").

Combined 2009/2011 accident rates by SIMD quintile are shown in Table 2.5. For children aged 0-15, the accident rate was slightly lower (but not significantly) for those living in the least deprived areas compared with those living in the most deprived areas (16 per 100 persons compared with 19 per 100). Accident rates did not consistently increase in line with deprivation - for example the rate for children aged 0-15 living in areas in the 4th quintile was equal to that for children living in areas in the most deprived quintile (19 per 100).

The pattern is similar when the accident rate for children living in the 85% least deprived areas in Scotland was compared with that for those living in the 15% most deprived areas. The accident rate for children living in both areas was almost identical (17 per 100 persons for children in the 85% least deprived areas and 18 per 100 for those in the most deprived 15% of areas in Scotland). Whilst there were some large differences within specific age groups – for example, the accident rate for children aged 11-15 living in the 85% least deprived areas was higher than for those of the same age living in the most deprived 15% of areas (26 per 100 persons compared with 18 per 100) – these differences were not significant. **Table 2.5**

2.6 CHARACTERISTICS OF ACCIDENTS, 2009 AND 2011 COMBINED

2.6.1 Causes of accidents

Participants who had at least one accident in the twelve months prior to interview were asked to describe the cause of the most recent accident and interviewers coded responses using the following options:

- hit by a falling object
- fall, slip or trip
- road traffic accident
- sports or recreational accident
- use of tool of implement, or piece of electrical or mechanical equipment
- burn or scald
- animal or insect bite or sting
- another person (including attacks).

Some caution is needed in the interpretation of the data on cause of accident derived from this interviewer coding. What is coded in individual cases will depend firstly upon how the participant describes the accident and secondly on how the interviewer interprets that description. For example, an accident in which a child sprains their ankle when playing football may be described as a fall by one participant ("I fell and sprained my ankle") or as a sporting accident by another ("I sprained my ankle when I was out playing football"). If the participant describes the accident to the interviewer as „I fell and sprained my ankle' then some interviewers may code this as a fall or slip automatically whereas others may probe further, establish that the

informant was playing football at the time of the fall, and code it as a sports accident. Interviewers were briefed to code more than one cause per accident if appropriate, the intention being to collect as full a description of the accident as possible in order to avoid misclassification. One implication of the ambiguity in coding is that accident rates cannot be readily derived for different types of accident.

Table 2.6 shows the causes of accidents, by age and sex for 2009/2011 combined. The most common cause of accident for boys and girls was a fall, slip or trip (52% of accidents). The only exception was among boys aged 8-15 for whom a sports or recreational accident was most common (47%). Falls, slips and trips were particularly common among children aged 0-7 (67% of accidents) though this cause reduced with age. In contrast, sports and recreational accidents increased with age; from 7% of accidents among children aged 0-7 to 41% of accidents among those aged 8-15. From the age of eight, boys were more prone to sports and recreational accidents than girls. 47% of boys aged 8-15 reported having such an accident, considerably higher than the 29% of girls who also did so.   **Table 2.6**

2.6.2   Locations of accidents

The location of the most recent accident by age and sex for 2009/2011 combined is presented in Table 2.7. The patterns for locations of accidents by age and sex are similar to those seen in relation to causes of accidents, reflecting both the fact that location and cause are related and that lifestyles and activities vary by age and sex.

The most common location for an accident was in a home or garden (38% of accidents), though many also occurred in a place used for sport, play or recreation (31%). A home or garden was a particularly likely accident location for younger children. 62% of accidents among children aged 0-7 took place here compared with 19% of accidents to children aged 8-15. Older children were considerably more likely to have an accident away from home, particularly in places for sports or recreation. 44% of the accidents to children aged 8-15 occurred in places for sports or recreation. Among older children, boys were more likely than girls to have had an accident outside of a home or garden. 87% of accidents to boys aged 8-15 happened somewhere other than a home or garden compared with 72% of accidents to girls in the same age group.   **Table 2.7**

2.6.3   Types of injury

Participants were asked to describe the injuries caused by their most recent accident using twelve categories of injury which were presented to them on a card; interviewers were briefed to probe for more than one kind of injury where appropriate:

- broken bones
- dislocated joints
- losing consciousness

- straining or twisting a part of the body
- cutting, piercing or grazing a part of the body
- bruising, pinching or crushing a part of the body
- swelling or tenderness in some part of the body
- something stuck in the eye, throat, ear or other part of the body
- burning or scalding
- poisoning
- other injury to internal parts of the body
- animal or insect bite or sting.

The distribution of types of injury by age and sex for 2009/2011 combined is shown in Table 2.8. The most common injury reported for all children who had an accident in the previous year was swelling or tenderness (30%), with cuts or grazes also relatively common (27%). Bruising, pinching or crushing (23%), broken bones (21%) and straining or twisting (19%) were less common, but occurred considerably more often than dislocation (5%) or burning or scalding (3%).

Boys were more likely than girls to suffer broken bones – particularly among those aged 8-15 – and swelling or tenderness. In contrast, girls were more likely to suffer bruising, pinching or crushing (25% compared with 21%). The oldest age group were more likely than the youngest to have experienced broken bones (27% compared with 11%), straining or twisting (29% compared with 2%) and swelling or tenderness (34% compared with 23%). The youngest age group however, were more than twice as likely as the oldest to have experienced cutting or grazing (41% compared with 18%). **Table 2.8**

References and notes

1 ISD's preferred term for accidents is "unintentional injury" due to concerns that the term "accidents" underplays the preventable nature of many accidents. As SHeS used the term "accidents" in the 1998 and 2003 reports, and in the questionnaire asked of participants, this chapter will describe unintentional injuries as "accidents".

2 Information Services Division. (2010). *Unintentional injuries; Admissions: Year ending 31 March 2010*, *Deaths: Year ending 31 December 2009*, Edinburgh: NHS National Services Scotland http://www.isdscotland.org/Health-Topics/Emergency-Care/Publications/2011-12-20/2011-12-20-UI-Report.pdf?1574343443.

3 ISD statistics reported in Scholes, S. (2005) Chapter 7: Accidents in Bromley, C., Sproston, K. and Shelton, N. (Eds.) *The Scottish Health Survey 2003 - Volume 3: Children Report,* Edinburgh: Scottish Executive.

4 Pearson, J. and Stone. D. (2009). Pattern of injury mortality by age-group in children aged 0–14 years in Scotland, 2002–2006, and its implications for prevention. *BMC Pediatrics*. 9: 26.

5 *Equally Well – Report of the Ministerial Taskforce on Health Inequalities*, Edinburgh: Scottish Government, 2008.

6 Children aged 13-15 were asked the questions directly, with a parent or guardian present. For children aged 0-12, a parent or guardian answered the questions, with the children themselves present.

7 2002/03 ISD statistics reported in Scholes, S. (2005) Chapter 7: Accidents in Bromley, C., Sproston, K. and Shelton, N. (Eds.) The Scottish Health Survey 2003 - Volume 3: Children Report, Edinburgh: Scottish Executive.

Table list

Table 2.1   Accident rates, 1998, 2003, 2009 and 2011 combined, by age and sex

Aged 0-15   *1998, 2003, 2009 and 2011 combined*

Accident rate	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
					Per 100 persons				
Boys									
1998									
Accident rate	n/a	28	19	19	24	24	32	31	25
Standard error of the accident rate	n/a	4.9	4.2	3.8	4.6	4.0	4.7	5.0	1.7
2003									
Accident rate	12	25	17	16	20	24	40	30	25
Standard error of the accident rate	2.7	4.0	3.1	3.3	4.0	4.1	5.6	4.4	1.7
2009 and 2011									
Accident rate	10	17	11	16	11	22	36	37	22
Standard error of the accident rate	2.6	3.7	2.7	4.1	2.7	4.5	5.8	5.8	1.8
Girls									
1998									
Accident rate	n/a	16	13	14	11	17	28	16	17
Standard error of the accident rate	n/a	3.8	3.3	2.9	2.8	3.5	4.7	3.8	1.4
2003									
Accident rate	10	18	11	14	16	20	14	17	16
Standard error of the accident rate	2.7	3.9	2.5	3.6	3.5	3.7	3.5	3.7	1.3
2009 and 2011									
Accident rate	9	19	12	12	15	14	13	16	14
Standard error of the accident rate	2.1	3.9	2.6	3.0	3.5	3.0	3.7	3.7	1.3
All children									
1998									
Accident rate	n/a	22	16	17	18	21	30	24	21
Standard error of the accident rate	n/a	3.1	2.7	2.4	2.8	2.7	3.3	3.2	1.1
2003									
Accident rate	11	21	14	15	18	22	27	24	20
Standard error of the accident rate	1.9	2.7	2.0	2.4	2.7	2.7	3.3	2.9	1.1
2009 and 2011									
Accident rate	10	18	12	14	13	18	24	27	18
Standard error of the accident rate	1.8	2.7	1.9	2.7	2.3	2.8	3.6	3.6	1.1

Continued…

Table 2.1   *- Continued*

Accident rate	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
Bases (weighted):									
Boys 1998	*n/a*	*146*	*155*	*163*	*157*	*162*	*159*	*154*	*1096*
Boys 2003	*185*	*190*	*203*	*207*	*220*	*231*	*240*	*223*	*1514*
Boys 2009/2011	*170*	*162*	*169*	*163*	*132*	*171*	*163*	*158*	*1118*
Girls 1998	*n/a*	*139*	*149*	*155*	*149*	*153*	*153*	*147*	*1045*
Girls 2003	*173*	*195*	*187*	*225*	*178*	*238*	*220*	*204*	*1448*
Girls 2009/2011	*175*	*151*	*143*	*136*	*157*	*162*	*168*	*140*	*1057*
All children 1998	*n/a*	*286*	*305*	*318*	*306*	*315*	*312*	*301*	*2142*
All children 2003	*359*	*385*	*390*	*432*	*398*	*470*	*461*	*427*	*2961*
All children 2009/2011	*345*	*313*	*312*	*298*	*289*	*333*	*331*	*298*	*2175*
Bases (unweighted):									
Boys 1998	*n/a*	*308*	*261*	*279*	*281*	*284*	*292*	*282*	*1987*
Boys 2003	*191*	*204*	*209*	*208*	*217*	*193*	*219*	*213*	*1463*
Boys 2009/2011	*164*	*156*	*170*	*169*	*141*	*167*	*159*	*164*	*1126*
Girls 1998	*n/a*	*268*	*272*	*263*	*259*	*296*	*275*	*271*	*1904*
Girls 2003	*199*	*205*	*191*	*226*	*184*	*239*	*216*	*206*	*1467*
Girls 2009/2011	*179*	*163*	*150*	*128*	*148*	*157*	*164*	*141*	*1051*
All children 1998	*n/a*	*576*	*533*	*542*	*540*	*580*	*567*	*553*	*3891*
All children 2003	*390*	*409*	*400*	*434*	*401*	*432*	*435*	*419*	*2930*
All children 2009/2011	*343*	*319*	*320*	*297*	*289*	*324*	*323*	*305*	*2177*

Table 2.2   Number of accidents in twelve months prior to interview, 2009 and 2011 combined, by age and sex

Number of accidents and accident rate	Age								Total
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
	%	%	%	%	%	%	%	%	%
Boys									
0	91	86	90	87	89	83	73	74	84
1	8	12	9	11	11	13	21	20	13
2	1	2	1	2	-	3	5	3	2
3+	-	1	-	0	-	1	2	3	1
Accident rate per 100 persons	10	17	11	16	11	22	36	37	20
Standard error of the accident rate	2.6	3.7	2.7	4.1	2.7	4.5	5.8	5.8	1.6
Girls									
0	92	81	88	88	87	88	90	87	88
1	8	19	12	11	11	10	7	11	11
2	0	0	-	1	1	2	2	1	1
3+	-	-	-	-	1	-	1	1	0
Accident rate per 100 persons	9	19	12	12	15	14	13	16	14
Standard error of the accident rate	2.1	3.9	2.6	3.0	3.5	3.0	3.7	3.7	1.1
All children									
0	91	83	89	88	88	85	82	80	86
1	8	15	11	11	11	12	14	16	12
2	1	1	1	1	1	2	3	2	1
3+	-	0	-	0	0	0	1	2	1
Accident rate per 100 persons	10	18	12	14	13	18	24	27	17
Standard error of the accident rate	1.8	2.7	1.9	2.7	2.3	2.8	3.6	3.6	1.0
Bases (weighted):									
Boys	*170*	*162*	*169*	*163*	*132*	*171*	*163*	*158*	*1288*
Girls	*175*	*151*	*143*	*136*	*157*	*162*	*168*	*140*	*1232*
All children	*345*	*313*	*312*	*298*	*289*	*333*	*331*	*298*	*2520*
Bases (unweighted):									
Boys	*164*	*156*	*170*	*169*	*141*	*167*	*159*	*164*	*1290*
Girls	*179*	*163*	*150*	*128*	*148*	*157*	*164*	*141*	*1230*
All children	*343*	*319*	*320*	*297*	*289*	*324*	*323*	*305*	*2520*

Table 2.3   Accident rates, 2009 and 2011 combined, by NS-SEC of household reference person, age and sex

Age; Accident rate	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi routine & routine
	%	%	%	%	%
Boys					
0-15					
Accident rate	19	29	19	19	21
Standard error of the accident rate	2.3	8.7	5.5	4.5	2.8
Girls					
0-15					
Accident rate	15	18	7	11	14
Standard error of the accident rate	1.9	4.8	2.2	3.0	2.1
All children					
0-5					
Accident rate	13	22	6	6	15
Standard error of the accident rate	2.0	5.9	2.5	2.3	2.3
6-10					
Accident rate	15	20	5	13	15
Standard error of the accident rate	2.3	6.2	2.5	5.9	3.0
11-15					
Accident rate	23	28	26	35	23
Standard error of the accident rate	3.2	12.2	7.6	6.8	3.9
All 0-15					
Accident rate	17	23	13	15	17
Standard error of the accident rate	1.5	4.9	3.0	2.5	1.7
Bases (weighted):					
Boys 0-15	*526*	*106*	*124*	*134*	*357*
Girls 0-15	*468*	*114*	*119*	*124*	*361*
All children 0-5	*385*	*91*	*84*	*111*	*263*
All children 6-10	*280*	*59*	*71*	*85*	*237*
All children 11-15	*329*	*69*	*89*	*62*	*218*
All children 0-15	*994*	*220*	*243*	*258*	*718*
Bases (unweighted):					
Boys 0-15	*525*	*110*	*117*	*135*	*363*
Girls 0-15	*483*	*117*	*112*	*125*	*354*
All children 0-5	*397*	*94*	*77*	*112*	*268*
All children 6-10	*280*	*60*	*71*	*84*	*231*
All children 11-15	*331*	*73*	*81*	*64*	*218*
All children 0-15	*1008*	*227*	*229*	*260*	*717*

Table 2.4   Accident rates, 2009 and 2011 combined, by equivalised household income, age and sex

Aged 0-15   *2009 and 2011 combined*

Age; Accident rate	Equivalised annual household income quintile				
	1st (highest)	2nd	3rd	4th	5th (lowest)
	%	%	%	%	%
Boys					
0-15					
Accident rate	19	17	21	20	18
Standard error of the accident rate	4.2	2.8	3.3	4.0	3.1
Girls					
0-15					
Accident rate	13	15	12	14	14
Standard error of the accident rate	3.1	2.6	2.3	2.8	2.6
All children					
0-5					
Accident rate	9	14	12	16	11
Standard error of the accident rate	2.4	2.9	2.8	3.5	2.6
6-10					
Accident rate	17	14	11	11	17
Standard error of the accident rate	4.3	3.2	3.2	2.9	3.7
11-15					
Accident rate	25	22	26	24	21
Standard error of the accident rate	6.7	4.1	4.4	5.3	4.9
All 0-15					
Accident rate	16	16	17	17	16
Standard error of the accident rate	2.8	2.0	2.1	2.4	2.0
Bases (weighted):					
Boys 0-15	*208*	*240*	*231*	*222*	*245*
Girls 0-15	*201*	*199*	*207*	*256*	*225*
All children 0-5	*178*	*205*	*158*	*174*	*166*
All children 6-10	*109*	*115*	*132*	*142*	*162*
All children 11-15	*123*	*120*	*148*	*161*	*142*
All children 0-15	*409*	*439*	*438*	*477*	*470*
Bases (unweighted):					
Boys 0-15	*203*	*250*	*239*	*223*	*231*
Girls 0-15	*210*	*206*	*214*	*259*	*203*
All children 0-5	*182*	*216*	*165*	*176*	*155*
All children 6-10	*108*	*118*	*139*	*143*	*150*
All children 11-15	*123*	*122*	*149*	*163*	*129*
All children 0-15	*413*	*456*	*453*	*482*	*434*

Table 2.5   Accident rates, 2009 and 2011 combined, by Scottish Index of Multiple Deprivation, age and sex

Age; Accident rate	Scottish Index of Multiple Deprivation					SIMD 85/15	
	5th (least deprived)	4th	3rd	2nd	1st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Boys							
0-15							
Accident rate	17	25	17	19	22	20	21
Standard error of the accident rate	3.3	4.2	3.2	3.1	3.4	1.8	3.8
Girls							
0-15							
Accident rate	15	13	11	14	15	13	16
Standard error of the accident rate	2.9	2.2	2.5	2.5	2.5	1.2	2.9
All children							
0-5							
Accident rate	13	11	10	15	16	12	18
Standard error of the accident rate	2.6	2.2	2.6	3.3	3.0	1.3	3.5
6-10							
Accident rate	14	15	12	10	18	13	19
Standard error of the accident rate	3.0	3.3	2.9	3.2	4.3	1.6	5.0
11-15							
Accident rate	22	32	21	25	22	26	18
Standard error of the accident rate	4.8	5.7	4.3	4.3	4.5	2.6	4.4
All 0-15							
Accident rate	16	19	14	17	19	17	18
Standard error of the accident rate	2.2	2.5	2.0	2.1	2.1	1.1	2.3
Bases (weighted):							
Boys 0-15	*267*	*284*	*240*	*246*	*251*	*1091*	*198*
Girls 0-15	*261*	*253*	*219*	*263*	*236*	*1042*	*189*
All children 0-5	*190*	*200*	*176*	*212*	*193*	*814*	*157*
All children 6-10	*166*	*147*	*138*	*149*	*158*	*629*	*128*
All children 11-15	*173*	*190*	*145*	*148*	*137*	*690*	*102*
All children 0-15	*528*	*537*	*459*	*509*	*487*	*2133*	*387*
Bases (unweighted):							
Boys 0-15	*252*	*283*	*243*	*242*	*270*	*1079*	*211*
Girls 0-15	*249*	*262*	*222*	*253*	*244*	*1029*	*201*
All children 0-5	*182*	*208*	*179*	*205*	*208*	*812*	*170*
All children 6-10	*151*	*147*	*141*	*148*	*162*	*617*	*132*
All children 11-15	*168*	*190*	*145*	*142*	*144*	*679*	*110*
All children 0-15	*501*	*545*	*465*	*495*	*514*	*2108*	*412*

Table 2.6   Causes of accidents, 2009 and 2011 combined, by age and sex

Aged 0 -15 who had an accident in the previous year   *2009 and 2011 combined*

Cause of accident	Age		Total
	0-7	8-15	
	%	%	%
Boys			
Hit by a falling object	6	2	3
Fall, slip or trip	62	35	45
Road traffic accident	1	1	1
Sports or recreational accident	7	47	33
Use of tool, implement or equipment	4	2	3
Burn or scald	5	1	3
Animal or insect bite or sting		1	0
Another person	7	6	6
Lifting	1	-	0
Other	9	9	9
Girls			
Hit by a falling object	3	2	2
Fall, slip or trip	72	54	63
Road traffic accident	2	3	3
Sports or recreational accident	7	29	19
Use of tool, implement or equipment	0	1	1
Burn or scald	2	4	3
Animal or insect bite or sting	-	1	1
Another person	2	5	4
Lifting	-	-	-
Other	12	3	7
All children			
Hit by a falling object	4	2	3
Fall, slip or trip	67	42	52
Road traffic accident	2	2	2
Sports or recreational accident	7	41	27
Use of tool, implement or equipment	2	2	2
Burn or scald	4	2	3
Animal or insect bite or sting	-	1	1
Another person	5	6	6
Lifting	1	-	0
Other	10	7	8
Bases (weighted):			
Boys	*90*	*169*	*259*
Girls	*78*	*90*	*168*
All children	*168*	*259*	*427*
Bases (unweighted):			
Boys	*76*	*131*	*207*
Girls	*78*	*75*	*153*
All children	*154*	*206*	*360*

Note: Columns add to more than 100% because in a few cases more than one injury was recorded.

