Financial circumstances, health and well-being of the older population in England

THE 2008 ENGLISH LONGITUDINAL STUDY OF AGEING (WAVE 4)

October 2010

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Contents

Figures

Tables

1. Introduction

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An encouraging feature of British policymaking has been its use of evidence. Nowhere is this more important than in policies for older people. At best, getting policies right for older people is a major opportunity for societal flourishing. At worst, not getting policies right for older people will be a drain on society's resources and will lead to marked social inequalities, and a high proportion of the population with economic, social and physical dependency.

The English Longitudinal Study of Ageing (ELSA) was set up with both research and policy as central objectives. With ageing of the population now a global phenomenon, it is of utmost importance to understand the health, well-being and the economic and social circumstances of older people. The longitudinal nature of ELSA provides researchers with increasing opportunities to determine how to put people on trajectories of economically secure older life, with good health, well-being and social engagement. The answers to these research questions will be fundamental to the development of policy.

Participants in ELSA are interviewed every two years. After each wave we produce a report which provides insight into the data collected. The previous report, produced after wave 3, was based on data collected in 2006–07 and examined several themes, including contributing to society through paid work, material well-being, health and quality of life. It highlighted the contribution of respondents' expectations, physical health and pension provision as well as, where relevant, partners' employment status, to ongoing employment in this cohort of over-50-year-olds. It showed that wealth was increasing in the over-50s, largely due to increasing housing wealth (growing house prices) with only small increases in non-housing wealth (financial and physical wealth but not pension wealth). Findings in that report also showed that being single, having a low level of pension provision and being out of the labour force were related to income poverty but that reaching state pension age was not, of itself, a driver of poverty of income. Income poverty is one of the possible consequences of low-level pension provision and being out of the labour force. Lower quality of life is another, since lower quality of life was found among those who were poorer as well as those who lived alone or had poor physical health.

This report of the wave 4 study is based on data collected in 2008–09. It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected. Readers should also bear in mind that the report was being prepared in the period that spanned the 2010 general election. The policy environment is constantly changing and some policies that were implemented by previous governments and in place at the time of the fieldwork in 2008–09 are under review by the new coalition government. Given the economic downturn experienced in England, and beyond, the chapters on the economic circumstances of ELSA respondents are particularly interesting. Also contained within this report are chapters describing some measures that have not been included or not given extensive focus in our earlier reports, including sleep quality, well-being and receipt of help and care.

This and previous ELSA reports paint a remarkably detailed picture of the lives of people in England aged 50 and over. They are but a starting point. The data from all waves of ELSA are available as public use data sets. The first wave of data collection

took place in 2002–03, with second and third waves in 2004–05 and 2006–07, respectively. This report summarises findings from wave 4 (2008–09) and, along with the three previous reports, serves as an invitation to scholars and policy analysts to delve behind the figures reported here to better understand the social and economic conditions, health and well-being of older people.

Financial circumstances

Three ways of looking at the financial circumstances of ELSA participants are wealth, income and consumption.

Growth in wealth

After a large increase in average wealth between 2002–03 and 2004–05, growth in wealth has subsequently slowed. The increase in average wealth up to 2004–05 appears to have been driven almost entirely by housing wealth and recent declines in house prices have started to move this trend into reverse.

Importance of private pensions

Average incomes have risen in real terms between 2002–03 and 2008–09. Income is also somewhat more unequally distributed in this age group than it was in 2002–03. These trends apply to those below and above the state pension age, although there are differences in the changes in the source of income over the period by age. For individuals aged between 50 and the state pension age, earnings from employment have, on average, become a more significant source of income for those towards the bottom of the income distribution, but a smaller share of income for those towards the top.

In 2008–09, we see that private pension income has become a more significant source of income for pensioners, right across the income distribution. Among lower-income pensioners, in particular, the average share of private pension income as a percentage of total income almost doubled. This suggests that, in this cohort, newly retiring pensioners have significantly more private pension entitlement, across the income distribution, than their already retired peers.

Spending on basics

Food and fuel typically make up a large part of elderly households' budgets and so any price increases tend to have a large impact on those households. Estimates based on the retail price index (RPI) suggest an increase in fuel prices of just under 60% and an increase in the price of food eaten inside the home of around 7% in real terms between the 2004–05 and 2008–09 waves of ELSA data collection. Findings in this report show that between 2004–05 and 2008–09, spending on basics (food, domestic fuel and clothing) as a share of income at the mean has not changed dramatically. However, this disguises the fact that a quarter of households experienced a 10 percentage point or more increase in the share of their income devoted to basics. There was also a considerable increase of 37.3% in the amount spent on domestic fuel over the same period. Spending on basics as a percentage of income can be used as a yardstick of welfare. Using this yardstick, we see that the poorest have been affected the most by the rise in prices.

Employment and pensions

In the context of increasing life expectancy and given the challenges of financing a secure pensions system, there is real interest in people working longer – a rise in employment rates among older people could be one way to reduce the pressure on public spending. Therefore the determinants of staying in work beyond current state pension age are of great relevance.

Working still

Despite the fact that the 2008–09 data were collected during a recession, unemployment remains low among study participants. In fact, employment rates increased from 2002–03 to 2008–09 at ages 55–69, with the increase particularly evident for part-time working.

Although there have been increases in employment rates across all wealth groups, the employment rate among the poorest 20% remains lower than that in the higher wealth quintiles.

Working, retiring and state pension age

Retiring before the state pension age is more common among those who are in poor health, in the higher wealth quintiles or have defined benefit private pensions. It is less common among those with outstanding financial commitments in the form of mortgages and those who have a partner in work.

Working beyond the state pension age is linked to a higher level of education, good health and having a partner in work.

Work disability

There has been a decline in the prevalence of work disability between 2004–05 and 2008–09 and an increase in the propensity to work with a disability, among men. One-in-four individuals aged between 50 and 69 reported having a work disability in 2008–09, of whom one-in-four were in work. The prevalence of work disability increases with age, as does the likelihood of not being in paid work among those with a work disability.

Work disability is more prevalent among individuals with lower levels of education and lower wealth.

Not all individuals who report being work disabled are in receipt of disability-related benefits. Forty per cent of those with work disability in 2008–09 receive one of a number of disability-related benefits. Receipt of disability-related benefits was less common among those with higher levels of education and higher levels of wealth.

Disability and care

Evidence on physical disability rates and trends in disability rates among older people is mixed. In the US, there has been the clear suggestion that, among older people, physical disability rates have been declining. Recent evidence indicates that this trend in disability reduction may have stopped, at least in those aged less than 70 (Seeman et al., 2010). There has been less study of this issue in Britain but the fourth wave of ELSA presents an opportunity to

examine trends for the first time using both objective and subjective measures of physical functioning and disability.

Analysis by birth cohort suggests very little change in the prevalence of disability between birth cohorts. Longitudinal analysis of objective physical functioning (captured by walking speed) over the four waves of the study showed a marked improvement between 2002–03 and 2004–05 but a subsequent significant decline by 2008–09. Although health conditions and socioeconomic factors are an important influence on levels of walking speed, intriguingly they did not explain the improvement or subsequent decline in walking speed.

The 2008–09 ELSA data collection also includes information on receipt of help with physical limitations. In the over-80 age group, 81% of men have at least one physical limitation and over 50% receive help with this. The corresponding figures for women show the prevalence of disability and receipt of help to be higher among women. At age 80+, 89% have a limitation, of whom 62% receive help.

Types of care and quality of life

One question addressed in this report is whether people receiving different types of help and care have different outcomes. Comparisons were made among four groups: those receiving no care, those receiving informal care, those receiving paid care and those receiving state-provided care. Allowing for differences in wealth and health conditions between these groups, there is no evidence that state care is associated with reduced quality of life compared with other forms of care.

Giving help and care

Both the giving and receiving of care have their costs. Analysis of 2008–09 data indicates that the provision of care is not evenly borne across gender and socioeconomic groups.

Across many forms of help and care, women are more involved in providing than are men. Women are more likely than men to keep in touch with someone who cannot get about, to run errands such as shopping and to provide personal care. Women are also more likely to have provided active care in the last week for a parent/parent-in-law or grandchild. However, men aged 75 and over are more likely to be caring for their partner or spouse than women of the same age.

A meaningful way to measure the burden of caring is hours spent per week. The differences are marked. Those in the most deprived areas are spending 31 hours more per week than those in the wealthiest areas. Hours spent caring increase steadily with age so that compared with people aged 50–64, people age 75+ are spending 41 hours more a week caring, mainly for a partner or spouse. Compared with people not providing any active care in the last week, quality of life is lower for those who provide care for their partner, adjusted for age, sex, wealth, area deprivation and self-rated health. However, caring for grandchildren is associated with a higher quality of life.

Health and well-being

A special feature of ELSA, which has made it a leader among multidisciplinary studies of ageing, has been the inclusion of biomarkers along with the richness of social, economic and other health data. Therefore, as well as ELSA documenting social gradients in health, it can contribute to understanding the biology of disadvantage which, in turn, helps with understanding causal pathways from social circumstances to health and illness.

Increases in weight and waist

In line with international concerns over the obesity epidemic, respondents who were present in both 2004–05 and 2008–09 had marked increases in body mass index (higher levels indicating greater obesity) and in waist circumference (higher levels indicating greater central obesity). Sedentary behaviour also increased over the same period.

Social gradients in health and risks to health

There is a clear social gradient in several health indicators and behavioural determinants of health in 2008–09, with less wealthy participants having poor outcomes for overweight and obesity, central obesity (that is, excess weight distributed around the waist, captured by waist circumference, for example), smoking, low levels of physical activity, eating fewer than five portions of fruit and vegetables a day, hypertension and diabetes. In contrast, alcohol consumption does not show the same gradient. The proportion of participants drinking above recommended limits of alcohol is higher among the more wealthy, although these analyses do not focus specifically on alcohol-associated harm.

A social gradient in biological indicators of health and illness (known as biomarkers) is also seen, with those in the less wealthy quintiles having low HDL cholesterol (low HDL is associated with increased risk of coronary heart disease), low IGF-I and low DHEAS (higher levels of these two biomarkers are thought to be associated with improved health and well-being). These biomarkers are also related to better cognitive function. The positive association between wealth and these biomarkers offers a possibility of examining biological pathways underlying socioeconomic inequalities in health conditions in future work. Behavioural and social factors are implicated in determining these biomarkers. For example, analyses of 2008–09 data show that high levels of physical activity and low levels of social isolation are associated with higher levels of DHEAS.

Sleep

Sleep deprivation and problems with sleep have considerable economic ramifications. Disturbed sleep is also linked to several health conditions and poorer quality of life. For these reasons, medical research is turning attention towards sleep quality and duration. Information on sleep was collected for the first time in ELSA in 2008–09. Between 5 and 8 hours of sleep per night is seen as normal and both more and less sleep than this on a regular basis may be indicative of poor sleep. Compared with men, women are more likely to sleep for 5 hours or fewer and are also more likely to sleep for 8 hours or more. Men consistently rate their quality of sleep higher than women. Participants in the higher quintiles of wealth are less likely to report 5 or fewer

hours' sleep and less likely to report 8 or more hours' sleep per night and are more likely to report better quality of sleep.

People who sleep for 5 or fewer hours per night or for 8 or more hours are more likely to report poor general health. Those who reported poor general health also tended to report poorer quality of sleep. People who have cardiovascular disease, or other chronic disease, are more likely to sleep for 5 hours or fewer or 8 or more hours per night, and are more likely to report poor-quality sleep. Poorer cognitive function was also associated with poorer sleep quality. A relationship between sleep duration and poor health or cognition is compatible with the causal link being in either or both directions. Data collection from future waves of ELSA, and other longitudinal studies, will allow determination of which comes first.

Well-being

Well-being is relevant to physical and mental health, social relationships, work, and resource distribution. As one example of the interest in well-being, there has been a move from within economics to emphasise that economic indicators, such as gross domestic product, may not be the best measure of societal progress (Layard, 2006). A measure of well-being might serve this purpose better; indeed one of the aims of public policy is to promote the subjective well-being of the population (HM Government, 2009; Dolan and White, 2007). In this report, well-being has been measured in four ways: depression, life satisfaction, quality of life and loneliness. These indicators of well-being were investigated in relation to gender, age, wealth, social support, physical functioning and health.

Depressive symptoms and loneliness rise with age, particularly among women, while quality of life decreases. However, life satisfaction is greater in men aged 65 and older than in younger men. This may be an age effect, or result from improvements in life satisfaction after retirement. Women aged 75 and older have particularly poor well-being, with high rates of depressive symptoms, low life satisfaction, poor quality of life and high ratings of loneliness. Wealth is associated with all aspects of well-being. More affluent individuals have fewer depressive symptoms, greater life satisfaction, better quality of life and lower levels of loneliness. Another important correlate of well-being is health and the ability to perform everyday activities. Those who were limited in their activities had poorer well-being for all four indicators, irrespective of age.

Levels of well-being were positively associated with the number of close personal relationships. High level of positive support from partner was associated with lower prevalence of depressive symptoms and higher mean life satisfaction and quality of life.

Health and social engagement among the oldest old

By the time of the 2008–09 data collection, there were sufficient numbers of ELSA members aged 80 and over (which we use to define the oldest old in

this report) to begin to explore their health and social characteristics in more detail. Rates of activity limitations are substantial in this age group and 35% of those who had survived to 80 years by 2008–09 had experienced an increase in severity of limitations since the start of the study in 2002–03. Almost 13% had developed significant symptoms of depression by 2008–09. Over 53% experienced a sizeable decrease in quality of life over the period, although 10% experienced a sizeable improvement. Despite these notable health difficulties, levels of engagement in social activities remained high. Around 10% took up membership in an organisation (such as political, environmental, religious and charitable groups) and over 50% were still members of at least one organisation in 2008–09. Contact with children, other family and friends also remained stable for the great majority of ELSA members between 2002–03 and 2008–09.

Methodology

Chapter 10 gives information on the fieldwork methods, response rates and content of the ELSA interview. A brief summary of the design is given here. The original ELSA sample was drawn from households previously responding to the Health Survey for England (HSE) in the years 1998, 1999 and 2001 (Marmot et al., 2003). Individuals were eligible for interview if they were born before 1 March 1952, had been living in a responding HSE household and were, at the time of the ELSA 2002–03 interview, still living in a private residential address in England. In addition, partners under the age of 50 years, and new partners who had moved into the household since HSE, were also given a full interview. All those who were recruited for the first wave or have since become partners of such people are known as Cohort 1.

In the second wave, which took place between June 2004 and July 2005, the core members and their partners were eligible for further interview, provided they had not refused any further contact after the first interview. In the third wave, the aim was to supplement the original cohort with people born between 1 March 1952 and 29 February 1956 so that the ELSA sample would again cover people aged 50 and over. The sources for the new recruits were the 2001–04 HSE years. As before, people were eligible if they had been living in a responding HSE household and were, at the time of the ELSA 2006–07 interview, still living in a private residential address in England. Partners were also interviewed. The fourth wave of ELSA took place between 2008 and 2009 and supplemented the original cohort with a refreshment sample of HSE respondents born between 1 March 1933 and before 29 February 1958, taken from HSE 2006.

Core members are represented by people eligible from HSE who took part in ELSA wave 1 (2002–03) plus the refreshment samples added in wave 3 (2006–07) and wave 4 (2008–09). The analyses contained in this report are predominantly based on data provided by the core members only.

In all waves of the study, there was a face-to-face interview and a self-completion form. In 2004–05 and 2008–09, there was also a nurse visit. Broad topics covered in every wave include household composition, employment and pension details, housing circumstances, income and wealth, self-reported

diseases and symptoms, tests of cognitive performance and of gait speed, health behaviours, social contacts and selected activities, and a measure of quality of life. The 2008–09 interview included some additional questions on sleep patterns, women's health, monetary gifts and transfers including Child Trust Funds and use of respite care. Some questions were also reintroduced from previous waves such as questions that test the respondent's numeracy (reintroduced from wave 1) and questions relating to spending on leisure activities (reintroduced from wave 2). The nurse visit carried out in wave 4 allowed collection of further objective biomedical and physical performance measures for the core sample members. These measures included: blood pressure, grip strength, blood samples, standing and sitting height, weight, waist and hip measurement, lung function, balance, leg raises, chair rises and saliva samples to measure levels of cortisol.

The ELSA data are deposited in the Economic and Social Data Service Archive (http://www.esds.ac.uk/longitudinal) for use by academics, policymakers and others with an interest in ageing.

Reporting conventions

The analyses in this report use information from the core members of ELSA. Cross-sectional analyses based on core members in 2008–09 are used predominantly as this provides the largest available number of participants including those recruited to the study for the first time in 2008–09. Proxy interviews have been excluded, mainly because a much reduced set of information is available for these people.

Cross-sectional analyses have been weighted so that estimates should reflect the population of those aged 50 and over in England. The longitudinal weight available for analyses has been used for most of the more descriptive longitudinal analyses unless the weighting made no substantive difference. Both sets of weights are described in Chapter 10.

Statistics in cells with between 30 and 49 observations are indicated by the use of square brackets. Statistics that would be based on fewer than 30 observations are omitted from the tables; the number eligible is given but a dash is placed in the cell where the statistic would otherwise be placed.

Future opportunities using ELSA

The next two waves of ELSA will take place in 2010–11 (wave 5) and 2012–13 (wave 6). The study is continuing to innovate both in survey methodology and content, with new forms of data collection and new topics being introduced. The value of ELSA to research and policy increases as the longitudinal aspect is extended. Ultimately, however, the value of the study depends on its use by research and policy analysts, and their exploration of ELSA's rich multidisciplinary data set.

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ELSA is a unique multidisciplinary study which would not have been achievable without the efforts of a great number of people. The study is managed by a small committee chaired by Professor Sir Michael Marmot and made up of James Banks, Richard Blundell, Kate Cox, Carli Lessof, James Nazroo, Zoe Oldfield, Nina Rogers, Mai Stafford and Andrew Steptoe. The past input of Elizabeth Breeze to this committee is gratefully acknowledged.

We recognise and greatly appreciate the support we have received from a number of different sources. We are mostly indebted to our respondents. They have given generously of their time on up to seven occasions already and most have agreed to be re-contacted. We hope that our respondents continue to commit to ELSA and, in doing so, will help us to understand the health, wealth and behaviours of the ageing population.

The principal institutions involved in organisation and research on ELSA are University College London (UCL), the Institute for Fiscal Studies (IFS) and the National Centre for Social Research (NatCen). We work closely with colleagues at the Universities of Manchester, Cambridge and East Anglia who are also lead researchers on the study. The study has involved a great many individuals in each of these institutions, some of whom are reflected in the authorship of chapters in this report. Others, including over 300 dedicated interviewers, are unnamed here, but have been pivotal to the success of the study. We would like to express our gratitude to Sheema Ahmed for her careful administration of the study. With regard to this report, particular thanks are due to Judith Payne and Anne Rickard for their meticulous copy-editing of the final manuscript and to Chantal Crevel-Robinson and Robert Markless for their continued guidance of the report during the different stages of publication.

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2. Employment, retirement and pensions

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The analysis in this chapter shows that:

- Employment between the ages of 55 and 69 has been increasing in recent years. Later cohorts have higher employment rates than their predecessors.
  - The increases have generally been largest for those with mid and high levels of education. A greater proportion of the increase seems to have come from increases in part-time working than from increases in full-time working.
- Working past the state pension age is significantly more prevalent in later cohorts, even after controlling for other observable characteristics.
  - Those with high levels of education, those who are in good health and those whose partner is working (if applicable) are significantly more likely to be in work after their state pension age.
- The proportion of individuals aged between 55 and 69 who are not in employment has decreased and the distribution of their self-reported activity has changed over time.
  - Among women, there has been a decline in the proportion reporting looking after their home or family and an increase in the proportion reporting being retired.
  - Among men, the decline in inactivity seems largely to reflect a decline in the proportion reporting themselves to be sick or disabled.
- There has been a decline in the prevalence of work disability among men between 2004–05 and 2008–09 and an increase in the propensity to work for men with a work disability.
  - Work disability is more prevalent among individuals with lower levels of education, those with lower wealth and older people.
  - The likelihood of being in paid work among those with a disability decreases with age and is lowest in the lowest wealth quintile.
- Later cohorts have higher expectations of being in work in future than their predecessors. The increases are larger for some groups than others – notably, they are larger for women in good health and among people aged 55 and over who are currently in work.
  - Not everyone who expects to be in work at a future age expects to be working full-time. If expectations in 2008–09 of future full-time working were borne out, this would result in an increase in full-time employment rates, particularly for women.

- Knowledge of the change to the female state pension age from 60 to 65 (which began in April 2010) remains low among those women who will be affected, although there is some evidence of improving knowledge between 2006–07 and 2008–09.

2.1 Introduction

With life expectancies increasing and the size of the pensioner population projected to grow rapidly over the next few decades,[1] government spending on older people is forecast to rise significantly.[2] One of the key margins on which individual behaviour could adjust to reduce this cost would be for individuals to work longer.

A huge variety of factors affect individuals' attitudes to working, whether or not they choose to work or are able to work at older ages and, if they are not working, what they are doing instead. If policymakers wish to increase workforce participation, the appropriate policy prescription could vary enormously for different groups of people depending on why they are not currently working. ELSA provides a rich source of information on various aspects of individuals' circumstances that could impact on their labour force participation decision – such as qualifications, previous employment, financial resources, health, disability, family circumstances and expectations of the future. Furthermore, ELSA allows us to follow people over time to look at when and how they change their employment patterns as they age and how employment patterns change between cohorts. This chapter provides some initial analysis of patterns of employment (and inactivity) across the first four waves of ELSA. It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn, which will have affected the distributions of many of the measures collected. This is discussed further below. However, the analysis presented here is far from exhaustive and further evidence from, for example, the ELSA life-history interviews or the linked administrative data could be used to produce an even richer picture of later-life work outcomes.[3]

Section 2.2 describes the analytical methods used in this chapter. Section 2.3 presents evidence from ELSA on how cross-sectional employment rates amongst those aged 50 and over in 2008–09 compare with what was observed amongst those who were aged 50 and over in 2002–03, and whether any difference still exists once other individual characteristics have been controlled

[1]See, for example, Office for National Statistics (2009).

[2]Department for Work and Pensions, *Pensioner Benefit Expenditure Projections*, http://research.dwp.gov.uk/asd/asd4/LT3.xls.

[3]ELSA respondents have been asked for permission to link to their National Insurance (NI) records and Department for Work and Pensions (DWP) benefit records. The link to NI records, for those who gave permission, has now been completed. These data contain a wealth of information on individual earnings and employment histories since 1975 and more limited information on employment between 1948 and 1974. Researchers wishing to make use of these data should apply to the ELSA Linked Data Access Committee for permission.

for.[4] Section 2.4 conducts a similar exercise for rates of labour market inactivity and, in particular, self-reported retirement. One form of non-work activity that is particularly prevalent among individuals in their fifties and sixties is reported disability. Therefore Section 2.5 examines the prevalence of work disability and the factors associated with it.

Section 2.6 looks at the transitions of older individuals out of the full-time labour market, and whether or not individuals ‘phase’ their withdrawal through a period of part-time work, while Section 2.7 presents evidence of individuals’ expectations of working, and of working full-time, in the future.

An important factor affecting many individuals’ decisions of whether or not to continue working is the state pension – crucially, at what age it can be claimed and how much it will be worth. This is one area where policy has been changed in a way that will affect the cohort of individuals who were aged over 50 in 2008–09. In particular, questions were included in the 2008–09 ELSA survey to examine knowledge of the change in the state pension age (SPA) for women, which is being increased from 60 to 65 between 2010 and 2020, and the rules surrounding deferral of state pension income, which were made more generous in 2005. Section 2.8 investigates how much women know about their own SPA, while Section 2.9 takes a first look at the data available in ELSA on the take-up of the option to defer claiming the state pension. Section 2.10 draws some conclusions.

The policy environment is constantly changing and some policies that were implemented by previous governments and in place at the time of the fieldwork in 2008–09 are under review by the new coalition government. All the evidence presented here should be interpreted in the context of the policies in place (and the ongoing debate about further policy reforms) at the time the survey was conducted.

2.2 Methods

2.2.1 Sample

The complete ELSA sample consists of people from three different cohorts: (a) the original ELSA sample that was drawn in 2002–03 and consisted of people then aged 50 or older; (b) the refreshment sample that was added to ELSA in 2006–07 and consisted of people then aged 50 to 53 years; and (c) a new sample that was added to ELSA in 2008–09 and comprised people aged 50 to 75 years. The analyses presented in this chapter use all core members from each of the sample cohorts[5] for whom the relevant information (for example, responses to particular questions within a given wave, or responses to the same sets of questions in successive waves) was available. The samples used in regression analysis are clearly stated in the notes to each table. Since there has been some attrition from the study, the numbers in the longitudinal

[4]We present here figures for all types of employment, without separately presenting figures for rates of self-employment. Self-employment at older ages, and the part it may play in allowing a phased retirement, is undoubtedly an interesting topic, but it is one that we do not attempt to address here.

[5]‘Core members’ are defined in Chapter 10.

analysis are smaller than those in the cross-sectional samples. A weighting factor to correct for non-response is used in all the analysis.

2.2.2 Outcomes of interest and classificatory measures

Working and not working

We define individuals as working if they reported, when interviewed, having been engaged in any paid employment or self-employment in the last month.

We define individuals as 'inactive' if they reported that they have not engaged in any form of employment or self-employment in the month prior to interview. In other words, we include both those individuals normally defined as economically inactive and those who are unemployed.

Full-time and part-time work

We define full-time work as working 35 hours or more per week, while part-time is defined as working less than 35 hours a week. This definition is used in order to be consistent with the questions asked in ELSA about expectations of future work patterns, which are analysed in Section 2.7. These questions ask respondents what the chances are that they will be working at all after a particular age and what the chances are that they will be working at least 35 hours a week at this point.

Categories of inactivity

Those individuals who reported not having done any paid work in the month prior to interview are further subdivided into groups based on the individual's response to a question about their current activity. We look specifically at four groups: unemployed, retired, looking after home or family, and permanently sick or disabled. We also include in the 'retired' category those individuals who defined themselves as 'semi-retired'. The small residual group is those who reported some other form of activity when asked – for example, being 'employed' or 'self-employed' (despite not having done any paid work in the past month) or some other self-defined category.

Work disability

In Section 2.5, we define as 'work disabled' (or as 'having a work disability') those individuals who responded in the affirmative when asked: 'Do you have any health problem or disability that limits the kind or amount of paid work you could do, should you want to?'. This question was asked both of ELSA respondents who were working and of those who were not working in 2004–05, 2006–07 and 2008–09.