Table 2.7   Location of accident, 2009 and 2011 combined, by age and sex

Aged 0 -15 who had an accident in the previous year   *2009 and 2011 combined*

| Location of accident	Age		Total
	0-7	8-15	
	%	%	%
Boys			
In a home or garden	66	13	33
In a place used for sport, play or recreation	8	48	33
Outdoors, pavement or road	18	23	21
School or other public building	8	15	12
Other	-	1	0
Girls			
In a home or garden	59	28	44
In a place used for sport, play or recreation	18	37	27
Outdoors, pavement or road	17	20	18
School or other public building	7	11	9
Other	-	4	2
All children			
In a home or garden	62	19	38
In a place used for sport, play or recreation	13	44	31
Outdoors, pavement or road	17	22	20
School or other public building	7	14	11
Other	-	2	1
Bases (weighted):			
Boys	*77*	*129*	*206*
Girls	*76*	*74*	*151*
All children	*153*	*204*	*357*
Bases (unweighted):			
Boys	*76*	*131*	*207*
Girls	*78*	*75*	*153*
All children	*154*	*206*	*360*

Table 2.8   Types of injury, 2009 and 2011 combined, by age and sex

Aged 0-15 who had an accident in the previous year   *2009 and 2011 combined*

Type of injury	Boys		Total Boys	Girls		Total Girls	Total 0-7	Total 8-15	Total
	0-7	8-15	0-15	0-7	8-15	0-15			
	%	%	%	%	%	%	%	%	%
Broken bones	12	28	23	11	24	18	11	27	21
Dislocated joints	3	7	5	6	4	5	4	6	5
Losing consciousness	-	3	2	-	1	1	-	2	1
Straining or twisting a part of the body	-	29	19	4	31	18	2	29	19
Cutting, piercing or grazing a part of the body	45	18	27	38	18	27	41	18	27
Bruising, pinching or crushing a part of the body	19	23	21	30	22	25	24	22	23
Swelling or tenderness in some part of the body	25	36	32	22	31	27	23	34	30
Getting something stuck in the eye, throat, ear or other part of the body	3	3	3	2	1	2	3	2	2
Burning or scalding	5	1	3	2	4	3	4	2	3
Poisoning	-	1	0	-	-	-	-	0	0
Other injury to internal parts of the body	-	1	1	-	1	1	-	1	1
Animal or insect bite or sting	-	-	-	-	1	1	-	0	0
Other injury	8	3	5	4	2	3	6	3	4
Bases (weighted):	*90*	*169*	*259*	*78*	*90*	*168*	*168*	*259*	*427*
Bases (unweighted):	*76*	*131*	*207*	*78*	*75*	*153*	*154*	*206*	*360*

Note: Columns add to more than 100% because in a few cases more than one injury was recorded.
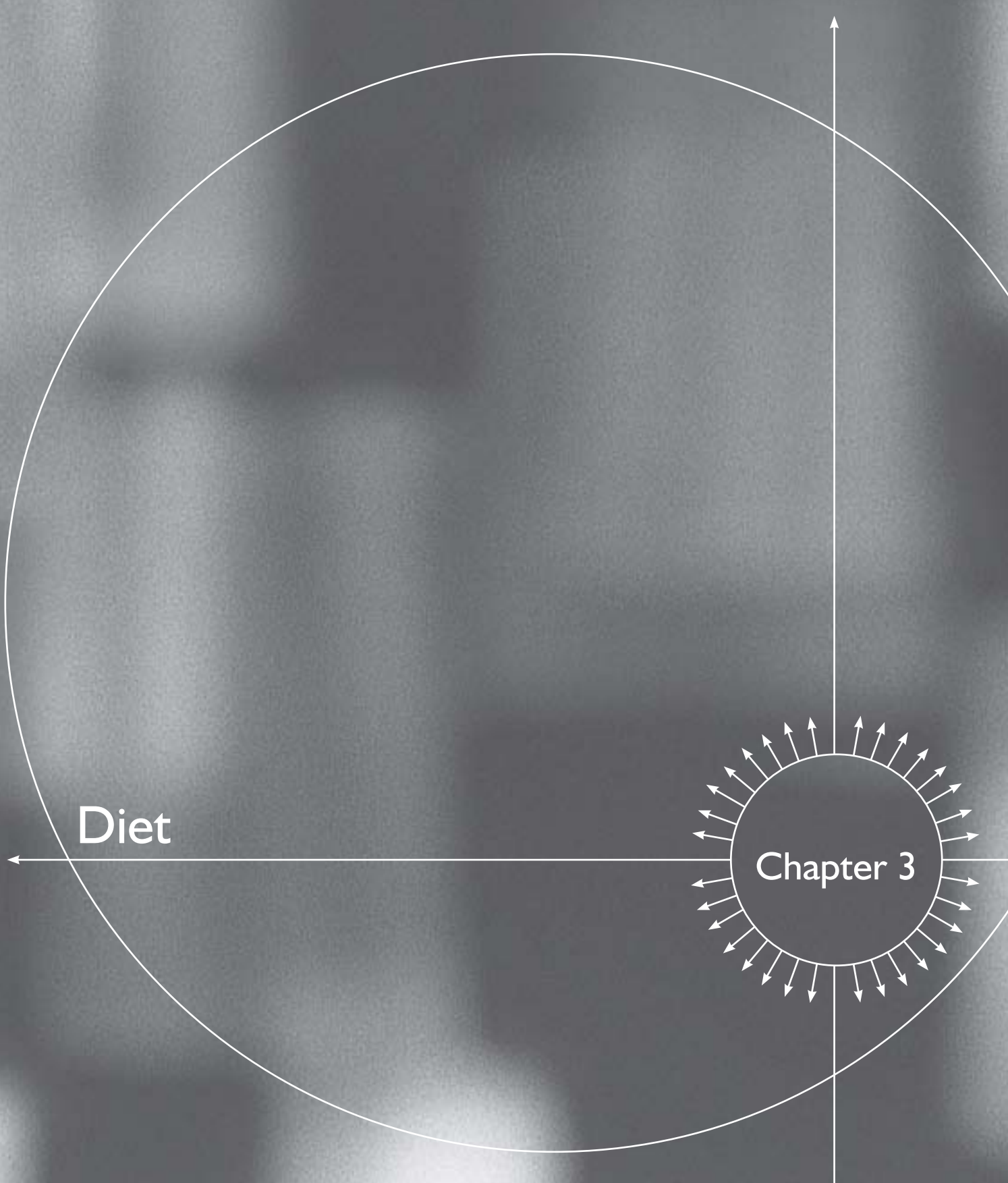
Diet

Chapter 3

3 DIET

Linsay Gray and Alastair H Leyland

SUMMARY

- In 2011, children aged 2-15 consumed a mean of 2.7 portions of fruit and vegetables per day (2.7 for boys and 2.8 for girls).

- Between 2003 and 2011 there was no significant change in the mean portions of fruit and vegetables consumed or the proportion of children meeting the recommendation to eat five or more portions.

- 13% of boys and 12% of girls met the recommended daily intake of five or more portions of fruit and vegetables per day in 2011.

- Children's mean daily consumption of fruit and vegetables varied significantly with age, varying from 3.2 portions among those aged 2-4 to 2.5 for those aged 13-15.

- One in ten children (9%) consumed no portions of fruit and vegetables with the likelihood of doing this increasing significantly with age. 5% of children aged 2-4 consumed no portions of fruit and vegetables compared with 14% of those aged 13-15.

- Children with at least one parent who met the recommended daily intake of fruit and vegetables consumed more portions on average, and were more likely to meet the recommended daily intake, than children with parents who did not meet the recommendations.

- There have been some improvements to children's diets since 2003. Consumption of oily fish (once a week or more) among children rose from 8% in 2003 to 14% in 2010/2011. White fish consumption (once a week or more) also increased in this period from 42% to 49%.

- Since 2003 the proportions eating some unfavourable food items has decreased. For example, the proportion of children aged 2-15 consuming crisps once a day or more decreased from 52% to 38% in 2010/2011. Consumption of chips two or more times a week also fell from 54% in 2003 to 42% in 2010/2011.

- There has however been a slight decrease in the proportion of children eating tuna fish once a week or more (from 33% to 29% in 2010/2011) and an increase in the proportion eating red meat two or more times a week (from 53% to 58% in 2010/2011).

- Eating habits were broadly similar for boys and girls, with some notable exceptions. In 2010/2011, boys were more likely than girls to eat meat products at least twice a week (43% versus 35%) and biscuits once a day or more (44% versus 36%), whereas girls were more likely than boys to eat tuna fish at least once a week (33% versus 25%).

3.1 INTRODUCTION

Much of Scotland's poor health can be attributed to its unhealthy diet. Previous research has shown that children and young people in Scotland follow a diet that falls short of national recommendations and is less healthy than that of children in other European countries.[1] Low consumption of fruit and vegetables is a risk factor for cardiovascular disease, cancer, hypertension, type 2 diabetes and obesity. 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.

The fruit and vegetable consumption chapter in the 2008 and 2010 Scottish Health Survey (SHeS) reports[2] and the diet chapter in the 2009 report[3] provided overviews of the policy context from the mid 1990s onwards. 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. These included:

- The Scottish Diet Action Plan,[4] which outlined the Scottish Dietary Targets.[5]
- The White Paper *Towards a Healthier Scotland.*[6]
- The Scottish Executive's *Improving Health in Scotland – the Challenge* paper.[7]
- The Hungry for Success initiative.[8]
- A framework for implementing the Diet Action Plan: *Eating for health meeting the challenge.*[9]
- The Scottish Government's *Better Health, Better Care Action Plan.*[10]
- *Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity (2008-2011).*[11]
- The Scottish Government's *Preventing Obesity Route Map.*[12]
- The Schools (Health Promotion and Nutrition) (Scotland) Act.[13]

Children and young people feature prominently in the Scottish Government's *Preventing Obesity Route Map Action Plan*[14] published in 2011. The plan includes actions to reduce energy consumption and encourage active living with the long-term goal to reduce overweight and obesity in the Scottish population. It outlines strategies for liaising with the food and drink industries, consumer groups, schools and the public sector, focusing on education, facilitating behaviour change and reshaping food environments by addressing food product reformulation, portion sizes, stocking policies, pricing, labelling and packaging, and marketing. Allied to the Action Plan, a set of 16 indicators and associated desired outcomes will help monitor its progress.[15] SHeS provides data for 7 of the indicators including the long-term goal of *'less children in Scotland overweight and obese'.*[16]

The school environment plays a vital role in improving children's diets, by providing healthy food and drinks to pupils and supporting children and young people to make healthy choices. School meal standards and the school environment have improved through policy and legislation.[17,18] A pilot project carried out in Glasgow in which S1 pupils in 8 schools were encouraged to stay in school at lunchtime, eat healthily and take part in activities was perceived to be successful in encouraging pupils to stay on site. School meal uptake rates among the S1 pupils remained higher than the previous year.[19]

Children's food purchases and consumption during and around the school day - but outwith school grounds - are also being examined. A recent study assessing the quality of popular foods purchased by pupils from outlets near five Glasgow secondary schools against Scottish nutrient standards for school lunches found

a large contrast with the nutritional quality of the food available within school.[20] It also noted that many secondary pupils who eat out of school at lunch time buy unhealthy convenience food of very poor nutritional quality. In addition to assessing progress towards the Scottish Dietary Targets, the most recent of the Food Standards Agency in Scotland's national studies of children's diets also explored food purchases outwith school. Results from the study are due to be published in autumn 2012.

The association between healthy weight and wellbeing noted above has also been reflected in the new National Mental Health Indicators for children and young people in Scotland.[21] The *percentage of 2 to 15 year olds who ate five or more portions of fruit and vegetables in the previous day* is one of the indicators and has been included as part of the individual contextual domain as a measure of healthy living.

Detailed measures of fruit and vegetable consumption were introduced into SHeS in 2003 and have been included annually since 2008. This chapter updates the trends in fruit and vegetable consumption among children since 2003 and examines the association between child fruit and vegetable consumption and parental consumption patterns. The trend in children's eating habits since 2003 is also explored.

3.2 METHODOLOGY

3.2.1 Measures of eating habits

Two different modules of questions were used to assess eating habits. One assessed fruit and vegetable consumption, and was designed to provide sufficient detail to monitor the '5-a-day' policy effectively. Each year this module is asked of all adults and children aged 2 and over. The second has been asked of children aged 2-15 annually since 2008. It uses 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 reports the findings from the fruit and vegetable module for children. It also presents 2008/2009 and 2010/2011 results for the adapted DINE questionnaire.

Fruit and vegetable module
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.

In the absence of consistent guidelines about the recommended daily intake of fruit and vegetables for children (in terms of grams per day rather than number of portions), portion sizes were standardised in this study as 80g (or one glass of 100% fruit juice) for both adults and children.[23] 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.

The DINE questionnaire

Some small changes were made to the DINE questionnaire from 2008 onwards to better meet the Scottish Government's information needs about diet:

- The question about breakfast cereal was amended to measure sugar content as well as fibre.
- The bread question removed the option "soft-grain" and added an explicit code for wholemeal/white hybrid breads.[24]
- The question about spreading fats (butter / margarine) was cut.
- A new instruction was added to the question about non-diet soft drinks to cover flavoured waters.
- New questions about diet / low calorie soft-drinks, milk (for children) and plain water (tap or bottled) were added.

3.3 FRUIT AND VEGETABLE CONSUMPTION

3.3.1 Trends in child consumption of fruit and vegetables since 2003

Information on the quantity of fruit and vegetables children had consumed in the 24 hours prior to the interview is presented in Table 3.1 for 2003 onwards. The fruit and vegetable questions were asked of children aged 2-15 from 2008 onwards and aged 5-15 prior to this. For this reason, the trends in consumption patterns since 2003 are based on children aged 5-15.

The mean number of portions consumed by children aged 5-15 changed little over the period: in 2003 the mean number consumed was 2.6; it was 2.7 in both 2008 and 2009, and 2.6 in 2010 and 2011. The proportions consuming the recommended five or more portions of fruit and vegetables varied only slightly over the survey years: rising slightly from 12% in 2003 to 14% in both 2008 and 2009, before dropping back to 12% in 2010 where it remained in 2011. Portions consumed and proportions eating the recommended quantity of fruit and vegetables were generally similar for boys and girls across the survey years.

Figures for children aged 2-15 are available from 2008 onwards. Since then, the proportion eating five or more portions a day has varied from 12% to 15% with no clear pattern or significant trend. Similarly, the mean number of portions consumed has ranged between 2.6 and 2.8 portions over this period.   **Table 3.1**

3.3.2 Portions of fruit and vegetables consumed by children in 2011

Detailed information on the quantity of fruit and vegetables children aged 2-15 had consumed in the 24 hours prior to the interview in 2011 is also presented in Table 3.1. In 2011, children consumed an average of 2.7 portions of fruit and vegetables per day, with similar numbers for boys and girls (2.7 and 2.8 respectively). There was some variation across the age groups: children aged 2-4 consumed the highest number of portions (3.2) while consumption was lowest among those aged 13-15 (2.5 portions). The mean number of portions consumed declined with age among boys from 3.2 portions for 2-4 year olds to 2.3 portions for those aged 13-15. In contrast the figures for girls ranged from 2.5 to 3.1 portions but with no obvious pattern.

13% of children (13% of boys and 12% of girls) aged 2-15 met the recommended daily intake of five or more portions of fruit and vegetables in 2011. The proportion consuming the recommended amount was highest in the youngest age group (17%), ranged from between 12% and 14% for those aged 8-15, and was lowest among children aged 5-7 (9%) but these differences were not significant. At the other extreme, one in ten (9%) children did not consume any portions of fruit and vegetables in the previous 24 hours (10% of boys and 9% of girls). Prevalence of consuming no portions varied significantly by age for boys and girls. Children aged 13-15 were most likely to have consumed no portions (14%) and this then declined with age to 5% for

those aged 2-4. Patterns for consuming no portions and for consuming five or more portions were similar for boys and girls.

Figure 3A, Table 3.1

Proportion of children aged 2-15 eating five or more portions, no portions, and mean portions consumed, per day, by age, 2011
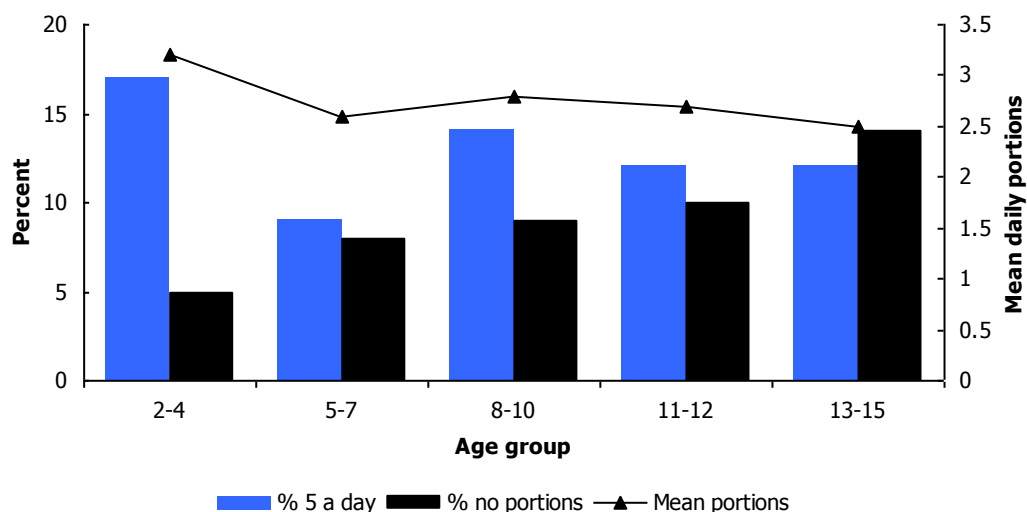
3.3.3 Child fruit and vegetable consumption, 2008-2011 combined by parental consumption patterns

Table 3.2 and Figure 3B show the quantity of fruit and vegetables consumed by boys and girls according to parents' fruit and vegetable consumption. In all four years the survey included a boost sample of households in which children were interviewed but adults were not. This table is therefore based on children in the main sample where at least one of their parents was also interviewed (and answered the questions on fruit and vegetables). The data have been re-weighted so this analysis shows the pattern of association between child and parental consumption, and provides population estimates of the prevalence of child fruit and vegetable consumption in households with different parental consumption patterns. For households with fruit and vegetable data for two parents, the measure of parental consumption was based on whichever parent's consumption was the highest.[25]

As Figure 3B illustrates, children's fruit and vegetable consumption was significantly and positively associated with parental consumption. For example, the mean number of portions consumed steadily increased in line with higher parental consumption from 1.4 for those whose parents consumed no portions to 3.7 for those with at least one parent consuming the recommended five a day. The patterns for boys and girls were very similar (from 1.3 to 3.6 and from 1.5 to 3.8 portions, respectively).

The correspondence between child and parental eating patterns was most notable for the group whose parents ate no portions on the previous day – 34% of children in this group ate no fruit or vegetables

compared with just 4% of those with at least one parent consuming five or more portions per day. Similarly, only 2%-3% of children whose parents consumed fewer than two portions of fruit and vegetables met the five a day recommendation, compared with 28% of children with at least one parent who consumed the recommended amount.

Figure 3B, Table 3.2

Figure 3B
Proportion of children aged 2-15 eating five or more portions, no portions, and mean portions consumed, per day, by parental consumption level, 2008-2011

69
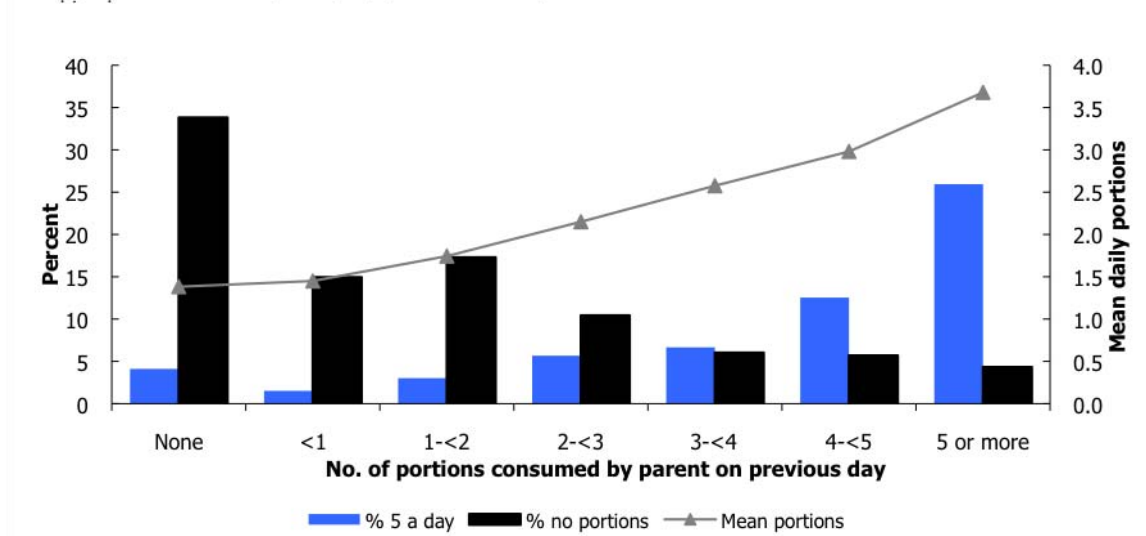
3.4 EATING HABITS

3.4.1 Trends in children's eating habits since 2003

Section 3.2.1 noted that additional questions about the eating habits of children have been asked each survey year since 2003. This section presents figures for consumption of a selection of food and drink items for children aged 2-15 in 2003, 2008/2009 combined, and 2010/2011 combined. In general, the changes observed for some of the food and drink items suggest an improvement in children's diets since 2003. For example, the proportion of children eating oily fish at least once a week has risen from 8% in 2003 to 14% in 2010/2011, while consumption of white fish also increased over this same period from 42% to 49%. There was also an increase in the proportion of children aged 2-15 drinking skimmed/semi-skimmed milk (from 51% in 2003 to 58%). Since 2003, there have also been decreases in the proportions eating some of the unfavourable food items. For example, the proportions of children aged 2-15 consuming crisps once a day or more, chips two or more times a week, sweets or chocolates once a day or more and biscuits once a day or more declined by around 8 to 14 percentage points between 2003 and 2010/2011.

Less positively, since 2003 there have been slight decreases in the proportions eating tuna fish once a week or more, and increases in the proportions eating red meat two or more times a week and cakes two or more times per week. Most of the changes observed in eating habits since 2003 occurred between 2003 and 2008/2009 with little change since then.

It was noted in Section 3.2 that the method of recording hybrid high fibre/white breads changed in 2008. There was a large increase observed in the consumption of this particular kind of bread between the three time points (data not shown). While some of this increase will be due to the greater availability of this kind of bread in recent years, it is also likely that the 2003 questionnaire underestimated consumption levels. The high fibre bread figures in 2003, 2008/2009 and 2010/2011 are not, therefore, directly comparable.

Eating habits were broadly similar for boys and girls, but with some notable exceptions. In 2010/2011, boys were more likely than girls to eat meat products at least twice a week (43% versus 35%) and biscuits once a day or more (44% versus 36%), whereas girls were more likely than boys to eat tuna fish at least once a week (33% versus 25%).

Table 3.3

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     obesity (2008-2011)*. Edinburgh: Scottish Government, 2008.

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[23] Fruit and vegetable portions sizes for children are often referred to as the amount a child can hold in their hand. As this will differ from child to child and will vary by age it is not possible to incorporate this into any systematic analysis of children's fruit and vegetable consumption.

[24] Hybrid breads were recorded by interviewers as open "other answers" in 2003 and a code was added to the codeframe when the data were edited. From 2008 onwards "Wholemeal/white mixture e.g. 'Best of both'" was an explicit code on the interviewers' screens.

[25] For example, if both parents ate five or more portions the parental consumption value matched that of both parents. If one parent consumed more portions than the other the parental consumption matched the highest value of either parent. In households where one parent was interviewed the parental value matched that parent's consumption.

Table list

Table 3.1   Child fruit and vegetable consumption, 2003, 2008, 2009, 2010, 2011, by age and sex

Portions per day	Age						Total
	2-4	5-7	8-10	11-12	13-15	Total 5-15	
	%	%	%	%	%	%	%
Boys							
2003							
5 portions or more	n/a	11	13	11	12	12	n/a
Mean	n/a	2.6	2.6	2.6	2.5	2.6	n/a
Standard error of the mean	n/a	0.11	0.12	0.15	0.13	0.07	n/a
Median	n/a	2.7	2.0	2.0	2.0	2.0	n/a
2008							
5 portions or more	12	14	12	14	17	14	14
Mean	3.0	2.5	2.6	2.6	2.6	2.6	2.7
Standard error of the mean	0.15	0.20	0.17	0.21	0.20	0.11	0.09
Median	3.0	2.0	2.0	2.7	2.0	2.0	2.3
2009							
5 portions or more	16	12	18	14	10	13	14
Mean	3.0	2.7	2.7	2.5	2.4	2.6	2.7
Standard error of the mean	0.12	0.11	0.15	0.17	0.13	0.07	0.06
Median	3.0	2.5	2.3	2.0	2.0	2.3	2.3
2010							
5 portions or more	16	9	13	13	12	11	12
Mean	3.0	2.6	2.7	2.5	2.3	2.5	2.6
Standard error of the mean	0.15	0.18	0.16	0.22	0.17	0.10	0.09
Median	2.7	2.3	2.7	2.3	2.0	2.3	2.3
2011							
None	4	7	13	13	14	11	10
Less than 1 portion	3	4	5	3	5	4	4
1 portion or more but less than 2	16	21	19	27	29	24	22
2 portions or more but less than 3	23	26	18	15	16	19	20
3 portions or more but less than 4	23	19	18	16	15	17	19
4 portions or more but less than 5	14	11	12	10	10	11	12
5 portions or more	17	11	13	15	10	12	13
Mean	3.2	2.7	2.7	2.7	2.3	2.6	2.7
Standard error of the mean	0.14	0.13	0.17	0.21	0.15	0.09	0.08
Median	3.0	2.7	2.7	2.3	2.0	2.3	2.5

Continued…

Table 3.1   - Continued

Portions per day	Age						Total
	2-4	5-7	8-10	11-12	13-15	Total 5-15	
	%	%	%	%	%	%	%
Girls							
2003							
5 portions or more	n/a	11	12	11	15	13	n/a
Mean	n/a	2.6	2.7	2.5	2.5	2.6	n/a
Standard error of the mean	n/a	0.11	0.12	0.12	0.13	0.07	n/a
Median	n/a	2.3	2.4	2.0	2.0	2.0	n/a
2008							
5 portions or more	11	14	11	12	19	14	13
Mean	3.0	2.9	2.6	2.7	3.1	2.8	2.9
Standard error of the mean	0.14	0.18	0.16	0.17	0.20	0.10	0.09
Median	3.0	2.5	2.4	2.5	2.7	2.5	2.7
2009							
5 portions or more	17	19	14	21	9	15	16
Mean	3.1	3.0	2.9	2.9	2.3	2.8	2.9
Standard error of the mean	0.12	0.17	0.16	0.18	0.13	0.09	0.08
Median	3.0	3.0	2.5	2.7	2.0	2.4	2.7
2010							
5 portions or more	14	16	12	10	10	12	13
Mean	2.9	2.9	2.6	2.5	2.4	2.6	2.7
Standard error of the mean	0.14	0.17	0.17	0.17	0.17	0.09	0.08
Median	2.7	2.7	2.5	2.2	2.3	2.5	2.5
2011							
None	5	10	6	7	15	10	9
Less than 1 portion	4	3	2	5	8	5	5
1 portion or more but less than 2	17	25	24	18	25	24	22
2 portions or more but less than 3	22	24	22	28	11	20	21
3 portions or more but less than 4	20	18	19	17	15	17	18
4 portions or more but less than 5	17	12	12	16	13	13	14
5 portions or more	16	7	14	9	13	11	12
Mean	3.1	2.5	2.9	2.8	2.6	2.7	2.8
Standard error of the mean	0.14	0.14	0.14	0.22	0.22	0.09	0.08
Median	3.0	2.2	2.7	2.5	2.0	2.5	2.5

Continued…

Table 3.1 *- Continued*

Portions per day	Age						Total
	2-4	5-7	8-10	11-12	13-15	Total 5-15	
	%	%	%	%	%	%	%
All children							
2003							
5 portions or more	n/a	11	12	11	14	12	n/a
Mean	n/a	2.6	2.6	2.5	2.5	2.6	n/a
Standard error of the mean	n/a	0.09	0.09	0.10	0.09	0.05	n/a
Median	n/a	2.5	2.3	2.0	2.0	2.0	n/a
2008							
5 portions or more	11	14	12	13	18	14	13
Mean	3.0	2.7	2.6	2.7	2.9	2.7	2.8
Standard error of the mean	0.11	0.12	0.12	0.13	0.14	0.08	0.07
Median	3.0	2.3	2.2	2.5	2.2	2.3	2.5
2009							
5 portions or more	16	15	16	17	10	14	15
Mean	3.1	2.9	2.8	2.7	2.4	2.7	2.8
Standard error of the mean	0.09	0.10	0.11	0.12	0.09	0.06	0.05
Median	3.0	2.7	2.5	2.3	2.0	2.3	2.5
2010							
5 portions or more	15	12	12	11	11	12	12
Mean	2.9	2.7	2.6	2.5	2.4	2.6	2.6
Standard error of the mean	0.11	0.13	0.11	0.14	0.13	0.07	0.07
Median	2.7	2.5	2.7	2.3	2.0	2.3	2.3
2011							
None	5	8	9	10	14	10	9
Less than 1 portion	4	4	3	4	7	5	4
1 portion or more but less than 2	16	23	22	23	27	24	22
2 portions or more but less than 3	23	25	20	21	13	20	20
3 portions or more but less than 4	21	19	19	17	15	17	18
4 portions or more but less than 5	15	12	12	13	11	12	13
5 portions or more	17	9	14	12	12	12	13
Mean	3.2	2.6	2.8	2.7	2.5	2.6	2.7
Standard error of the mean	0.10	0.10	0.12	0.15	0.14	0.07	0.06
Median	3.0	2.3	2.7	2.5	2.0	2.3	2.5

Continued…

Table 3.1 *- Continued*

Portions per day	Age						Total
	2-4	5-7	8-10	11-12	13-15	Total 5-15	
Bases (weighted):							
Boys 2003	*n/a*	*311*	*319*	*258*	*338*	*1225*	*n/a*
Boys 2008	*173*	*159*	*165*	*125*	*170*	*618*	*791*
Boys 2009	*243*	*239*	*235*	*183*	*253*	*910*	*1153*
Boys 2010	*171*	*176*	*167*	*113*	*166*	*621*	*792*
Boys 2011	*195*	*203*	*162*	*133*	*188*	*686*	*881*
Girls 2003	*n/a*	*327*	*292*	*239*	*308*	*1166*	*n/a*
Girls 2008	*146*	*143*	*161*	*120*	*167*	*591*	*736*
Girls 2009	*241*	*215*	*252*	*169*	*231*	*867*	*1108*
Girls 2010	*168*	*162*	*156*	*115*	*158*	*591*	*759*
Girls 2011	*182*	*168*	*182*	*124*	*178*	*652*	*835*
All children 2003	*n/a*	*638*	*611*	*497*	*646*	*2391*	*n/a*
All children 2008	*319*	*302*	*326*	*244*	*336*	*1209*	*1527*
All children 2009	*484*	*454*	*486*	*353*	*484*	*1777*	*2261*
All children 2010	*340*	*338*	*323*	*228*	*323*	*1212*	*1551*
All children 2011	*378*	*371*	*344*	*257*	*366*	*1338*	*1716*
Bases (unweighted):							
Boys 2003	*n/a*	*311*	*296*	*224*	*321*	*1152*	*n/a*
Boys 2008	*173*	*151*	*159*	*117*	*164*	*591*	*764*
Boys 2009	*230*	*254*	*243*	*179*	*247*	*923*	*1153*
Boys 2010	*192*	*190*	*171*	*104*	*164*	*629*	*821*
Boys 2011	*206*	*209*	*156*	*114*	*170*	*649*	*855*
Girls 2003	*n/a*	*326*	*298*	*237*	*309*	*1170*	*n/a*
Girls 2008	*155*	*135*	*150*	*135*	*177*	*597*	*752*
Girls 2009	*263*	*211*	*237*	*158*	*231*	*837*	*1100*
Girls 2010	*176*	*147*	*133*	*104*	*148*	*532*	*708*
Girls 2011	*214*	*162*	*176*	*110*	*171*	*619*	*833*
All children 2003	*n/a*	*637*	*594*	*461*	*630*	*2322*	*n/a*
All children 2008	*328*	*286*	*309*	*252*	*341*	*1188*	*1516*
All children 2009	*493*	*465*	*480*	*337*	*478*	*1760*	*2253*
All children 2010	*368*	*337*	*304*	*208*	*312*	*1161*	*1529*
All children 2011	*420*	*371*	*332*	*224*	*341*	*1268*	*1688*

Table 3.2   Child fruit and vegetable consumption, 2008-2011 combined, by parental fruit and vegetable consumption and sex

Aged 2-15   *2008-2011 combined*

Portions per day	Parental consumption							Total
	None	Less than 1 portion	1 portion or more but < 2	2 portions or more but < 3	3 portions or more but < 4	4 portions or more but < 5	5 portions or more	
	%	%	%	%	%	%	%	%
Boys								
None	33	18	18	12	6	6	5	10
Less than 1 portion	0	28	8	9	4	3	2	5
1 portion or more but < 2	37	21	33	29	23	19	13	23
2 portions or more but < 3	14	20	20	22	31	22	18	22
3 portions or more but < 4	11	10	12	15	22	20	21	18
4 portions or more but < 5	3	2	6	8	9	16	15	11
5 portions or more	1	-	3	6	6	14	25	12
Mean	1.3	1.3	1.7	2.1	2.5	3.0	3.6	2.6
Standard error of the mean	0.12	0.14	0.09	0.11	0.08	0.11	0.10	0.05
Median	1.0	1.0	1.3	2.0	2.3	2.8	3.3	2.3
Girls								
None	34	12	16	9	6	5	4	9
Less than 1 portion	7	29	9	9	2	2	2	5
1 portion or more but < 2	25	25	29	27	21	17	13	21
2 portions or more but < 3	17	19	24	27	28	24	17	22
3 portions or more but < 4	7	7	13	15	24	26	18	18
4 portions or more but < 5	3	4	5	9	12	16	20	12
5 portions or more	7	3	3	5	7	11	27	12
Mean	1.5	1.6	1.8	2.2	2.6	3.0	3.8	2.7
Standard error of the mean	0.17	0.20	0.09	0.10	0.09	0.10	0.11	0.05
Median	1.0	1.0	1.7	2.0	2.7	3.0	3.7	2.5
All children								
None	34	15	17	10	6	6	4	10
Less than 1 portion	4	28	8	9	3	2	2	5
1 portion or more but < 2	31	23	31	28	22	18	13	22
2 portions or more but < 3	15	20	22	24	29	23	18	22
3 portions or more but < 4	9	9	13	15	23	23	20	18
4 portions or more but < 5	3	3	6	8	10	16	17	12
5 portions or more	4	2	3	6	7	13	26	12
Mean	1.4	1.4	1.7	2.1	2.6	3.0	3.7	2.6
Standard error of the mean	0.11	0.12	0.07	0.08	0.06	0.08	0.08	0.04
Median	1.0	1.0	1.5	2.0	2.5	3.0	3.5	2.3
Bases (weighted):								
Boys	*151*	*84*	*359*	*383*	*463*	*386*	*701*	*2526*
Girls	*149*	*89*	*339*	*381*	*426*	*361*	*664*	*2409*
All children	*300*	*173*	*698*	*764*	*889*	*747*	*1365*	*4936*
Bases (unweighted):								
Boys	*156*	*91*	*349*	*379*	*432*	*385*	*707*	*2499*
Girls	*143*	*88*	*332*	*375*	*413*	*361*	*658*	*2370*
All children	*299*	*179*	*681*	*754*	*845*	*746*	*1365*	*4869*

Table 3.3 **Summary of children's eating habits, 2003, 2008/2009 combined, 2010/2011 combined, by sex**

Aged 2-15   *2003, 2008/2009 combined, 2010/2011 combined*

Food type and frequency of consumption	Boys			Girls			All children		
	2003	2008/ 2009	2010/ 2011	2003	2008/ 2009	2010/ 2011	2003	2008/ 2009	2010/ 2011
	%	%	%	%	%	%	%	%	%
Eats oily fish once a week or more	8	12	13	8	13	15	8	13	14
Eats white fish once a week or more	45	51	50	39	45	47	42	48	49
Eats tuna fish once a week or more	29	28	25	37	36	33	33	32	29
Eats red meat 2+ times a week	55	59	59	52	56	57	53	57	58
Eats meat products 2+ times a week	48	43	43	39	32	35	43	38	39
Drinks skimmed/semi-skimmed milk	51	55	56	50	59	60	51	57	58
Sweets or chocolates once a day or more	57	53	50	60	52	48	59	53	49
Biscuits once a day or more	51	44	44	45	41	36	48	42	40
Cakes 2+ times a week	31	33	35	28	31	34	30	32	34
Ice-cream once a week or more	58	53	53	57	54	51	58	53	52
Non-diet soft drinks once a day or more	46	39	39	43	36	38	44	38	38
Crisps once a day or more	50	36	38	53	35	39	52	36	38
Eats chips 2+ times a week	55	41	43	53	39	41	54	40	42
Eats potatoes, pasta, rice 5+ times a week	48	54	52	51	54	53	50	54	53
Eats at least 2-3 slices of high fibre bread a day[a]	16	35	36	13	34	32	14	35	34
Eats high fibre cereal at least 5-6 times a week	27	n/a	n/a	22	n/a	n/a	25	n/a	n/a
Eats high fibre/low sugar cereal at least 5-6 times a week	n/a	28	30	n/a	26	27	n/a	27	28
Bases (weighted):[b]	*1511*	*1942*	*1673*	*1440*	*1845*	*1597*	*2957*	*3789*	*3270*
Bases (unweighted):	*1459*	*1917*	*1677*	*1461*	*1852*	*1544*	*2924*	*3771*	*3221*

a The question wording about bread types changed in 2008 which resulted in a much higher prevalence of high fibre/white hybrid bread types. These figures are therefore not directly comparable.
b Bases vary: the smallest of the range is presented and may be marginally higher for some food items.