Marital status

Some of the analysis in this chapter exploits information about respondents' current and previous marital status. In particular, individuals are divided into three groups: those who are currently single (i.e. not cohabiting) and have never been married (or in a civil partnership); those who are currently married, in a civil partnership or cohabiting; and those who are currently single (i.e. not cohabiting) but were previously married or in a civil partnership (that is, they are now separated, divorced or widowed, or their civil partnership has been

dissolved). These groups are referred to in the tables of regression results as 'single, never married', 'couple' and 'previously married', respectively.

Education

Education level is defined using the self-reported age of first leaving full-time education. Individuals are grouped into three categories: those who left at or before the compulsory school-leaving (CSL) age that applied in the UK to their cohort (referred to in this chapter as 'low' education), those leaving school after CSL age but before age 19 (referred to as 'mid' education) and those leaving at or after age 19 (referred to as 'high' education). Those who did not know or refused to report the age at which they left full-time education are classified as low education; those who reported still being in full-time education are excluded from all analysis in this chapter where education is used.

Wealth

The measure of wealth used throughout this chapter is benefit unit net non-pension wealth. This includes all wealth held by an individual (and, where applicable, their partner) in financial assets, property, other physical assets and the assets of any business they own. It is measured net of any outstanding secured or unsecured debts, including mortgages. This measure of wealth excludes wealth held in private pensions or implicit in state pension entitlements. The wealth quintiles for each wave used in this chapter are calculated by dividing respondents to ELSA into five groups, from the lowest wealth to the highest wealth – no attempt is made to equivalise wealth for the number of individuals in the benefit unit when defining the quintiles. Further detail is provided in the ELSA Financial Derived Variables User Guide.[6]

Housing tenure

The housing tenure of the benefit unit (i.e. single person or couple, as applicable) is defined as 'renter' if the benefit unit rents its accommodation or lives rent-free in a property it does not own, 'mortgage' if the benefit unit has a mortgage outstanding on its main residence, and 'own outright' if the benefit unit lives in a property that it owns without a mortgage.

Private pension status

The private pension indicators used throughout this chapter show whether individuals have a private pension of any type – that is, one to which they currently contribute, one to which they do not contribute but from which they are not yet drawing an income, or one from which they are already receiving an income. We further distinguish between whether these pensions are defined benefit (DB) or defined contribution (DC). Due to the nature of the questions asked, for 2002–03 and 2004–05 we do not have full information about the split between DB and DC for some past pensions; where information was not available, these pensions have been classified as 'other'.

[6]Available at http://www.ifs.org.uk/elsa/documentation.php.

Receipt of disability-related benefits

Section 2.5 presents some analysis of the number of individuals receiving disability-related state benefits. A variety of disability-related benefits are available in the UK. In particular, respondents to ELSA were asked about receipt of Incapacity Benefit (IB),[7] Severe Disablement Allowance, Statutory Sick Pay, Attendance Allowance, Disability Living Allowance, Industrial Injuries Disablement Benefit and War Disablement Pension. Respondents are classified as receiving a disability-related benefit if they reported having received any of the aforementioned benefits in the last year. IB was only available to those aged under the SPA; the other benefits are open to everyone who meets certain health (and, in some cases, income) criteria.

Health: long-standing illness

The first measure of health used in this chapter is whether or not individuals reported having a long-standing illness or disability ('long-standing illness'), and whether or not individuals reported having a long-standing illness or disability that limited their activities in some way ('limiting long-standing illness').

Health: self-reported general health

The second measure of health used in this chapter is self-reported general health status. In 2002–03, 2004–05 and 2008–09, respondents were asked how their health was on a five-point scale: excellent, very good, good, fair or poor. In the analysis in Section 2.7, we split respondents into two broad groups: those who reported excellent, very good or good health, and those who reported fair or poor health.

Region

The regional indicators used throughout this chapter divide England into nine regions: North East, North West, Yorkshire and the Humber, East Midlands, West Midlands, East of England, London, South East, and South West.[8] The small number of households in the ELSA sample who live outside England (in either Scotland or Wales) are excluded from the analyses in this chapter where region is used.

2.2.3 Analysis

This chapter presents three types of analysis: (a) comparing the cross-sectional distributions of outcomes of interest in some or all of the four waves of ELSA; (b) looking at changes in behaviour between two consecutive waves of the survey; and (c) looking at longer-term patterns of changes across up to four waves of the survey.

[7]Incapacity Benefit was replaced by Employment Support Allowance (ESA) in October 2008, during the ELSA wave 4 fieldwork period.

[8]For a map of the nine English regions, see http://www.statistics.gov.uk/hub/regional-statistics/england/index.html.

Cross-sectional analysis

The majority of the analysis presented in this chapter compares the cross-sectional distributions of various outcomes of interest (such as current employment, expectations of future employment, having a health condition that limits one's ability to work, and knowledge of policy changes) in some or all of the survey years (2002–03, 2004–05, 2006–07 and 2008–09). Groups are defined in each wave based on their characteristics at the time of interview.

The aim of these cross-sectional comparisons is to explore whether there have been any time or cohort effects on the behaviour or expectations of middle-aged and older people in England. There are a number of reasons to expect that there would be such differences. For example, later cohorts of women have had (on average) greater labour market attachment during their lifetimes and so we might expect their employment at older ages to be different from that of earlier cohorts of women who had lower labour market attachment (i.e. a cohort effect). Also, the recession of 2008 and 2009 may have had an effect on employment rates across all age groups (i.e. a time effect). As with all analysis of this type, we cannot – without further assumptions – identify from the data whether differences between the employment patterns of individuals of a particular age at different points in time are due to cohort effects or to time effects.

We present both univariate and multivariate cross-sectional analysis. The multivariate analysis in Sections 2.3.2, 2.4.2, 2.5.2, 2.6.2, 2.6.3 and 2.8.2 estimates logistic regressions of dichotomous outcomes on various observed characteristics, using pooled cross-sections; the standard errors are estimated allowing for correlation at the individual level to account for the fact that many individuals are observed in more than one wave of data. The same reference group is chosen for each regression and is based on those characteristics that are most prevalent in the whole sample. The exceptions are: wealth quintile, where the middle quintile is used as the reference group; sex and age, where the reference group chosen depends on the analysis being conducted; and marital status, where 'single, never married' is used as the reference group as we want to highlight in our analysis the additional association of various outcomes with specific characteristics of a partner (such as having a partner who is working). The reference group is indicated in each of the relevant tables.

Using the panel: changes in employment status between consecutive waves

In parallel with this cross-sectional analysis, Section 2.6 presents analysis of changes in employment status between consecutive waves of data (i.e. 2002–03 to 2004–05, 2004–05 to 2006–07 and 2006–07 to 2008–09) and Section 2.8 presents evidence on how knowledge of changes to the female SPA changed between 2006–07 and 2008–09 for individual women who were interviewed in both waves. The aim in Section 2.6 is to examine the baseline characteristics associated with different patterns of subsequent withdrawal from paid work. Characteristics are defined on the basis of observed characteristics in the period before the transition – for example, age in 2006–07 if we are examining change in employment between 2006–07 and 2008–09.

Using the panel: changes in reported work disablement over a six-year period

Finally, Section 2.5.3 uses the subsample of people who were interviewed in each of waves 2 to 4, i.e. in 2004–05, 2006–07 and 2008–09. Individuals are classified into groups based on their responses in three consecutive waves of interview to a question about whether they had any health problem or disability that limited the kind or amount of work they could do. The aim is to examine how common it is to answer differently to this question in consecutive waves of the survey.

Throughout this chapter, F-tests and Wald tests have been used to assess the statistical significance of the observed differences. Where regression results are presented in the chapter, statistical significance at the 0.1%, 1% and 5% levels is indicated by ‡, † and *, respectively. Differences referred to in the text are all significant at no less than the 5% level. All results are weighted for non-response. The weighting strategy is discussed in Chapter 10. The detailed data underlying the figures presented here, plus further descriptive statistics, are available in the appendix to this chapter.

2.3 Employment among older individuals

Employment rates of men aged 50 and over fell significantly between the 1970s and the mid-1990s; since then, employment rates of older men have started to increase but they remain below the levels seen in the 1970s, despite the fact that life expectancies have increased, on average health has improved and jobs are now generally less physically demanding than they were in the 1970s.[9]

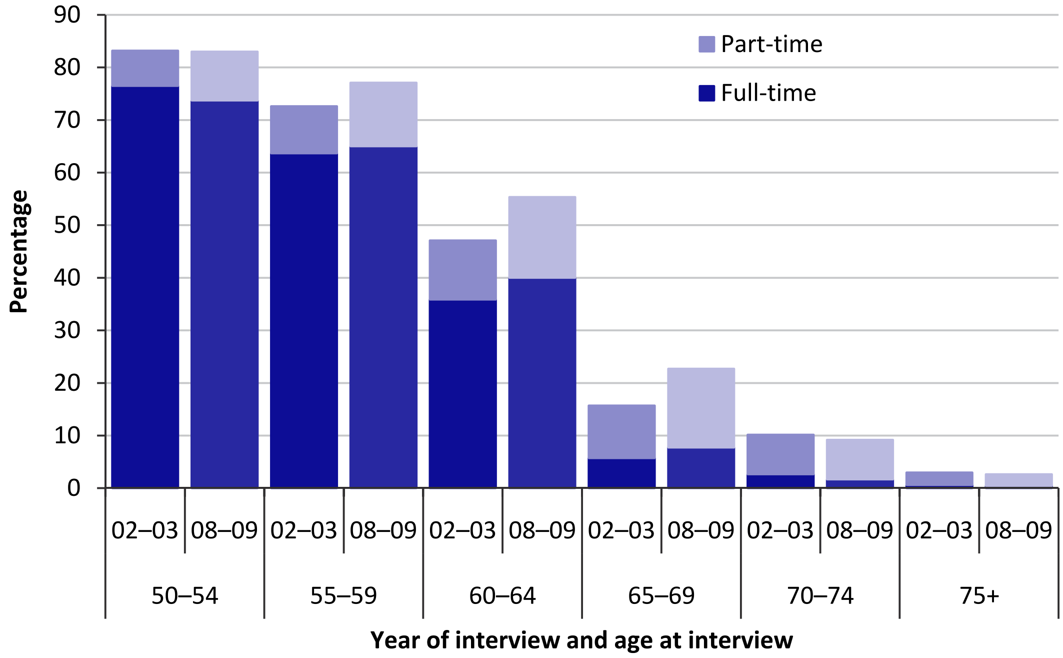
Section 2.3.1 describes the employment rates of individuals aged 50 and over in 2008–09, and compares these with the employment rates observed in 2002–03. We show that employment rates increased between 2002–03 and 2008–09 in ELSA, in common with the findings from other surveys (such as the Labour Force Survey). Employment differences by various individual characteristics are considered, and a distinction is made between employment in full-time and part-time work. Section 2.3.2 then goes on to consider the characteristics that are associated with individuals working beyond their SPA and whether there has been a statistically significant increase in the probability of working after SPA between 2002–03 and 2008–09 once we control for a number of other observed differences in characteristics.

2.3.1 Cohort differences in employment

Comparing employment rates among individuals with a certain characteristic (such as age, education or region of residence) in 2002–03 with employment rates among individuals with the same characteristic in 2008–09 allows us to examine whether there are any differences in employment rates across cohorts

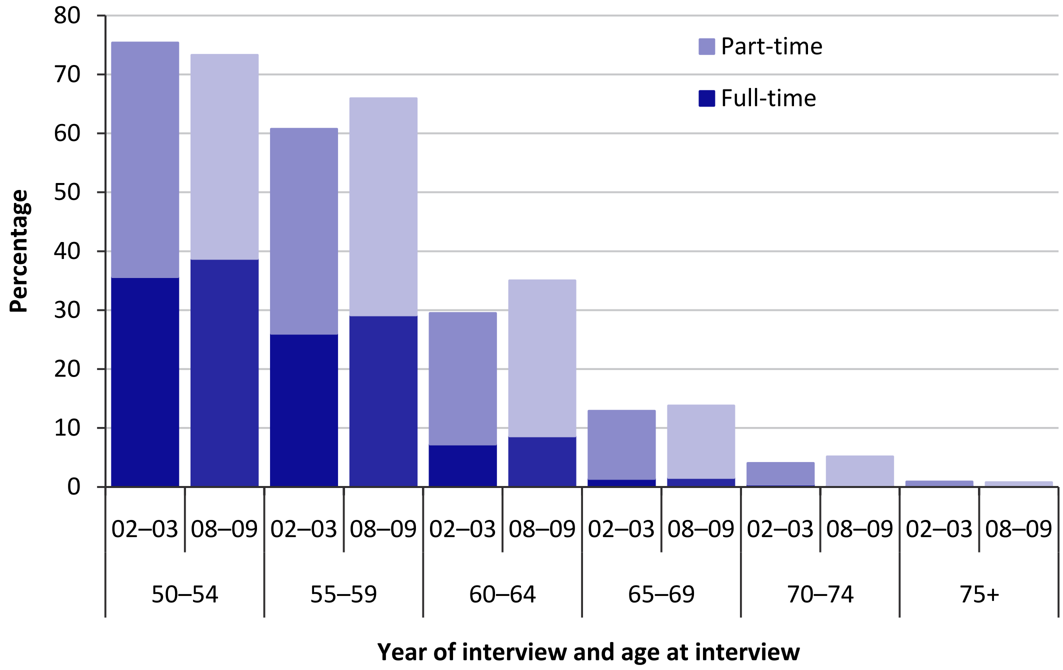
[9]Employment rates since the 1970s come from the Labour Force Survey.

Figure 2.1. Employment rates among men (full-time and part-time) by age, 2002–03 and 2008–09



Notes: Excludes individuals who did not report their hours of work. Underlying statistics and sample sizes are shown in Table 2A.1.

Figure 2.2. Employment rates among women (full-time and part-time) by age, 2002–03 and 2008–09



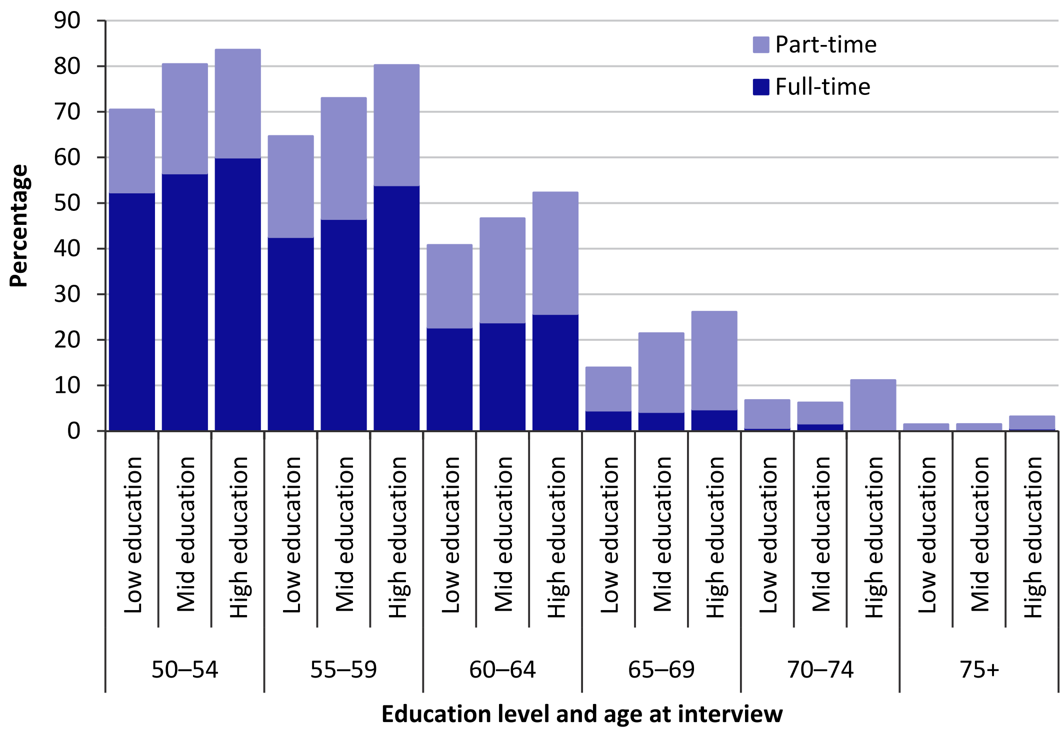
Notes: Excludes individuals who did not report their hours of work. Underlying statistics and sample sizes are shown in Table 2A.1.

born at different points in time. The 2002–03 and 2008–09 ELSA data suggest that there has been an increase in employment rates among older individuals in recent years. Figures 2.1 and 2.2 compare employment rates for men and women (respectively) in 2002–03 and 2008–09; the data underlying these figures are shown in Table 2A.1. While employment rates of individuals aged 50–54 and over 70 changed little over this six-year period, there was a statistically significant increase in employment rates among individuals aged between 55 and 69. The increase in employment was larger in most age groups for men than for women; the exception is for the 55–59 age group, for whom the increase in employment rates was slightly larger for women.

Rates of both full-time and part-time work increased for both men and women aged between 55 and 69 between 2002–03 and 2008–09. However, the percentage point increase in part-time working was generally larger than the percentage point increase in full-time working. For example, Figure 2.1 shows that, while the full-time employment rate for men aged 55–59 increased from 63.6% in 2002–03 to 65.0% in 2008–09 (i.e. an increase of 1.4 percentage points), the part-time employment rate increased by 3.1 percentage points.

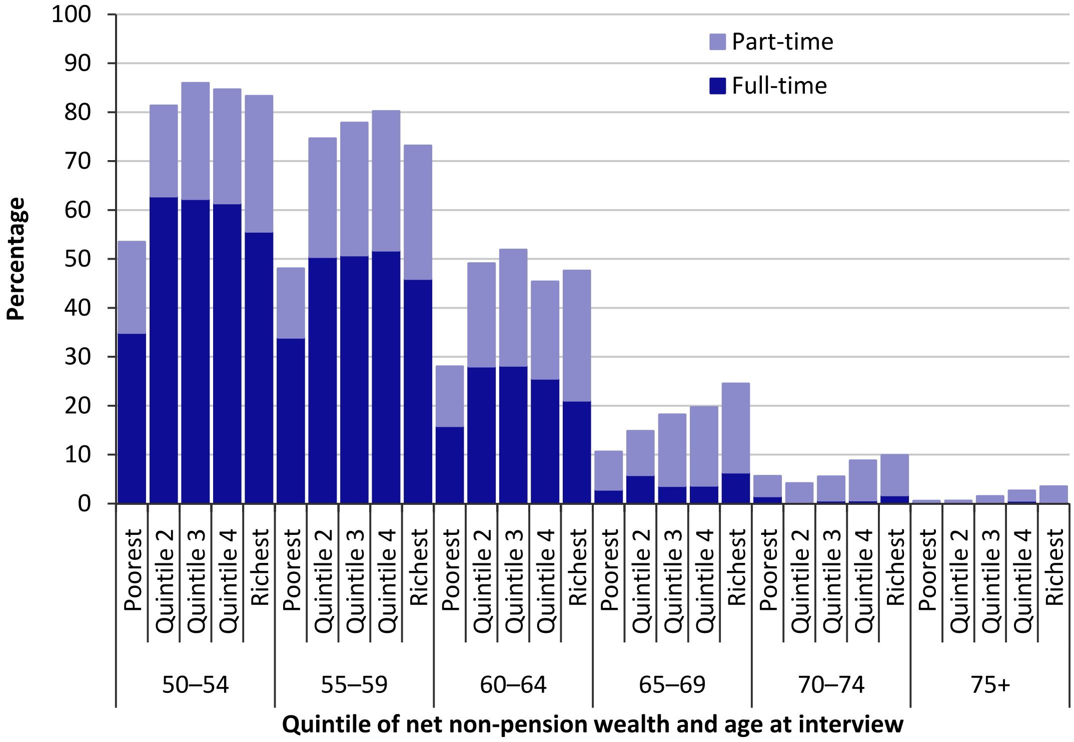
Table 2A.2 shows employment in full-time and part-time work in 2002–03 and 2008–09 by age and education. Figure 2.3 shows the full-time and part-time employment rates in 2008–09 of individuals with a particular level of education at each age. Within each of the two cohorts, employment rates are higher among individuals with higher levels of education.

Figure 2.3. Employment rates (full-time and part-time) by education level and age, 2008–09



Notes: Excludes individuals who did not report their hours of work or who reported still being in full-time education at the time of interview. Underlying statistics and sample sizes are shown in Table 2A.2.

Figure 2.4. Employment rates (full-time and part-time): by wealth quintile and age, 2008–09



Notes: Excludes individuals who did not report their hours of work or for whom it was not possible to calculate a comprehensive measure of wealth. Underlying statistics and sample sizes are shown in Table 2A.3.

Figure 2.4 shows that, among those aged under 65, employment was highest in the middle wealth quintile and the second highest quintile, and lowest in the poorest wealth quintile. However, employment rates above age 65 were highest for those with the highest levels of wealth. These patterns were also true in 2002–03 (Table 2A.3). Looking at the changes in employment rates between 2002–03 and 2008–09, on average, the employment rates of individuals aged between 55 and 69 in all wealth quintiles increased over this period.

The level of employment at older ages also varied by region, as shown in Table 2A.4. Employment rates among men and women aged 50 and over were much lower in the North East and North West, for example, than they were in the East of England and the South East.[10] Furthermore, the overall increases in employment between 2002–03 and 2008–09 – shown in Figures 2.1 and 2.2 – did not arise from equal increases in employment in all regions. For example, employment among individuals aged 55 to 69 living in Yorkshire and the Humber was much higher in 2008–09 than in 2002–03, whilst employment in London and the East of England was only slightly (and not statistically significantly) higher in 2008–09 than in 2002–03.

[10]The patterns of employment by region among this older group are similar to those among all working-age adults, with the exception that the employment rates seen among older people in the North East and South West are lower relative to the England-wide average than among all working-age adults (Office for National Statistics, 2010).

2.3.2 Who works beyond the SPA?

We typically observe a large fall in employment rates between individuals aged just below the SPA and those aged just over the SPA – this was shown (cross-sectionally) for 2002–03 and 2008–09 in Figures 2.1 and 2.2. There are likely to be a number of social and financial factors underlying this pattern. The SPA has been 60 for women and 65 for men since the end of the Second World War. It is, therefore, likely to provide a strong signal to individuals that this is the age at which to retire. Furthermore, many employers have also tended to encourage (or force) individuals to retire at around these ages.[11] At the SPA, individuals also (provided they have adequate contribution records) become eligible to receive a state pension income; individuals who are credit-constrained may not be able to afford to retire before they become eligible for their state pension income, even if they would like to. Many employer-provided pension schemes also have normal retirement ages of 60 or 65, which provide incentives to retire at these ages. This combination of social and financial factors provides strong incentives for individuals to quit work at this point.

This subsection looks specifically at employment among those aged over the SPA and below 75 (that is, women aged 60 to 74 and men aged 65 to 74) and at the characteristics that are associated with being more or less likely to still be working at these ages. We focus on individuals aged under 75 since employment rates drop off rapidly after age 75 (as was seen in Figures 2.1 and 2.2). Subsection 2.4.2 below examines the factors associated with being 'retired' before the SPA.

Knowing what characteristics are important is useful for assessing which policies may be effective at encouraging individuals to remain in work at older ages. The previous government had a stated objective of increasing employment among individuals aged 50 to 69 (i.e. not just among those aged under the SPA) and the new coalition government has said that it will review bringing forward the increase in the state pension age to 66, which is currently scheduled to happen from April 2024.[12]

Pooling the four waves of ELSA data collected so far allows us to exploit a large sample of observations of individuals older than the SPA in order to examine the characteristics associated with whether or not they choose to work. Table 2.1 presents the results from a logistic regression of the characteristics associated with working for individuals aged between the SPA and 74 in each of the waves of the ELSA data.[13] Indicators are included for

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[11]Prior to 2006, employers were allowed to discriminate on the basis of age – allowing them to force older workers out of their jobs – but since the Employment Equality (Age) Regulations 2006, employers have only been able to set mandatory retirement ages at or above age 65 (unless they can objectively justify a lower age). The ability of employers to require individuals aged 65 or over to retire has been highly controversial and HM Government (2010) states that the government will 'phase out the default retirement age'.

[12]See Public Service Agreement (PSA) 17 (http://www.dwp.gov.uk/policy/ageing-society/evaluating-progress/public-service-agreement-17) and HM Government (2010).

[13]Standard errors are clustered at the individual level.

Table 2.1. Multivariate analysis of factors associated with working beyond the SPA

	Odds ratio	p-value
Men 65–69	reference	
Men 70–74	0.564‡	<0.001
Women 60–64	2.529†	0.010
Women 65–69	0.929	0.839
Women 70–74	0.363†	0.006
Single, never married	reference	
Previously married man	1.240	0.491
Previously married woman	1.453	0.136
Man in couple: partner under SPA and working	2.554*	0.012
Man in couple: partner under SPA and not working	0.718	0.433
Man in couple: partner over SPA and working	3.837‡	<0.001
Man in couple: partner over SPA and not working	0.628	0.182
Woman in couple: partner under SPA and working	1.637	0.124
Woman in couple: partner under SPA and not working	0.488	0.032
Woman in couple: partner over SPA and working	2.441†	0.007
Woman in couple: partner over SPA and not working	0.438	0.011
Low education	reference	
Mid education	1.151	0.093
High education	1.430†	0.003
Own outright	reference	
Mortgage	1.870‡	<0.001
Renter	1.447	0.063
Poorest wealth quintile	0.638*	0.024
Wealth quintile 2	0.868	0.159
Wealth quintile 3	reference	
Wealth quintile 4	1.001	0.990
Richest wealth quintile	0.965	0.723
No private pension	reference	
Private DB pension	1.117	0.269
Private DC pension	1.637‡	<0.001
Private ‘other’ pension	1.062	0.617
No long-standing illness	reference	
Long-standing illness (not limiting)	0.788‡	0.001
Long-standing illness (limiting)	0.336‡	<0.001
Partner has no long-standing illness	reference	
Partner has non-limiting long-standing illness	1.172	0.073
Partner has limiting long-standing illness	1.242*	0.020
North East	0.526‡	0.001
North West	0.638†	0.001
Yorkshire and the Humber	0.757	0.053
East Midlands	0.968	0.823
West Midlands	0.802	0.129
East of England	1.018	0.889
London	0.970	0.827
South East	reference	
South West	0.843	0.201
Wave 1 (2002–03)	reference	
Wave 2 (2004–05)	1.009	0.870
Wave 3 (2006–07)	1.033	0.629
Wave 4 (2008–09)	1.189*	0.011

Notes: See next page.