Physical activity

Chapter 4
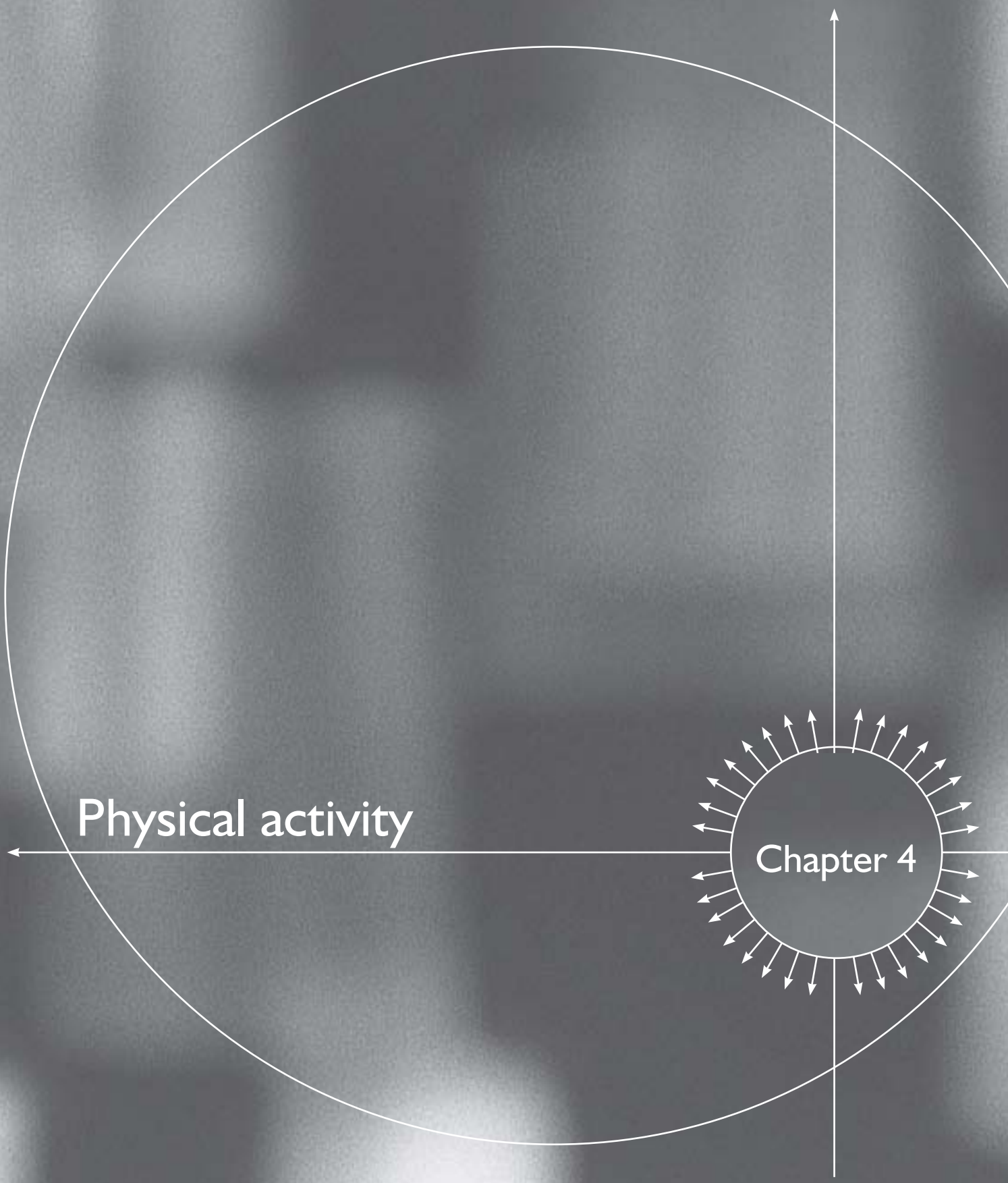
4   PHYSICAL ACTIVITY

Tessa Hill

SUMMARY

- In 1998, 65% of children aged 2-15 were physically active at the recommended level (excluding school-based activity, which was not measured prior to 2008). This increased to 69% in 2003, but has been 64%-65% since 2008.
- In 2011, 73% of children (76% of boys and 70% of girls) met the physical activity recommendations *including* school-based activity. Although there was little change between 2008 and 2011 in this measure for boys, the proportion of girls meeting the recommendations increased from 64% in 2008.
- Seven in ten children aged 2-4 were active at the recommended level (including school based activity) in 2011; this increased to 80%-81% for children aged 5-10, and then declined to 75% at age 11-12 and further to 59% of those aged 13-15. This decline with age was particularly apparent in girls (48% of girls aged 13-15 met the recommendations compared with 69% of boys).
- Activity levels for girls varied significantly by socio-economic classification. Girls in lower supervisory and technical households stood out as the most active (77% compared with 67%-69% for those living in other household types).
- There was no significant relationship between household income and meeting recommended child physical activity levels.
- Area deprivation was significantly associated with physical activity levels for boys, but not for girls: 81% of boys in the least deprived quintile and 77% in the second most deprived quintile met the recommendations, while the equivalent figure for the remaining groups ranged from 72%-74%.
- Fruit and vegetable consumption was significantly associated with meeting the physical activity recommendations: 65% of children who ate no portions of fruit and vegetables in the previous day met the recommendations. This increased to 79% for children who ate five or more portions.
- Children were more likely to meet the physical activity recommendations if their mothers did so: 80% of boys and 71% of girls whose mothers met the adult recommendations met the recommendations themselves. Children's activity levels were not associated with the activity levels of their father.

4.1   INTRODUCTION

A growing body of evidence suggests that being physically active in childhood has numerous short and longer-term benefits for children's health and development.[1] The 2011 UK Chief Medical Officers' report, which outlined updated physical activity recommendations for the population, cited positive links between high activity levels and the development of early motor skills and bone strength, the prevention of overweight/obesity, and a reduced incidence of metabolic risk factors as well as mental health problems.[2] For older children, it appears that physical activity exerts a dose-response relationship whereby the higher the level of activity, the greater the health benefits derived. There is also evidence that the activity habits established in childhood track into adulthood,

which suggests that long-term initiatives designed to increase activity levels in the adult population need to take account of children's early experiences. In addition, sedentary activity (such as periods sitting in front of TV or computer screens) has been shown to be independently associated with negative health outcomes, once activity levels have been taken into account.[2]

The introductions to the physical activity chapters in the three previous Scottish Health Survey (SHeS) reports[3,4,5] provided a comprehensive overview of the recent policy context in this area. 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 children increase their activity levels. These included:

- The 2003 Physical Activity Taskforce publication *Let's Make Scotland More Active: A strategy for physical activity*[6] and its five year review, conducted in 2008.[7]
- 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).[8]
- The Scottish Government's *Route Map* for tackling obesity and the associated *Obesity Route Map Action Plan,* published in 2011.[9] The Scottish Health Survey's measures of the proportion of children 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.[10]
- The opportunities presented by the 2012 Olympics and 2014 Commonwealth Games to help accelerate progress towards making Scotland more active.
- The Curriculum for Excellence,[11] adopted in schools from August 2010, which sets out a framework for children and young people (aged 3-18) to experience, on a regular basis, a wide range of purposeful, challenging, progressive and enjoyable physical activities in addition to the required 2 hours of PE.
- The Active Schools[12] programme which is designed to encourage young people to be involved in physical activity and sporting opportunities outwith PE lessons.

Children are recommended to accumulate at least 60 minutes of moderate activity on every day of the week, which can be accumulated in shorter bouts of as little as 10 minutes. Allied to the above initiatives, the following physical activity target for children is monitored by SHeS:

> *80% of children aged 16 and under should be meeting the current recommended levels of physical activity by the year 2022*

The percentage of children aged 5-15 meeting the recommended level of activity is also one of the new National Mental Health Indicators for children and young people in Scotland.[13] It is included as part of the individual contextual domain as a measure of healthy living.

Over and above this, additional support has been provided to ensure all primary schools deliver 2 hours of Physical Education (PE) per week and all S1-S4 pupils receive 2 periods of PE. The Healthy Living Survey (published on the 25th June 2012) showed that 84% of primary schools and 92% of secondary schools were providing two hours of PE per week.[14]

Children's physical activity is not, of course, confined solely to organised sports or school lessons. Initiatives have also focused on encouraging walking or cycling to school, while, for younger children in particular, funds have been provided to help support active play, for example through the Early Years Early Action Fund.[15]

The 2010 SHeS Report[5] outlined the more detailed recommendations for children's physical activity published jointly in July 2011 by the UK's four Chief Medical Officers.[2] The new UK guidelines for children are tailored to two specific age groups:

- **Children under 5**
    - Babies should be encouraged to be active from birth (through floor-based play or water activities).
    - Pre-school children who can walk unaided should be active for at least 180 minutes a day.
    - Extended periods of sedentary activities (such as sitting in buggies or watching television) should be limited.

- **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.

In line with these new recommendations, from 2012, SHeS includes more questions about children's sedentary activity (since 2003 a question has been asked about hours spent in front of a screen, and from 2012 other sedentary activities such as reading will also be covered). Measuring the intensity level of activity in children, and its muscle strengthening potential, is very difficult. To do this would have required a major revision to the questionnaire and a consequential loss of time series data. It was therefore decided that, for the time being at least, the child physical activity questionnaire would not be adapted to enable monitoring of the more detailed recommendations.

This chapter updates the trends presented in the three previous SHeS Reports for child physical activity levels.[3,4,5] It uses two summary measures based on all types of activities reported by participants (see below for further details). Activity levels are presented by three socio-economic measures: the National Statistics Socio-economic Classification (NS-SEC), household income, and the Scottish Index of Multiple Deprivation (SIMD). To explore the extent to which children share more than one unhealthy risk factor (low activity and low consumption), the association between activity levels and fruit and vegetable consumption is presented. Finally, the chapter takes advantage of the fact that information

about activity is collected from all household members to look at the association between parents' and children's activity levels.

4.2 METHODS

4.2.1 The child physical activity questionnaire

The questions on child physical activity included in the 1998, 2003, and 2008-11 questionnaires were based on the 1997 Health Survey for England (HSE) children's physical activity module. The questions covered:

- Sports and exercise
- Active play
- Walking, and
- Housework or gardening.

Questions about time spent on housework or gardening were only asked for children aged 8 and over. Prior to 2008, SHeS did not include sport and exercise, active play and walking undertaken as part of school lessons, although activities undertaken on school premises but not as part of lessons (for example, play or sport at lunchtime or at after-school clubs) were included. However, from 2008 onwards, an additional set of questions was added to the questionnaire specifically asking about 'walking, sports, exercise or other active things' undertaken as part of school lessons.

4.2.2 Child physical activity definitions

Types of activity covered

Further details of what was collected in relation to each activity type are as follows:

Walking

Information was collected about walks of at least 5 minutes duration. Participants were asked on how many days in the last week the child had done walks of at least this length, and how long in total they spent walking on each of those days. Children aged 13-15 were asked about their usual walking pace using the same options as in the adult questionnaire (see above for a description of these).

Housework or gardening (children aged 8 and over only)

For children aged 8 and over, participants were asked about any 'housework or gardening that involved pulling or pushing, like hoovering, cleaning a car, mowing grass or sweeping up leaves'. Only housework or gardening lasting at least 15 minutes was included. Participants were asked on how many days in the last week the child had done such activities, and how long they spent doing this on each day.

Sports and exercise

This category was intended to cover structured or organised sporting activities, and included things like swimming, football, gymnastics and dance lessons. The interview recorded whether the child had participated in any sport and exercise in the last week, on how many week and weekend days they had participated, the total time spent on sport and exercise at the weekend, and the total time on each weekday. There was no lower time limit for inclusion.

Active play

This category covered less structured activities, like riding a bike, kicking a ball around, running about, playing active games or jumping around. The questionnaire asked whether the child had taken part in this kind of 'active play' in the last week, and then, as for sports and exercise, how many week and weekend days they had participated, the total time spent on active play at the weekend, and the total duration each weekday.

School-based activities

Since 2008 the questionnaire has also asked participants about any active things that children who were at school did as part of lessons. They were asked how many days in the last week they did these kinds of activities in lessons, and how long they spent doing them.

Intensity

It is more complicated to assess the intensity of children's activities than is the case with adults. The child physical activity questions do not therefore collect any information on intensity (with the exception of asking those aged 13-15 about their walking pace). For the purposes of calculating physical activity levels, it is assumed that all reported activities were of at least moderate intensity.

The data on the different activities described above has been summarised into an overall measure of child physical activity, which takes into account both the average time spent participating in physical activity and the number of active days in the last week. Child physical activity levels were assigned to one of three categories:

- Meets recommendations – active for 60 minutes on 7 days in the last week (meeting the recommended level of activity for children and young people)
- Some activity – active for 30-59 minutes on 7 days in the last week
- Low activity – active on fewer than 7 days in the last week or for less than 30 minutes a day.

4.3 SUMMARY PHYSICAL ACTIVITY LEVELS

4.3.1 Trends in the proportion of children meeting physical activity recommendations (excluding school-based activities) since 1998

In 2011, 65% of children met the recommendations when activity at school was excluded. This figure was the same in 2010 and has been either 64% or 65% in all other years in the 1998-2010 period apart from a peak of 69% in 2003. Over two-thirds (69%) of boys met the recommendations in 2011. This was significantly lower than the 2003 figure of 74% but similar to all other years which ranged between 68%-72%. The proportion of girls meeting the recommendations has varied more from year to year, fluctuating between 56% and 63%, but with no obvious pattern. In 2011, 62% of girls met the recommendations, the same as was reported in 2010.

The sample sizes are not large enough to compare individual age groups across the years. For example, although the proportion of boys aged 11-12 meeting the target increased by 11 percentage points between 2010 and 2011 (from 60% to 71%), it is likely that this reflects sampling variation rather than real increases in the population. The 11-12 age group is particularly prone to this as it is the smallest sub-group presented in the table (all other sub-groups are based on pooling three chronological years rather than two).   **Table 4.1**

4.3.2 Children's activity levels (excluding school-based activities), 2011, by age and sex

As in all previous years, in 2011, boys were more likely than girls to meet the physical activity recommendations (excluding school-based activities) (69% compared with 62%).

Up until the age of 8-10, the proportion of children meeting the target varied little by age (ranging between 70% and 72%). It dropped to 64% for those aged 11-12 and to 50% for the oldest age group (13-15 year olds). The main difference between the genders was the point at which the proportion meeting the recommendation began to decline. For boys, levels were largely similar up until aged 13-15 when they dropped to 59%. For girls however, the proportion meeting the target began to drop at age 11-12 (56%) and then reduced further to 41% for those aged 13-15.   **Table 4.1**

4.3.3 Trends in the proportion of children meeting physical activity recommendations (including school-based activities) since 2008

Since 2008, the survey has measured school-based physical activities. When combined with all other activities, this is a better measure of children's adherence to the physical activity recommendations as activities at school and beyond count towards this. As might be expected, when physical activity undertaken at school is factored in, the proportion meeting the activity targets is higher. In 2011, 73% of children aged 2-15 met the physical activity recommendations,

compared with 65% when activity at school was excluded from the measure. As shown in Table 4.2, 72% of children met the targets in 2010 and 71% in both 2008 and 2009. Since 2008, the proportion of boys meeting the recommendations has been stable (75%-77%). The figure for girls increased from 64% in 2008 to 70% in 2010, and remained at this level in 2011. This stability in the figure for girls in the last two years' might signal an upward trend; future years will be able to confirm this.

As noted in Section 4.3.1, the sample sizes for the individual age groups are too small to allow robust conclusions about apparent changes over time to be made. For example, the large differences between years evident among boys aged 2-4, and girls aged 11-12 and 13-15, should not be over-interpreted. **Table 4.2**

4.3.4 Children's activity levels (including school-based activities), 2011, by age and sex

As was the case when school based-activities were excluded, boys were more likely than girls to meet the physical activity recommendations in 2011 (76% versus 70%). The pattern by age was similar to that described in Section 4.3.2. Participation rates began to decline at age 11-12 for girls and at age 13-15 for boys.

As would be expected, the proportion of children aged 2-4 meeting the recommendations (70%) was unaffected by the inclusion of school-based activity whereas the figures for school-aged children increased by between 9-11 percentage points. Increases were seen among both sexes and across all age groups. **Table 4.2**

4.4 PHYSICAL ACTIVITY BY SOCIO-DEMOGRAPHIC FACTORS

4.4.1 Introduction

Tables 4.3 to 4.5 present children's activity levels by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (SIMD) (descriptions of each of these measures are available in the Glossary at the end of this volume). These tables use data from the 2008-2011 survey years combined.

4.4.2 Socio-economic classification (NS-SEC)

For boys, there was no significant association between NS-SEC and whether they were active for at least 60 minutes on every day of the last week. However, the association was significant for girls. Girls living in lower supervisory and technical households stood out as the most active: 77% met the recommendations, compared with 67%-69% in all other types of household. This pattern was also evident when the 2008/2009 figures were analysed, though it is unclear why this group has higher activity levels. **Table 4.3**

4.4.3 Equivalised household income

Equivalised income was not significantly associated with meeting the recommendations, though the decrease in girls' activity levels as income declined was close to being significant. The proportions of girls in the three highest household income quintiles meeting the target were 71%-72% before dropping slightly to 67% in the fourth and 64% in the lowest income quintile.   **Table 4.4**

4.4.4 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% areas and the intermediate quintiles. The second compares the most deprived 15% of areas with the rest of Scotland (described in the tables as the "85% least deprived areas").

There was a significant association between SIMD and activity among boys, but not girls. However, the pattern was not linear: 81% of boys in the least deprived quintile, and 77% in the second most deprived quintile, met the recommendations, while for boys in the remaining three groups, the figure ranged from 72%-74%. There were no significant differences in the proportion of boys or girls meeting the physical activity recommendations between those living in the 15% most deprived areas of Scotland and the rest of the country.
Table 4.5

4.5 PHYSICAL ACTIVITY BY FRUIT AND VEGETABLE CONSUMPTION, 2008-2011 COMBINED

Table 4.6 and Figure 4A show how activity levels varied by fruit and vegetable consumption for children in 2008-2011. Eating more portions of fruit and vegetables was significantly associated with an increased likelihood of meeting the physical activity recommendations, although the relationships were not strictly linear. Although these findings illustrate an association between the two activities, they do not, of course, imply a causal link. However, it is evident that risk factors for poor health appear to cluster in children in a similar manner to that found in the analysis of multiple risk factors among adults presented in the 2010 SHeS report.[16]

The pattern by fruit and vegetable consumption is illustrated in Figure 4A. As the number of portions of fruit and vegetables consumed on the previous day increased, so too did the likelihood of children meeting the activity recommendations. However, the patterns were not strictly linear. 65% of children who ate no portions, and 63% of those who ate less than one portion (but more than none), met the recommendations. This then steadily increased to 79% for children who ate five or more portions. There were some differences in this pattern between boys and girls at the lower end of the fruit and vegetable scale. For example, among boys, those who ate less than one portion (but more than none) were the least likely to meet the recommendations (66% compared with 73%-74% who ate none, or one to fewer than three portions). However, the group that ate less than one portion was the smallest in the population overall so the estimate will be subject to a wide confidence interval. This figure then

rose gradually as fruit and vegetable consumption increased, to 76% for those eating three portions, 79% for those eating four and 84% for those eating five or more.