Notes to Table 2.1: Sample size = 13,542. Sample is all individuals aged between SPA and 74. The dependent variable equals 1 if the individual was in work. Where the individual's sex is referred to in the table, this is the sex of the respondent (rather than that of their partner). Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

which wave of the ELSA data an individual was observed in. The other variables controlled for in this analysis are indicators of age and sex, education, wealth quintiles, housing tenure, broad health status, private pension membership, partner's work status and health status (where applicable), whether the individual had previously had a partner and region of residence. (More detail on the definitions of the regressors used is provided in Section 2.2.)

Table 2.1 reports the odds ratio for being in work beyond the SPA, where the odds (or probability) of being in work are expressed relative to the odds for the reference group – the reference group is indicated in the table. An odds ratio of 1 indicates that the predicted probability of being in work is the same for the two groups in question. Odds ratios that are statistically significantly different from 1 at the 5%, 1% and 0.1% significance levels are indicated in Table 2.1 by *, † and ‡ respectively. As an example, taking the figures in the second row of Table 2.1 tells us that men aged 70 to 74 were only 56.4% (or just over half) as likely to be in paid work as men aged 65 to 69, other things being equal; this odds ratio is statistically significantly different from 1 at the 0.1% level. The p-values are shown in the final column.

Women aged 60–64 are more likely to be in paid work than men or women aged 65–74, other things being equal. This group of women are more than twice as likely to be in employment as men aged 65−69. There is no statistically significant difference in the probability of working between men and women aged 65–69, after controlling for other differences. The likelihood of employment decreases with age for each sex, as would be expected.[14]

Education is highly correlated with the probability of being in work: high-education individuals are around 40% more likely to be in work than low-education individuals. Housing tenure is also important; those who still had an outstanding mortgage on their home were nearly twice as likely still to be working as those who owned their homes outright.[15]

Health seems to be significantly associated with employment outcomes after the SPA. Individuals who reported having a long-standing illness were much less likely to be in work, particularly if they considered their illness to be limiting, while individuals whose partner reported having a limiting long-standing illness were actually 24% more likely to be in work.

[14]This decline in employment rates by age is statistically significant for both men and women.

[15]The odds for renters are not statistically significantly different from either those for owner-occupiers or those for mortgagees, once other differences are controlled for.

For couples, family work status also seems to be very important. Men and women in couples whose partners worked were more likely than singles to be working.[16]

The odds ratio on the indicator for an individual being observed in 2008–09 shows that (even after controlling for all these other characteristics) employment after the SPA was nearly 20 per cent higher in 2008–09 than in 2002–03.[17] There was, conversely, no statistically significant increase in post-SPA employment rates observed in 2004–05 or 2006–07.

2.4 Inactivity and retirement at older ages

As described in Section 2.3.1, employment among older individuals declines with age – particularly around the SPA – but there has been a general increase in employment rates at older ages between the first and fourth waves of ELSA. However, those older individuals who are not in employment may not necessarily consider themselves to be retired and can be out of work for a variety of reasons. This section therefore examines patterns of 'inactivity' at older ages in ELSA and how these have changed over time. As described in Section 2.2, we define inactivity here as covering all those who are not currently in paid work.

The ELSA questionnaire allows individuals to self-report their economic status. Section 2.4.1 considers the proportion of individuals aged over 50 who are out of work and reporting each status, and how this proportion has changed between 2002–03 and 2008–09. Differences in reported status by individual characteristics are also described. Section 2.4.2 goes on to consider the characteristics associated with an individual self-reporting being 'retired' while still aged less than the SPA.

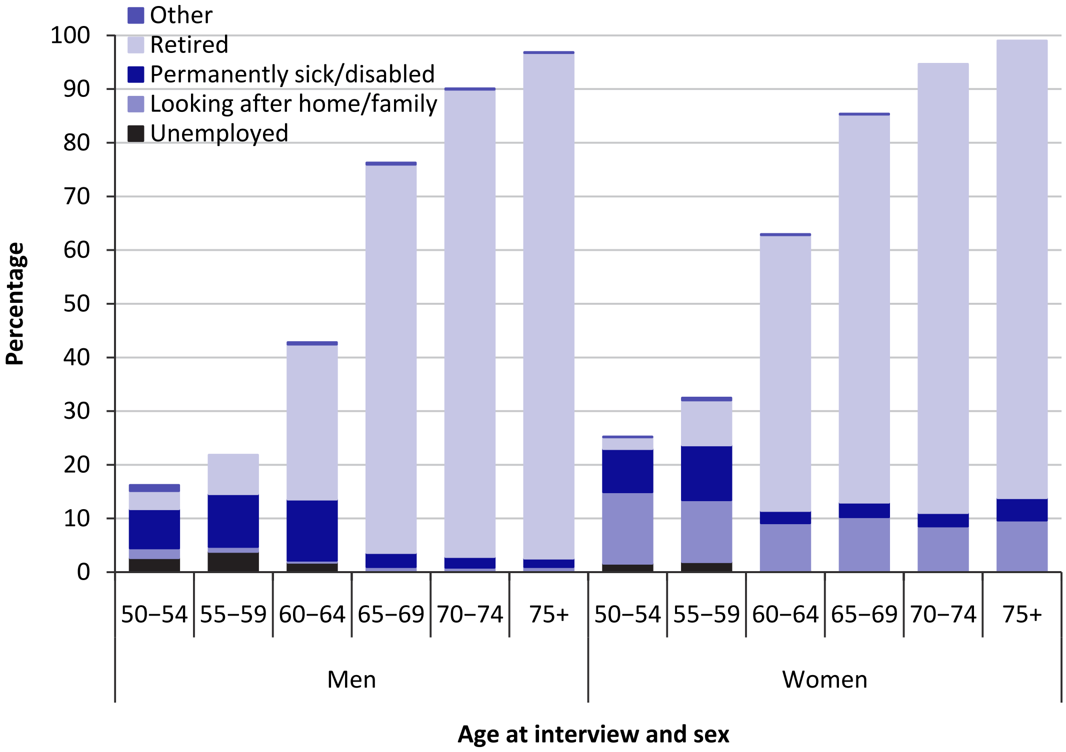
2.4.1 Cohort differences in inactivity

Figure 2.5 shows the percentage of individuals who were inactive and reporting each status in 2008–09. More detailed figures for 2002–03 and 2008–09 are shown in Table 2A.5. This subsection discusses each of the self-reported inactive states in turn – first describing the interesting age patterns that are evident in the cross-sections, and then describing the changes in the prevalence of particular states among each age group over time.

[16]For men, there is no statistically significant difference (at the 5% level) between the odds ratio for men whose partner was under the SPA and those whose partner was over the SPA. For women, the odds ratio is statistically significantly higher (at the 5% level) for women whose partner was working and aged above the SPA than for those whose partner was working and aged below the SPA.

[17]Statistics from the Labour Force Survey (LFS) also suggest that (before controlling for other characteristics) there was a large increase in the employment rate of men and women aged above the SPA between 2002–03 and 2008–09. The LFS suggests that 11.7% of all individuals aged over the SPA were in employment in 2008–09, compared with just 8.6% in 2002–03. In contrast, the employment rate among those aged 16–SPA was virtually the same in 2008–09 as it was in 2002–03.

Figure 2.5. Prevalence of inactive states by age and sex, 2008–09



Note: Underlying statistics and sample sizes are shown in Table 2A.5.

At younger ages, the most prevalent self-reported status among inactive men is being permanently sick or disabled, while for women it was that they were looking after their home or family (closely followed by those reporting being permanently sick or disabled). Inability to work due to ill health is likely to be one of the major barriers to increasing employment rates at older ages. Section 2.5 therefore examines in more detail the prevalence of and changes in self-reported work disablement over time using evidence from ELSA between 2004–05 and 2008–09.

The proportion of individuals who self-reported themselves as unemployed was very small, particularly for women. This was true even in the 2008–09 data, which were collected during a recession. The proportion of individuals aged under 60 who reported themselves as unemployed was significantly higher in 2008–09 than in 2002–03 (2.5% compared with 1.8%),[18] but the difference is quantitatively small considering the timing of the 2008–09 survey and the recession in the UK economy at the time. The group with the highest prevalence of 'unemployment' in the 2008–09 data was men aged 55−59, among whom 3.8% reported being unemployed, but this still only accounted for about 17% of the men aged 55−59 who were out of work in 2008–09 (as Figure 2.5 shows).

[18]The significance of the difference was tested by regressing self-reported unemployment in 2002–03 and 2008–09 on a constant and an indicator for being interviewed in 2008–09. The coefficient on the dummy variable for being interviewed in 2008–09 was statistically significantly different from zero at the 5% level.

Around one-in-eight inactive individuals aged 50−54 reported themselves to be retired in 2008–09 (figures for men and women combined are shown in Table 2A.5), and just under one-in-three inactive individuals reported this in the 55−59 age group. The proportion of the inactive who reported being retired is substantially higher in the 60−64 age group for both men and women, despite only women having passed their SPA by this point. For men, there is a further increase in the proportion of inactive individuals who reported being retired in the 65−69 age group, and there is also an increase for women at this age despite all the women in the previous age group also having passed their SPA.

A significant proportion of individuals, particularly men, report being retired before their SPA. This can have potentially important implications for policymakers attempting to extend the length of working life and is particularly interesting in light of the forthcoming increases to both the male and female state pension ages. Retirement before the SPA is therefore discussed in more detail in Section 2.4.2.

The proportion of individuals reporting being sick or disabled drops off among older age groups as the proportion reporting themselves as retired rises. However, the proportion of individuals (mainly women) who reported that they were looking after their home or family did not fall substantially among older age groups, and 9.3% of women aged 60 and over reported themselves to be looking after their home or family rather than being retired.

The proportion of men aged between 50 and 69 who were inactive declined significantly between 2002–03 and 2008–09 (Table 2A.5).[19] Among those aged 55–64, there was a significant fall in the proportion of men reporting that they were sick or disabled. For men aged 65–69, there was no significant change in the proportion reporting being permanently sick but there was a significant decline in the proportion of men reporting themselves to be retired.

The proportion of women who were inactive between ages 55 and 69 fell between 2002–03 and 2008–09 (Table 2A.5), and the distribution of self-reported activity among these women also changed. There was a decline in the proportion of inactive women who reported that they were looking after their home or family, but an increase in the proportion who reported that they were retired or unemployed. It is possible that this reflects an increase in the proportion of women in later cohorts who had worked at some point in their lives; women who have worked at some point are perhaps more likely to consider themselves to be 'retired' (or 'unemployed') at older ages than women who had never worked.

Patterns of inactivity by wealth quintile in 2002–03 and 2008–09 are shown in Table 2A.6. Among those aged under the SPA, inactivity was generally lowest among the middle and second highest wealth quintiles and highest among the poorest individuals. Among those aged 65 and over, the pattern actually changes, with inactivity rates being lowest among those in the top wealth

[19]The significance of the difference was tested by regressing employment in 2002–03 and 2008–09 on a constant and an indicator for being interviewed in 2008–09. The coefficient on the dummy variable for being interviewed in 2008–09 was statistically significantly different from zero at the 5% level.

quintile. The composition of self-reported activity among inactive individuals is also very different between the wealth quintiles. Looking after their home or family (which is commonly reported by women, but rarely by men – see Figure 2.5) is a commonly reported activity among inactive individuals in all wealth quintiles.[20] However, younger individuals in the poorest two quintiles who were out of work were more likely to report being sick or disabled than those in the other quintiles, whilst younger individuals in the top three wealth quintiles were more likely to report being retired than those in the bottom two.

2.4.2 Who 'retires' before the SPA?

There are likely to be many reasons why people withdraw from paid work before reaching the SPA. If the government wants to see further increases in employment rates among older individuals, it will need to continue to address the various barriers that inhibit continued employment among older individuals or the incentives that encourage individuals to withdraw from the labour market in their fifties and early sixties. One of the groups who might perhaps be most responsive to policies that change the incentives to remain in paid work at older ages are those who are out of work and report themselves to be 'retired' as opposed to 'permanently sick or disabled' or 'unemployed' – these latter two categorisations suggest barriers to employment that go beyond merely financial (dis)incentives or individual preferences.

A significant proportion of people 'retire' before the SPA. Figure 2.5 and Table 2A.5 show that this is particularly true of men: 28.9% of the men in 2008–09 aged 60−64 reported themselves as retired, compared with 8.4% of women aged 55−59. Retirement before the SPA is also more common among higher-wealth individuals than among low-wealth individuals, as shown in Table 2A.6.

This subsection therefore examines the characteristics associated specifically with reporting oneself to be 'retired' while still aged below the SPA. Table 2.2 presents the results from a logistic regression of the characteristics associated with retirement before the SPA. The first pair of columns show the results for the whole sample of individuals aged under the SPA from the pooled waves of ELSA data; the second pair show them for the subsample of individuals who were inactive at the time of interview. The first of each pair of columns gives the odds ratios for the regression, where the odds of being retired before the SPA are expressed relative to the odds for the reference group – the reference group is indicated in the table. The p-values are given in the second of each pair of columns. Odds ratios that are statistically significantly different from 1 are indicated by *, † and ‡, as before.

Holding other things constant, the odds of being retired before the SPA (as opposed to being in paid work or reporting some other form of inactivity) among those in the highest wealth quintile were 2.2 times those of individuals in the middle wealth quintile, while the odds for those in the poorest quintile were just half those of individuals in the middle quintile.

[20]This reflects the fact that women are distributed across all wealth quintiles and a significant fraction of inactive women at all levels of wealth self-report themselves to be looking after their home or family.

Table 2.2. Multivariate analysis of factors associated with retiring before the SPA

	All individuals		Inactive individuals	
	Odds ratio	**p-value**	**Odds ratio**	**p-value**
Men 50−54	0.133‡	<0.001	0.180‡	<0.001
Men 55−59	0.276‡	<0.001	0.330‡	<0.001
Men 60–64	reference		reference	
Women 50−54	0.063‡	<0.001	0.053‡	<0.001
Women 55−59	0.226‡	<0.001	0.152‡	<0.001
Single, never married	reference		reference	
Previously married man	0.801	0.242	0.763	0.233
Previously married woman	0.711	0.177	1.489	0.222
Man in couple: partner under SPA and working	0.335‡	<0.001	0.743	0.391
Man in couple: partner under SPA and not working	0.970	0.910	0.981	0.955
Man in couple: partner over SPA and working	0.361‡	<0.001	1.072	0.868
Man in couple: partner over SPA and not working	0.974	0.922	0.927	0.838
Woman in couple: partner under SPA and working	0.307‡	<0.001	0.412*	0.031
Woman in couple: partner under SPA and not working	1.269	0.453	1.222	0.640
Woman in couple: partner over SPA and working	0.471	0.152	1.039	0.961
Woman in couple: partner over SPA and not working	1.721	0.132	1.863	0.190
Low education	reference		reference	
Mid education	1.220*	0.025	1.259*	0.037
High education	0.945	0.615	1.422*	0.017
Own outright	reference		reference	
Mortgage	0.437‡	<0.001	0.743*	0.010
Renter	0.797	0.272	1.207	0.488
Poorest wealth quintile	0.499†	0.001	0.173‡	<0.001
Wealth quintile 2	0.771*	0.025	0.455‡	<0.001
Wealth quintile 3	reference		reference	
Wealth quintile 4	1.367†	0.002	1.243	0.112
Richest wealth quintile	2.205‡	<0.001	1.678‡	<0.001
No private pension	reference		reference	
Private DB pension	1.879‡	<0.001	4.352‡	<0.001
Private DC pension	0.763*	0.020	1.776‡	<0.001
Private ‘other’ pension	1.318*	0.039	1.976‡	<0.001
No long-standing illness	reference		reference	
Long-standing illness (not limiting)	1.176*	0.053	1.023	0.854
Long-standing illness (limiting)	1.518‡	<0.001	0.325‡	<0.001
Partner has no long-standing illness	reference		reference	
Partner has non-limiting long-standing illness	1.071	0.473	0.963	0.774
Partner has limiting long-standing illness	0.835	0.066	0.872	0.288
North East	1.468*	0.028	1.296	0.230
North West	1.426†	0.009	1.513	0.016
Yorkshire and the Humber	1.395*	0.026	1.732†	0.005
East Midlands	1.239	0.148	1.691†	0.007

Table 2.2 continued

	All individuals		Inactive individuals	
	Odds ratio	**p-value**	**Odds ratio**	**p-value**
West Midlands	1.134	0.389	1.132	0.505
East of England	1.094	0.537	1.397	0.086
London	1.078	0.630	1.450	0.063
South East	reference		reference	
South West	1.312	0.057	1.552*	0.016
Wave 1 (2002–03)	reference		reference	
Wave 2 (2004–05)	0.991	0.898	1.025	0.815
Wave 3 (2006–07)	0.922	0.297	1.134	0.278
Wave 4 (2008–09)	0.817*	0.012	1.080	0.504

Notes: Sample size = 14,275 for the 'all individuals' regression; sample size = 4,365 for the 'inactive individuals' regression. The sample for the 'all individuals' regression is all individuals aged between 50 and the SPA at the time of interview. The sample for the 'inactive individuals' regression is all individuals aged between 50 and the SPA who were not working at the time of interview. The dependent variable takes the value 1 if the individual was not working and self-defined themselves as 'retired' or 'semi-retired'. Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

Those with a defined benefit (DB) pension were nearly twice as likely to be retired before the SPA as those with no private pension, while those with a defined contribution (DC) pension were 24% less likely to be than individuals who have never had any private pension. This pattern is in keeping with what we know about the incentives provided by these different types of pension schemes, which depend on how any pension entitlements accrue. A typical DB pension scheme will provide an incentive to remain in paid work until the scheme's normal retirement age (which is often 60 or 65) and a financial disincentive to remain in the scheme thereafter. State pensions (particularly under the rules prevailing for those who reached SPA before April 2010) provide an incentive to remain in work until the SPA, since up to that point individuals will usually accrue additional entitlement and will not be able to draw their pension income; there is less incentive to remain in work beyond that point, however. In contrast, individuals will continue to accrue additional wealth in DC pensions for as long as they choose not to annuitise the fund, meaning there are fewer incentives to retire at a specific age for holders of private DC pensions.

For those who were not in work, whether or not they had ever been a member of a private pension scheme was strongly associated with the likelihood of reporting being 'retired', as opposed to some other status. Those who had a private pension (whether DB, DC or 'other', though particularly those who had DB pensions) were more likely to report themselves to be 'retired' if they were not working before reaching SPA, than those who had never had a private pension.

Individuals with a mortgage still outstanding were less than half as likely to be retired before the SPA as those who own their homes outright. Since Table 2.1 showed that individuals with a mortgage were also more likely to be in work beyond the SPA than those who own their homes, it seems plausible to suggest that individuals with mortgages are likely to work until they have paid off their

mortgage and then retire once repayments have ceased. There is no statistically significant difference between the odds of being retired for those who own outright and for renters.

Individuals who had a long-standing illness were more likely to be retired before the SPA – those with a long-standing illness that limited their daily activity were over 50% more likely to be retired than individuals without any long-standing illness. However, in the subpopulation of individuals who were out of work, having a limiting long-standing illness was actually associated with far lower odds of reporting being retired. Instead, these individuals were more likely to report some other status, such as being permanently sick or disabled.

The regional indicators suggest that, even after controlling for a number of other characteristics, individuals in Northern England (the North East, North West, and Yorkshire and the Humber) were significantly more likely to report being retired than those in the South East.

Across the whole sample, individuals were about 18% less likely to retire before the SPA in 2008–09 than in 2002–03. However, there was no significant difference between the waves in the odds of reporting being retired for the subsample of individuals who were actually out of work, implying that the reduction in the odds of reporting retirement in 2008–09 compared with 2002–03 will have contributed to a reduction in overall inactivity below the SPA between the waves. (This reduction in overall inactivity, not controlling for differences in other characteristics, is shown in Table 2A.5. The multivariate analysis in Table 2.2 suggests that this conclusion still holds even after we control for changes in other characteristics – such as the prevalence of long-standing health conditions – over time.)

2.5 Work-limiting health conditions and working at older ages

One of the major barriers to increasing participation in the labour force among older individuals is ill health. As Section 2.4 showed, even among those aged below the current SPA, a significant proportion of individuals who were not working reported that they were permanently sick or disabled. Increasing employment rates among those aged 50 and over will require addressing the barriers that currently prevent some individuals with health problems from working. This section looks specifically at the prevalence of health conditions that limit the kind or amount of work that older individuals are able to do. As described in Section 2.2, we examine the responses to the question asked of ELSA respondents about whether they have ‘any health problem or disability that limits the kind or amount of paid work [they] could do, should [they] want to’. This question was asked both of respondents to ELSA who were currently working and of those who were not in 2004–05, 2006–07 and 2008–09. This section focuses on individuals aged between 50 and 69. For ease of exposition, throughout this section we refer to those who gave a positive response to the question about whether they had ‘any health problem or disability that limits the kind or amount of paid work [they] could do, should [they] want to’ as being ‘work disabled’ or having a ‘work disability’.

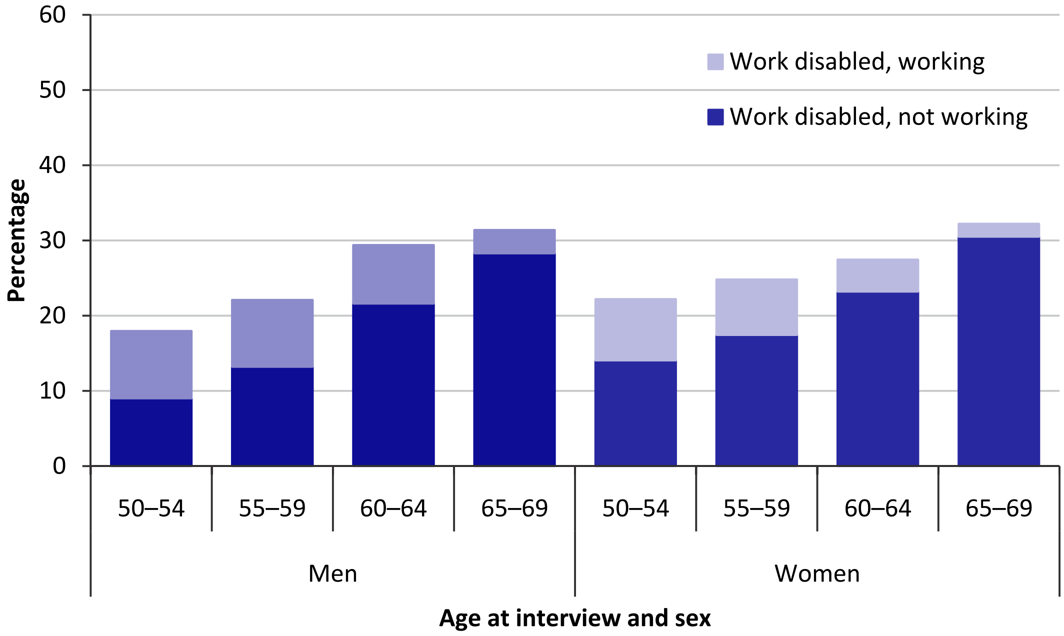
We look first at the prevalence of self-reported work disability and which characteristics, in isolation, are associated with being more likely to report having a work disability using the 2008–09 cross-section of data. (The broad patterns discussed below are also evident in 2004–05 and 2006–07.) Section 2.5.2 then presents some multivariate analysis of the characteristics associated with reporting having a work disability (and whether individuals were working or receiving disability-related benefits, given that they reported being work disabled) and examines whether reports of work disability increased or decreased significantly over time, using all three waves of data in which this question was asked. Finally, Section 2.5.3 examines how many people experienced the onset of work disability over time and how many people ceased to consider themselves to be work disabled. We find that, for some people at least, work disablement is temporary – even at older ages, some individuals who previously reported being work disabled subsequently reported themselves not to be.

2.5.1 Prevalence of work disability in 2008–09

Just over one-in-four (25.8% of) individuals aged between 50 and 69 reported being work disabled in 2008–09, with one-in-four of these work-disabled individuals being in paid work at that time (Table 2A.7). The difference in the prevalence of self-reported work disability between men and women is not statistically significant at the 5% level.

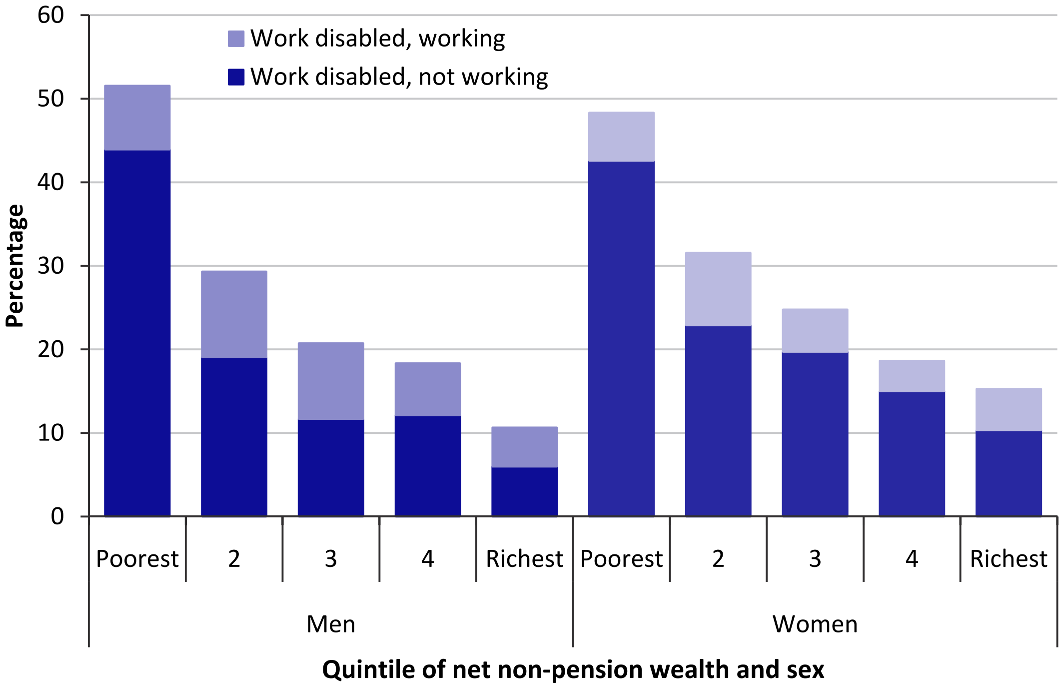
Figure 2.6 shows how the prevalence of work disability (and working or not working with a work disability) varied by age for men and women in 2008–09.

Figure 2.6. Percentage of individuals working and not working with a work disability, by age and sex, 2008–09



Notes: Sample is all those aged between 50 and 69 who responded to the relevant questions about work disability and work status. Underlying statistics and sample sizes are shown in Table 2A.7.

Figure 2.7. Percentage of individuals working and not working with a work disability, by wealth quintile and sex, 2008–09



Notes: Sample is all those aged between 50 and 69 who responded to the relevant questions about work disability and work status and for whom a measure of total wealth is available. Underlying statistics and sample sizes are shown in Table 2A.8.

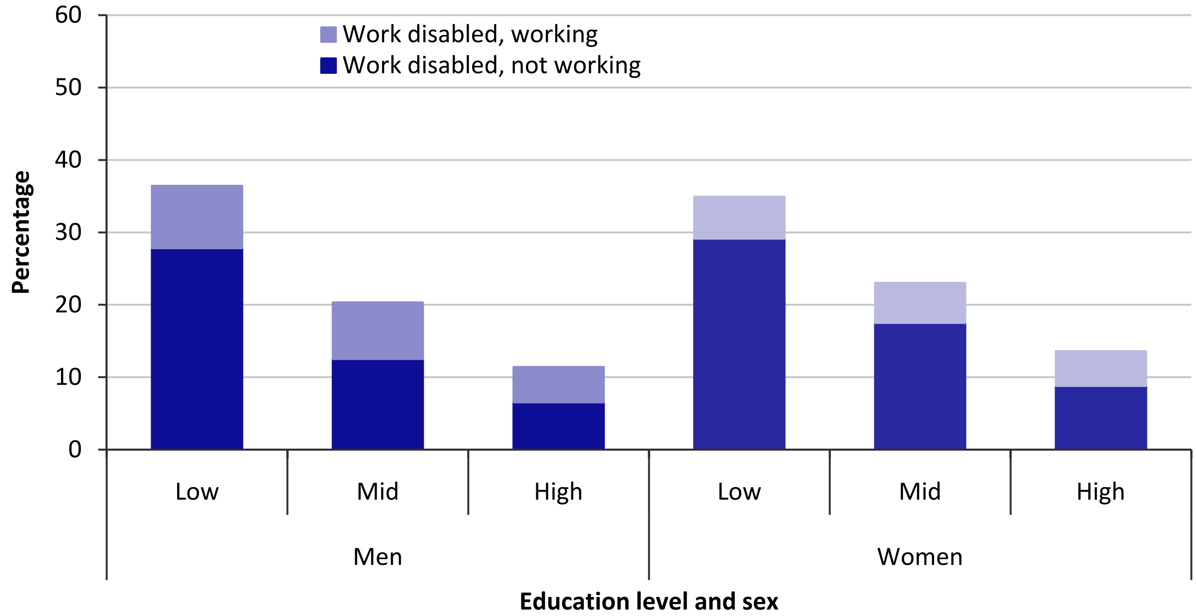
The prevalence of work disability was higher among older men and women, and the proportion of those who were work disabled who were in paid work was significantly lower at older ages. Among men aged 50 to 54, 18.0% reported being work disabled, with half of these individuals being in paid work. The percentage who reported a work disability rose to 31.4% among men aged 65 to 69 (i.e. up to five years past SPA), while only one-in-ten (10.0%) of these work-disabled individuals were in paid employment; this was much lower than the employment rate across all men aged 65–69 in 2008–09 (22.7%, as shown in Table 2A.1). A similar pattern was seen for women. A smaller fraction of work-disabled women than work-disabled men in each age group were actually in paid work; however, this was also true among non-work disabled women – the lower overall employment rates among women in these cohorts were presented in Section 2.3.1.

Work disability was substantially more common among those with low wealth than those with high wealth – just over half of men aged 50–69 in the lowest wealth quintile reported being work disabled in 2008–09, compared with just one-in-nine of those in the highest wealth quintile. This is shown in Figure 2.7 and is in keeping with the results discussed in Section 2.4.1 (and shown in Table 2A.6) that low-wealth individuals were much more likely to class themselves as being 'permanently sick or disabled' than higher-wealth individuals. However, the causation could run in either direction, or indeed there could be a third factor influencing both outcomes. First, low-wealth individuals may be more likely than higher-wealth individuals to experience

declines in health at older ages that make them unable to continue working; in other words, low-wealth individuals could be more likely to be out of work due to ill health at older ages *because* they have low levels of wealth. Second, current wealth reflects earnings and saving behaviour throughout the individual's life; therefore, if individuals who experienced poor health throughout their lives had lower earning potential and/or higher consumption needs during working life, they might well reach their fifties and sixties with a lower stock of wealth *as a result of* having been in poor health. Finally, lower-ability individuals may be more likely to be engaged in manual work; this could mean they had lower earning potential throughout their working lives (and thus end up with lower wealth) and also these types of jobs may be less easy to adapt to the needs of someone in poor health than the types of jobs that higher-ability individuals do; in other words, low wealth in older age and being out of work due to ill health could both be the results of a third causal factor. With this simple analysis alone, we cannot establish which of these causal mechanisms is at work.

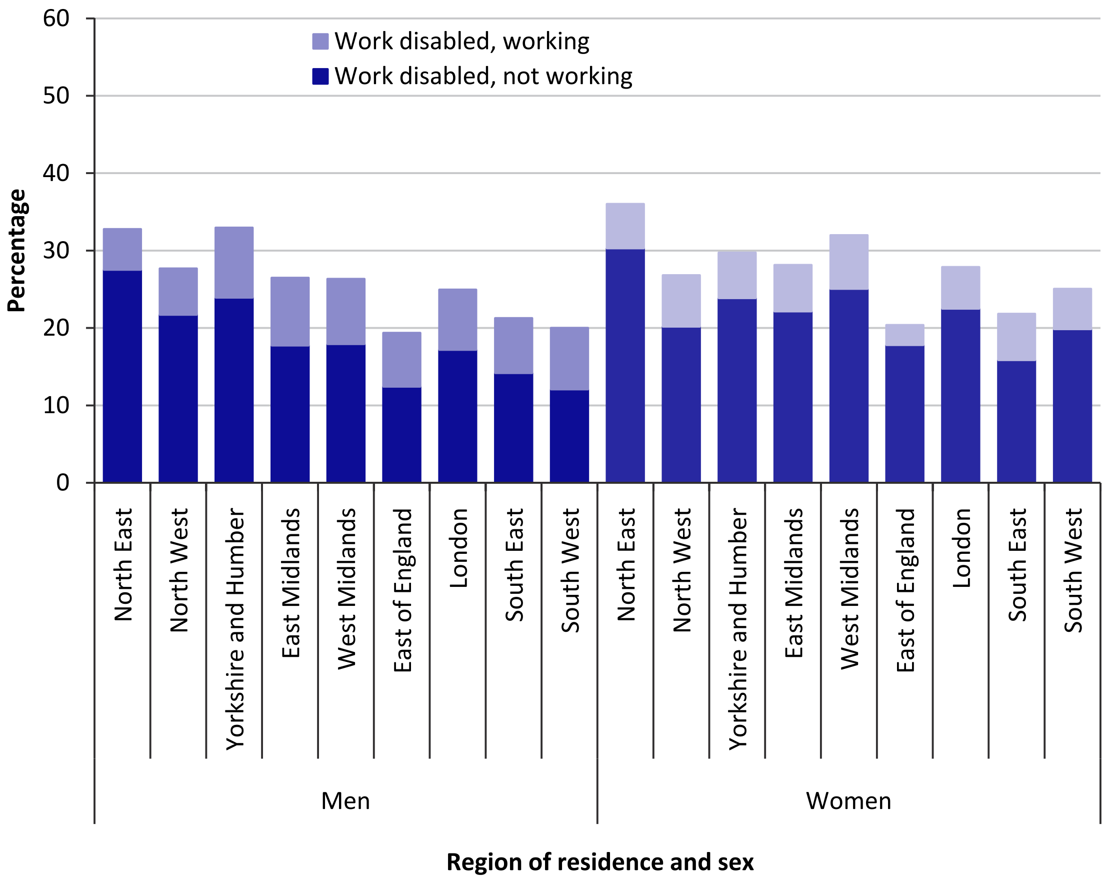
Figure 2.8 shows that work disability was also more prevalent among those with low levels of education than among those with mid or high education. Without controlling for other differences between individuals across regions, there were also regional variations in the prevalence of reported work disability. Figure 2.9 shows that reported work disability was most prevalent (among both men and women) in the North East, with the lowest proportion of people reporting themselves to be work disabled in the East of England.

Figure 2.8. Percentage of individuals working and not working with a work disability, by level of education and sex, 2008–09



Notes: Sample is all those aged between 50 and 69 who responded to the relevant questions about work disability and work status. Individuals who reported still being in full-time education at the time of interview are excluded. Underlying statistics and sample sizes are shown in Table 2A.10.

Figure 2.9. Percentage of individuals working and not working with a work disability, by region and sex, 2008–09



Notes: Sample is all those aged between 50 and 69 who responded to the relevant questions about work disability and work status. Underlying statistics and sample sizes are shown in Table 2A.9.

A variety of disability-related benefits are available in the UK and many, but by no means all, of those who reported being work disabled in ELSA also reported receiving some form of disability-related benefit (see Section 2.2 for details). Tables 2A.7 to 2A.10 suggest that, among those who reported being work disabled and not working, receipt of disability-related benefits was more prevalent among men, those aged under the SPA, lower-wealth individuals, those with lower education and people in the North East. Some of these patterns are to be expected given the eligibility rules for receipt of some of these disability-related benefits. In particular, people aged over the SPA could not claim IB (which may partly explain the lower prevalence of benefit receipt among work-disabled individuals aged over the SPA).[21] Furthermore, receipt of IB is means-tested against any private pension income that an individual has (which may partly explain why benefit receipt was less common among higher-wealth individuals).

[21]Among men aged under the SPA who reported being work disabled and receiving some disability-related benefit, just 63.6% were receiving some other disability-related benefit as well as (or instead of) IB.

2.5.2 Multivariate analysis of factors associated with reported work disability

The previous subsection examined how individual characteristics related to reported work disability in 2008–09. However, some of these characteristics (such as education level and wealth) may be highly correlated with one another. Therefore, this section presents multivariate analysis to examine which factors remain important once we control for other characteristics. We look at three outcomes of interest. First, among all those aged 50–69, we examine what factors are associated with reporting having a work disability. Second, among the subsample of individuals who reported being work disabled, we examine which characteristics were associated with being in paid work. Finally, again among the subsample of individuals who reported being work disabled, we examine what factors were associated with receiving a disability-related benefit.

The analysis presented in this section uses data from all three waves in which questions about work disability were asked (2004–05, 2006–07 and 2008–09), which also allows us to examine whether the proportion of individuals reporting work disability increased or decreased over time, controlling for various other differences in characteristics observed in each wave. The analysis is conducted separately for men and women. As in Tables 2.1 and 2.2 earlier, the results reported in Tables 2.3 to 2.5 are odds ratios from a logistic regression. The odds ratios (shown in the first and third columns of each table) show the odds (or probability) of the dependent variable taking the value 1 in each regression expressed relative to the odds for the reference group – the reference group is shown in the table. The second and last columns show the p-values. Odds ratios that are statistically significantly different from 1 are indicated.

Factors associated with reporting having a work disability

Table 2.3 shows that reported work disability was more prevalent among older people (though there is no statistically significant difference between the odds for those aged 60–64 and for those aged 65–69). Men aged 50–54 were only half as likely to report being work disabled as men aged 60–64. Reported work disability was also less common among more highly educated men and women than less educated men and women.

As was suggested by Table 2A.6, reported work disability was much more prevalent among the low-wealth groups. Men in the poorest fifth of the population were three times as likely as men in the middle wealth quintile to report being work disabled, while women in the poorest quintile were twice as likely as women in the middle wealth quintile to report being work disabled. There were also significant differences in the prevalence of work disability among individuals with different private pension arrangements. However, after controlling for other characteristics, there were almost no significant differences in the prevalence of work disability across individuals in different regions.

Table 2.3. Multivariate analysis of factors associated with reporting being work disabled

	Men		Women	
	Odds ratio	**p-value**	**Odds ratio**	**p-value**
Aged 50−54	0.511‡	<0.001	0.687‡	<0.001
Aged 55−59	0.787†	0.003	0.956	0.536
Aged 60–64	reference		reference	
Aged 65–69	1.133	0.139	1.118	0.138
Low education	reference		reference	
Mid education	0.659‡	<0.001	0.810†	0.005
High education	0.496‡	<0.001	0.688†	0.001
Single, never married	reference		reference	
Previously married	1.179	0.325	1.013	0.940
Couple	0.979	0.885	0.765	0.107
No private pension	reference		reference	
Private DB pension	0.550‡	<0.001	0.582‡	<0.001
Private DC pension	0.575‡	<0.001	0.521‡	<0.001
Private 'other' pension	0.913	0.566	0.792	0.053
Poorest	3.091‡	<0.001	2.105‡	<0.001
Wealth quintile 2	1.547‡	<0.001	1.278†	0.007
Wealth quintile 3	reference		reference	
Wealth quintile 4	0.945	0.566	0.828*	0.040
Richest	0.634‡	<0.001	0.655‡	<0.001
North East	1.244	0.189	1.181	0.279
North West	1.093	0.525	1.069	0.607
Yorkshire and the Humber	1.203	0.176	1.201	0.156
East Midlands	0.951	0.739	1.128	0.381
West Midlands	1.003	0.986	1.228	0.121
East of England	0.799	0.129	0.706†	0.009
London	0.903	0.518	1.019	0.887
South East	reference		reference	
South West	1.165	0.294	1.097	0.491
Wave 2 (2004–05)	reference		reference	
Wave 3 (2006–07)	0.961	0.449	0.981	0.692
Wave 4 (2008–09)	0.862*	0.013	0.981	0.707

Notes: Sample size = 7,493 for men and 8,916 for women. Sample is all individuals aged 50–69 at the time of interview. The dependent variable takes the value 1 if the individual reported that they had a health condition that limited the kind or amount of work they were able to do, if they wanted to. Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

Interestingly, there is some evidence of a fall in reported work disability over time among men. Men in 2008–09 were (after controlling for other differences) only about 86% as likely to report a work disability as male respondents were in 2004–05.

Factors associated with working among those who reported having a work disability

Table 2.4 shows that among those who reported having a work disability, younger people and men who had partners at the time of interview were more likely to be working. Men in the middle quintile of the wealth distribution were significantly more likely than those at the bottom or top of the wealth distribution to be working with a work disability – the odds of working for

men with a work disability in the bottom wealth quintile were only 0.265 times those of men with a work disability in the middle wealth quintile. For women, the reverse is true: work-disabled women in the richest two-fifths of the wealth distribution were significantly more likely to be in work than work-disabled women in the middle quintile of the wealth distribution.

Even after controlling for differences in wealth, work-disabled men and women in the North East were significantly less likely than those in the South East to be working. For men, though not for women, there is evidence of an increasing prevalence of working with a work disability over time: the odds of working among work-disabled men in 2008–09 were one-and-a-half times those for work-disabled men in 2004–05.

Table 2.4. Multivariate analysis of factors associated with working, conditional on having reported being work disabled

	Men		Women	
	Odds ratio	**p-value**	**Odds ratio**	**p-value**
Aged 50–54	3.884‡	<0.001	5.202‡	<0.001
Aged 55–59	2.288‡	<0.001	3.151‡	<0.001
Aged 60–64	reference		reference	
Aged 65–69	0.234‡	<0.001	0.401‡	<0.001
Low education	reference		reference	
Mid education	1.317	0.102	0.858	0.311
High education	1.112	0.651	1.241	0.372
Single, never married	reference		reference	
Previously married	1.256	0.479	0.850	0.604
Couple	1.995*	0.019	1.201	0.535
No private pension	reference		reference	
Private DB pension	1.434	0.130	2.809‡	<0.001
Private DC pension	2.561‡	<0.001	3.165‡	<0.001
Private 'other' pension	1.204	0.574	1.685	0.054
Poorest	0.265‡	<0.001	0.794	0.316
Wealth quintile 2	0.632*	0.026	1.527*	0.034
Wealth quintile 3	reference		reference	
Wealth quintile 4	0.646*	0.052	1.521*	0.036
Richest	0.624*	0.002	1.653*	0.021
North East	0.381*	0.011	0.424†	0.005
North West	0.739	0.271	0.872	0.582
Yorkshire and the Humber	0.922	0.753	0.639	0.104
East Midlands	0.794	0.407	0.982	0.945
West Midlands	0.873	0.610	0.804	0.413
East of England	1.065	0.821	1.005	0.986
London	1.009	0.978	0.656	0.139
South East	reference		reference	
South West	1.006	0.983	0.909	0.730
Wave 2 (2004–05)	reference		reference	
Wave 3 (2006–07)	1.266	0.052	0.879	0.264
Wave 4 (2008–09)	1.523†	0.002	0.881	0.327

Notes: Sample size = 1,976 for men and 2,409 for women. Sample is all individuals aged 50–69 who reported that they had a health condition that limited the kind or amount of work they were able to do, if they wanted to. The dependent variable takes the value 1 if the individual was working. Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

Factors associated with receiving disability-related benefits among those who reported having a work disability

Many of the patterns of disability-related benefit receipt that were discussed above (Tables 2A.7 to 2A.10) are also found in the multivariate analysis presented in Table 2.5. Work-disabled individuals aged over the SPA (60 for women, 65 for men) were significantly less likely to report receiving disability-related benefits than those aged under the SPA. The wave indicators suggest there was no statistically significant change in the prevalence of disability-related benefit receipt over time among those who were work disabled.

Table 2.5. Multivariate analysis of factors associated with receiving a disability-related benefit, conditional on having reported being work disabled

	Men		Women	
	Odds ratio	**p-value**	**Odds ratio**	**p-value**
Aged 50−54	0.715	0.068	1.745†	0.001
Aged 55−59	0.834	0.187	2.055‡	<0.001
Aged 60–64	reference		reference	
Aged 65–69	0.392‡	<0.001	0.939	0.642
Low education	reference		reference	
Mid education	0.626†	0.002	1.021	0.877
High education	0.369‡	<0.001	0.571*	0.023
Single, never married	reference		reference	
Previously married	0.984	0.948	1.046	0.873
Couple	0.855	0.503	0.749	0.290
No private pension	reference		reference	
Private DB pension	0.626†	0.008	1.003	0.987
Private DC pension	0.613†	0.003	0.677*	0.014
Private ‘other’ pension	0.906	0.672	1.448	0.086
Poorest	1.760†	0.002	1.714†	0.001
Wealth quintile 2	1.331	0.094	1.205	0.245
Wealth quintile 3	reference		reference	
Wealth quintile 4	0.821	0.284	0.721	0.075
Richest	0.604*	0.028	0.487‡	<0.001
North East	2.585‡	<0.001	1.415	0.195
North West	1.386	0.176	1.431	0.127
Yorkshire and the Humber	1.041	0.864	1.230	0.387
East Midlands	1.798*	0.027	0.995	0.985
West Midlands	1.400	0.205	1.324	0.242
East of England	1.045	0.870	0.995	0.990
London	1.316	0.343	0.803	0.409
South East	reference		reference	
South West	1.063	0.816	0.975	0.922
Wave 2 (2004–05)	reference		reference	
Wave 3 (2006–07)	0.965	0.720	0.916	0.318
Wave 4 (2008–09)	0.943	0.587	1.033	0.724

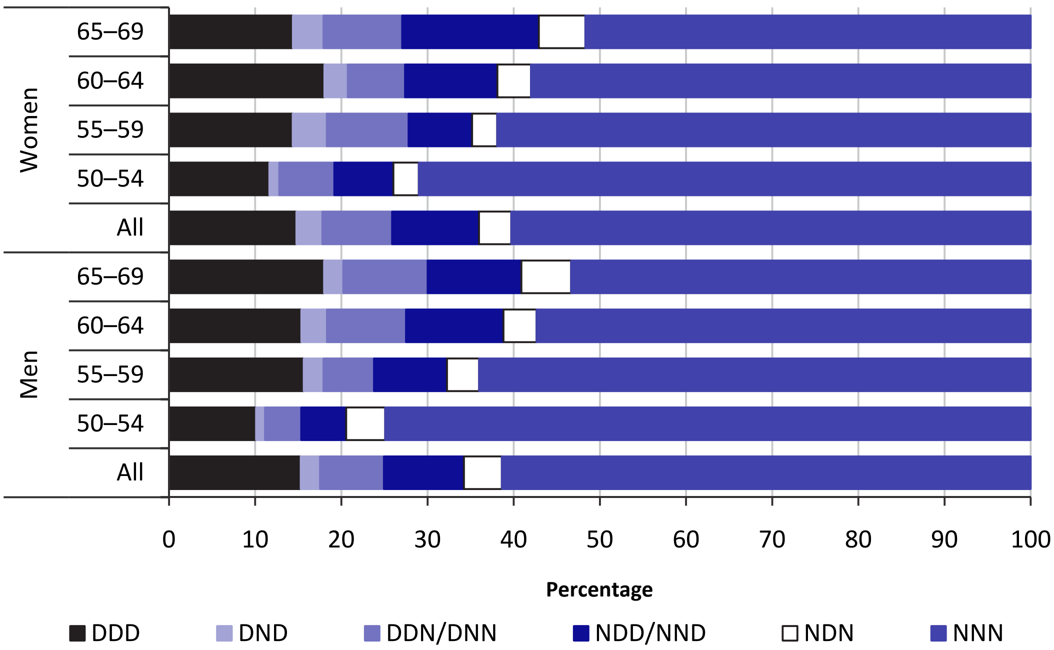
Notes: Sample size = 1,976 for men and 2,409 for women. Sample is all individuals aged 50–69 who reported that they had a health condition that limited the kind or amount of work they were able to do, if they wanted to. The dependent variable takes the value 1 if the individual was receiving a disability-related benefit (see Section 2.2 for details). Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

Those with higher levels of education were less likely to report receiving disability-related benefits than those with lower levels of education. Men with private DB or DC pensions (and women with DC pensions) were also less likely to be receiving disability-related benefits than those with no private pension.[22] Furthermore, men and women in the poorest fifth of the population were significantly more likely than men and women in the richest three-fifths to receive such benefits. Men (women) in the richest wealth quintile were only about 60% (50%) as likely to receive disability-related benefits as those in the middle wealth quintile. Even after controlling for other factors, work-disabled men in the North East and East Midlands are found to be significantly more likely to be receiving disability-related benefits than men in the South East.

2.5.3 Changes in individuals' reported work disability

Even among older individuals, work disability seems to be a far from permanent state of affairs. Figure 2.10 categorises the patterns of work disability reported by individuals who were observed in 2004–05, 2006–07 and 2008–09. (The underlying data and some additional statistics are provided in Table 2A.11.)

Figure 2.10. Transitions into and out of work disability between 2004–05 and 2008–09, by age in 2004–05 and sex



Notes: Sample is those aged 50 to 69 in 2004–05 who also responded to the survey in 2006–07 and 2008–09. Underlying statistics and sample sizes are shown in Table 2A.11. The three-letter initialisms designate the pattern of reported work disability in each of the survey years 2004–05, 2006–07 and 2008–09 respectively. 'D' denotes reporting being work disabled while 'N' denotes reporting not being work disabled.

[22]Though Incapacity Benefit is means-tested against private pension income, individuals could choose not to draw their private pension in order to qualify for IB. Therefore, it is not entirely obvious that disability benefit receipt ought to be lower among those who are members of a private pension.

The left-most block in Figure 2.10 shows the percentage of individuals who reported being work disabled in all three waves (labelled 'DDD') – this accounts for between 10% and 18% of individuals in each age group. The next two blocks show those individuals who were work disabled in 2004–05 but who either reported not being work disabled in 2006–07 and then were again in 2008–09 ('DND') or who reported not being work disabled in 2008–09 ('DDN and DNN'). Of all those aged 50–69 who reported being work disabled in 2004–05, 41.1% did not report a work disability in either 2006–07 or 2008–09 or in both. Even for those who were initially aged 65–69, a not insignificant fraction of the initially work disabled reported not being so in one or both of the subsequent waves.

The three right-hand blocks comprise those who did not report being work disabled in 2004–05. The right-most block shows the percentage of individuals who never reported being work disabled ('NNN') – between 50% and 75% of individuals in each age group. The second block from the right shows the percentage of individuals who were not work disabled in 2004–05 or 2008–09 but were in 2006–07 ('NDN'). The third block from the right shows the percentage of individuals who were not work disabled in 2004–05, but were in 2006–07 and 2008–09, 'NDD' (or who were not in 2004–05 and 2006–07 but were in 2008–09, 'NND'). Of all those who were not work disabled in 2004–05, 18.5% reported being work disabled in either 2006–07 or 2008–09 or in both – this was most prevalent (as we might expect) among older groups.

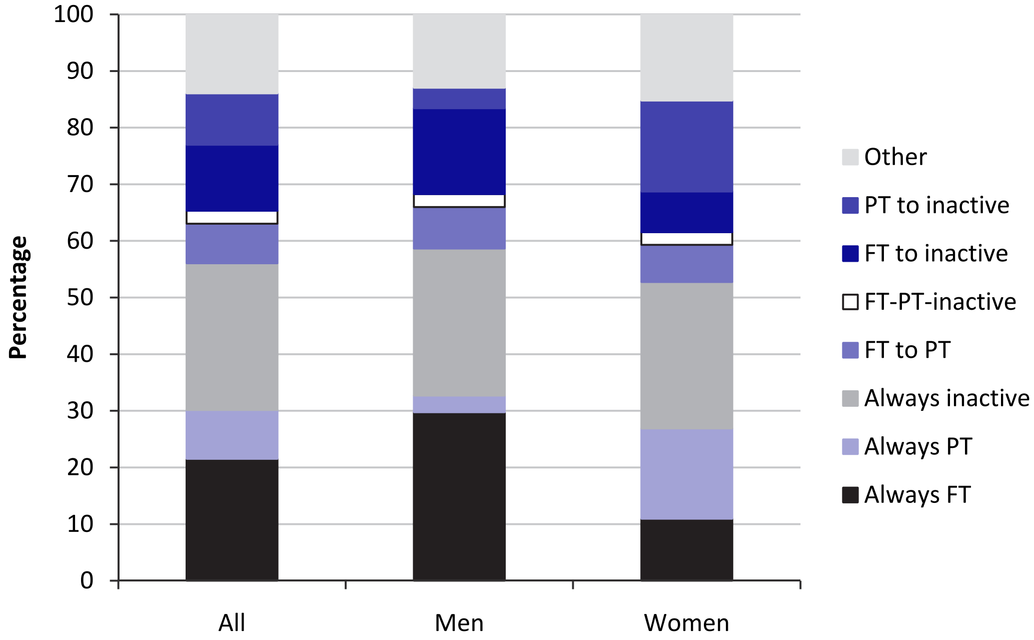
2.6 Labour market transitions

Existing literature suggests that financial incentives, family status and health, amongst other things, are all important factors affecting individuals' decisions about when to stop working. See, for example, Disney, Meghir and Whitehouse (1994), Disney, Emmerson and Wakefield (2006) and Banks and Tetlow (2008). Furthermore, these factors have also been found to be related to whether individuals cease work entirely or reduce their hours first.