The proportion of boys in the low activity category was highest among those eating less than one portion or no fruit or vegetables (13%). This decreased as fruit and vegetable consumption increased and just 5% of those who ate five or more portions a day were in the low activity group. Girls who ate no fruit or vegetables were the least likely group to meet the recommendations with only 55% doing so. This figure increased to 59% for those eating less than one portion and 64% for those eating one portion a day. The proportion then fluctuated between 68%-72% of girls eating between two and four portions a day before rising to 74% for those eating five portions or more. Just over a fifth (22%) of girls who ate no fruit or vegetables were also in the low activity category, and this decreased to 10% of those eating four portions or more.

Figure 4A, Table 4.6

Figure 4A
% of children who met the physical activity recommendations by fruit and vegetable consumption, 2008-2011 combined

■ Boys
■ Girls
■ All children

Number of portions of fruit & vegetables consumed on previous day
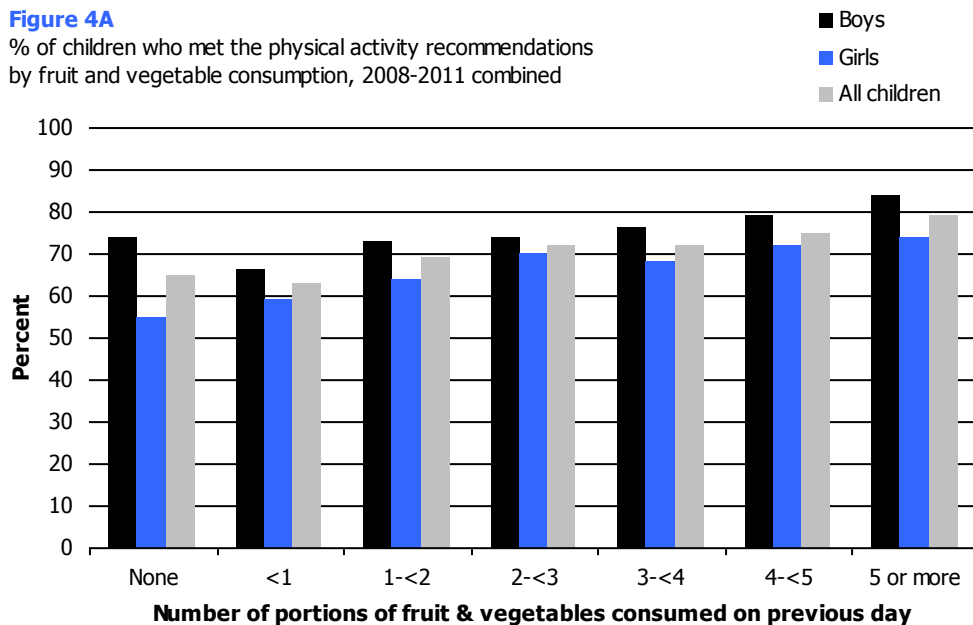
4.6   PHYSICAL ACTIVITY BY PARENTAL PHYSICAL ACTIVITY, 2008-2011 COMBINED

Children's physical activity levels grouped according to whether their parents met the adult physical activity recommendations are presented in Table 4.7. Note that in all years the survey included a boost sample of households in which children were interviewed but adults were not. The results in this section are therefore only based on children in the main sample where at least one of their parents was also interviewed (and answered the physical activity questions). The data have been re-weighted accordingly to show the pattern of association between parental and child physical activity in households where we have a physical activity measure for parents. Complete information was more likely to be gained for mothers than for fathers (this will be due to more single-parent families being headed by women than men, and differential

response rates within households, with fathers less likely to respond than mothers).

When this analysis was last conducted (based on the 2008 and 2009 surveys),[4] it showed that activity levels among mothers and fathers were 6-7 percentage points higher than for the population as a whole. This will, at least in part, reflect the age profile of people with children aged under 16 (they are less likely to fall into the oldest age groups, where physical activity levels are lowest). Fathers were more likely than mothers to meet the recommendations.

As was found with the 2008/2009 analysis, children were more likely to meet the physical activity recommendations if their mothers did so too.[4] This was true for both sexes: 80% of boys and 71% of girls whose mothers met the adult recommendations met the child recommendations themselves. This compared with 72% of boys and 62% of girls whose mothers did not meet the adult recommendations. However, in common with previous analysis, children's activity levels were not associated with father's activity levels.   **Table 4.7**

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Table list

Table 4.1   **Proportions of children meeting the physical activity recommendations[a] (excluding activity at school), 1998, 2003, 2008, 2009, 2010, 2011, by age and sex**

Aged 2-15   *1998, 2003, 2008, 2009, 2010, 2011*

Proportion meeting recommendations[a]	Age					Total
	2-4	5-7	8-10	11-12	13-15	
	%	%	%	%	%	%
Boys						
1998	66	77	77	70	67	72
2003	77	75	77	78	68	74
2008	76	74	76	73	62	72
2009	67	67	77	74	61	69
2010	70	65	76	60	65	68
2011	68	74	73	71	59	69
Girls						
1998	69	68	64	57	36	59
2003	70	75	75	57	41	63
2008	64	67	60	57	33	56
2009	68	66	72	53	31	58
2010	68	63	75	70	36	62
2011	72	67	72	56	41	62
All Children						
1998	68	73	71	64	52	65
2003	73	75	76	67	55	69
2008	71	70	68	65	48	64
2009	68	67	74	64	47	64
2010	69	64	75	65	51	65
2011	70	71	72	64	50	65
Bases (weighted):						
Boys 1998	*219*	*241*	*238*	*159*	*230*	*1088*
Boys 2003	*278*	*309*	*312*	*252*	*327*	*1478*
Boys 2008	*170*	*156*	*165*	*121*	*164*	*776*
Boys 2009	*240*	*236*	*233*	*182*	*251*	*1142*
Boys 2010	*169*	*175*	*165*	*113*	*162*	*784*
Boys 2011	*191*	*203*	*159*	*131*	*183*	*867*
Girls 1998	*206*	*228*	*225*	*152*	*222*	*1032*
Girls 2003	*275*	*321*	*290*	*235*	*303*	*1424*
Girls 2008	*142*	*143*	*156*	*118*	*162*	*721*
Girls 2009	*236*	*214*	*248*	*167*	*231*	*1096*
Girls 2010	*167*	*156*	*155*	*112*	*154*	*743*
Girls 2011	*182*	*166*	*181*	*125*	*176*	*830*
All children 1998	*425*	*469*	*463*	*312*	*452*	*2120*
All children 2003	*553*	*629*	*603*	*487*	*630*	*2903*
All children 2008	*312*	*298*	*321*	*240*	*326*	*1497*
All children 2009	*477*	*450*	*480*	*349*	*481*	*2237*
All children 2010	*336*	*331*	*320*	*225*	*316*	*1527*
All children 2011	*372*	*369*	*340*	*256*	*359*	*1697*

Continued…

Table 4.1   *- Continued*

Proportion meeting recommendations[a]	Age					Total
	2-4	5-7	8-10	11-12	13-15	
Bases (unweighted):						
Boys 1998	*419*	*422*	*420*	*286*	*425*	*1972*
Boys 2003	*298*	*308*	*289*	*220*	*313*	*1428*
Boys 2008	*170*	*148*	*159*	*114*	*159*	*750*
Boys 2009	*227*	*251*	*241*	*178*	*245*	*1142*
Boys 2010	*188*	*190*	*170*	*104*	*159*	*811*
Boys 2011	*201*	*208*	*154*	*112*	*166*	*841*
Girls 1998	*395*	*390*	*410*	*261*	*425*	*1881*
Girls 2003	*289*	*321*	*297*	*233*	*304*	*1444*
Girls 2008	*151*	*135*	*147*	*133*	*171*	*737*
Girls 2009	*258*	*210*	*233*	*155*	*229*	*1085*
Girls 2010	*174*	*143*	*132*	*100*	*145*	*694*
Girls 2011	*213*	*160*	*175*	*110*	*168*	*826*
All children 1998	*814*	*812*	*830*	*547*	*850*	*3853*
All children 2003	*587*	*629*	*586*	*453*	*617*	*2872*
All children 2008	*321*	*283*	*306*	*247*	*330*	*1487*
All children 2009	*485*	*461*	*474*	*333*	*474*	*2227*
All children 2010	*362*	*333*	*302*	*204*	*304*	*1505*
All children 2011	*414*	*368*	*329*	*222*	*334*	*1667*

a At least 60 minutes of activity on all 7 days in previous week, not including activities at school.

Table 4.2 **Proportions of children meeting the physical activity recommendations[a] (including activity at school), 2008, 2009, 2010, 2011, by age and sex**

Proportion meeting recommendations[a]	Age					Total
	2-4	5-7	8-10	11-12	13-15	
	%	%	%	%	%	%
Boys						
2008	77	81	82	77	69	77
2009	68	75	81	84	70	75
2010	70	75	85	69	75	75
2011	68	82	82	81	69	76
Girls						
2008	64	74	77	70	39	64
2009	68	76	80	65	42	66
2010	69	71	83	79	48	70
2011	72	78	80	70	48	70
All Children						
2008	71	77	79	73	54	71
2009	68	75	80	75	56	71
2010	70	73	84	74	62	72
2011	70	80	81	75	59	73
Bases (weighted):						
Boys 2008	*170*	*156*	*165*	*121*	*164*	*776*
Boys 2009	*240*	*236*	*233*	*182*	*251*	*1142*
Boys 2010	*169*	*175*	*165*	*113*	*162*	*784*
Boys 2011	*191*	*203*	*159*	*131*	*183*	*867*
Girls 2008	*142*	*143*	*156*	*118*	*162*	*721*
Girls 2009	*236*	*214*	*248*	*167*	*231*	*1096*
Girls 2010	*167*	*156*	*155*	*112*	*154*	*743*
Girls 2011	*182*	*166*	*181*	*125*	*176*	*830*
All children 2008	*312*	*298*	*321*	*240*	*326*	*1497*
All children 2009	*477*	*450*	*480*	*349*	*481*	*2237*
All children 2010	*336*	*331*	*320*	*225*	*316*	*1527*
All children 2011	*372*	*369*	*340*	*256*	*359*	*1697*
Bases (unweighted):						
Boys 2008	*170*	*148*	*159*	*114*	*159*	*750*
Boys 2009	*227*	*251*	*241*	*178*	*245*	*1142*
Boys 2010	*188*	*190*	*170*	*104*	*159*	*811*
Boys 2011	*201*	*208*	*154*	*112*	*166*	*841*
Girls 2008	*151*	*135*	*147*	*133*	*171*	*737*
Girls 2009	*258*	*210*	*233*	*155*	*229*	*1085*
Girls 2010	*174*	*143*	*132*	*100*	*145*	*694*
Girls 2011	*213*	*160*	*175*	*110*	*168*	*826*
All children 2008	*321*	*283*	*306*	*247*	*330*	*1487*
All children 2009	*485*	*461*	*474*	*333*	*474*	*2227*
All children 2010	*362*	*333*	*302*	*204*	*304*	*1505*
All children 2011	*414*	*368*	*329*	*222*	*334*	*1667*

a At least 60 minutes of activity on all 7 days in previous week, including activities at school.

Table 4.3   Children's summary physical activity levels[a] (including activity at school), 2008-2011 combined, by NS-SEC of household reference person and sex

Summary activity levels[a]	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
	%	%	%	%	%
Boys					
Meets recommendations	76	79	79	77	73
Some activity	15	13	15	13	16
Low activity	9	8	6	9	10
Girls					
Meets recommendations	67	67	69	77	67
Some activity	20	21	21	14	17
Low activity	14	12	10	8	16
All children					
Meets recommendations	72	73	74	77	70
Some activity	17	17	18	14	17
Low activity	11	10	8	9	13
Bases (weighted):					
Boys	*1431*	*299*	*341*	*368*	*1023*
Girls	*1358*	*311*	*312*	*348*	*951*
All children	*2788*	*609*	*654*	*716*	*1973*
Bases (unweighted):					
Boys	*1403*	*302*	*336*	*386*	*1020*
Girls	*1334*	*305*	*313*	*366*	*932*
All children	*2737*	*607*	*649*	*752*	*1952*

a Meets recommendations=at least 60 minutes of activity on all 7 days in previous week; some activity=30-59 minutes of activity on all 7 days; low activity=lower level of activity (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 4.4 **Children's summary physical activity levels[a] (including activity at school), 2008-2011 combined, by equivalised household income quintile and sex**

Summary activity levels[a]	Equivalised annual household income quintile				
	1st (highest)	2nd	3rd	4th	5th (lowest)
	%	%	%	%	%
Boys					
Meets recommendations	80	76	73	78	76
Some activity	14	14	15	15	15
Low activity	6	10	11	7	9
Girls					
Meets recommendations	71	72	71	67	64
Some activity	18	15	17	21	19
Low activity	11	13	13	12	17
All children					
Meets recommendations	76	74	72	73	70
Some activity	16	15	16	18	17
Low activity	8	11	12	9	13
Bases (weighted):					
Boys	*579*	*673*	*608*	*660*	*668*
Girls	*539*	*664*	*613*	*588*	*633*
All children	*1117*	*1338*	*1221*	*1247*	*1301*
Bases (unweighted):					
Boys	*562*	*710*	*618*	*654*	*634*
Girls	*537*	*680*	*615*	*590*	*584*
All children	*1099*	*1390*	*1233*	*1244*	*1218*

a Meets recommendations=at least 60 minutes of activity on all 7 days in previous week; some activity=30-59 minutes of activity on all 7 days; low activity=lower level of activity (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 4.5   Children's summary physical activity levels[a] (including activity at school), 2008-2011 combined, by Scottish Index of Multiple Deprivation and sex

Summary activity levels[a]	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5th (least deprived)	4th	3rd	2nd	1st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Boys							
Meets recommendations	81	72	74	77	74	76	75
Some activity	12	17	16	14	16	15	15
Low activity	7	11	11	9	10	9	10
Girls							
Meets recommendations	70	68	65	66	67	68	65
Some activity	17	18	20	23	18	19	18
Low activity	12	14	15	11	15	13	16
All children							
Meets recommendations	76	70	69	72	71	72	70
Some activity	15	18	18	18	17	17	17
Low activity	10	12	13	10	12	11	13
Bases (weighted):							
Boys	*714*	*780*	*657*	*697*	*720*	*3015*	*553*
Girls	*712*	*758*	*648*	*584*	*684*	*2858*	*528*
All children	*1426*	*1538*	*1305*	*1281*	*1404*	*5874*	*1081*
Bases (unweighted):							
Boys	*664*	*794*	*675*	*670*	*741*	*2968*	*576*
Girls	*655*	*772*	*653*	*573*	*689*	*2797*	*545*
All children	*1319*	*1566*	*1328*	*1243*	*1430*	*5765*	*1121*

a Meets recommendations=at least 60 minutes of activity on all 7 days in previous week; some activity=30-59 minutes of activity on all 7 days; low activity=lower level of activity (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 4.6   Children's summary physical activity levels[a] (including activity at school), 2008-2011 combined, by fruit and vegetable consumption and sex

Summary activity levels[a]	Fruit and vegetable consumption							Total[b]
	None	Less than 1 portion	1 portion or more but < 2	2 portions or more but < 3	3 portions or more but < 4	4 portions or more but < 5	5 portions or more	
	%	%	%	%	%	%	%	%
Boys								
Meets recommendations	74	66	73	74	76	79	84	76
Some activity	13	21	17	17	14	13	11	15
Low activity	13	13	10	9	10	8	5	9
Girls								
Meets recommendations	55	59	64	70	68	72	74	67
Some activity	22	27	21	17	19	18	16	19
Low activity	22	14	15	14	13	10	10	14
All children								
Meets recommendations	65	63	69	72	72	75	79	72
Some activity	17	24	19	17	17	16	13	17
Low activity	17	13	12	11	11	9	8	11
Bases (weighted):								
Boys	*353*	*163*	*782*	*772*	*625*	*395*	*475*	*3565*
Girls	*292*	*152*	*677*	*734*	*620*	*438*	*468*	*3381*
All children	*645*	*316*	*1459*	*1505*	*1245*	*833*	*943*	*6946*
Bases (unweighted):								
Boys	*350*	*173*	*773*	*766*	*634*	*393*	*452*	*3541*
Girls	*276*	*149*	*663*	*739*	*615*	*427*	*469*	*3338*
All children	*626*	*322*	*1436*	*1505*	*1249*	*820*	*921*	*6879*

a Meets recommendations=at least 60 minutes of activity on all 7 days in previous week; some activity=30-59 minutes of activity on all 7 days; low activity=lower level of activity (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).

b The total column includes figures for a small number of children who did not answer the fruit and vegetable questionnaire.

Table 4.7   Children's summary physical activity levels[a] (including activity at school), 2008-2011 combined, by parental physical activity[b] and sex of child

Summary activity levels[a]	Mother's physical activity level[b]		Father's physical activity level[b]	
	Meets recommendations	Does not meet recommendations (some or low activity)	Meets recommendations	Does not meet recommendations (some or low activity)
	%	%	%	%
Boys				
Meets recommendations	80	72	77	75
Some activity	14	16	14	15
Low activity	7	11	9	10
Girls				
Meets recommendations	71	62	69	65
Some activity	18	21	19	21
Low activity	11	17	12	14
All children				
Meets recommendations	75	67	73	70
Some activity	16	19	17	18
Low activity	9	14	11	12
Bases (weighted):				
Boys	*1005*	*1362*	*726*	*689*
Girls	*1006*	*1250*	*661*	*595*
All children	*2010*	*2612*	*1387*	*1283*
Bases (unweighted):				
Boys	*980*	*1355*	*728*	*669*
Girls	*974*	*1243*	*669*	*593*
All children	*1954*	*2598*	*1397*	*1262*

a Meets recommendations=at least 60 minutes of activity on all 7 days in previous week; some activity=30-59 minutes of activity on all 7 days; low activity=lower level of activity (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).

b 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.

Obesity

Chapter 5
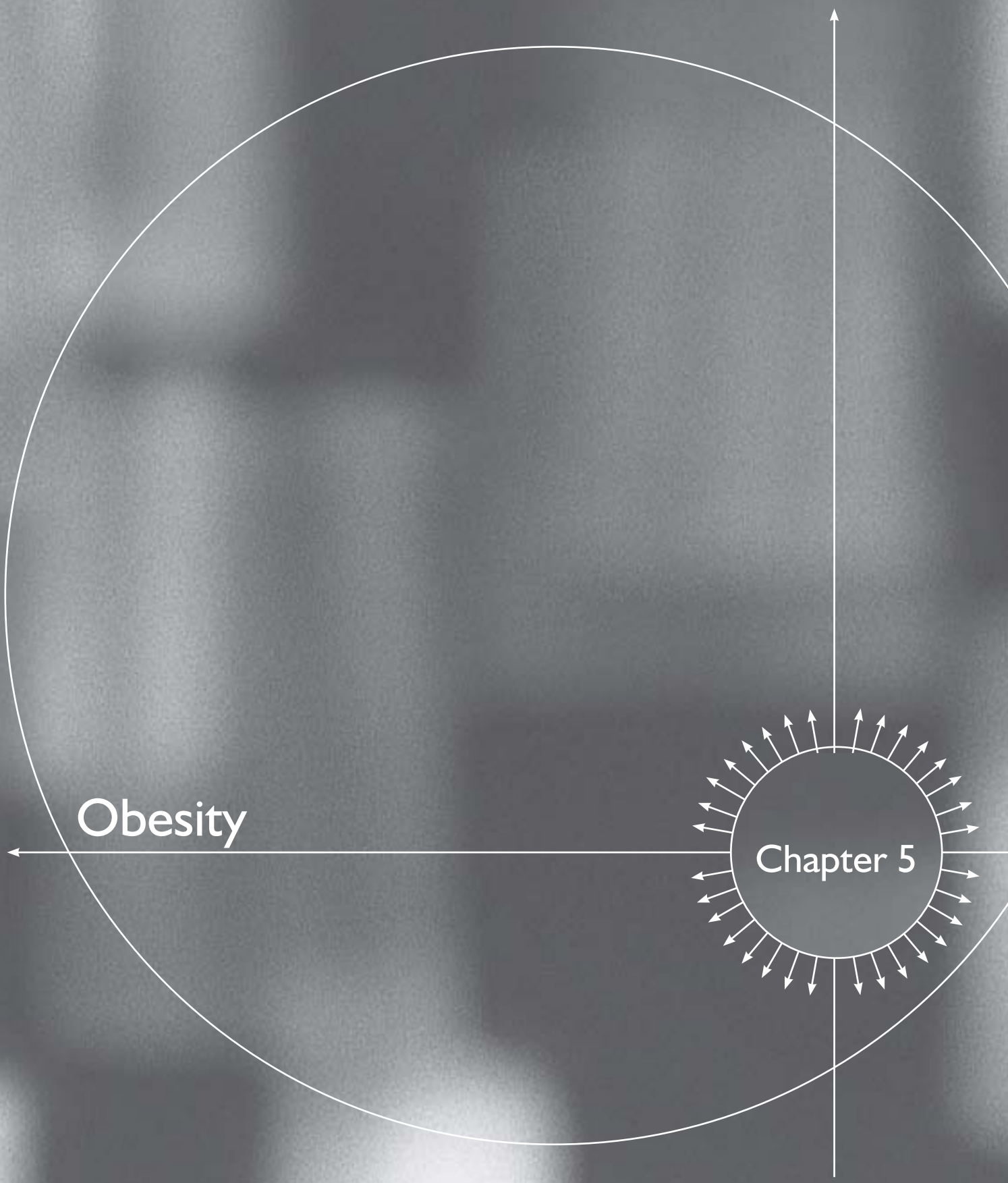
5   OBESITY

Linsay Gray and Alastair H Leyland

SUMMARY

- In 2011, 65.6% of children aged 2-15 had a healthy weight (BMI >5th percentile and <85th percentile), a small decrease from 70.3% in 1998.
- 31.6% of children were overweight or obese in 2011 (BMI $\geq$85th percentile), a slight increase since 1998 when the prevalence was 28.0%.
- 15.7% of children were obese (BMI $\geq$95th percentile and <98th percentile) or morbidly obese (BMI $\geq$98th percentile) in 2011, representing a small rise in prevalence from 13.0% in 1998.
- The trends over time have largely been driven by boys, with little change seen for girls in the 1998-2011 period.
- Boys were significantly less likely than girls to be a healthy weight (65.1% compared with 69.8%) and were more likely to be overweight or obese (32.7% compared with 28.0%) (2008-2011 combined).
- Healthy weight prevalence was significantly associated with age though not in a linear fashion. Prevalence was generally highest in the early years (aged 2-7) and was lowest among boys aged 10-11 (56.6%) and girls aged 12-13 (62.9%).
- Boys aged 10-11 and girls aged 12-13 had the highest prevalence of overweight or obesity (41.9% and 33.4%, respectively).
- There is a strong association between parental BMI and child BMI. Children with parents who are either a healthy weight or underweight are less likely to be overweight or obese than children of obese parents (21.0% compared with 40.1%).
- Boys in the lowest income households were more likely than those in other household income groups to be obese (19.7% compared with 14.2% in the highest income group). There was no clear pattern by household income for girls.
- Area deprivation was significantly associated with obesity. Girls and boys in the most deprived quintile were less likely to be a healthy weight and more likely to be obese than girls and boys in the least deprived areas. Children living in the 15% most deprived areas in Scotland had a significantly higher prevalence of obesity than those living elsewhere (18.7% compared with 14.5%).

5.1   INTRODUCTION

The negative health consequences experienced by overweight and obese children are wide ranging and include an increased risk of hypertension, type 2 diabetes and asthma.[1,2] Children's mental wellbeing has also been shown to be negatively affected by overweight and obesity. The health risks of an unhealthy weight in childhood continue into adulthood and can result in an increased risk of conditions in life including cardiovascular disease.[3,4] The SIGN guidelines for managing child healthy weight reflect the evidence about such lifecourse risks and recommend that parents should be made aware of the increased prevalence of a number of risk factors for cardiovascular disease and diabetes among obese children and adolescents.[4] Similarly, recognition of the mental

health consequences for obese children is underlined by SIGN's recommendation that they should be referred for psychological assessment if they show signs of distress.

The policy significance of child healthy weight is evident by its inclusion as one of the Scottish Government's National Performance Framework (NPF) national indicators, which is being monitored via the Scottish Health Survey (SHeS). The original indicator in the 2007 NPF was:[5]

> *Reduce the rate of increase in the proportion of children with their Body Mass Index outwith a healthy weight*

In the revised NPF, published in 2011, the indicator was changed to:[6]

> *Increase the proportion of healthy weight children*

The revised NPF also includes a new indicator to increase the proportion of babies born with a healthy birth weight, another reflection of the increasing recognition that a long-term approach to overweight and obesity prevention is needed.

The introductions to the obesity chapters in the three previous SHeS Reports[7,8,9,10] 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*.[11]
- The Keep Well initiative.[12]
- The Scottish Government's *Route Map* for tackling obesity and the associated *Obesity Route Map Action Plan,* published in 2011.[13] SHeS is the measurement tool for seven of the Route Map's indicators, including the long-term goal of: fewer children in Scotland overweight or obese.[14]
- The Scottish Intercollegiate Guidelines Network (SIGN) national clinical guideline on obesity management.[4]
- The NHS Scotland HEAT[15] target established in 2008/09 to deliver 6,317 child healthy weight interventions by March 2011. 8,406 interventions were delivered during the target period.[16]

In addition, a number of policy actions targeted specifically at improving children's diets (described in Chapter 3) and physical activity levels (described in Chapter 4) are also relevant in the context of tackling obesity.

The HEAT target noted above was extended to cover the delivery of 14,910 interventions in the April 2011 to March 2014 period with a new requirement that at least 40% of such interventions should be delivered to children living in the two most deprived SIMD quintiles.[16] 5,052 interventions were delivered between April 2011 and March 2012 and an evaluation is currently underway to explore the impact of the programme.

The association between healthy weight and wellbeing noted above has also been reflected in the new National Mental Health Indicators for children and young people in Scotland.[17] The *percentage of 2 to 15 year olds classified as obese or morbidly obese* (Body Mass Index (BMI) at or above the 95th Centile of the 1990 UK reference data) is one of the indicators and has been included as part of the individual contextual domain as a measure of healthy living.

This chapter focuses on body mass index (BMI), derived from the direct measurements of height and weight taken in the main interview. Trends in child BMI over the 1998-2011 period are examined by age and sex. The chapter takes advantage of the combined 2008 to 2011 samples to provide more robust estimates of BMI for different age groups, and repeats the analysis of the association between parents' and children's BMI presented in the 2009 report.[9] Finally, differences by socio-demographic group are also shown.

5.2 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.

5.2.1 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 and socks. One measurement was taken, with the participant stretching to the maximum height and the head positioned in the Frankfort plane.[18] The reading was recorded to the nearest even millimetre.

5.2.2 Weight

Weight was measured using Soehnle and Tanita electronic scales with a digital display. Participants were asked to remove shoes, socks 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.

5.2.3 Body Mass Index (BMI)

The Body Mass Index (BMI), defined as weight (kg)/height (m^2), is a widely accepted measure that allows for differences in weight due to height. It has been used in each Scottish Health Survey report to date. However, BMI has some limitations.[19,20] 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 in children is defined in the same way as it is for adults: weight (kg)/height (m^2). However, despite the relatively wide acceptance of the use of BMI as an adiposity indicator, the establishment of a specific obesity and overweight classification system for children and young people has proved to be difficult. Constant changes in body composition during growth mean that the relationship between weight-for-height and adiposity during childhood and adolescence is age-dependent, and this relationship is further complicated by ethnicity and gender.[21] Several methods have been employed to define early life overweight and obesity, including body fatness as measured by skinfold thickness,[22,23] national BMI percentile charts,[24,25,26] weight-for-height indices,[27] BMI percentile cut-off points,[28] and international[29] and national[30] BMI cut-off points.

Percentile charts can be used to compare an individual child's BMI with the distribution of BMI in a reference population to see whether it corresponds with the average or whether it is unusually high or low. Since children's BMI changes as they age, the comparison needs to be age specific. For example the BMI for a child of 5 needs to be compared with a reference population with a large sample of 5 year olds rather than data for children with a wide age range.

The classifications of children's BMI used in this chapter, set out below, have been derived from BMI percentiles of the UK 1990 reference curves[25,26] (referred to as the National BMI percentiles classification); these have been used in all the Scottish Health Surveys to date. SIGN recommends that these reference curves and thresholds should be used for population surveillance in Scotland.[31]

Percentile cut-off	Description
At or below 5th percentile	Underweight
Above 5th percentile and below 85th percentile	Healthy weight
At or above 85th percentile and below 95th percentile	Overweight
At or above 95th percentile and below 98th percentile	Obese
At or above 98th percentile	Morbidly obese

The 85th / 95th cut-off points are commonly accepted thresholds used to analyse overweight and obesity in children. These thresholds have previously been used to describe childhood overweight and obesity prevalence trends in the UK.[32,33,34,35] The National BMI percentiles classification has been shown to be reasonably sensitive (i.e. not classifying obese children as non-obese) and specific (i.e. not classifying non-obese children as obese).[36,37] As noted in the introduction, one of the Scottish Government's National Indicators relates to healthy weight in children, defined as neither underweight nor

overweight / obese.[6] For this reason the data have been categorised to show the total proportions that are overweight, obese or morbidly obese, as well as the proportion underweight.

The use of reference curves require children's ages to be exactly matched to those in the reference population charts. This is a fairly straightforward process in clinical settings where an individual child's exact age can be compared with the look-up chart for their age. Matching exact ages to population charts in a survey dataset containing many children is somewhat less straightforward. SHeS uses a method developed by ISD Scotland that plots the exact ages of the children in the sample against the reference population data.[38]

Although children's exact age was used to calculate the BMI grouping prevalence rates (based on the interview date and the date of birth), the results are presented using grouped ages based on age at last birthday.

5.3 RESPONSE TO ANTHROPOMETRIC MEASUREMENTS, BY AGE AND SEX

The response to anthropometric measurements for children aged 2-15 in 2011 is shown in Table 5.1. Similar proportions of boys and girls had their height and weight measured. A valid measurement for height was obtained for 75% of boys and 76% of girls. The equivalent figures for weight were 76% and 75% respectively. The proportions providing valid height and weight measurements increased significantly with age for boys but not for girls. 70% of boys aged 2-6 had a valid height measurement and 72% had a valid weight measurement compared with 81% of those aged 12-15. Among girls, response to weight measurement was lowest among the oldest age group (aged 13-15) (72% compared with 76%-77% for younger girls).

A valid BMI was derived for 74% of boys and 75% of girls. Response increased significantly by age for boys, from 70% at age 2-6 to 81% at age 12-15, whereas among girls, the oldest group were the least likely to have a valid BMI measure (72%).   **Table 5.1**

5.4 TRENDS IN THE PREVALENCE OF CHILD HEALTHY WEIGHT, OVERWEIGHT AND OBESITY SINCE 1998

This section focuses on three measures of BMI for children aged 2-15: obese ($\geq$95th percentile); overweight or obese ($\geq$85th percentile); and within the healthy weight range (not underweight, overweight or obese; i.e. >5th percentile and <85th percentile). The previous three reports have included discussions of the proportions of children with a BMI outwith the healthy weight (i.e. underweight, overweight and obese combined).[7,9,10] This reflected the National Performance indicator relating to this measure.[5] However, as noted in the introduction, the new National Performance Framework child weight indicator, published in 2011, is based on healthy weight prevalence.[6] For this reason, both the prevalence of children within and outwith the healthy range are shown in Table 5.2, but the discussion below focuses on the within healthy range results. Figures for 1998 onwards are presented in Table 5.2 and Figure 5A. A more detailed analysis of

the patterns by sex and age group, based on the 2008 to 2011 combined data, is presented in Section 5.5 below, and shown in Table 5.3.

As noted in the introduction, the proportion of children aged 2-15 who are obese or morbidly obese is one of the new Mental Health Indicators for children and young people in Scotland.[17] In 2011, 15.7% of children aged 2-15 were obese or morbidly obese. This represents a small rise over time in prevalence, from 13.0% when it was first measured in 1998. With the exception of 2009 and 2010, when figures stabilised or dropped slightly, most years have seen small increases. As noted in previous reports, this slight increase in obesity prevalence was largely confined to boys. For example, 13.1% of girls were obese in 1998, as were 13.7% in 2011, with fluctuations between 12.3% and 14.7% in the intervening years. In contrast, with the exception of 2009 and 2010, the proportion of boys that were obese has increased each year since 1998 when it stood at 13.0%. In 2011 17.5% of boys aged 2-15 were obese.

The overall prevalence of overweight including obesity since 1998 has followed a similar pattern to that of obesity. There was a slight increase in prevalence among all children (from 28.0% in 1998 to 31.6% in 2011), relatively little change for girls (ranging between 26.9% and 28.9%) and, despite some fluctuation between 2003 and 2009, a more pronounced increase for boys (from 27.8% in 1998 to 34.5% in 2011) in this period.

The trend data for the prevalence of healthy weight is presented in Figure 5A (note that the scale in the graph runs from 50 to 90 to increase its clarity). In line with the small increase in the prevalence of overweight including obesity outlined above, the proportion of children with a healthy weight followed a corresponding small decrease in the same period, from 70.3% in 1998 to 65.6% in 2011 (though note that at 66.4%, the 2008 figure is very similar to the 2011 figure). As is clear from Figure 5A, most of the change occurred among boys rather than girls, and there have been some notable fluctuations, particularly between 2008 and 2009 when there was a six percentage point increase in healthy weight prevalence in boys. Given the pattern since 2009, it seems likely that 2008 represented an atypical year, particularly for boys, and that the overall pattern is one of gradual decline.   **Figure 5A, Table 5.2**

Percentage of children aged 2-15 with BMI in the healthy weight range by sex
1998, 2003, 2008, 2009, 2010 and 2011
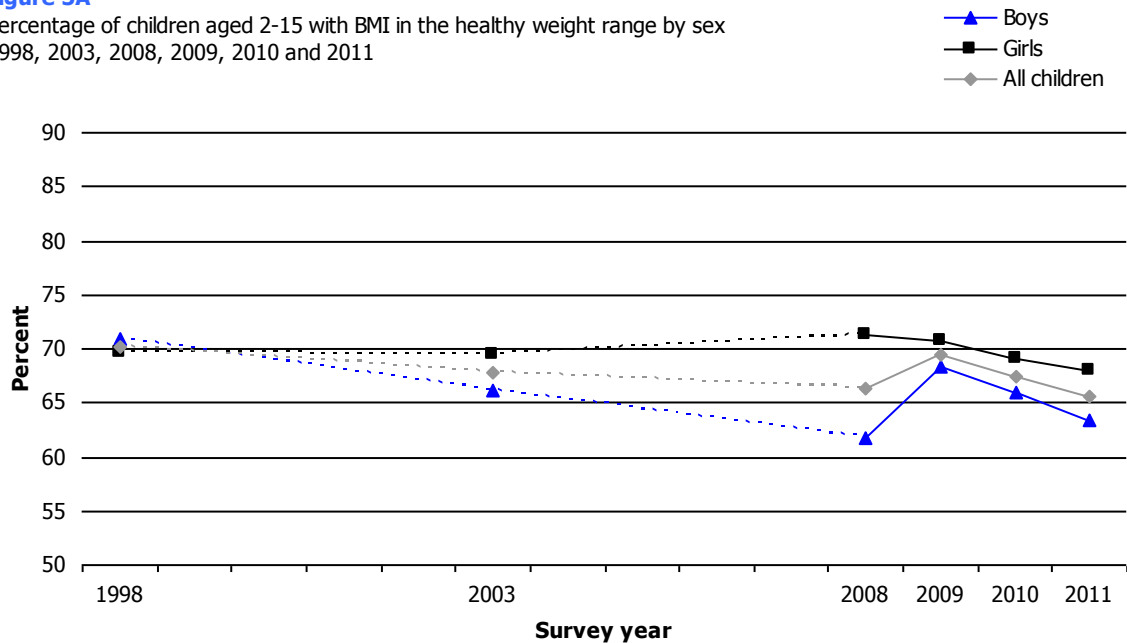
5.5 CHILDREN'S BMI CATEGORIES, BY AGE AND SEX, 2008-2011 COMBINED

Previous SHeS reports noted that the sample size for children in individual survey years is not sufficiently large to detect statistically significant differences in BMI between some sub-groups. Now that data for the 2008-2011 period have been collected, it is possible to present more robust prevalence estimates for smaller age sub-groups based on all four years. This section examines the 2008-2011 combined prevalence figures for the three summary BMI groups discussed above (obese; overweight including obesity; and within healthy weight) as well as the proportion of underweight children, by age and sex.

As Table 5.3 shows, in the 2008-2011 period two thirds (67.4%) of children aged 2-15 had a healthy weight. The difference between the proportion of boys (65.1%) and girls (69.8%) with a healthy weight was statistically significant. Healthy weight prevalence was also significantly associated with age, though not in a linear fashion (as Figure 5B illustrates). Prevalence of healthy weight was generally highest in the early years (ages 2-7) for both boys and girls. The patterns then depart somewhat, with a large decline among boys from 74.1% at age 6-7 to a low of 56.6% at age 10-11, followed by a small increase for those aged 12-15 (62.4%-63.0%). Among girls, there was a sharp decline between the ages of 6-7 and 8-9 (from 78.1% to 70.4%) which continued until age 12-13 (62.9%), before increasing to 66.4% at age 14-15.