2.6.1 Overview of available transitions

With four waves of ELSA data, we have observations on individuals' work status over a six-year period, and we have observed different patterns of movement into and out of work. Figure 2.11 describes the percentage of individuals who exhibited various different types of labour market transitions between the waves, for those who were observed in all four waves of the ELSA data and who were aged under the SPA in 2002–03. Three-in-ten (30.1%) of these individuals did not change their work status (either they worked full-time in all of the four waves or they worked part-time in all of the four waves – the 'always FT' and 'always PT' groups in Figure 2.11 respectively), and just over a quarter (25.9%) were not in work in any of the four waves (the 'always inactive' group). One-in-nine (11.6% of) individuals left full-time work to become inactive at some point between 2002–03 and 2008–09 (the 'FT to inactive' group), whilst 9.3% of individuals appeared to be phasing towards retirement, since they were observed either moving from full-time to part-time work (the 'FT to PT' group), or even from full-time

Figure 2.11. Percentage of individuals with various types of labour market movements across the first four waves of ELSA by sex



Notes: Underlying statistics and sample sizes are shown in Table 2A.12. 'FT' denotes being in full-time work while 'PT' denotes being in part-time work. 'Other' includes all individuals whose work pattern does not match one of the listed options, or who did not know their hours of work in one or more waves. Weighted using longitudinal weights.

work to part-time work to inactivity (the 'FT-PT-inactive' group) between 2002–03 and 2008–09.

Given four waves of ELSA data, we have three possible points at which individuals could have made a transition from one work status to another. By pooling the observed transitions at these points, we have sufficient data to start to look at the characteristics associated with individuals' transitions.

2.6.2 Leaving full-time work

Banks and Tetlow (2008) considered factors associated with leaving full-time work between 2002–03 and 2006–07. They found that, after controlling for other characteristics, women and older individuals were more likely to leave full-time work (either for part-time work or inactivity), as were men with private pensions and individuals who experienced the onset of a major health condition. Individuals whose partner was also working in 2002–03 were significantly less likely to leave full-time work between 2002–03 and 2006–07 than individuals whose partner had not been in work in 2002–03.

This section updates that analysis, taking advantage of all four waves of ELSA, and pooling observations across the three potential transition points (2002–03 to 2004–05, 2004–05 to 2006–07 and 2006–07 to 2008–09) for individuals observed in all four waves. The results of multivariate analysis are presented in Table 2.6. An individual is taken to have left full-time work at a transition point (i.e. the dependent variable in the regression shown in Table

Table 2.6. Multivariate analysis of characteristics associated with leaving full-time work

	Baseline controls only		Including changes in characteristics across the transition point	
	Odds ratio	p-value	Odds ratio	p-value
Men 50–54	reference		reference	
Men 55–59	2.489‡	<0.001	2.319‡	<0.001
Men 60–64	4.358‡	<0.001	3.717‡	<0.001
Men 65–69	15.487‡	<0.001	12.416‡	<0.001
Women 50–54	2.954‡	<0.001	2.762‡	<0.001
Women 55–59	2.484‡	<0.001	2.307‡	<0.001
Women 60–64	11.775‡	<0.001	10.549‡	<0.001
Reach the SPA	6.666‡	<0.001	6.931‡	<0.001
Single, never married	reference		reference	
Previously married	0.823	0.434	0.795	0.369
Couple	1.906	0.114	0.973	0.917
Partner not working	reference		-	-
Partner working	0.628†	0.001	-	-
Low education	reference		reference	
Mid education	0.895	0.355	0.897	0.373
High education	0.982	0.901	0.985	0.919
Poorest	0.705	0.128	0.624*	0.040
Wealth quintile 2	0.890	0.451	0.830	0.244
Wealth quintile 3	reference		reference	
Wealth quintile 4	1.031	0.831	1.001	0.996
Richest	1.251	0.137	1.269	0.127
No private pension	reference		reference	
Private DB pension	1.984†	0.002	2.022†	0.002
Private DC pension	1.351	0.179	1.391	0.142
Private 'other' pension	1.425	0.228	1.473	0.187
No limiting long-standing illness	reference		-	-
Limiting long-standing illness	1.815‡	<0.001	-	-
Partner has no limiting long-standing illness	reference		-	-
Partner has a limiting long-standing illness	0.888	0.384	-	-
No limiting long-standing (LS) illness either before or after	-	-	reference	
Still have a limiting LS illness	-	-	2.992‡	<0.001
Now have a limiting LS illness	-	-	1.927‡	<0.001
No longer have a limiting LS illness	-	-	0.970	0.894
Partner still not working	-	-	reference	
Partner still in work	-	-	0.558‡	<0.001
Partner now in work	-	-	1.220	0.575
Partner left work	-	-	1.636*	0.011
Partner had no limiting LS illness either before or after	-	-	reference	
Partner still has a limiting LS illness	-	-	1.030	0.847
Partner now has a limiting LS illness	-	-	1.029	0.885
Partner no longer has a limiting LS illness	-	-	0.697	0.178
Transition 2002–03 to 2004–05	reference		reference	
Transition 2004–05 to 2006–07	0.653†	0.002	0.658†	0.002
Transition 2006–07 to 2008–09	0.982	0.897	0.961	0.774

Notes to Table 2.6: Sample size = 2,876. Sample is all individuals who: were interviewed in all of the first four waves of ELSA; were aged between 50 and the SPA and were working full-time in 2002–03; and followed one of these patterns of employment over the four waves – ‘always FT’, ‘FT to PT’, ‘FT to inactive’ or ‘FT-PT-inactive’ (see Figure 2.11). The dependent variable takes the value 1 if the individual was observed to be in full-time work before the transition point but not after. Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively). The variable ‘reach the SPA’ takes the value 1 if the individual was aged less than the SPA before the transition point but not after.

2.6 takes the value 1) if they were in full-time work before the transition point (for example, in 2002–03 in the case of transitions between 2002–03 and 2004–05) but not in full-time work after the transition point *and* if after the transition point they were either permanently part-time, permanently inactive, or part-time and later become inactive (i.e. they belong to one of the ‘FT to PT’, ‘FT to inactive’ or ‘FT-PT-inactive’ groups in Figure 2.11). Conversely, an individual is taken not to have left full-time work (i.e. the dependent variable in the regression shown in Table 2.6 takes the value 0) if they were in full-time work both before and after the transition point *and* they belong to one of the following groups from Figure 2.11: ‘always FT’, ‘FT to PT’, ‘FT-PT-inactive’ or ‘FT to inactive’. Individuals who exhibited some other pattern of transitions across the four waves (i.e. the 57.6% of individuals who were working part-time or not working initially or who moved out of and then back into full-time work) are excluded from the analysis presented in Table 2.6.

Table 2.6 presents the results from a multivariate analysis (logistic regression) of the characteristics associated with leaving full-time work. Two alternative specifications are shown – the left hand set of columns includes only those characteristics measured in the survey wave before the transition point, while the right-hand set of columns in addition includes indicator variables for other changes in characteristics that were observed to have happened between the waves in question. These changes are likely to be jointly determined with changes in work status. For example, the finding that those who developed a long-standing limiting health condition were more likely to leave full-time work (odds ratio of 1.927 in the third column) could reflect individuals leaving work due to a deterioration in their health, but equally it could be that individuals who left work were more likely to see a deterioration in their health – in other words, it is unknown in which direction the causation runs.

The only ‘transition’ indicator that is included in the first regression is whether or not an individual reached the SPA between the two waves of the survey, since this is clearly not affected by the decision of whether or not to leave work. This indicator is therefore included in both specifications shown in Table 2.6. The reference person for each specification is indicated in the table.

As was found by Banks and Tetlow (2008), women were more likely than men to move out of full-time work, and older individuals were far more likely to move out of work than younger individuals, even after controlling for whether or not they passed their SPA.

While wealth itself does not seem to have been highly correlated with individuals’ movements out of full-time work, individuals with defined benefit

private pensions were nearly twice as likely to leave full-time work as those without a private pension.

Health seems to be important. Those who had a long-standing limiting illness before the transition point were more likely to leave work than those who were in good health. When we take into account the changes in characteristics between waves, those who had a long-standing health condition both before and after the transition point were the most likely to leave full-time work, followed by those who reported a limiting long-standing health condition after the transition point but not before. Interestingly, the odds for someone who reported a limiting long-standing health condition before the transition point but not after were not statistically significantly different from 1 (and, indeed, the point estimate for the odds is also almost exactly 1, at 0.970). In other words, these people were no more or less likely to leave full-time work than someone who did not report a limiting long-standing illness either before or after the transition point.

Family status also seems to have had an important role – individuals with a partner who was in work in the year before the transition point were 37.2% less likely to leave full-time work. Taking into account the transitions in a partner's characteristics between waves, if the partner was in work both before and after the transition point then the individual was 44.2% less likely to leave full-time work than an individual whose partner was not in work in either case. By contrast, if an individual's partner left work at the transition point then the individual was 63.6% more likely to leave full-time work.

2.6.3 Phasing-out of full-time work

The last government was keen to encourage continued attachment to the labour market at older ages, and changes to legislation over the last few years attempted to make it easier for older workers to withdraw more gradually from paid work – notably, since October 2006, individuals have been able to continue to work for an employer whilst being paid an occupational pension by that employer. The government document *Building a Society for All Ages* (HM Government, 2009) explained that 'Continuing some form of work can give people the opportunity to use their skills and experience, maintain social networks, boost their retirement income, maintain a strong sense of purpose and stay healthy'. The new coalition government has also suggested that it is keen to encourage more employment at older ages by phasing out the default retirement age and making it possible for all employees to request flexible working arrangements (HM Government, 2010).

As described in Figure 2.11, while some individuals move out of full-time work and straight into inactivity, around 10% move from full-time to part-time work. Table 2.7 presents the results from a multivariate analysis (logistic regression) of the characteristics associated with movements out of full-time work straight into inactivity, as opposed to a more phased withdrawal from the labour market (in other words, moving out of full-time work and being in the group 'FT to inactive' as opposed to 'FT to PT' or 'FT-PT-inactive). The specifications are the same as used for Table 2.6. The sample used is all those moving out of full-time work at the transition point in question and the

Table 2.7. Multivariate analysis of characteristics associated with leaving full-time work for inactivity rather than phasing retirement

	Baseline controls only		Including changes in characteristics across the transition point	
	Odds ratio	p-value	Odds ratio	p-value
Men 50–54	reference		reference	
Men 55–59	0.583	0.195	0.672	0.359
Men 60–64	0.946	0.901	0.899	0.816
Men 65–69	0.245	0.048	0.168*	0.016
Women 50–54	0.151‡	<0.001	0.155‡	<0.001
Women 55–59	0.487	0.107	0.522	0.164
Women 60–64	0.623	0.393	0.696	0.532
Reach the SPA	1.234	0.394	1.281	0.338
Single, never married	reference		reference	
Previously married	0.666	0.338	0.654	0.323
Couple	4.088*	0.035	1.647	0.251
Partner not working	reference		-	-
Partner working	0.536†	0.007	-	-
Low education	reference		reference	
Mid education	0.694	0.092	0.745	0.186
High education	0.546*	0.015	0.519*	0.011
Poorest	2.614*	0.038	1.728	0.217
Wealth quintile 2	1.486	0.165	1.270	0.442
Wealth quintile 3	reference		reference	
Wealth quintile 4	1.142	0.612	1.031	0.910
Richest	1.177	0.548	1.095	0.752
No private pension	reference		reference	
Private DB pension	2.406*	0.011	2.807†	0.004
Private DC pension	1.573	0.186	1.662	0.149
Private ‘other’ pension	1.872	0.209	2.418	0.105
No limiting long-standing illness	reference		-	-
Limiting long-standing illness	1.680*	0.017	-	-
Partner has no limiting long-standing illness	reference		-	-
Partner has a limiting long-standing illness	0.568*	0.023	-	-
No limiting long-standing (LS) illness either before or after	-	-	reference	
Still have a limiting LS illness	-	-	2.635‡	<0.001
Now have a limiting LS illness	-	-	3.050‡	<0.001
No longer have a limiting LS illness	-	-	0.806	0.614
Partner still not working	-	-	reference	
Partner still in work	-	-	0.268‡	<0.001
Partner now in work	-	-	0.166*	0.014
Partner left work	-	-	1.237	0.507
Partner had no limiting LS illness either before or after	-	-	reference	
Partner still has a limiting LS illness	-	-	0.412†	0.004
Partner now has a limiting LS illness	-	-	1.003	0.993
Partner no longer has a limiting LS illness	-	-	1.103	0.841
Transition 2002–03 to 2004–05	reference		reference	
Transition 2004–05 to 2006–07	0.733	0.182	0.794	0.355
Transition 2006–07 to 2008–09	0.764	0.241	0.749	0.221

Notes to Table 2.7: Sample size = 602. Sample is all individuals who: were interviewed in all of the first four waves of ELSA; were aged between 50 and the SPA and working full-time in 2002–03; followed one of these patterns of employment over the four waves – 'FT to PT', 'FT to inactive' or 'FT-PT-inactive'; and actually left full-time employment at the transition point in question. The dependent variable takes the value 1 if the individual moved straight into inactivity (from full-time work) at the transition point, and 0 if the individual moved instead into part-time work at the transition point. Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively). The variable 'reach the SPA' takes the value 1 if the individual was aged less than the SPA before the transition point but not after.

dependent variable takes the value 1 if the individual moves from full-time work to inactivity at the transition point and 0 if the individual moves from full-time to part-time work at the transition point. Odds ratios are expressed relative to the odds for the reference group, which is indicated in the table.

Individuals with high levels of education were less likely to withdraw from the labour market entirely than individuals with low levels of education. Health was also important – those who were working full-time but in less good health initially were more likely to leave work entirely than to move to part-time work.

As with the decision of whether or not to leave full-time work at all, pension status was significantly correlated with whether individuals chose to leave the labour market entirely or whether to phase into part-time work. The odds of someone with a DB private pension leaving the labour market entirely were over twice the odds of someone without a private pension doing so.

Family status again seems to have played an important role. Individuals whose partners were not in work and did not have any limiting long-standing illnesses were four times more likely to leave work entirely than singles. However, individuals whose partner was working and had a limiting long-standing illness before the transition point were no more likely than singles to quit work entirely at the transition point.[23]

2.7 Expectations of future employment

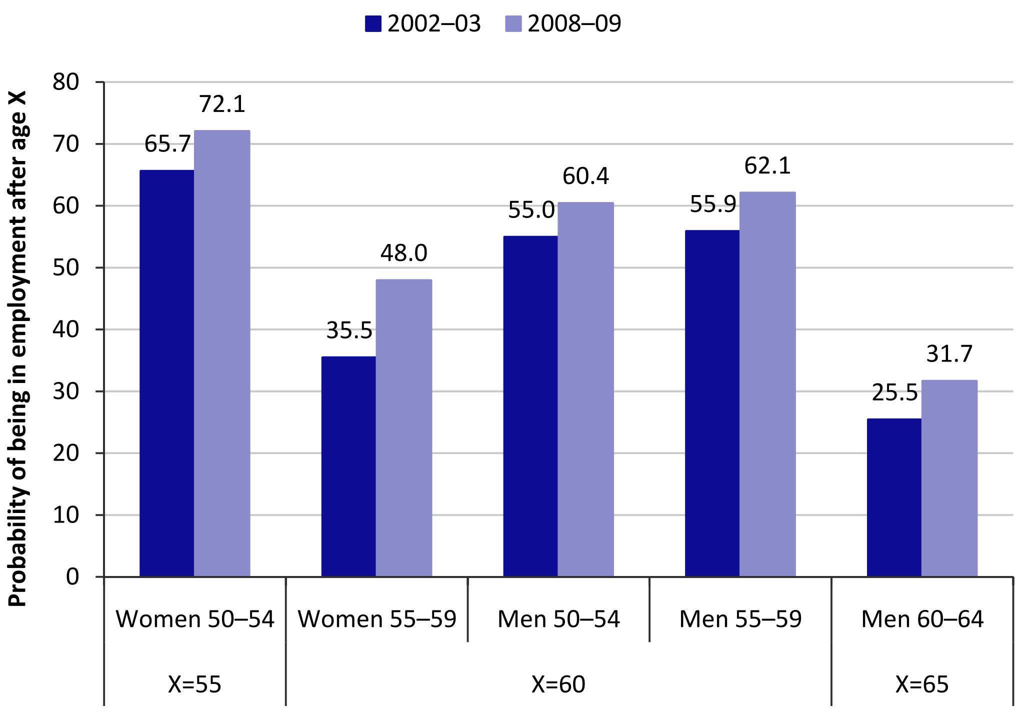
One of the strengths of ELSA is that it allows us to examine not only employment rates and how these differ by individual characteristics, but also individuals' expectations about their future employment. All respondents to the ELSA survey aged under the SPA were asked about their expectations of working after a certain age a few years in the future. In addition, in 2006–07 and 2008–09, respondents who reported some chance of being in work in future were asked the chances that they would be working full-time at that point. This section explores expectations of future working and how these have changed over time.

[23] Joint significance of the 'couple', 'partner working' and 'partner has a limiting long-standing illness' tested using a χ^2 test.

2.7.1 Changes in expectations since 2002–03

Figure 2.12 shows that individuals in 2008–09 reported higher expectations of being in work after a particular age than individuals of the same age in 2002–03. For instance, among the women aged 55−59 in 2008–09 the average reported chance of being in employment after age 60 was 48.0%, while among the women aged 55−59 in 2002–03 the average reported chance was only 35.5%. This reinforces the increases in reported expectations of working in future that were found between 2002–03 and 2006–07, documented in Banks and Tetlow (2008).

Figure 2.12. Expectations of being in employment after age X, by age and sex, 2002–03 and 2008–09



Notes: Underlying statistics and sample sizes are shown in Table 2A.13. Excludes those who did not know their probability of being in employment.

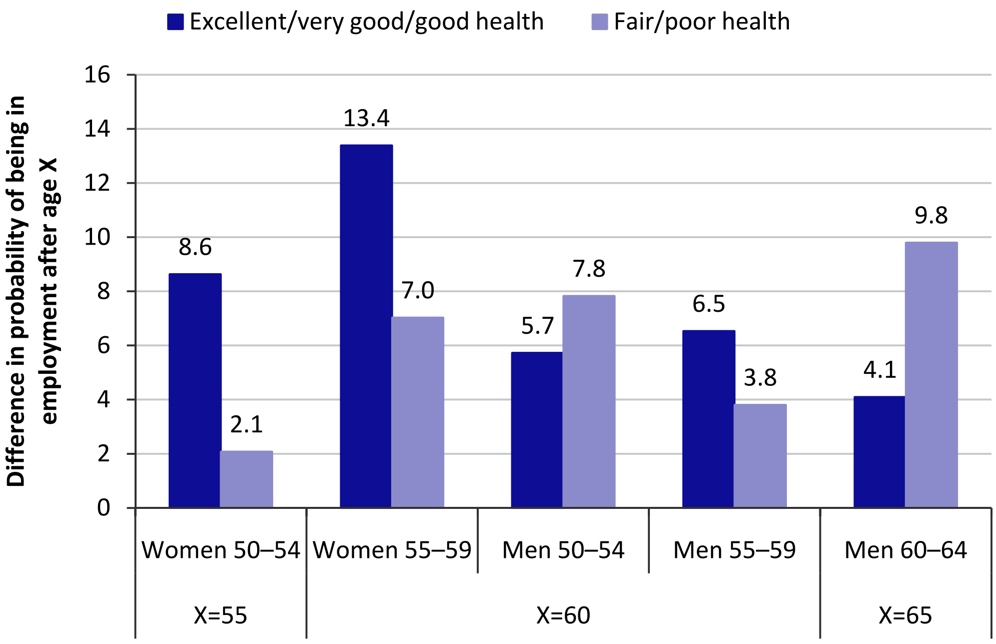
Banks and Casanova (2003) showed, using data from ELSA collected in 2002–03, that expectations of future employment were higher for individuals who were currently in work than for those who were inactive, and higher for individuals who self-reported being in excellent, very good or good health than for those who self-reported being in fair or poor health. Tables 2A.13 and 2A.14 compare the mean expectations of future work in 2002–03 and 2008–09 by health status and work status respectively.

Figure 2.13 shows how much higher average self-reported expectations of future work were in 2008–09 than in 2002–03. This is shown separately for different groups defined by age and self-reported health at the time of interview. On average, the reported chances of being in work in future were higher for individuals of a given age and level of self-reported health in 2008–09 than among individuals of the same age and health status in 2002–03. The difference in average reported chances between 2002–03 and 2008–09 within

each age group was higher for women who self-reported being in excellent, very good or good health than for women who self-reported being in fair or poor health, for all age groups. This was also true of men aged 55−59, but among men aged 50−54 and men aged 60–64 the difference between 2002–03 and 2008–09 in average reported chances of being in work in future was higher for those self-reporting being in fair or poor health than for those self-reporting being in excellent, very good or good health. Overall, the difference in expectations of working between the cohort aged 50−64 in 2008–09 who were in excellent, very good or good health and those aged 50−64 in 2002–03 who were in excellent, very good or good health is not significantly different from the difference in expectations between those aged 50−64 in 2008–09 who were in fair or poor health and those aged 50−64 in 2002–03 who were in poor or fair health. So the gap between the average expectations of those in good health and those in poorer health has not changed significantly over the period, though the level of average expectations has increased for both.

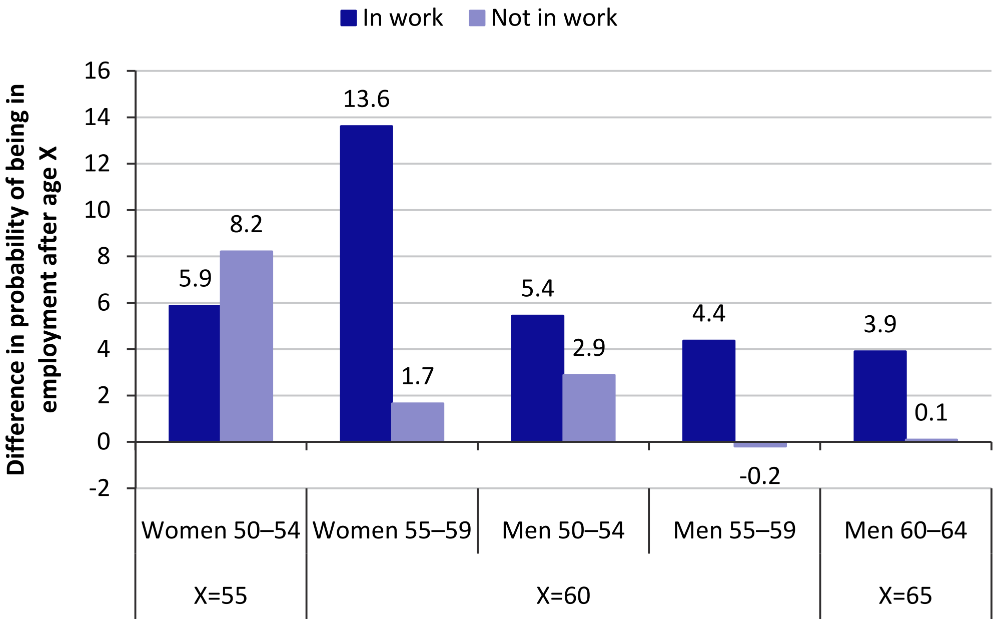
Figure 2.14 shows that, on average, expectations were higher in 2008–09 than in 2002–03 by significantly more if we look just across those who were currently in work than if we look just across those who were not in work. This

Figure 2.13. Difference between average reported expectations of being in employment after age X in 2002–03 and average reported expectations of being in employment after age X in 2008–09, by age and self-reported health status at time of interview



Notes: To aid interpretation of this figure – the number '8.6' for women aged 50–54 in excellent, very good or good health indicates that the mean self-reported expectation of being in employment after age 55 among women aged 50–54 reporting being in excellent, very good or good health in 2008–09 was 8.6 percentage points higher than the mean self-reported expectation of being in employment after age 55 among women aged 50–54 reporting being in excellent, very good or good health in 2002–03. Other numbers in this figure can be interpreted in a similar way. Underlying statistics and sample sizes are shown in Table 2A.13. Excludes those who did not know their probability of being in employment or who did not respond to the self-rated health question.

Figure 2.14. Difference between average reported expectations of being in employment after age X in 2002–03 and average reported expectations of being in employment after age X in 2008–09, by age and work status at time of interview



Notes: Underlying statistics and sample sizes are shown in Table 2A.14. Excludes those who did not know their probability of being in employment. On interpretation, see note to Figure 2.13.

is true in almost all age groups; the exception in this case was women aged 50−54, for whom the average expectations in 2008–09 were higher relative to those reported in 2002–03 by more for those who were currently out of work (8.2 percentage point difference) than for those in work (5.9 percentage point difference).

The ELSA data contain a vast array of information on other characteristics that may be expected to be associated with expectation of employment at future ages. Perhaps one of the most important is private pension membership, as in some cases private pensions enable individuals to stop working before their SPA (as was discussed in Section 2.4.2). Table 2A.15 shows how future expectations of work varied in 2008–09 by private pension status – specifically, whether an individual had ever been a member of a defined benefit private pension scheme, had ever been a member of some other private pension scheme or had never been a member of a private pension scheme.[24] Women aged 55−59 and men aged 60−64 who were members of private DB pension schemes on average had significantly lower expectations of working after the SPA than members of other types of private pension schemes. However, women aged 55–59 who had never been a member of a private

[24]Unfortunately, we cannot show exactly equivalent figures for 2002–03, as in the first wave of ELSA respondents were not asked whether their employer pension was DB or DC in nature if they were not currently contributing to the pension when interviewed.