Prevalence of healthy weight in chidlren aged 2-15, by age and sex,
2008-2011 combined
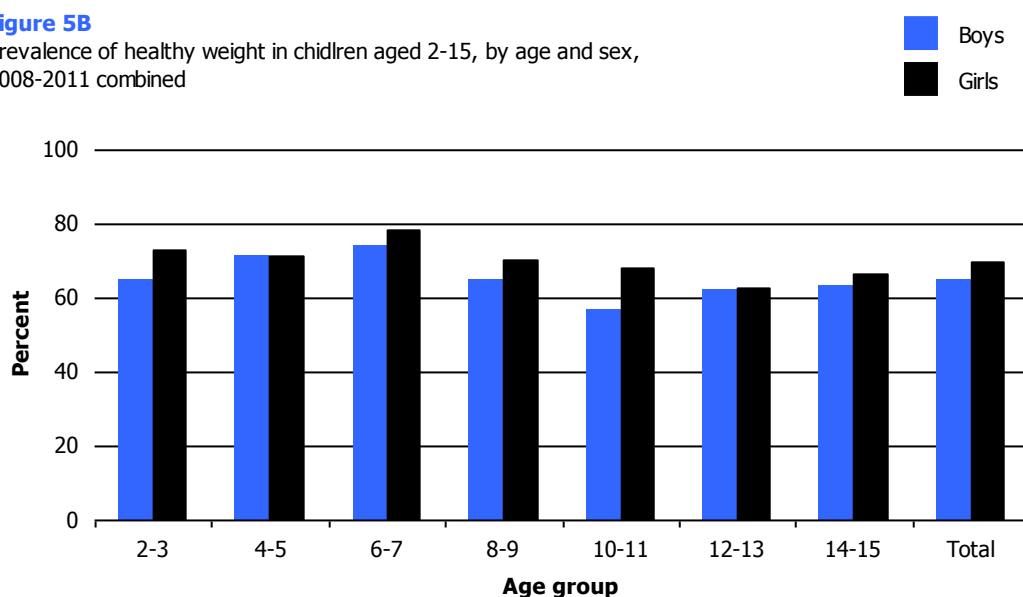
It is clear from Table 5.3 that the pattern in healthy weight prevalence across the age groups illustrated in Figure 5B was largely accounted for by differences in the proportion of children classified as obese or morbidly obese. For example, 5.1% of boys and 2.9% of girls aged 2-3 were morbidly obese, this increased threefold by the age of 10-11, to 15.9% in boys and 8.8% in girls. In contrast, the prevalence of underweight fluctuated in boys with no obvious pattern. Prevalence of underweight was higher among girls aged 10-13 (3.7%) than at any other age.

Three in ten children (30.4%) aged 2-15 were overweight or obese; again this was significantly higher for boys (32.7%) than for girls (28.0%). The proportions that were overweight or obese showed similar (but inverted) age-related patterns to those for children within the healthy weight range. For example, boys aged 10-11, and girls aged 12-13, had the highest overweight including obesity prevalence (41.9% and 33.4%, respectively).   **Figure 5B, Table 5.3**

5.6   CHILDREN'S BMI CATEGORIES, BY PARENTAL BMI CATEGORIES

The BMI status of children by parental BMI is presented in Table 5.4. This table is based on the 2008-2011 combined samples. Each year the survey included a boost sample of households in which children were interviewed but adults were not. This table is therefore based on children in the main sample where at least one of their parents was also interviewed (and had a valid BMI measurement). The data have been re-weighted so this analysis shows the pattern of association between parental and child BMI, and provides population estimates of the prevalence of child unhealthy weight in households with different parental profiles. For households with BMI measures for two parents, the measure of parental BMI was based on whichever parent's BMI was the highest.[39] If just one parent's BMI was measured this was used for this analysis.

The results presented in the 2009 report[9] showed a strong association between parental and child BMI. The 2008-2011 combined data confirmed this.

Children with a parent who was healthy weight or underweight were more likely to have a healthy weight themselves. For example, 75.7% of children with an under or healthy weight parent had a healthy weight compared with 71.4% of children with an overweight parent, and 58.7% of those with an obese parent.

Prevalence of overweight and obesity in children increased significantly in line with parental BMI. Children with an obese parent were twice as likely as those with an under or healthy weight parent to be overweight or obese (40.1% compared with 21.0%). The relative difference between the groups was even larger for the obese/morbidly obese category. The prevalence of obesity in children was three times higher for those with an obese parent than for those with an under or healthy weight parent (23.2% versus 9.4%).

All these patterns were similar for girls and boys. Despite having data from four years, the sample size is still not sufficiently large to permit this analysis to be conducted for mothers and fathers separately. Evidence from other sources suggests that maternal BMI has a stronger influence on girls' BMI than on boys', while the opposite is true for father's BMI.[40]   **Table 5.4**

5.7   OVERWEIGHT AND OBESITY, BY SOCIO-DEMOGRAPHIC FACTORS

Tables 5.5 to 5.7 present children's BMI status by socio-economic classification (NS-SEC of the household reference person), equivalised household income and the Scottish Index of Multiple Deprivation (SIMD) for the years 2008-2011 combined (descriptions of each of these measures are available in the Glossary at the end of this volume).

5.7.1   Socio-economic classification (NS-SEC)

Children's BMI status by NS-SEC of the household reference person is presented in Table 5.5 for all children and for boys and girls separately. There were no significant associations between NS-SEC and the prevalence of healthy weight, overweight including obese, or obesity. This confirms the findings presented in the 2009 report.[9]   **Table 5.5**

5.7.2   Equivalised household income

Similarly, as discussed in the 2009 report,[9] while the overall association between BMI status and household income was not significant, boys in the lowest income quintile households had a significantly higher prevalence of obesity (19.7%) than boys in other income groups (14.2%-16.4%). In contrast, no significant differences evident among girls.   **Table 5.6**

5.7.3   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, and helps to assess the extent of any inequalities. The second contrasts the most deprived 15% of areas with the rest of Scotland (described in the tables as the "85% least deprived areas").

Of the socio-demographic factors considered, area deprivation had the strongest association with BMI status (Table 5.7 and Figure 5C). There was a significant association between deprivation (measured in quintiles) and BMI category. Patterns did not always follow a clear gradient, but children in the most deprived quintile were less likely to be a healthy weight and more likely to be obese than those in the other quintile groups. For example, 68.2%-70.0% of children in the three least deprived quintiles had a healthy weight compared with 63.3% of those in the most deprived quintile. In contrast, obesity prevalence was lowest among children in the least deprived quintile (12.1%), ranged from 14.5% to 15.2% in the next three, and was highest in the most deprived quintile, at 19.4%.

As Figure 5C illustrates, the increase in obesity prevalence by deprivation quintile among boys followed a linear pattern, increasing from 13.8% in the least deprived quintile to 21.0% in the most deprived quintile. For girls, while the pattern was not linear, prevalence was lowest for those in the least deprived quintile (10.4%) and highest in the most deprived (17.8%).The prevalence of underweight among boys and girls did not differ significantly across SIMD quintile groups.

In line with the findings for deprivation quintiles, children living in the 15% most deprived areas of Scotland had a significantly higher prevalence of obesity (18.7%) than children living elsewhere (14.5%). This pattern was evident for both boys and girls. The differences between these two deprivation groups were smaller for other BMI categories – though were in the direction expected based on the quintile analysis.   **Figure 5C, Table 5.7**

Figure 5C

Prevalence of obesity (including morbid obesity) in chidlren aged 2-15, by SIMD quintile and sex, 2008-2011 combined
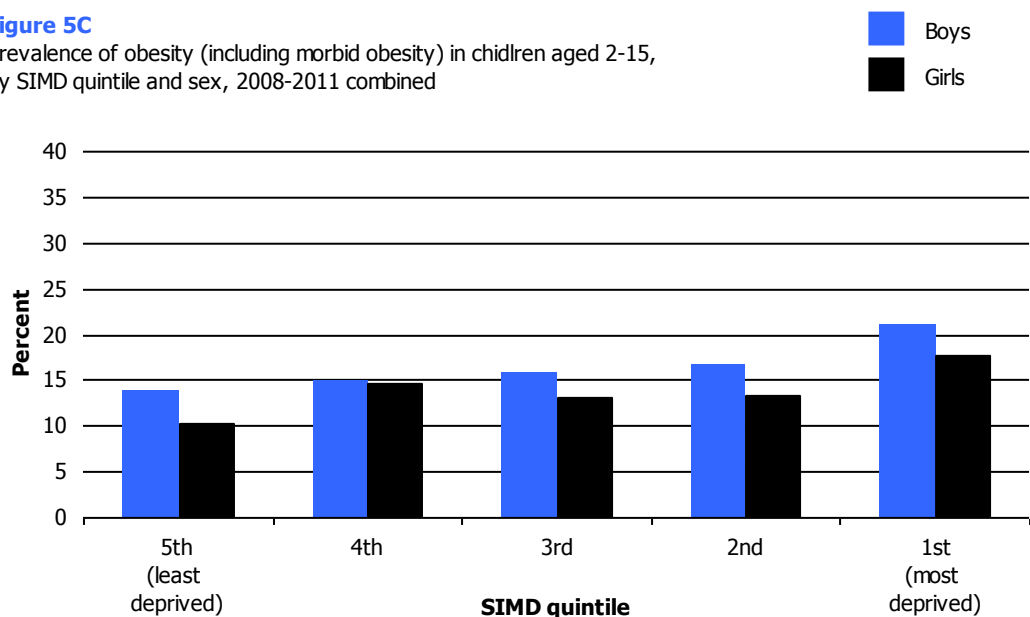
Boys
Girls

Throughout this chapter, differences in the prevalence of obesity have tended to stand out, both over time and between sub-groups. For example, obesity prevalence is associated with SIMD for both boys and girls, with income for boys, and is notably associated with parental BMI. These findings suggest that initiatives to increase the prevalence of healthy weight might benefit from a targeted focus on children at the upper end of the weight distribution, in combination with a whole population approach to increase healthy weight across the board.

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11   *Healthy Eating, Active Living: An action plan to improve diet, increase physical activity and tackle obesity (2008-2011)*, Edinburgh: Scottish Government, 2008.

12   See: <www.keepwellscotland.com> and <www.healthscotland.com/Prevention-2010.aspx>

13   *Obesity Route Map: Action Plan – Version 1.0.* Edinburgh: Scottish Government, 2011. <www.scotland.gov.uk/Resource/Doc/346007/0115166.pdf>

14   Health Analytical Services Scottish Government and Information and Statistics Division, NHS National Services Scotland. *Indicators to Monitor Progress of the Obesity Route Map*. Edinburgh: Scottish Government, 2011 <www.scotland.gov.uk/Resource/Doc/346011/0115167.pdf>

15   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.

16   See: <www.scotland.gov.uk/About/scotPerforms/partnerstories/NHSScotlandperformance/childhealthyweight>

17   Parkinson, J. (2012). *Establishing a core set of national, sustainable mental health indicators for children and young people in Scotland: Final report.* Glasgow: NHS Health Scotland.

18   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.

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38   This method has been developed by ISD Scotland, full details of the procedure are available on request from the Scottish Government Health Survey team.

39   For example, if both parents were overweight or obese, or both were of normal weight or underweight, the parental BMI value matched that of both parents. If one parent was overweight and one was normal weight the parental BMI matched the highest value of either parent. In households where one parent was interviewed, or just one parent provided a valid BMI measurement, the parental value matched that parent's BMI.

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Table list

Table 5.1   Child response to anthropometric measurements (height, weight and BMI), 2011, by age and sex

Proportion providing valid measurement	Age			Total
	2-6	7-11	12-15	
	%	%	%	%
Boys				
Height	70	75	81	75
Weight	72	76	81	76
BMI	70	75	81	74
Girls				
Height	75	78	75	76
Weight	76	77	72	75
BMI	75	77	72	75
Bases (weighted):				
Boys	*340*	*291*	*254*	*885*
Girls	*306*	*297*	*237*	*840*
Bases (unweighted):				
Boys	*355*	*276*	*227*	*858*
Girls	*333*	*280*	*224*	*837*

Table 5.2   Proportion of children with BMI within the healthy range, and prevalence of overweight and obesity in children, 1998, 2003, 2008, 2009, 2010, 2011, by age and sex

Aged 2-15 with both valid height and weight measurements[a]   *1998, 2003, 2008, 2009, 2010, 2011*

BMI status (National BMI percentiles)[b]	Age			Total
	2-6	7-11	12-15	
	%	%	%	%
Boys				
Within healthy range[b]				
1998	69.8	72.0	70.6	70.9
2003	67.8	66.4	64.1	66.1
2008	72.3	55.8	57.9	61.8
2009	75.8	65.7	63.9	68.3
2010	69.0	64.0	65.2	66.0
2011	63.9	61.5	64.8	63.4
Outwith healthy range[c]				
1998	30.2	28.0	29.4	29.2
2003	32.2	33.6	35.9	33.9
2008	27.7	44.2	42.1	38.2
2009	24.2	34.3	36.1	31.7
2010	31.0	36.0	34.8	34.0
2011	36.1	38.5	35.2	36.6
Overweight (including obese)[d]				
1998	29.1	27.3	26.9	27.8
2003	30.0	33.1	34.1	32.4
2008	25.9	43.4	38.2	36.1
2009	23.1	33.2	33.2	30.0
2010	27.5	33.0	32.7	31.1
2011	33.3	36.6	33.7	34.5
Obese (including morbidly obese)[e]				
1998	11.3	13.4	14.1	13.0
2003	9.5	18.0	18.9	15.6
2008	7.8	22.9	19.1	16.8
2009	9.0	18.3	18.4	15.4
2010	12.5	21.0	12.2	15.6
2011	15.7	18.2	18.9	17.5
Girls				
Within healthy range[b]				
1998	71.4	71.1	65.9	69.6
2003	71.6	69.5	67.0	69.4
2008	73.6	74.8	64.8	71.3
2009	74.9	71.0	65.8	70.8
2010	73.6	69.2	63.2	69.1
2011	68.9	68.7	65.8	68.0
Outwith healthy range[c]				
1998	28.6	28.9	34.1	30.4
2003	28.5	30.7	33.0	30.7
2008	26.4	25.2	35.2	28.7
2009	25.1	29.0	34.2	29.2
2010	26.4	30.8	36.8	30.9
2011	31.1	31.3	34.2	32.0

Continued…

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Table 5.2   *- Continued*

Aged 2-15 with both valid height and weight measurements[a]   *1998, 2003, 2008, 2009, 2010, 2011*

BMI status (National BMI percentiles)	Age			Total
	2-6	7-11	12-15	
	%	%	%	%
Overweight (including obese)[d]				
1998	26.4	27.3	31.6	28.3
2003	27.0	28.2	31.8	28.9
2008	26.0	23.1	32.1	26.9
2009	24.5	27.3	32.0	27.8
2010	24.7	28.1	34.3	28.5
2011	27.9	27.5	30.7	28.5
Obese (including morbidly obese)[e]				
1998	11.3	13.0	15.1	13.1
2003	9.9	13.5	13.5	12.3
2008	12.9	11.3	15.8	13.2
2009	12.0	14.9	17.3	14.7
2010	9.3	13.9	16.3	12.9
2011	11.9	16.0	13.1	13.7
All children				
Within healthy range[b]				
1998	70.6	71.5	68.3	70.3
2003	69.7	68.0	65.5	67.8
2008	72.9	64.7	61.3	66.4
2009	75.4	68.4	64.8	69.5
2010	71.3	66.6	64.3	67.5
2011	66.4	65.2	65.3	65.6
Outwith healthy range[c]				
1998	29.4	28.5	31.7	29.7
2003	30.3	32.1	34.5	32.3
2008	27.1	35.3	38.7	33.6
2009	24.6	31.6	35.2	30.5
2010	28.7	33.4	35.7	32.5
2011	33.6	34.8	34.8	34.4
Overweight (including obese)[d]				
1998	27.8	27.3	29.2	28.0
2003	28.5	30.7	33.0	30.7
2008	26.0	33.9	35.1	31.7
2009	23.8	30.2	32.6	28.9
2010	26.0	30.6	33.4	29.9
2011	30.6	31.9	32.3	31.6
Obese (including morbidly obese)[e]				
1998	11.3	13.2	14.6	13.0
2003	9.7	15.7	16.3	14.0
2008	10.3	17.5	17.4	15.1
2009	10.5	16.6	17.9	15.0
2010	10.9	17.5	14.1	14.3
2011	13.8	17.1	16.3	15.7

Continued…

Table 5.2   *- Continued*

Aged 2-15 with both valid height and weight measurements[a]   *1998, 2003, 2008, 2009, 2010, 2011*

BMI status (National BMI percentiles)	Age			Total
	2-6	7-11	12-15	
Bases (weighted):				
Boys 1998	*318*	*364*	*284*	*967*
Boys 2003	*378*	*449*	*377*	*1205*
Boys 2008	*215*	*246*	*192*	*653*
Boys 2009	*295*	*341*	*304*	*940*
Boys 2010	*199*	*233*	*190*	*623*
Boys 2011	*228*	*211*	*199*	*637*
Girls 1998	*307*	*334*	*275*	*915*
Girls 2003	*379*	*438*	*343*	*1159*
Girls 2008	*205*	*216*	*190*	*611*
Girls 2009	*293*	*345*	*269*	*907*
Girls 2010	*211*	*230*	*161*	*602*
Girls 2011	*222*	*223*	*166*	*611*
All children 1998	*625*	*698*	*559*	*1882*
All children 2003	*757*	*887*	*720*	*2364*
All children 2008	*420*	*462*	*382*	*1264*
All children 2009	*588*	*687*	*573*	*1848*
All children 2010	*410*	*464*	*350*	*1224*
All children 2011	*450*	*434*	*365*	*1249*
Bases (unweighted):				
Boys 1998	*581*	*640*	*521*	*1742*
Boys 2003	*391*	*425*	*356*	*1172*
Boys 2008	*215*	*240*	*182*	*637*
Boys 2009	*301*	*343*	*303*	*947*
Boys 2010	*220*	*242*	*179*	*641*
Boys 2011	*244*	*199*	*182*	*625*
Girls 1998	*563*	*607*	*505*	*1675*
Girls 2003	*396*	*444*	*351*	*1191*
Girls 2008	*205*	*217*	*208*	*630*
Girls 2009	*309*	*324*	*264*	*897*
Girls 2010	*208*	*197*	*153*	*558*
Girls 2011	*243*	*210*	*163*	*616*
All children 1998	*1144*	*1247*	*1026*	*3417*
All children 2003	*787*	*869*	*707*	*2363*
All children 2008	*420*	*457*	*390*	*1267*
All children 2009	*610*	*667*	*567*	*1844*
All children 2010	*428*	*439*	*332*	*1199*
All children 2011	*487*	*409*	*345*	*1241*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age
   were excluded from the table.
b BMI above 5th percentile, below 85th percentile.
c BMI at or below 5th percentile, at or above 85th percentile.
d BMI at or above 85th percentile.
e BMI at or above 98th percentile.