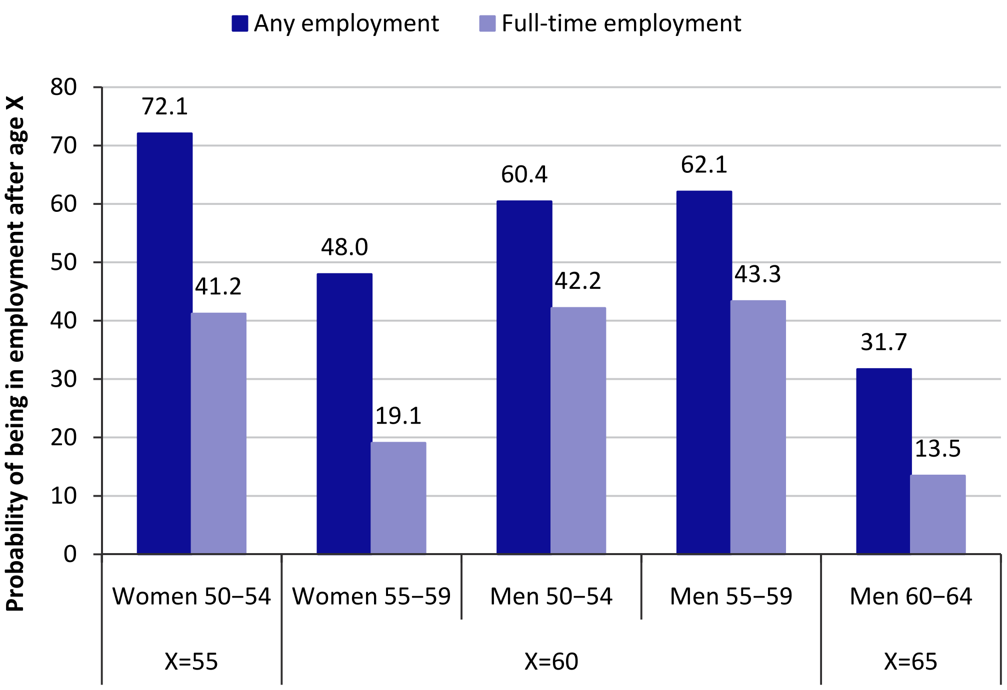
pension scheme had lower average expectations than women who were private pension scheme members.[25] In each of the age/sex groups shown in Table 2A.15, those with a non-DB private pension had significantly higher average expectations of being in employment in the future than those without a private pension. With the exception of women aged 50–54, those with only a non-DB private pension also had significantly higher expectations of being in paid work in future than those with DB schemes.

2.7.2 Expectations of future full-time working

In 2008–09, ELSA respondents who reported a non-zero expectation of working in the future were asked with what probability they expected this work to be full-time. Figure 2.15 shows that the average reported chances of working full-time among men were around two-thirds the level of the average reported chances of working at all. However, this ratio was much lower among women.

As shown in Table 2A.16, expectations of being in full-time work (among those individuals who expected some chance of being in some form of work in future) were substantially higher for individuals who were currently in full-

Figure 2.15. Expectations of being in any employment and in full-time employment after age X, by age and sex, 2008–09



Notes: Underlying statistics and sample sizes are shown in Tables 2A.14 and 2A.16. Figures for 'any employment' exclude those who did not know their probability of being in employment, while figures for 'full-time employment' exclude those who did not know either their probability of being in employment or their probability of being in full-time employment.

[25]We cannot reject that the average expectations for men aged 60–64 who had a DB scheme were the same as for men with no private pension.

time work than for individuals who were working part-time, and significantly higher for those working part-time than for those who were not currently in work.

If 48.0% of women were to work past age 60 (the mean reported expectation for women aged 55–59 in 2008–09, as shown in Figure 2.15), this would represent an increase in employment compared with the 38.4% of women aged 61 in 2008–09 who were actually in work. Similarly, if 19.1% of women were to work full-time past age 60 (the mean reported expectation of full-time employment for women aged 55–59 in 2008–09, as shown in Figure 2.15), this would represent an increase on the 10.3% of women aged 61 in 2008–09 who were in full-time work.

By contrast, 63.8% of men aged 61 were in work in 2008–09, and so if the expectations of men aged 50−59 of working after age 60 were to prove correct (average reported chance of working is 61.5% for this group as a whole), this would result in a slight decrease in employment. However, if 43.3% of men aged 55−59 were to be in full-time work after age 60 (the average reported chance of working full-time for this group as a whole), this would represent a slight increase on the 41.1% of men aged 61 in 2008–09 who were in full-time work. Similarly, if the expectations of men aged 60−64 of working, and of working full-time, past the age of 65 (shown in Figure 2.15) proved to be correct, this would result in higher levels of employment and full-time employment than among those currently aged 66 in 2008–09.

It is unknown whether those who expect to work past a certain age in the future will in fact do so, or whether those who do not expect to work in future will actually work or not. Therefore it is not clear that the higher expectations of working in future amongst individuals in the 2008–09 ELSA sample will translate into higher employment rates at older ages in future. However, Banks and Tetlow (2008) investigated the correlation between expectations and outcomes by comparing individuals' expectations of future working in 2002–03 with their observed employment outcomes in 2006–07. This analysis suggested that there was, in fact, strong correlation between expectations of working and subsequent outcomes.

2.8 Knowledge of changes to the SPA

One reason women of a given age in 2008–09 may expect to work for longer than women of the same age in 2002–03 is that the later cohorts will be affected by the increases to the female SPA, which was legislated in 1995 and began to be phased in in 2010. The age at which a woman can start drawing her state pension is increasing from 60 (for women born before 6 April 1950) to 65 (for those born after 5 April 1955). The extent to which this increase is reflected in work expectations will depend not just on how individuals' work decisions depend on the social norms associated with the SPA and the financial constraints imposed by not receiving the state pension income as soon, but also crucially on whether the women in question are aware of the changes to their SPA.

Further changes to the SPA were legislated in Pensions Act 2007. This legislated for an increase in the SPA for both men and women from 65 to

(ultimately) 68, which was to be phased in between 2024 and 2046. Members of the ELSA sample in 2008–09 are actually too old to have been affected by these reforms, though some may have incorrectly thought that they were affected. The coalition government (which came to power in May 2010) is now reviewing the possibility of bringing forward these further increases in SPA for men and women, with a review due to report in Autumn 2010. Depending on the conclusions of the review, some ELSA sample members may be affected by the reforms. We hope to extend questions about knowledge of SPA to both men and women who might be affected by these further reforms in future waves of ELSA.

2.8.1 Level of knowledge

Questions included for the first time in 2006–07 aimed to identify the extent to which women were aware that the female SPA was changing, and specifically whether they knew their own SPA. Banks and Tetlow (2008) found that the level of knowledge was relatively low among those women affected by the SPA changes, and therefore some women may be expecting to receive a state pension earlier than they actually will be able to, and thus may be underestimating how long they will need to continue working. With the questions repeated in 2008–09, we can now investigate whether knowledge has increased. We can do this both on average across all women aged under the SPA and for the specific group of women asked this question in both 2006–07 and 2008–09, who are now two years closer to retirement than when they were originally asked.

Figure 2.16 shows the percentage of individuals reporting various state pension ages, split by what their actual SPA is, in 2006–07 and 2008–09. Among those whose SPA is 60, knowledge was high in both 2006–07 and 2008–09 (78.9% and 80.8% correct, respectively). Knowledge among women affected by the state pension reforms is much lower, with only 34.1% of women whose SPA is 65 being aware of this in 2006–07, although 43.4% of the women in 2008–09 whose SPA is 65 were aware of this – this is a statistically significant increase. Women with a SPA between 60 and 65 could be expected to have much less accurate knowledge of their own SPA simply because of the complexity of the pension reform – during the phasing-in period, the reform phases the *date* at which an individual can retire rather than the *age*, and so women born between 6 April 1950 and 6 April 1955 have SPAs that may differ to the day depending on their date of birth. Only 16.7% of women in 2006–07 with a SPA between 60 and 65 knew their SPA to within three months, although 34.6% knew that it was somewhere between 60 and 65. In 2008–09, knowledge was higher – these figures are 23.6% and 48.1% respectively.

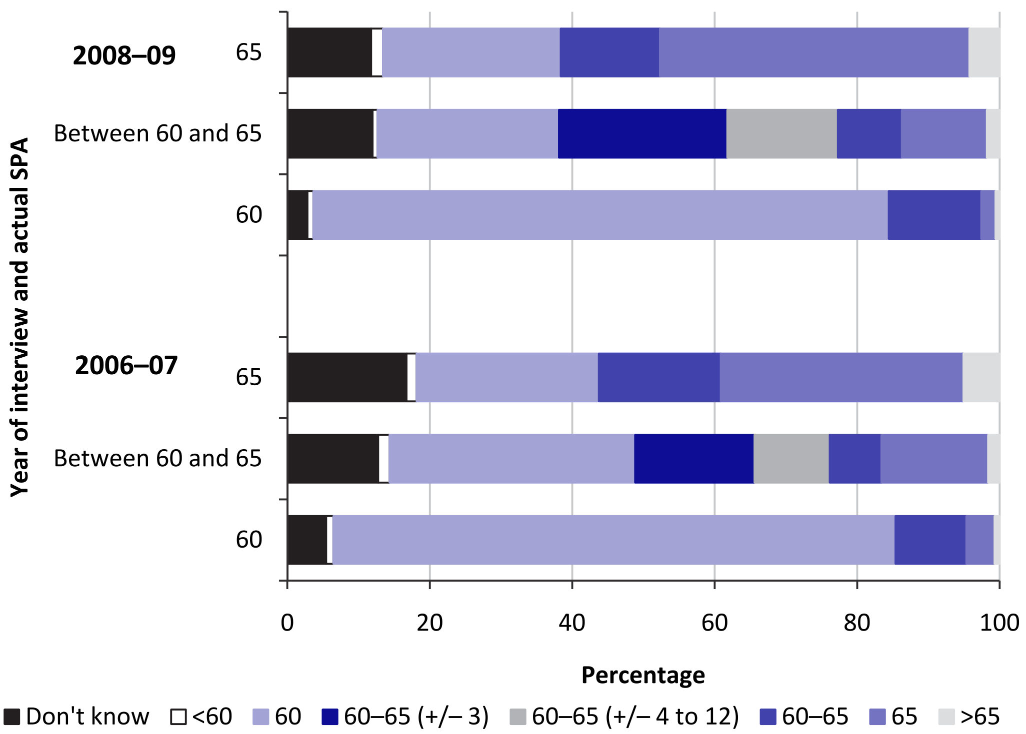
Table 2.8 examines changes in knowledge between 2006–07 and 2008–09 among those who were asked these questions twice.[26] Respondents are

[26]Of course, it is possible that there may be a familiarisation effect of the survey – that is, women may have taken steps to become better informed as a direct result of having been asked these questions in the ELSA interview. This is potentially a concern and would need to be borne in mind when generalising the results from the ELSA sample to the population as a whole. However, the evidence we have so far of changes in knowledge between 2006–07 and 2008–09 (discussed here) does not show strong evidence of this sort of 'learning'.

categorised into four groups based on whether they gave the right (R) or wrong (W) answer when asked for their SPA in each year. What is clear is that there is a fairly large amount of uncertainty around individuals' own SPA, particularly among those whose SPA is somewhere between 60 and 65. Though the fraction of individuals who changed from giving a wrong answer in 2006–07 to giving the right answer in 2008–09 was greater than the fraction that moved in the other direction, the latter category was not insignificant in size. The movements are, however, suggestive of generally increasing knowledge among women of their own SPA.

Consider women whose SPA is somewhere between 60 and 65, and take the second definition of 'right' (labelled [2] in Table 2.8) as giving an answer within 12 months of the true SPA. We can see that 71.7% of these women (=15.3+56.3; figures do not sum due to rounding) gave the wrong answer in 2006–07. Of those who had given the wrong answer, 21.4% (=15.3/71.7) then gave the 'right' answer in 2008–09. However, of those who had originally given the 'right' answer (23.7+4.6=28.3%), 16.3% (=4.6/28.3) then gave the wrong answer in 2008–09.

Figure 2.16. Knowledge of own SPA by actual SPA, 2006–07 and 2008–09



Notes: Underlying statistics and sample sizes are shown in Table 2A.17. For those whose SPA is actually exactly 60 or 65, the '60–65' group includes all those who reported something between 60 years and 1 month and 64 years and 11 months; for those whose SPA is actually somewhere between 60 and 65, the '60–65' group includes only those who reported something between 60 years and 1 month and 64 years and 11 months who do not fall into one of the following two categories: '60–65 (+/– 3)' means the respondent reported a SPA somewhere between 60 years and 1 month and 64 years and 11 months that was within three months of their true SPA. '60–65 (+/– 4 to 12)' means the respondent reported a SPA somewhere between 60 years and 1 month and 64 years and 11 months that was more than three but less than 12 months from their true SPA.

Table 2.8. Change in accuracy of reported SPA between 2006–07 and 2008–09, by actual SPA

	RR	RW	WR	WW	*Unweighted N*
SPA = 60	65.7	10.3	16.7	7.3	*199*
SPA between 60 & 65 [1]	13.9	4.7	11.6	69.8	*572*
SPA between 60 & 65 [2]	23.7	4.6	15.3	56.3	*572*
SPA = 65	27.4	8.2	19.3	45.1	*170*

Notes: 'RR' indicates that the respondent gave the right answer in both years, 'RW' denotes a right answer in 2006–07 and a wrong answer in 2008–09 etc. Sample is those women who responded to the question about SPA in both 2006–07 and 2008–09.
[1] Defines 'right' as reporting an answer within three months of true SPA.
[2] Defines 'right' as reporting an answer within 12 months of true SPA.

A key advantage of the longitudinal data provided by ELSA is that we will be able to follow these women in future years and see whether or not their knowledge improves as they approach their SPA. We will also have data on the outcomes of these women – for instance, their subsequent work patterns and (perceptions of) financial adequacy – and will be able to compare the outcomes of those who had good knowledge of their SPA with the outcomes of those who had less good knowledge.

2.8.2 Characteristics associated with knowledge of own SPA

Given the differences in knowledge among women of their state pension age, an interesting question is which types of women are more aware of their SPA than others and whether knowledge has changed significantly over time. Table 2.9 shows the results of a multivariate analysis of the characteristics associated with women knowing their own SPA, using a pooled sample of data from 2006–07 and 2008–09. A woman is counted as knowing her SPA if she is correct in thinking that it is 60 or 65 or, if her actual SPA is between 60 and 65, she reports her SPA correctly to within 12 months. The odds ratios in Table 2.9 are estimated from a logistic regression, where the odds are expressed relative to the odds for the reference group; the reference group is indicated in the table.

All else being equal, women were significantly more likely to know their own SPA if they had a private pension for which they know the type (either defined benefit or defined contribution) than if they had never been a member of a private pension. Women were also significantly more likely to know their own SPA if they were currently working than if they were inactive but did not classify themselves as retired (as was found in a univariate context in Banks and Tetlow (2008)). However, there is virtually no significant relationship between wealth or housing tenure and knowledge.

The bottom part of the table examines whether there is a significant difference in knowledge between women with different SPAs and also whether there is an increase in knowledge as women get closer to their SPA. The SPA applying to particular individuals is determined by their exact date of birth. The regression further distinguishes between the cohorts based on their age at interview and the year in which they were interviewed. In line with findings in Section 2.8.1, those whose SPA is greater than 60 were significantly less likely to report correctly, even after controlling for various other characteristics. It is

perhaps more interesting, however, to compare the odds ratios between different groups of women (as classified by age at interview and date of interview) who have similar SPAs (that is, either somewhere between 60 and 65, or exactly 65). For example, comparing those aged 51–52 in 2006–07 with those aged 53–54 in 2006–07, we find that the level of knowledge was significantly lower among the younger group (odds ratio of 0.050) than among

Table 2.9. Multivariate analysis of factors associated with correct knowledge of own SPA

	Odds ratio	p-value
Single, never married	reference	
Previously married	1.185	0.393
Couple	0.982	0.842
Low education	reference	
Mid education	1.021	0.853
High education	1.022	0.880
Own outright	reference	
Mortgage	0.893	0.279
Renter	0.653	0.060
Working	reference	
Retired	1.108	0.582
Other inactive	0.647‡	<0.001
Poorest wealth quintile	0.685	0.109
Wealth quintile 2	0.790	0.095
Wealth quintile 3	reference	
Wealth quintile 4	0.863	0.308
Richest wealth quintile	0.823	0.183
No private pension	reference	
Private DB	1.891‡	<0.001
Private DC	1.564‡	<0.001
Other private pension	0.917	0.713
No long-standing illness	reference	
Long-standing illness	1.154	0.137
SPA=60		
Aged 55–57, interviewed in 2006–07	reference	
Aged 58–59, interviewed in 2006–07	1.261	0.273
Aged 58–59, interviewed in 2008–09	1.391	0.137
SPA between 60 and 65		
Aged 51–52, interviewed in 2006–07	0.050‡	<0.001
Aged 53–54, interviewed in 2006–07	0.119‡	<0.001
Aged 55–57, interviewed in 2006–07	0.176‡	<0.001
Aged 53–54, interviewed in 2008–09	0.083‡	<0.001
Aged 55–57, interviewed in 2008–09	0.236‡	<0.001
Aged 58–59, interviewed in 2008–09	0.223‡	<0.001
SPA=65		
Aged 50–51, interviewed in 2006–07	0.165‡	<0.001
Aged 50–52, interviewed in 2008–09	0.198‡	<0.001
Aged 53–55, interviewed in 2008–09	0.249‡	<0.001

Notes: Sample size = 2,998. Sample is all women aged under SPA when interviewed in either 2006–07 or 2008–09 who did not have a proxy interview. The dependent variable equals 1 if the individual reported the correct SPA (in the case of women whose SPA is between 60 and 65, this is taken to be reporting an age within 12 months of their true SPA). Standard errors are clustered at the individual level. * indicates that an odds ratio is statistically significantly different from 1 at the 5% level († and ‡ indicate significance at the 1% and 0.1% levels, respectively).

the older group (odds ratio of 0.119). However, we do not find a significant difference between the level of knowledge among those aged 53–54 in 2008–09 (odds ratio of 0.083) and the level of knowledge among those aged 53–54 in 2006–07.

Knowledge of the SPA was also significantly higher among women aged 50–51 in 2006–07 (whose SPA is exactly 65; odds ratio of 0.165) than among women aged 51–52 in 2006–07 (whose SPA is somewhere between 60 and 65; odds ratio of 0.050). This is suggestive of the fact that knowledge is higher when the answer is easier to understand.

2.9 Deferral of state pension receipt

Upon reaching the SPA, individuals can choose to claim their state pension entitlement, or they can 'defer' their entitlement (not start to claim immediately) and receive an increased entitlement when they do start to claim. Since April 2005, individuals who deferred their entitlement have been able to receive a 1% increase in their subsequent weekly state pension for every five weeks that they have deferred, while those deferring for at least one year have (since April 2006) been given the option of a lump-sum payment of the amount deferred plus interest (paid, approximately, at the Bank of England base rate plus 2 percentage points).[27]

Paying a more generous state pension to those who have deferred receipt might be seen as appropriate for two reasons. First, it might be seen as fair to do so. Second, it might help to encourage individuals to remain in work for longer. Emmerson and Wakefield (2003) suggest that this may be the case for some liquidity-constrained individuals and that, additionally, if people see deferment as a signal that later retirement is an accepted option for older people, the social norm of the SPA being the age at which to retire may change.

The generosity of the deferral arrangements, and any net cost to the Exchequer, are likely to depend on what type of individuals benefit from the arrangements. However, to date there is relatively little evidence on the characteristics of individuals who have deferred receipt of their state pension. Coleman et al. (2008) look at this issue, but their data were collected for their study and were specifically designed to include a relatively large number of individuals from certain types of deferral categories, rather than being representative of the population as a whole. To remedy this lack of representative data, a number of questions on deferral were included in the 2008–09 ELSA questionnaire and asked of individuals aged between the SPA and 75.

Individuals aged between the SPA and 75 who were receiving a state pension were asked whether they had started receiving it at the SPA or whether they had deferred. Those who had deferred were then asked how long they had deferred for, and whether they chose to receive the increment or the lump sum

[27]Prior to April 2005, deferral was possible but less generous: the increase was 1% for every seven weeks deferred, there was no lump-sum option and there was a five-year limit on how long an individual could defer for.

when they did start to draw their state pension. Around 2% of individuals aged between the SPA and 75 were receiving a state pension income when interviewed but had deferred receipt in the past.[28] Sample sizes are too small for any robust analysis but, illustratively, nearly three-in-five individuals reported that they had chosen to receive the weekly increment, just over a quarter reported they received a lump sum and the remainder did not know.

Those aged between the SPA and 75 but not receiving the state pension were asked whether this was because they were not entitled to one or because they had deferred. Those answering that they had deferred were then asked whether they intended to receive a higher weekly state pension or a lump-sum payment, and how long they expected to defer for. Of those between the SPA and 75 not receiving the state pension, 2.6% answered that they were entitled to a state pension but had chosen to defer claiming it, with the split between those intending to take the weekly increment, those intending to take a lump sum and those who had not yet decided being around one-third each.

While the sample sizes at this stage are too small to do any real subgroup analysis of people who do actually defer, it is interesting to note that women were more likely to be deferring their state pension or to have deferred claiming it in the past than men and, of those who had deferred, women seem to have been slightly more likely to claim the weekly increment than men. As future waves of ELSA add to these data, more detailed analysis of the characteristics associated with these decisions will be an interesting area for future research.

2.10 Conclusions

Understanding the nature of employment and withdrawal from the labour market at older ages is an important issue. The increasingly aged population in England will potentially put greater financial pressure on public and private resources to provide for older individuals. Increasing the employment of older people will be one important way of alleviating these pressures. Furthermore, the increasingly aged workforce means that a greater proportion of potential employees will be older in coming years than has previously been the case; this perhaps makes issues around the barriers to working posed by work disability even more salient.

The longitudinal data supplied by ELSA provide an invaluable resource for examining changes in work patterns over time – covering both broad economic outcomes and more specific policy-related questions (such as knowledge of changes to the female SPA) and how these relate to numerous other characteristics. This chapter has provided some very preliminary analysis of the patterns of economic activity observed over the first four waves of ELSA (from 2002–03 to 2008–09), including changes in individual behaviour over time and changes in behaviour across cohorts.

[28]The 2008–09 wave of ELSA contains a sample of 4,039 individuals aged between the SPA and 75, and so 1.9% (rounded to 2% in the main text) of this is a subsample of 77 individuals, while 2.6% (the proportion currently deferring at the time of the interview) is a subsample of 103 individuals.

Understanding the causes of the timing and means of exiting from work would require the data to be interpreted within a structural model of individual behaviour – this is beyond the scope of this chapter but could certainly be pursued in future work. The additional data available on many of the ELSA respondents from the life-history interviews and the linked administrative data should also provide further useful insights into lifetime patterns of employment and their relationship to later-life outcomes.

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Appendix 2A

Tables on employment, retirement and pensions

Table 2A.1. Percentage in full-time and part-time paid work, by age and sex, 2002–03 and 2008–09

	% in paid work		% full-time		% part-time		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
Men	**42.3**	**44.2**	**34.7**	**33.9**	**7.6**	**10.3**	***5,126***	***4,290***
50–54	83.2	83.0	76.5	73.7	6.8	9.3	*883*	*457*
55–59	72.6	77.1	63.6	65.0	9.0	12.1	*1,003*	*782*
60–64	47.1	55.4	35.8	40.0	11.3	15.4	*790*	*875*
65–69	15.7	22.7	5.7	7.7	10.0	15.0	*796*	*692*
70–74	10.2	9.2	2.6	1.6	7.6	7.6	*672*	*661*
75+	3.0	2.7	0.6	0.4	2.4	2.2	*982*	*823*
Women	**30.4**	**31.6**	**12.1**	**12.7**	**18.3**	**18.9**	***6,166***	***5,291***
50–54	75.4	73.3	35.6	38.7	39.8	34.6	*1,068*	*532*
55–59	60.8	66.0	26.0	29.1	34.8	36.8	*1,156*	*988*
60–64	29.5	35.0	7.2	8.6	22.3	26.5	*869*	*1,067*
65–69	12.9	13.8	1.4	1.5	11.6	12.3	*906*	*786*
70–74	4.1	5.2	0.4	0.2	3.7	4.9	*795*	*780*
75+	0.9	0.8	0.2	0.1	0.7	0.7	*1,372*	*1,138*
All	**35.9**	**37.5**	**22.5**	**22.6**	**13.4**	**14.9**	***11,292***	***9,581***
50–54	79.3	78.1	55.9	56.1	23.4	22.0	*1,951*	*989*
55–59	66.6	71.5	44.6	46.8	22.1	24.6	*2,159*	*1,770*
60–64	38.1	44.9	21.2	23.8	16.9	21.1	*1,659*	*1,942*
65–69	14.3	18.1	3.4	4.5	10.8	13.6	*1,702*	*1,478*
70–74	6.9	7.1	1.4	0.9	5.4	6.2	*1,467*	*1,441*
75+	1.7	1.6	0.3	0.2	1.4	1.3	*2,354*	*1,961*

Notes: Excludes those individuals who did not know their hours of work. Weighted, using cross-sectional weights.

Table 2A.2. Percentage in full-time and part-time paid work, by age and education, 2002–03 and 2008–09

	% in paid work		**% full-time**		**% part-time**		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
50–54	**79.3**	**78.0**	**55.9**	**55.9**	**23.4**	**22.1**	***1,916***	***972***
Low	74.7	70.5	49.4	52.3	25.4	18.2	*818*	*284*
Mid	80.8	80.4	58.2	56.5	22.5	24.0	*723*	*466*
High	86.6	83.6	65.6	60.0	21.0	23.6	*375*	*222*
55–59	**66.7**	**71.7**	**44.5**	**46.8**	**22.1**	**24.9**	***2,097***	***1,736***
Low	62.9	64.7	40.0	42.5	23.0	22.1	*1,026*	*591*
Mid	67.2	73.0	44.7	46.5	22.4	26.5	*771*	*690*
High	78.4	80.2	59.9	53.9	18.5	26.3	*300*	*455*
60–64	**38.2**	**44.7**	**21.2**	**23.6**	**17.0**	**21.1**	***1,615***	***1,912***
Low	35.7	40.8	21.8	22.7	13.9	18.1	*907*	*841*
Mid	38.7	46.6	19.0	23.8	19.6	22.8	*488*	*754*
High	47.3	52.3	23.0	25.7	24.3	26.6	*220*	*317*
65–69	**14.2**	**17.9**	**3.5**	**4.4**	**10.7**	**13.5**	***1,667***	***1,457***
Low	11.9	13.9	3.3	4.5	8.6	9.4	*1,001*	*741*
Mid	17.2	21.4	3.7	4.2	13.5	17.3	*496*	*494*
High	19.1	26.1	3.9	4.7	15.2	21.4	*170*	*222*
70–74	**6.7**	**7.1**	**1.4**	**0.9**	**5.3**	**6.2**	***1,431***	***1,416***
Low	5.9	6.8	1.1	0.7	4.8	6.1	*881*	*775*
Mid	6.8	6.2	1.4	1.7	5.4	4.6	*443*	*461*
High	14.3	11.2	4.7	0.0	9.6	11.2	*107*	*180*
75+	**1.7**	**1.6**	**0.4**	**0.2**	**1.4**	**1.4**	***2,300***	***1,913***
Low	1.1	1.5	0.2	0.3	0.9	1.2	*1,416*	*1,089*
Mid	2.3	1.5	0.4	0.1	1.9	1.4	*747*	*660*
High	5.6	3.2	1.3	0.5	4.3	2.7	*137*	*164*
All	**35.9**	**37.5**	**22.5**	**22.6**	**13.4**	**15.0**	***11,026***	***9,406***
Low	29.5	27.4	17.8	16.3	11.7	11.0	*6,049*	*4,321*
Mid	39.4	43.1	24.8	25.8	14.6	17.3	*3,668*	*3,525*
High	56.2	56.5	38.5	34.8	17.7	21.7	*1,309*	*1,560*

Notes: Excludes those individuals who did not know their hours of work and individuals who reported still being in full-time education. Weighted, using cross-sectional weights.

Table 2A.3. Percentage in full-time and part-time paid work, by age and wealth quintile, 2002–03 and 2008–09

	% in paid work		**% full-time**		**% part-time**		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
50–54	**79.4**	**77.9**	**55.9**	**55.7**	**23.5**	**22.2**	***1,903***	***952***
Poorest	48.8	53.5	30.8	34.9	18.0	18.6	*299*	*180*
2	81.3	81.4	58.9	62.8	22.4	18.6	*398*	*228*
3	89.7	86.0	64.5	62.2	25.2	23.7	*401*	*184*
4	87.6	84.7	63.6	61.4	24.0	23.3	*428*	*180*
Richest	80.8	83.3	54.3	55.6	26.5	27.8	*377*	*180*
55–59	**66.3**	**71.5**	**44.6**	**46.9**	**21.7**	**24.6**	***2,107***	***1,726***
Poorest	42.2	48.1	27.1	33.9	15.1	14.2	*309*	*275*
2	66.9	74.6	47.1	50.4	19.8	24.3	*401*	*353*
3	75.1	77.9	49.8	50.7	25.3	27.1	*404*	*313*
4	73.7	80.2	50.8	51.7	22.9	28.5	*456*	*357*
Richest	67.1	73.2	43.7	45.9	23.4	27.3	*537*	*428*
60–64	**38.0**	**44.6**	**20.9**	**23.6**	**17.0**	**21.0**	***1,632***	***1,883***
Poorest	21.9	28.0	14.4	15.8	7.5	12.2	*247*	*301*
2	36.7	49.1	23.7	28.0	12.9	21.1	*290*	*306*
3	41.9	51.9	23.6	28.2	18.3	23.7	*342*	*372*
4	42.0	45.4	20.3	25.5	21.7	19.9	*339*	*423*
Richest	42.2	47.6	21.3	21.0	20.8	26.6	*414*	*481*
65–69	**14.0**	**18.0**	**3.4**	**4.5**	**10.6**	**13.5**	***1,681***	***1,452***
Poorest	7.6	10.6	3.6	2.8	4.0	7.8	*278*	*216*
2	9.4	14.9	2.1	5.8	7.4	9.0	*338*	*264*
3	16.5	18.2	4.7	3.6	11.8	14.6	*344*	*318*
4	15.8	19.7	2.1	3.7	13.6	16.1	*355*	*312*
Richest	19.3	24.5	4.4	6.3	14.9	18.2	*366*	*342*
70–74	**6.8**	**6.9**	**1.2**	**0.9**	**5.5**	**6.0**	***1,444***	***1,420***
Poorest	5.6	5.7	0.3	1.5	5.3	4.2	*309*	*256*
2	4.5	4.2	1.5	0.0	3.0	4.2	*321*	*255*
3	7.6	5.6	0.4	0.6	7.1	5.0	*285*	*295*
4	5.5	8.8	1.4	0.6	4.1	8.2	*291*	*302*
Richest	12.0	9.9	2.7	1.7	9.2	8.2	*238*	*312*
75+	**1.6**	**1.5**	**0.3**	**0.2**	**1.3**	**1.3**	***2,327***	***1,934***
Poorest	0.2	0.6	0.0	0.3	0.2	0.3	*710*	*470*
2	0.9	0.6	0.4	0.0	0.5	0.6	*478*	*428*
3	1.7	1.5	0.3	0.0	1.4	1.5	*441*	*399*
4	2.3	2.7	0.3	0.6	2.0	2.1	*350*	*373*
Richest	5.1	3.5	1.0	0.3	4.0	3.2	*348*	*264*
All	**35.7**	**37.2**	**22.4**	**22.4**	**13.3**	**14.8**	***11,094***	***9,367***
Poorest	17.2	22.0	10.3	13.7	6.8	8.3	*2,152*	*1,698*
2	34.4	39.1	23.4	25.9	11.0	13.1	*2,226*	*1,834*
3	41.0	39.5	26.0	23.7	15.1	15.8	*2,217*	*1,881*
4	43.2	41.2	27.4	24.5	15.8	16.6	*2,219*	*1,947*
Richest	42.5	44.4	24.8	24.3	17.7	20.2	*2,280*	*2,007*

Notes: Excludes those individuals who did not know their hours of work and individuals for whom benefit-unit-level wealth could not be calculated, due to non-response of one member of the benefit unit. Weighted, using cross-sectional weights.

Table 2A.4. Percentage in full-time and part-time paid work, by age and region, 2002–03 and 2008–09

	% in paid work		% full-time		% part-time		*Unweighted N*	
	2002–03	2008–09	2002–03	2008–09	2002–03	2008–09	*2002–03*	*2008–09*
50–54	**79.3**	**78.1**	**55.9**	**56.1**	**23.4**	**22.0**	***1,951***	***989***
North East	70.3	78.6	45.6	59.9	24.7	18.7	*124*	*55*
North West	77.0	78.5	58.1	52.8	18.8	25.7	*264*	*128*
Yorkshire & Humber	76.3	70.5	51.4	49.6	25.0	20.9	*230*	*112*
East Midlands	79.0	75.2	56.5	51.1	22.5	24.1	*215*	*104*
West Midlands	77.1	74.5	53.3	46.7	23.8	27.9	*201*	*105*
East of England	85.5	85.3	58.6	63.5	26.9	21.8	*233*	*129*
London	77.0	66.8	54.3	51.8	22.7	15.0	*180*	*94*
South East	82.9	83.9	61.1	59.8	21.7	24.1	*296*	*168*
South West	82.8	85.7	56.4	68.1	26.4	17.6	*208*	*94*
55–59	**66.6**	**71.4**	**44.6**	**46.8**	**22.1**	**24.7**	***2,159***	***1,769***
North East	59.4	63.4	37.3	39.0	22.0	24.4	*136*	*106*
North West	63.1	72.2	42.9	44.6	20.2	27.6	*288*	*224*
Yorkshire & Humber	56.8	67.4	35.0	42.4	21.8	25.0	*227*	*199*
East Midlands	69.5	75.0	45.3	50.5	24.1	24.5	*213*	*194*
West Midlands	67.2	72.2	42.6	48.8	24.6	23.4	*234*	*193*
East of England	72.3	68.9	53.8	48.2	18.6	20.7	*224*	*222*
London	67.3	69.4	48.1	53.2	19.2	16.2	*229*	*168*
South East	71.2	79.7	47.5	51.4	23.8	28.2	*373*	*272*
South West	67.7	67.7	44.0	37.4	23.7	30.2	*235*	*191*
60–64	**38.1**	**44.9**	**21.2**	**23.9**	**16.9**	**21.0**	***1,659***	***1,941***
North East	17.8	39.1	8.8	23.8	9.0	15.3	*107*	*120*
North West	27.3	40.8	14.3	22.1	13.0	18.7	*227*	*227*
Yorkshire & Humber	33.7	41.7	20.6	19.8	13.1	22.0	*186*	*201*
East Midlands	39.1	46.7	23.8	25.6	15.3	21.1	*165*	*219*
West Midlands	35.0	43.8	18.0	20.7	17.1	23.1	*169*	*203*
East of England	47.3	49.5	22.5	28.2	24.7	21.3	*200*	*246*
London	47.1	46.1	27.9	25.6	19.1	20.5	*173*	*177*
South East	48.1	46.1	27.1	25.2	21.0	20.9	*269*	*341*
South West	35.0	46.2	21.0	22.2	14.0	24.0	*163*	*207*
65–69	**14.3**	**18.1**	**3.4**	**4.5**	**10.8**	**13.6**	***1,702***	***1,478***
North East	7.9	8.3	1.6	1.0	6.4	7.3	*128*	*81*
North West	10.4	15.1	3.2	6.3	7.2	8.8	*216*	*187*
Yorkshire & Humber	10.1	19.5	3.1	3.6	7.0	15.9	*185*	*173*
East Midlands	17.0	11.7	3.8	3.2	13.2	8.5	*159*	*149*
West Midlands	10.6	19.1	1.6	5.8	9.0	13.3	*195*	*149*
East of England	19.9	18.6	4.8	3.9	15.1	14.7	*207*	*197*
London	18.6	22.4	5.8	7.3	12.8	15.1	*145*	*128*
South East	19.6	20.6	4.4	4.0	15.2	16.6	*267*	*244*
South West	11.2	20.1	2.1	3.3	9.2	16.8	*200*	*170*
70–74	**6.9**	**7.1**	**1.4**	**0.9**	**5.4**	**6.2**	***1,467***	***1,441***
North East	1.9	2.4	0.0	1.4	1.9	1.0	*117*	*100*
North West	4.4	3.4	2.0	0.0	2.4	3.4	*201*	*160*
Yorkshire & Humber	6.5	4.9	1.8	0.7	4.7	4.1	*167*	*149*
East Midlands	9.2	7.4	1.4	0.6	7.8	6.8	*140*	*138*
West Midlands	5.1	5.6	2.3	0.6	2.8	4.9	*167*	*165*
East of England	5.9	11.5	0.6	0.0	5.3	11.5	*164*	*186*
London	5.5	6.5	0.0	0.0	5.5	6.5	*126*	*117*
South East	10.2	10.3	0.8	3.6	9.3	6.7	*220*	*247*
South West	11.1	7.2	3.0	0.0	8.1	7.2	*165*	*179*

Table 2A.4 continued

	% in paid work		**% full-time**		**% part-time**		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
75+	**1.7**	**1.6**	**0.3**	**0.2**	**1.4**	**1.3**	***2,354***	***1,960***
North East	0.7	0.6	0.0	0.0	0.7	0.6	*132*	*138*
North West	1.9	1.2	0.6	0.4	1.3	0.9	*307*	*242*
Yorkshire & Humber	0.4	2.1	0.0	0.9	0.4	1.3	*238*	*209*
East Midlands	1.4	3.9	0.0	0.5	1.4	3.4	*203*	*188*
West Midlands	1.8	1.0	0.7	0.5	1.2	0.6	*259*	*236*
East of England	2.5	1.1	0.7	0.0	1.8	1.1	*262*	*217*
London	2.2	0.9	0.8	0.0	1.4	0.9	*243*	*164*
South East	1.0	1.9	0.0	0.0	1.0	1.9	*395*	*320*
South West	2.7	1.5	0.3	0.0	2.4	1.5	*315*	*246*
All	**35.9**	**37.5**	**22.5**	**22.6**	**13.4**	**14.9**	***11,292***	***9,578***
North East	27.5	32.2	16.4	20.8	11.1	11.4	*744*	*600*
North West	32.9	35.7	22.1	21.4	10.8	14.4	*1,503*	*1,168*
Yorkshire & Humber	33.1	35.7	20.5	20.4	12.6	15.3	*1,233*	*1,043*
East Midlands	39.7	38.8	25.0	23.4	14.7	15.3	*1,095*	*992*
West Midlands	33.7	36.1	20.6	21.2	13.1	14.9	*1,225*	*1,051*
East of England	40.3	40.7	24.8	25.5	15.5	15.2	*1,290*	*1,197*
London	37.5	37.3	24.3	24.9	13.3	12.4	*1,096*	*848*
South East	39.8	41.0	24.9	24.5	15.0	16.5	*1,820*	*1,592*
South West	34.5	35.9	21.0	19.8	13.4	16.0	*1,286*	*1,087*

Notes: Excludes those individuals who did not know their hours of work and individuals living outside England. Weighted, using cross-sectional weights.

Table 2A.5. Percentage engaged in various non-work activities, by age and sex, 2002–03 and 2008–09

	% not working		*Categories of non-work activity:* % unemployed		% looking after home or family		% permanently sick or disabled		% retired		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
Men	**57.0**	**54.3**	**1.6**	**1.6**	**1.0**	**0.9**	**7.1**	**6.3**	**46.8**	**45.0**	***5,186***	***4,398***
50–54	16.5	16.2	2.2	2.6	1.3	1.8	8.1	7.3	4.3	3.4	*896*	*477*
55–59	26.9	21.9	3.2	3.8	0.8	1.0	12.1	9.8	9.8	7.3	*1,020*	*819*
60–64	51.7	42.9	3.3	1.8	1.1	0.4	16.1	11.4	30.5	28.9	*808*	*909*
65–69	83.5	76.3	0.1	0.1	0.6	0.9	2.2	2.6	80.2	72.3	*803*	*701*
70–74	89.3	90.1	0.0	0.0	1.0	0.8	1.2	2.0	86.9	87.1	*676*	*666*
75+	96.9	96.9	0.0	0.0	0.9	0.9	0.9	1.6	95.1	94.2	*983*	*826*
Women	**69.2**	**66.8**	**0.3**	**0.7**	**15.4**	**10.3**	**5.8**	**5.3**	**47.0**	**50.3**	***6,205***	***5,407***
50–54	24.2	25.3	1.2	1.6	12.6	13.3	7.5	8.0	2.5	2.2	*1,085*	*562*
55–59	38.9	32.5	0.5	1.9	16.4	11.5	10.9	10.2	10.1	8.4	*1,165*	*1,033*
60–64	69.6	63.0	0.0	0.3	14.5	8.8	3.5	2.3	51.2	51.4	*880*	*1,098*
65–69	87.0	85.4	0.0	0.0	13.5	10.2	2.6	2.7	70.2	72.3	*907*	*793*
70–74	95.9	94.7	0.0	0.0	17.3	8.5	3.4	2.5	74.9	83.7	*795*	*781*
75+	99.0	99.0	0.0	0.1	17.3	9.6	5.3	4.2	75.4	85.2	*1,373*	*1,140*
All	**63.5**	**60.9**	**0.9**	**1.1**	**8.7**	**5.9**	**6.4**	**5.8**	**46.9**	**47.8**	***11,391***	***9,805***
50–54	20.4	20.8	1.7	2.1	7.0	7.6	7.8	7.7	3.4	2.8	*1,981*	*1,039*
55–59	33.0	27.3	1.9	2.8	8.7	6.3	11.5	10.0	9.9	7.9	*2,185*	*1,852*
60–64	60.8	53.2	1.6	1.0	7.9	4.7	9.7	6.7	41.0	40.4	*1,688*	*2,007*
65–69	85.3	81.0	0.1	0.0	7.4	5.7	2.4	2.7	74.9	72.3	*1,710*	*1,494*
70–74	92.9	92.6	0.0	0.0	9.9	4.9	2.4	2.3	80.4	85.3	*1,471*	*1,447*
75+	98.2	98.2	0.0	0.0	11.0	6.0	3.6	3.1	83.0	88.9	*2,356*	*1,966*

Notes: Types of non-work activity (‘unemployed’, ‘looking after home or family’, ‘permanently sick or disabled’ and ‘retired’) do not sum across the row to ‘% not working’ due to the exclusion from the table of the ‘other’ category. Weighted, using cross-sectional weights.

Table 2A.6. Percentage engaged in various non-work activities, by age and wealth quintile, 2002–03 and 2008–09

			Categories of non-work activity:									
	% not working		**% unemployed**		**% looking after home or family**		**% permanently sick or disabled**		**% retired**		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
50–54	**20.3**	**21.0**	**1.7**	**2.1**	**6.8**	**7.6**	**7.9**	**7.8**	**3.4**	**2.9**	***1,931***	***1,001***
Poorest	49.8	45.4	6.3	4.9	12.5	11.1	28.0	27.2	1.5	2.1	*308*	*184*
2	18.5	17.8	1.0	2.6	5.0	6.9	10.6	5.7	2.0	2.0	*402*	*238*
3	10.1	13.1	0.2	1.1	4.5	5.6	2.8	3.4	2.4	3.0	*407*	*195*
4	12.3	14.7	0.8	0.9	5.0	7.6	2.0	2.9	4.3	2.3	*431*	*188*
Richest	18.9	15.4	1.4	0.9	8.9	7.3	1.0	0.4	6.6	5.2	*383*	*196*
55–59	**33.3**	**27.2**	**1.9**	**2.7**	**8.7**	**6.3**	**11.7**	**10.1**	**10.1**	**7.8**	***2,133***	***1,808***
Poorest	56.2	49.5	6.6	5.7	10.0	8.0	34.4	31.6	4.0	3.7	*317*	*288*
2	32.8	24.5	1.4	4.4	10.2	3.5	13.9	12.5	6.6	3.6	*404*	*365*
3	24.4	21.3	0.8	1.7	6.2	7.1	8.7	6.3	8.0	6.1	*412*	*326*
4	26.1	18.7	1.3	1.7	6.7	6.3	6.9	2.7	10.8	8.1	*459*	*378*
Richest	32.7	25.4	1.0	0.8	10.3	7.1	2.5	2.0	17.5	15.4	*541*	*451*
60–64	**60.9**	**53.4**	**1.6**	**1.0**	**7.9**	**4.8**	**9.8**	**6.8**	**41.0**	**40.4**	***1,661***	***1,947***
Poorest	76.1	70.6	2.7	1.8	7.2	4.3	25.6	19.6	40.2	44.7	*253*	*306*
2	62.3	48.3	1.5	0.6	7.9	2.5	14.3	9.6	37.6	35.3	*295*	*320*
3	57.5	46.0	2.2	1.3	7.0	6.8	8.6	4.1	39.6	33.5	*346*	*390*
4	56.7	52.5	0.9	0.8	10.1	4.6	4.7	2.6	40.0	44.5	*347*	*439*
Richest	57.0	50.9	1.2	0.4	7.5	5.4	2.1	1.5	46.0	43.0	*420*	*492*
65–69	**85.5**	**81.1**	**0.1**	**0.0**	**7.4**	**5.7**	**2.4**	**2.7**	**75.2**	**72.3**	***1,689***	***1,468***
Poorest	91.7	88.9	0.3	0.0	8.5	4.7	6.3	4.3	76.6	78.6	*280*	*217*
2	90.0	84.2	0.0	0.0	7.5	4.4	2.8	5.7	79.2	74.2	*340*	*266*
3	83.5	81.0	0.0	0.2	7.7	6.3	1.8	3.1	74.0	71.5	*344*	*321*
4	83.7	79.0	0.0	0.0	4.2	7.2	0.5	0.3	78.2	71.3	*357*	*317*
Richest	80.2	74.5	0.0	0.0	9.1	5.7	1.2	0.9	68.4	67.9	*368*	*347*

Table 2A.6 continued

	% not working		*Categories of non-work activity:* % unemployed		% looking after home		% permanently sick or disabled		% retired		*Unweighted N*	
	2002–03	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	**2002–03**	**2008–09**	*2002–03*	*2008–09*
70–74	**93.0**	**92.7**	**0.0**	**0.0**	**9.9**	**5.0**	**2.4**	**2.3**	**80.6**	**85.4**	***1,448***	***1,426***
Poorest	94.4	94.3	0.0	0.0	11.1	5.0	5.2	4.0	77.8	85.3	*309*	*256*
2	95.2	95.2	0.0	0.0	8.1	6.7	1.3	2.6	85.5	85.8	*322*	*257*
3	92.4	94.1	0.0	0.0	8.3	4.4	2.5	2.9	81.6	86.9	*285*	*296*
4	94.5	90.6	0.0	0.0	10.3	4.4	1.3	1.2	83.0	85.0	*291*	*304*
Richest	86.9	89.7	0.0	0.0	12.1	4.5	1.3	0.9	73.2	84.0	*241*	*313*
75+	**98.3**	**98.2**	**0.0**	**0.0**	**10.9**	**6.1**	**3.6**	**3.2**	**83.1**	**88.9**	***2,329***	***1,939***
Poorest	99.8	98.8	0.0	0.0	7.6	3.8	5.0	5.6	86.7	89.4	*710*	*472*
2	99.1	99.4	0.0	0.0	12.0	6.1	4.0	3.9	82.3	89.3	*478*	*428*
3	98.1	98.5	0.0	0.2	10.7	6.6	1.8	1.8	84.5	89.8	*442*	*399*
4	97.7	97.3	0.0	0.0	14.3	8.0	2.8	1.9	80.0	87.2	*350*	*373*
Richest	94.6	95.5	0.0	0.0	13.6	7.4	2.8	0.3	77.9	87.8	*349*	*267*
All	**63.8**	**61.2**	**0.9**	**1.1**	**8.7**	**5.9**	**6.5**	**5.8**	**47.1**	**48.1**	***11,191***	***9,589***
Poorest	81.9	76.7	2.2	2.0	9.2	5.8	15.0	15.2	54.9	53.4	*2,177*	*1,723*
2	65.1	59.4	0.6	1.5	8.6	5.0	7.8	7.1	47.6	45.6	*2,241*	*1,874*
3	58.5	59.0	0.5	0.8	7.4	6.3	4.3	3.7	45.8	48.1	*2,236*	*1,927*
4	56.4	57.2	0.6	0.6	8.2	6.4	3.2	2.0	43.9	48.0	*2,235*	*1,999*
Richest	56.9	53.7	0.7	0.4	10.0	6.3	1.9	1.2	43.5	45.4	*2,302*	*2,066*

Notes: Individuals for whom benefit-unit-level wealth could not be calculated, due to non-response of one member of the benefit unit, are excluded. Types of non-work activity ('unemployed', 'looking after home or family', 'permanently sick or disabled' and 'retired') do not sum across the row to '% not working' due to the exclusion from the table of the 'other' category. Weighted, using cross-sectional weights.

Table 2A.7. Prevalence of work disability, working and disability-related benefit receipt, by age and sex, 2008–09

% of sample	**Work disabled**				**Not work disabled**				
	Not working		**Working**		**Not working**		**Working**		
	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	*Unweighted N*
Men	**10.6**	**7.0**	**1.3**	**6.2**	**1.0**	**18.1**	**0.9**	**55.0**	***2,817***
50–54	6.3	2.7	2.3	6.7	0.0	6.6	0.8	74.6	*458*
55–59	10.6	2.6	0.8	8.1	0.7	8.1	1.3	67.9	*798*
60–64	14.2	7.4	1.9	5.9	1.8	19.2	0.6	49.0	*885*
65–69	9.8	18.4	0.2	2.9	1.8	46.1	0.4	20.3	*676*
Women	**9.4**	**11.5**	**0.5**	**5.1**	**0.8**	**27.9**	**0.5**	**44.3**	***3,426***
50–54	7.8	6.2	1.0	7.1	0.6	10.3	1.4	65.5	*552*
55–59	11.4	6.0	0.6	6.8	0.4	14.7	0.4	59.7	*1,019*
60–64	7.2	16.0	0.3	4.0	1.1	38.3	0.3	32.8	*1,080*
65–69	10.6	19.9	0.1	1.7	1.2	53.8	0.3	12.5	*775*
All	**10.0**	**9.3**	**0.9**	**5.6**	**0.9**	**23.1**	**0.7**	**49.5**	***6,243***
50–54	7.1	4.5	1.6	6.9	0.3	8.5	1.1	69.9	*1,010*
55–59	11.0	4.3	0.7	7.4	0.5	11.5	0.8	63.7	*1,817*
60–64	10.6	11.9	1.1	4.9	1.4	29.0	0.5	40.7	*1,965*
65–69	10.2	19.2	0.2	2.3	1.5	50.1	0.4	16.2	*1,451*

Notes: Sample is all core members aged between 50 and 69 who responded to the relevant questions about work disability, work status and benefit receipt. Weighted, using cross-sectional weights.

Table 2A.8. Prevalence of work disability, working and disability-related benefit receipt, by wealth quintile and sex, 2008–09

% of sample	**Work disabled**				**Not work disabled**				
	Not working		**Working**		**Not working**		**Working**		
	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	*Unweighted N*
Men	**10.8**	**6.7**	**1.3**	**6.1**	**1.1**	**18.0**	**0.9**	**55.0**	***2,750***
Poorest	32.1	11.8	1.4	6.2	2.5	12.1	0.3	33.6	*427*
2	11.4	7.6	1.6	8.6	1.1	14.4	1.7	53.5	*511*
3	7.6	4.1	2.6	6.4	0.5	16.9	1.5	60.4	*531*
4	5.3	6.9	0.4	5.8	0.7	19.5	0.4	61.1	*613*
Richest	1.9	4.1	0.6	4.1	0.9	25.4	0.6	62.4	*668*
Women	**9.7**	**11.6**	**0.5**	**5.1**	**0.8**	**27.9**	**0.6**	**43.8**	***3,327***
Poorest	24.0	18.6	0.6	5.1	1.5	20.0	0.7	29.5	*539*
2	12.2	10.7	1.4	7.2	1.4	19.0	0.8	47.2	*648*
3	8.0	11.7	0.4	4.7	0.2	29.4	0.3	45.4	*672*
4	4.7	10.2	0.1	3.5	0.5	31.6	0.9	48.4	*682*
Richest	2.2	8.1	0.1	4.8	0.6	37.6	0.1	46.4	*786*
All	**10.3**	**9.2**	**0.9**	**5.6**	**0.9**	**23.1**	**0.7**	**49.3**	***6,077***
Poorest	27.9	15.3	1.0	5.6	2.0	16.1	0.5	31.5	*966*
2	11.8	9.2	1.5	7.9	1.3	16.8	1.2	50.3	*1,159*
3	7.8	8.1	1.5	5.5	0.3	23.4	0.9	52.6	*1,203*
4	5.0	8.6	0.3	4.6	0.6	25.5	0.6	54.8	*1,295*
Richest	2.1	6.1	0.4	4.5	0.7	31.6	0.3	54.3	*1,454*

Notes: Sample is all core members aged between 50 and 69 who responded to the relevant questions about work disability, work status and benefit receipt and for whom a measure of non-pension wealth was available. Individuals for whom benefit-unit-level wealth could not be calculated, due to non-response of one member of the benefit unit, are excluded. Weighted, using cross-sectional weights.