Table 5.3   Children's body mass index (BMI), 2008-2011 combined, by age and sex

Aged 2-15 with both valid height and weight measurements [a]   *2008-2011 combined*

BMI status (National BMI percentiles)	Age							Total
	2-3	4-5	6-7	8-9	10-11	12-13	14-15	
	%	%	%	%	%	%	%	%
Boys								
Underweight[b]	2.0	2.7	1.9	1.7	1.5	2.9	2.6	2.2
Healthy weight[c]	65.0	71.3	74.1	64.7	56.6	62.4	63.0	65.1
Overweight[d]	17.9	17.2	13.7	16.1	16.0	17.8	16.1	16.4
Obese[e]	10.1	3.5	4.5	7.4	10.0	5.4	9.6	7.2
Morbidly obese[f]	5.1	5.4	5.9	10.1	15.9	11.5	8.6	9.1
Outwith healthy range[g]	*35.0*	*28.7*	*25.9*	*35.3*	*43.4*	*37.6*	*37.0*	*34.9*
Overweight (including obese)[h]	*33.0*	*26.1*	*24.0*	*33.6*	*41.9*	*34.7*	*34.4*	*32.7*
Girls								
Underweight[b]	1.3	1.0	1.5	1.8	3.7	3.7	1.8	2.2
Healthy weight[c]	72.9	71.6	78.1	70.4	68.0	62.9	66.4	69.8
Overweight[d]	16.3	13.9	10.9	12.4	13.0	16.5	16.3	14.2
Obese[e]	6.6	5.8	4.6	9.3	6.5	7.9	6.9	6.8
Morbidly obese[f]	2.9	7.8	4.8	6.2	8.8	9.0	8.6	7.0
Outwith healthy range[g]	*27.1*	*28.4*	*21.9*	*29.6*	*32.1*	*37.1*	*33.6*	*30.2*
Overweight (including obese)[h]	*25.8*	*27.4*	*20.3*	*27.9*	*28.3*	*33.4*	*31.8*	*28.0*
All children								
Underweight[b]	1.7	1.8	1.7	1.7	2.6	3.3	2.3	2.2
Healthy weight[c]	68.8	71.4	75.9	67.7	62.3	62.6	64.6	67.4
Overweight[d]	17.1	15.5	12.4	14.2	14.5	17.2	16.2	15.3
Obese[e]	8.4	4.7	4.5	8.4	8.3	6.6	8.4	7.0
Morbidly obese[f]	4.0	6.6	5.4	8.1	12.3	10.3	8.6	8.1
Outwith healthy range[g]	*31.2*	*28.6*	*24.1*	*32.4*	*37.7*	*37.4*	*35.4*	*32.6*
Overweight (including obese)[h]	*29.5*	*26.8*	*22.3*	*30.6*	*35.1*	*34.1*	*33.2*	*30.4*
Bases (weighted):								
Boys	*348*	*379*	*427*	*370*	*448*	*456*	*426*	*2854*
Girls	*328*	*412*	*360*	*401*	*447*	*413*	*374*	*2736*
All children	*676*	*791*	*787*	*771*	*895*	*869*	*800*	*5589*
Bases (unweighted):								
Boys	*364*	*393*	*441*	*390*	*416*	*426*	*420*	*2850*
Girls	*358*	*428*	*338*	*371*	*418*	*404*	*384*	*2701*
All children	*722*	*821*	*779*	*761*	*834*	*830*	*804*	*5551*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age
  were excluded from the table.
b BMI at or below 5th percentile.
c BMI above 5th percentile, below 85th percentile.
d BMI at or above 85th percentile, below 95th percentile.
e BMI at or above 95th percentile, below 98th percentile.
f BMI at or above 98th percentile.
g BMI at or below 5th percentile, at or above 85th percentile.
h BMI at or above 85th percentile.

Table 5.4   Children's body mass index (BMI), 2008-2011 combined, by parental body mass index (BMI) and sex

Aged 2-15 with both valid height and weight measurements [a] with at least one parent with both valid height and weight measurements (main sample only)   *2008-2011 combined*

BMI status (National BMI percentiles)	Parental BMI		
	Underweight/ healthy weight	Overweight	Obese
	%	%	%
Boys			
Underweight[b]	3.0	2.4	0.9
Healthy weight[c]	73.5	69.2	56.2
Overweight[d]	13.1	16.9	18.2
Obese / morbidly obese[e]	10.4	11.6	24.8
Outwith healthy range[f]	*26.5*	*30.8*	*43.8*
Overweight (including obese)[g]	*23.5*	*28.4*	*42.9*
Girls			
Underweight[b]	3.6	2.0	1.4
Healthy weight[c]	77.8	73.7	61.6
Overweight[d]	10.1	14.7	15.5
Obese / morbidly obese[e]	8.5	9.6	21.5
Outwith healthy range[f]	*22.2*	*26.3*	*38.4*
Overweight (including obese)[g]	*18.6*	*24.3*	*37.0*
All children			
Underweight[b]	3.3	2.2	1.1
Healthy weight[c]	75.7	71.4	58.7
Overweight[d]	11.6	15.8	16.9
Obese / morbidly obese[e]	9.4	10.6	23.2
Outwith healthy range[f]	*24.3*	*28.6*	*41.3*
Overweight (including obese)[g]	*21.0*	*26.4*	*40.1*
Bases (weighted):			
Boys	*445*	*701*	*708*
Girls	*473*	*693*	*641*
All children	*918*	*1393*	*1349*
Bases (unweighted):			
Boys	*450*	*683*	*717*
Girls	*449*	*668*	*661*
All children	*899*	*1351*	*1378*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age were excluded from the table.
b BMI at or below 5th percentile.
c BMI above 5th percentile, below 85th percentile.
d BMI at or above 85th percentile, below 95th percentile.
e BMI at or above 95th percentile.
f BMI at or below 5th percentile, at or above 85th percentile.
g BMI at or above 85th percentile.

Table 5.5   Children's body mass index (BMI), and prevalence of overweight and obesity in children, 2008-2011 combined, by NS-SEC of household reference person and sex

Aged 2-15 with both valid height and weight measurements[a]   *2008-2011 combined*

BMI status (National BMI percentiles)	NS-SEC of household reference person				
	Managerial & professional	Intermediate	Small employers & own account workers	Lower supervisory & technical	Semi-routine & routine
	%	%	%	%	%
Boys					
Underweight[b]	1.4	2.1	3.1	1.7	3.0
Healthy weight[c]	67.7	61.1	66.3	63.1	63.0
Overweight[d]	16.4	19.0	15.1	17.8	15.9
Obese / morbidly obese[e]	14.5	17.8	15.5	17.5	18.1
Outwith healthy range[f]	*32.3*	*38.9*	*33.7*	*36.9*	*37.0*
Overweight (including obese)[g]	*30.9*	*36.8*	*30.6*	*35.2*	*34.0*
Girls					
Underweight[b]	2.3	2.8	2.3	1.2	2.4
Healthy weight[c]	71.2	70.2	69.5	67.8	68.9
Overweight[d]	13.6	14.4	16.4	16.2	13.7
Obese / morbidly obese[e]	13.0	12.7	11.9	14.8	15.0
Outwith healthy range[f]	*28.8*	*29.9*	*30.6*	*32.2*	*31.2*
Overweight (including obese)[g]	*26.5*	*27.0*	*28.2*	*31.0*	*28.7*
All children					
Underweight[b]	1.8	2.5	2.7	1.4	2.7
Healthy weight[c]	69.4	65.7	67.8	65.4	65.9
Overweight[d]	15.0	16.7	15.7	17.0	14.8
Obese / morbidly obese[e]	13.8	15.2	13.8	16.2	16.6
Outwith healthy range[f]	*30.6*	*34.3*	*32.2*	*34.6*	*34.1*
Overweight (including obese)[g]	*28.8*	*31.9*	*29.5*	*33.2*	*31.4*
Bases (weighted):					
Boys	*1172*	*234*	*277*	*301*	*787*
Girls	*1111*	*239*	*250*	*277*	*788*
All children	*2283*	*472*	*527*	*578*	*1575*
Bases (unweighted):					
Boys	*1152*	*236*	*278*	*324*	*788*
Girls	*1089*	*234*	*251*	*292*	*770*
All children	*2241*	*470*	*529*	*616*	*1558*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age were excluded from the table.
b BMI at or below 5th percentile.
c BMI above 5th percentile, below 85th percentile.
d BMI at or above 85th percentile, below 95th percentile.
e BMI at or above 95th percentile.
f BMI at or below 5th percentile, at or above 85th percentile.
g BMI at or above 85th percentile.

Table 5.6   Children's body mass index (BMI), and prevalence of overweight and obesity in children, 2008-2011 combined, by equivalised household income quintile and sex

Aged 2-15 with both valid height and weight measurements[a]   *2008-2011 combined*

BMI status (National BMI percentiles)	Equivalised annual household income quintile				
	1st (highest)	2nd	3rd	4th	5th (lowest)
	%	%	%	%	%
Boys					
Underweight[b]	1.5	1.1	2.2	2.9	2.9
Healthy weight[c]	67.7	67.4	64.1	64.9	62.8
Overweight[d]	16.6	16.0	18.0	15.8	14.6
Obese / morbidly obese[e]	14.2	15.5	15.8	16.4	19.7
Outwith healthy range[f]	*32.3*	*32.6*	*35.9*	*35.1*	*37.2*
Overweight (including obese)[g]	*30.8*	*31.5*	*33.8*	*32.2*	*34.3*
Girls					
Underweight[b]	1.8	1.8	3.4	2.0	1.9
Healthy weight[c]	69.8	72.2	69.3	67.7	74.1
Overweight[d]	14.4	15.8	13.9	13.8	10.8
Obese / morbidly obese[e]	14.0	10.3	13.5	16.6	13.2
Outwith healthy range[f]	*30.2*	*27.9*	*30.7*	*32.3*	*25.9*
Overweight (including obese)[g]	*28.4*	*26.1*	*27.4*	*30.3*	*24.0*
All children					
Underweight[b]	1.6	1.4	2.8	2.5	2.4
Healthy weight[c]	68.7	69.8	66.7	66.2	68.3
Overweight[d]	15.5	15.9	15.9	14.8	12.7
Obese / morbidly obese[e]	14.1	12.9	14.6	16.5	16.5
Outwith healthy range[f]	*31.3*	*30.2*	*33.3*	*33.8*	*31.7*
Overweight (including obese)[g]	*29.6*	*28.8*	*30.6*	*31.3*	*29.3*
Bases (weighted):					
Boys	*482*	*551*	*503*	*531*	*536*
Girls	*452*	*552*	*506*	*473*	*515*
All children	*935*	*1104*	*1010*	*1005*	*1050*
Bases (unweighted):					
Boys	*473*	*580*	*517*	*524*	*512*
Girls	*449*	*564*	*506*	*476*	*476*
All children	*922*	*1144*	*1023*	*1000*	*988*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age
  were excluded from the table.
b BMI at or below 5th percentile.
c BMI above 5th percentile, below 85th percentile.
d BMI at or above 85th percentile, below 95th percentile.
e BMI at or above 95th percentile.
f BMI at or below 5th percentile, at or above 85th percentile.
g BMI at or above 85th percentile.

Table 5.7   Children's body mass index (BMI), and prevalence of overweight and obesity in children, 2008-2011 combined, by Scottish Index of Multiple Deprivation and sex

Aged 2-15 with both valid height and weight measurements [a]　　　　　　　　　*2008-2011 combined*

BMI status (National BMI percentiles)	Scottish Index of Multiple Deprivation quintile					SIMD 85/15	
	5th (least deprived)	4th	3rd	2nd	1st (most deprived)	85% least deprived	15% most deprived
	%	%	%	%	%	%	%
Boys							
Underweight[b]	2.3	1.9	2.2	2.5	2.1	2.1	2.6
Healthy weight[c]	67.3	65.4	67.7	63.7	61.3	65.5	62.9
Overweight[d]	16.5	17.9	14.3	17.1	15.6	16.7	14.5
Obese / morbidly obese[e]	13.8	14.9	15.8	16.7	21.0	15.7	20.0
Outwith healthy range[f]	*32.7*	*34.6*	*32.4*	*36.3*	*38.7*	*34.5*	*37.1*
Overweight (including obese)[g]	*30.4*	*32.7*	*30.1*	*33.8*	*36.6*	*32.4*	*34.5*
Girls							
Underweight[b]	1.6	2.3	2.1	0.7	4.1	2.1	2.7
Healthy weight[c]	72.8	71.1	68.8	70.8	65.2	70.3	67.0
Overweight[d]	15.2	12.1	15.9	15.2	12.9	14.4	13.0
Obese / morbidly obese[e]	10.4	14.6	13.2	13.3	17.8	13.2	17.3
Outwith healthy range[f]	*27.2*	*28.9*	*31.2*	*29.2*	*34.8*	*29.7*	*33.0*
Overweight (including obese)[g]	*25.6*	*26.7*	*29.1*	*28.5*	*30.7*	*27.6*	*30.2*
All children							
Underweight[b]	2.0	2.1	2.2	1.7	3.1	2.1	2.6
Healthy weight[c]	70.0	68.2	68.2	66.9	63.3	67.8	65.0
Overweight[d]	15.9	15.0	15.1	16.3	14.3	15.6	13.7
Obese / morbidly obese[e]	12.1	14.7	14.5	15.2	19.4	14.5	18.7
Outwith healthy range[f]	*30.0*	*31.8*	*31.8*	*33.1*	*36.8*	*32.2*	*35.0*
Overweight (including obese)[g]	*28.0*	*29.7*	*29.6*	*31.4*	*33.7*	*30.0*	*32.4*
Bases (weighted):							
Boys	*597*	*644*	*531*	*536*	*545*	*2427*	*427*
Girls	*586*	*638*	*532*	*441*	*538*	*2321*	*414*
All children	*1183*	*1282*	*1064*	*978*	*1083*	*4748*	*841*
Bases (unweighted):							
Boys	*554*	*664*	*552*	*520*	*560*	*2405*	*445*
Girls	*537*	*649*	*540*	*435*	*540*	*2275*	*426*
All children	*1091*	*1313*	*1092*	*955*	*1100*	*4680*	*871*

a Children whose BMI was more than 3 standard deviations above or below the norm for their age were excluded from the table.
b BMI at or below 5th percentile.
c BMI above 5th percentile, below 85th percentile.
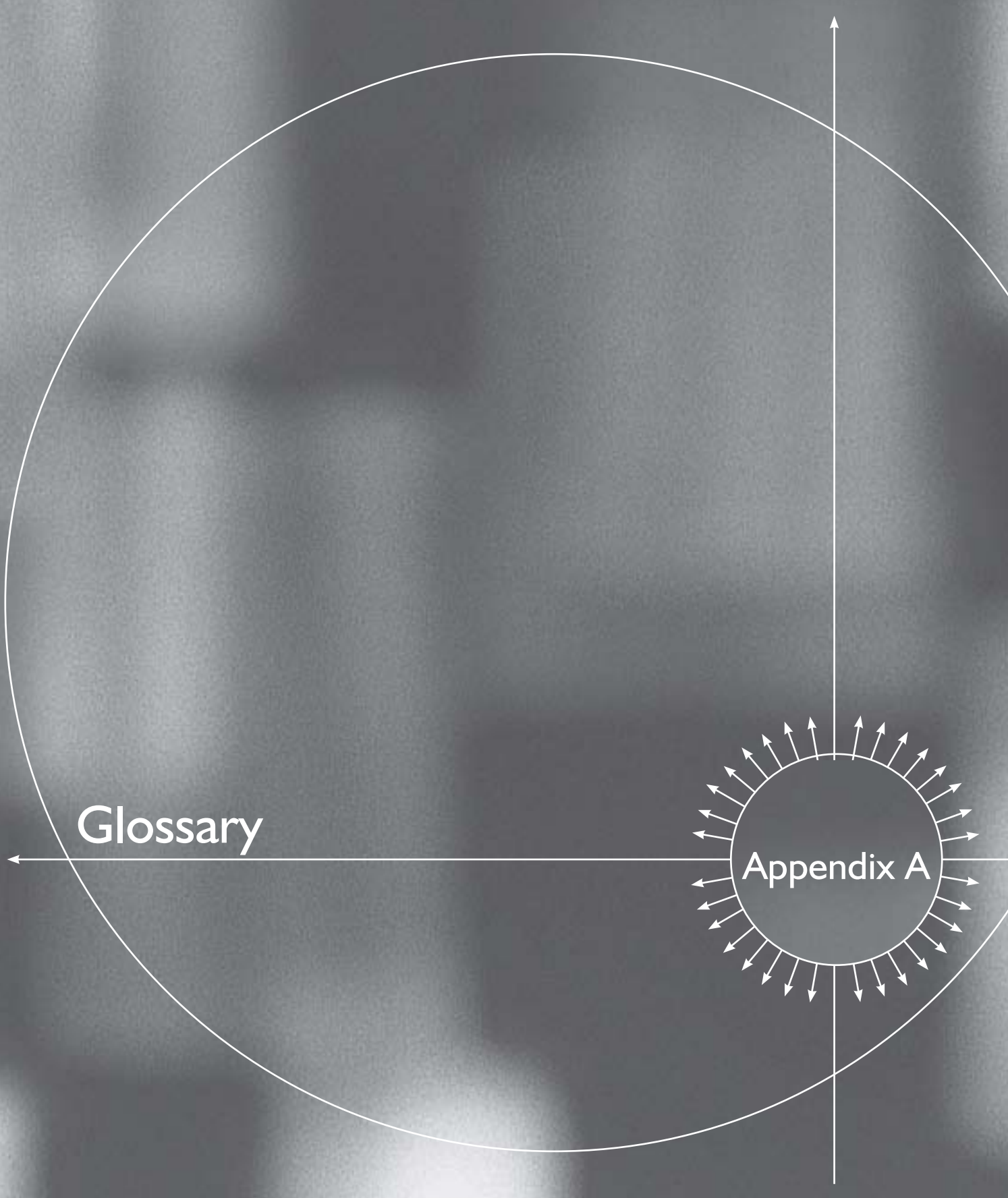d BMI at or above 85th percentile, below 95th percentile.
e BMI at or above 95th percentile.
f BMI at or below 5th percentile, at or above 85th percentile.
g BMI at or above 85th percentile.

Glossary

Appendix A

APPENDIX A: GLOSSARY

This glossary explains terms used in Volume 2 of the 2011 report, other than those fully described in particular chapters.

Anthropometric   See **Body mass index (BMI)**

Arithmetic mean   See **Mean**

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:

BMI (kg/m^2)	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
40 and above	Morbidly obese

Although the BMI calculation method is the same, there are no fixed BMI cut-off points defining overweight and obesity in children. Instead, overweight and obesity are defined using several other methods including age and sex specific BMI cut-off points or BMI percentiles cut-offs based on reference populations. Children can be classified into the following groups:

Percentile cut-off	Description
At or below 5th percentile	Underweight
Above 5th percentile and below 85th percentile	Healthy weight
At or above 85th percentile and below 95th percentile	Overweight
At or above 95th percentile and below 98th percentile	Obese
At or above 98th percentile	Morbidly obese

**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.

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.

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.

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**

Logistic regression   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. For example, this was used in the analysis of children's strengths and difficulties scores.

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 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.

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

SDQ The Strengths and Difficulties Questionnaire (SDQ) is designed to detect behavioural, emotional and relationship difficulties in children aged 4-16. The questionnaire is based on 25 items: 10 strengths, 14 difficulties and one neutral item. The 25 items are divided into 5 scales of 5 items each: hyperactivity, emotional symptoms, conduct problems, peer problems and prosocial behaviour. Each SDQ item has three possible answers which are assigned a value 0,1 or 2. The score for each scale is generated by adding up the scores on the 5 items within that scale, producing scale scores ranging from 0 to 10. A 'Total Difficulties' score is derived from the sum of scores from each of the scales except the Prosocial Behaviour scale, producing a total score from 0 to 40. The SDQ was used for children aged 4-12 in the 2008, 2009, 2010 and 2011 surveys.

The SDQ correlates highly with the Rutter questionnaire and the Child Behaviour Checklist, both of which are long established behavioural screening questionnaires for children that have been proved valid and reliable in many contexts and correlate highly with one another. The SDQ is shorter than these screening instruments and is the first to include a scale focusing on positive behaviour: the Prosocial Behaviour Scale.
Reference: Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry.* 38: 581-586.

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.

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