Table 2A.9. Prevalence of work disability, working and disability-related benefit receipt, by region and sex, 2008–09

% of sample	**Work disabled**				**Not work disabled**				
	Not working		**Working**		**Not working**		**Working**		
	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	*Unweighted N*
Men	**10.6**	**7.0**	**1.3**	**6.2**	**1.0**	**18.1**	**0.9**	**54.9**	***2,815***
North East	22.8	4.7	0.6	4.7	1.6	15.1	4.3	46.2	*157*
North West	13.8	7.9	1.0	5.0	1.4	16.6	0.7	53.6	*359*
Yorkshire & Humber	14.7	9.3	0.9	8.2	0.2	17.2	1.3	48.3	*311*
East Midlands	11.9	5.9	1.8	7.0	0.8	15.7	0.0	57.0	*307*
West Midlands	11.9	6.0	1.3	7.1	0.8	17.0	1.1	54.7	*304*
East of England	7.3	5.1	1.1	5.9	0.7	19.7	0.0	60.2	*360*
London	8.9	8.2	1.6	6.2	2.0	18.2	0.6	54.3	*257*
South East	6.9	7.3	1.1	6.0	0.4	20.4	0.5	57.5	*455*
South West	5.5	6.6	2.2	5.8	2.0	20.1	1.4	56.5	*305*
Women	**9.4**	**11.5**	**0.5**	**5.1**	**0.8**	**27.9**	**0.5**	**44.3**	***3,426***
North East	15.8	14.5	0.0	5.8	0.0	21.6	0.5	41.8	*200*
North West	10.8	9.4	1.5	5.2	1.2	28.2	0.9	42.8	*411*
Yorkshire & Humber	12.7	11.1	0.7	5.2	0.8	27.5	0.0	42.0	*376*
East Midlands	10.1	12.0	0.2	5.8	2.3	27.2	1.2	41.2	*368*
West Midlands	11.8	13.3	0.6	6.3	0.7	25.3	0.5	41.5	*348*
East of England	7.9	9.9	0.2	2.4	0.7	32.1	0.4	46.3	*442*
London	8.5	14.0	0.4	5.0	0.7	28.4	0.4	42.6	*320*
South East	5.8	10.0	0.6	5.4	0.3	26.7	0.3	50.9	*585*
South West	7.7	12.2	0.0	5.2	0.4	30.5	0.9	43.1	*376*
All	**10.0**	**9.3**	**0.9**	**5.6**	**0.9**	**23.1**	**0.7**	**49.5**	***6,241***
North East	19.2	9.8	0.3	5.2	0.8	18.5	2.3	43.9	*357*
North West	12.3	8.7	1.3	5.1	1.3	22.4	0.8	48.2	*770*
Yorkshire & Humber	13.7	10.2	0.8	6.7	0.5	22.4	0.7	45.1	*687*
East Midlands	11.0	9.0	1.0	6.4	1.6	21.6	0.6	48.9	*675*
West Midlands	11.8	9.6	1.0	6.7	0.7	21.1	0.8	48.1	*652*
East of England	7.6	7.6	0.6	4.1	0.7	26.1	0.2	53.1	*802*
London	8.7	11.2	1.0	5.6	1.3	23.4	0.5	48.3	*577*
South East	6.3	8.8	0.8	5.7	0.3	23.7	0.4	54.0	*1,040*
South West	6.6	9.5	1.0	5.5	1.2	25.5	1.1	49.6	*681*

Notes: Sample is all core members aged between 50 and 69 who responded to the relevant questions about work disability, work status and benefit receipt. Those living outside England are excluded. Weighted, using cross-sectional weights.

Table 2A.10. Prevalence of work disability, working and disability-related benefit receipt, by education level and sex, 2008–09

	Work disabled				**Not work disabled**				
% of sample	**Not working**		**Working**		**Not working**		**Working**		
	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	Received benefits	No benefits	*Unweighted N*
Men	**10.6**	**7.0**	**1.2**	**6.3**	**1.0**	**18.2**	**0.9**	**54.8**	***2,768***
Low	17.8	10.0	1.3	7.3	1.4	15.9	0.8	45.5	*1,106*
Mid	7.3	5.2	1.4	6.4	0.7	20.5	0.9	57.6	*1,023*
High	2.1	4.4	0.6	4.3	0.7	18.9	0.9	68.0	*639*
Women	**9.4**	**11.5**	**0.5**	**5.0**	**0.8**	**28.0**	**0.6**	**44.3**	***3,368***
Low	13.5	15.6	0.6	5.2	1.3	30.5	0.8	32.4	*1,338*
Mid	8.1	9.4	0.4	5.1	0.5	25.6	0.4	50.4	*1,420*
High	2.0	6.8	0.6	4.2	0.2	27.6	0.3	58.3	*610*
All	**10.0**	**9.3**	**0.9**	**5.7**	**0.9**	**23.2**	**0.7**	**49.4**	***6,136***
Low	15.6	12.9	1.0	6.2	1.3	23.4	0.8	38.8	*2,444*
Mid	7.8	7.5	0.9	5.7	0.6	23.3	0.6	53.7	*2,443*
High	2.1	5.5	0.6	4.3	0.5	22.8	0.7	63.7	*1,249*

Notes: Sample is all core members aged between 50 and 69 who responded to the relevant questions about work disability, work status and benefit receipt. Individuals who reported still being in full-time education are excluded. Weighted, using cross-sectional weights.

Table 2A.11. Transitions in reported work disability between 2004–05, 2006–07 and 2008–09, by age in 2004–05 and sex

%	DDD	DND	DDN/DNN	NDD/NND	NDN	NNN	*N*
Men	**15.3**	**2.3**	**7.4**	**9.3**	**4.4**	**61.4**	***1,820***
50–54	10.1	1.0	4.2	5.2	4.5	74.9	*287*
55–59	15.6	2.3	5.9	8.5	3.7	64.0	*614*
60–64	15.4	3.0	9.2	11.3	3.8	57.4	*469*
65–69	18.0	2.2	9.8	10.9	5.8	53.3	*450*
Women	**14.8**	**3.0**	**8.1**	**10.1**	**3.7**	**60.3**	***2,321***
50–54	11.6	1.1	6.4	6.8	3.0	71.0	*438*
55–59	14.4	4.0	9.5	7.4	2.9	61.9	*759*
60–64	18.0	2.7	6.6	10.7	3.9	58.0	*588*
65–69	14.4	3.5	9.1	15.9	5.4	51.7	*536*
All	**15.0**	**2.7**	**7.8**	**9.7**	**4.0**	**60.8**	***4,141***
50–54	11.0	1.1	5.5	6.2	3.6	72.6	*725*
55–59	14.9	3.2	7.9	7.9	3.3	62.9	*1,373*
60–64	16.8	2.8	7.8	11.0	3.9	57.7	*1,057*
65–69	16.0	2.9	9.4	13.6	5.6	52.4	*986*

Notes: The three-letter initialisms denote the pattern of reported work disability in each of the survey years 2004–05, 2006–07 and 2008–09 respectively. ‘D’ denotes reporting being work disabled while ‘N’ denotes reporting not being work disabled. Excludes those who did not respond to the questions about health limiting the ability to work. Unweighted.

Table 2A.12. Labour market movements across the first four waves of ELSA, by sex

	Men	Women	All
Always full-time	29.8	11.0	21.5
Always part-time	2.9	16.0	8.6
Always inactive	26.0	25.8	25.9
Full-time to part-time	7.3	6.6	7.0
Full-time – part-time – inactive	2.3	2.2	2.3
Full-time to inactive	15.1	7.2	11.6
Part-time to inactive	3.6	16.1	9.1
Other	12.9	15.2	13.9
N	*1,563*	*1,357*	*2,920*

Notes: Includes only individuals who were aged under the SPA in 2002–03. ‘Other’ includes all individuals whose work pattern does not match one of the listed options, or who did not know their hours of work in one or more waves. Weighted using longitudinal weights.

Table 2A.13. Expectations of being in work after age X, by self-reported health status, 2002–03 and 2008–09

	Mean % chance		**Difference**	*Unweighted N*	
	2002–03	**2008–09**		*2002–03*	*2008–09*
X = 55					
Women 50–54	**65.7**	**72.1**	**6.4**	***1,075***	***545***
Excellent/very good/good	71.3	79.9	8.6	*869*	*432*
Fair/poor	40.6	42.6	2.1	*206*	*113*
X = 60					
Men 50–54	**55.0**	**60.4**	**5.5**	***875***	***453***
Excellent/very good/good	59.5	65.2	5.7	*717*	*360*
Fair/poor	34.2	42.0	7.8	*158*	*93*
Women 55–59	**35.5**	**48.0**	**12.5**	***1,134***	***1,011***
Excellent/very good/good	39.5	52.9	13.4	*861*	*802*
Fair/poor	22.6	29.7	7.0	*273*	*209*
Men 55–59	**55.9**	**62.1**	**6.2**	***985***	***797***
Excellent/very good/good	61.7	68.2	6.5	*757*	*629*
Fair/poor	36.7	40.5	3.8	*228*	*168*
X = 65					
Men 60–64	**25.5**	**31.7**	**6.2**	***780***	***879***
Excellent/very good/good	32.0	36.1	4.1	*557*	*676*
Fair/poor	9.0	18.8	9.8	*223*	*203*

Notes: Excludes those who did not know their probability of being in employment or who did not answer the question about self-rated health. Weighted, using cross-sectional weights.

Table 2A.14. Expectations of being in work after age X, by work status, 2002–03 and 2008–09

	Mean % chance		**Difference**	*Unweighted N*	
	2002–03	**2008–09**		*2002–03*	*2008–09*
X = 55					
Women 50–54	**65.7**	**72.1**	**6.4**	***1,075***	***545***
Working	82.1	87.9	5.9	*809*	*417*
Not working	13.7	22.0	8.2	*266*	*128*
X = 60					
Men 50–54	**55.0**	**60.4**	**5.5**	***875***	***453***
Working	62.5	68.0	5.4	*734*	*381*
Not working	16.0	18.9	2.9	*141*	*72*
Women 55–59	**35.5**	**48.0**	**12.5**	***1,135***	***1,011***
Working	52.4	66.0	13.6	*695*	*692*
Not working	8.5	10.1	1.7	*440*	*319*
Men 55–59	**55.9**	**62.1**	**6.2**	***986***	***797***
Working	71.4	75.7	4.4	*722*	*627*
Not working	13.9	13.7	-0.2	*264*	*170*
X = 65					
Men 60–64	**25.5**	**31.7**	**6.2**	***780***	***879***
Working	47.1	51.0	3.9	*377*	*518*
Not working	5.2	5.3	0.1	*403*	*361*

Notes: Excludes those who did not know their probability of being in employment. Weighted, using cross-sectional weights.

Table 2A.15. Expectations of being in work after age X, by private pension status, 2008–09

	Mean % chance of being in paid work after age X	*Unweighted N*
X = 55		
Women 50–54	**72.1**	***545***
Defined benefit	80.9	*197*
Other private pension	79.6	*179*
No private pension	54.7	*169*
X = 60		
Men 50–54	**60.4**	***453***
Defined benefit	57.4	*174*
Other private pension	65.1	*220*
No private pension	52.4	*59*
Women 55–59	**48.0**	***1,011***
Defined benefit	48.3	*382*
Other private pension	57.5	*339*
No private pension	37.4	*290*
Men 55–59	**62.1**	***797***
Defined benefit	58.4	*315*
Other private pension	70.1	*373*
No private pension	45.0	*109*
X = 65		
Men 60–64	**31.7**	***879***
Defined benefit	22.8	*346*
Other private pension	39.3	*426*
No private pension	29.6	*107*

Notes: Excludes those who did not know their probability of being in employment. Weighted, using cross-sectional weights.

Table 2A.16. Expectations of being in full-time work after age X, by current work status, 2008–09

	Of all respondents...		***Of those who expect some chance of working after age X...***	
	% chance	*Unweighted N*	**% chance**	*Unweighted N*
X = 55				
Women 50–54	**41.2**	***521***	**49.1**	***437***
Working full-time	78.6	*204*	79.1	*203*
Working part-time	22.7	*189*	23.3	*184*
Not working	8.1	*128*	19.8	*50*
X = 60				
Men 50–54	**42.2**	***441***	**49.4**	***374***
Working full-time	51.3	*325*	55.0	*302*
Working part-time	25.6	*44*	29.5	*38*
Not working	9.4	*72*	20.0	*34*
Women 55–59	**19.1**	***977***	**28.2**	***668***
Working full-time	49.8	*294*	54.9	*267*
Working part-time	9.8	*364*	11.3	*318*
Not working	2.4	*319*	9.2	*83*
Men 55–59	**43.3**	***772***	**52.4**	***639***
Working full-time	60.4	*507*	62.4	*489*
Working part-time	20.8	*95*	23.0	*85*
Not working	6.3	*170*	16.7	*65*
X = 65				
Men 60–64	**13.5**	***853***	**24.6**	***479***
Working full-time	28.8	*349*	34.3	*295*
Working part-time	8.4	*143*	10.8	*112*
Not working	1.1	*361*	5.5	*72*

Notes: Excludes those who did not know either their probability of being in employment or their probability of being in full-time employment. Weighted, using cross-sectional weights.

Table 2A.17. Distribution of reported SPA, by actual SPA, 2006–07 and 2008–09

Survey year:		**2006–07**			**2008–09**	
Actual SPA:	**60**	**Between 60 & 65**	**65**	**60**	**Between 60 & 65**	**65**
Reported SPA						
Don't know	5.4	12.8	16.7	2.8	12.0	11.8
<60	1.0	1.6	1.4	0.8	0.7	1.7
60	78.9	34.5	25.6	80.8	25.5	24.9
>60 but <65: incorrect	10.0	7.3	17.1	13.0	9.0	13.9
>60 but <65: correct to ±3 months	n/a	16.7	n/a	n/a	23.6	n/a
>60 but <65: correct to ±4 to 12 months	n/a	10.6	n/a	n/a	15.5	n/a
65	4.0	15.0	34.1	2.0	11.9	43.4
>65	0.7	1.6	5.1	0.6	1.8	4.2
Unweighted N	*669*	*729*	*212*	*281*	*983*	*295*

Notes: Excludes proxy respondents. Weighted, using cross-sectional weights.

3. Financial circumstances and consumption

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In this chapter, we assess changes to the material living standards of individuals aged 50 and over in England, taking advantage of the multiple measures of material well-being in the ELSA data. The analysis in this chapter shows the following:

- Looking at changes in the distribution of income among individuals aged between 50 and the state pension age (SPA) between 2002–03 and 2008–09, we see that this age group has significantly higher average incomes in real terms in 2008–09. Income is also somewhat more unequally distributed in this age group than it was in 2002–03.
- The same holds true for individuals aged above the SPA: average incomes are higher and inequality is somewhat greater.
- Looking at changes in the sources of income between 2002–03 and 2008–09, we see that for individuals aged between 50 and the SPA, earnings from employment have become a more significant source of income for those towards the bottom of the income distribution, but a smaller share of income for those towards the top.
- Among individuals aged above the SPA, income from the state (benefits and the state pension) remains the largest single source of income (on average) for those in the bottom two-thirds of the income distribution. However, its share of overall income has fallen slightly between 2002–03 and 2008–09, as income from private pensions has grown in importance across the distribution.
- Turning to changes in the distribution of wealth between 2002–03 and 2008–09, we see that the largest shift in the wealth distribution occurred between 2002–03 and 2004–05, with a significant increase in wealth (on average) between these years. This increase appears to have been driven almost entirely by housing wealth, with other sources of wealth changing little. However, recent declines in house prices have started to move this trend into reverse.
- After four waves of ELSA, we have now observed over a thousand individuals both before and after their retirement. Comparing pre-retirement incomes with post-retirement incomes, we find that average income falls significantly (in real terms) on entering retirement. Most individuals have post-retirement incomes amounting to less than three-quarters of their pre-retirement income. However, among individuals with low incomes (less than £150 per week) before retirement, income actually tends to increase on entering retirement, perhaps as a result of state support

for pensioners on low incomes (such as the Pension Credit) and the state pension.

- Spending on basics (food, domestic fuel and clothing) at the mean went up by 9.4% and spending on domestic fuel increased by 37.3% between 2004–05 and 2008–09.
- Spending on basics as a percentage of income can be used as a yardstick of welfare. A quarter of households experienced an increase of more than 10 percentage points in the share of their income devoted to basics between 2004–05 and 2008–09.
- Those in the bottom income quintile (after controlling for other factors) are 17 percentage points more likely to experience a 10 percentage point or more increase in the share of their income devoted to basics than those in the top income quintile. If we choose to use spending on basics as a percentage of income as a yardstick of welfare, this implies that the poorest have been affected the most by the rise in prices of food and domestic fuel.
- Retirement is not associated with a big change in the share of income devoted to spending on basic goods and on leisure once changes in income and other factors that occur around the time of retirement have been accounted for.

3.1 Introduction

The living standards of older people have long been a concern of policymakers, with the current coalition government committed to ‘safeguarding key benefits and pensions’ to provide older people ‘with the support they need’, as part of the coalition’s programme for government.[1] The previous Labour government also targeted the well-being of older people, introducing a number of reforms to the tax and benefit system aimed at reducing the number of pensioners living on very low incomes – notably, the introduction of the Minimum Income Guarantee for pensioners, later replaced by the Pension Credit. These policies attempted to create a ‘floor’ for pensioners’ income, to ensure that the incomes of retired people could not fall below a certain level (currently £132.60 per week for a single pensioner and £202.40 per week for couples).

However, income is just one yardstick by which to measure living standards. Another important aspect of individuals’ living standards is the level of their consumption. Consumption and income are closely related but nonetheless can tell us a different story about living standards. For example, Brewer, Goodman and Leicester (2006) showed that the fall in relative income poverty for pensioners seen in the 1990s and early 2000s was not replicated in terms of expenditure. Because of the way that individuals draw down their savings to fund consumption (and, equally, save at times when income is high), consumption can tell us about longer-term living standards rather than the snapshot picture that is sometimes given by looking at income alone.

[1] HM Government, 2010.

In this chapter, we assess changes to the material living standards of individuals aged 50 and over in England, taking advantage of the multiple measures of material well-being in the ELSA data. We begin in Section 3.2 by assessing changes to the income and wealth distribution between 2002–03 and 2008–09 (the first and fourth ELSA waves, respectively). We also use the longitudinal nature of the ELSA data to examine how individuals' pre-retirement income compares with their income after retiring (the 'replacement rate', an important statistic for retirement policy). In Section 3.3, we consider what has happened to spending on 'basics' (food, domestic fuel and clothing) between 2004–05 and 2008–09 (the second and fourth waves of ELSA).

3.2 Financial circumstances

3.2.1 Methods

Measurement of income in ELSA

From its inception, ELSA has included a wide range of questions relating to respondents' income from a range of sources, including income from employment, private and state pensions, financial assets, state benefits and other sources. Income information is collected at the family unit level,[2] so that for couples who keep their finances together, only one member of the couple is asked the series of income questions, while for couples who keep their finances separate, the questions are asked of both respondents separately.

Information about each source of income is collected via a two-stage process: respondents are first asked to report a precise value for their income from a given source; any respondent who refuses to report (or is not sure of the exact amount) is then asked a series of questions designed to elicit an upper and lower bound for their income from that source. Where respondents have an upper and lower bound, they are then allocated a precise value using an imputation procedure known as the 'conditional hot deck'.[3] This leaves only a small fraction of respondents with completely missing income information (see under 'Sample' below).

For the purposes of the analysis below, total income is defined net of taxes and is the sum of employment income, income from self-employment, private pension income, state pension income, other benefit income (excluding Housing Benefit and Council Tax Benefit), asset income and any other income. While our income measure is at the family unit level, we analyse the data at the individual level, following the approach of the Department for Work and Pensions (DWP) 'Households Below Average Income' series[4] (though the latter measures incomes at the household, rather than the family unit, level). This is motivated by the fact that it matters how many people are living in a particular family unit (if two individuals are living in a low-income

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[2]A family unit is defined as a single person or a couple and any dependent children that they might have.

[3]See annex 9.1 of Marmot et al. (2003) for more information about imputation of income components.

[4]See Brewer et al. (2009).

family, we care about both those individuals' welfare). Total family incomes are adjusted to take into account family size (a procedure known as 'equivalising') using the modified OECD equivalence scale.[5] Cross-sectional weights are used in all calculations.

Measurement of wealth in ELSA

The ELSA survey collects detailed information on respondents' wealth, including their financial wealth (savings and investments), physical assets and debts (credit cards, loans, etc.). ELSA also has detailed questions relating to respondents' housing wealth (and any mortgage debt they may have) and private pension wealth. Information regarding each source of wealth is collected according to the same two-stage process as that described above, with individuals who refuse to give an exact amount (or who do not know the exact amount) being asked a series of questions designed to elicit upper and lower bounds. As was the case for income sources, these individuals are then allocated a precise amount using the 'conditional hot deck' imputation procedure.

In the analysis below, we focus on total non-pension wealth (financial plus physical plus housing wealth minus any debt). The analysis is conducted at the individual level, though wealth is measured at the family unit level. As in the income analysis, weights are used in all calculations.

Sample

For our cross-sectional analysis of incomes and wealth, our sample is all core ELSA sample members in each wave. We exclude only individuals whose income or wealth information is completely missing, even after being asked the series of questions designed to elicit upper and lower bounds. This removes less than 2% of the income and wealth samples in 2002–03 and just under 3% of the income and wealth samples in 2008–09.

For our longitudinal analysis of replacement rates after retirement, our sample is core ELSA sample members who were in work in 2002–03 and who were still in the ELSA sample in 2008–09 but had retired from work by this time (a sample of just over 1,000 individuals). To avoid our results being driven entirely by outliers, however, we then remove from the sample individuals whose incomes have been subject to imputation without a clear upper or lower bound ('open band' imputation) for any income source. This stringent data requirement reduces the sample to around 600 observations in total.

3.2.2 The income distribution

We begin by considering how the income distribution in ELSA has changed over time, from the first ELSA wave in 2002–03 to the fourth ELSA wave in 2008–09. Figure 3.1A shows the distribution of family income (adjusted to

[5]Note, however, that the modified OECD equivalence scale is designed to adjust incomes at the household, rather than the family unit, level. Over 80% of our sample live in households with just one family unit, but for those who live in households with multiple family units the use of this equivalence scale is an approximation. For more details regarding equivalence scales, see the OECD documentation at http://www.oecd.org/dataoecd/61/52/35411111.pdf.

Figure 3.1A. The income distribution among individuals aged between 50 and the state pension age, 2002–03 and 2008–09

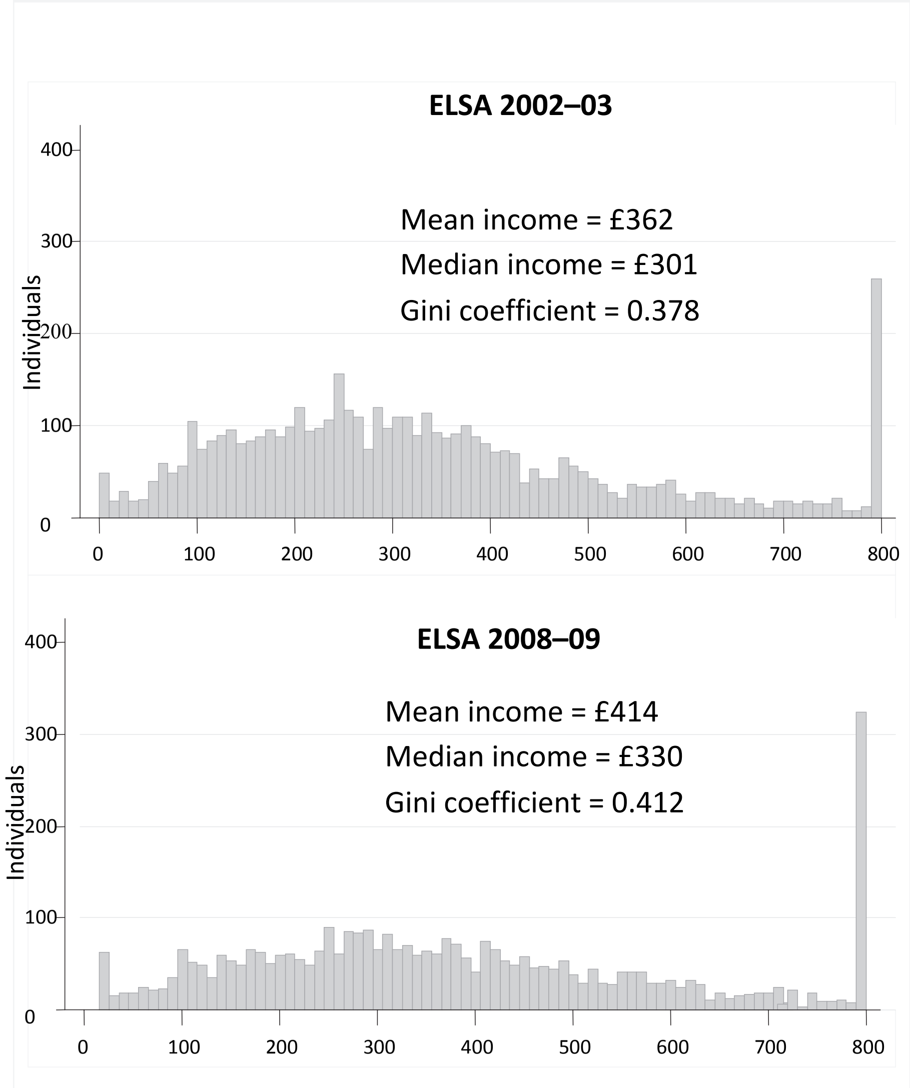
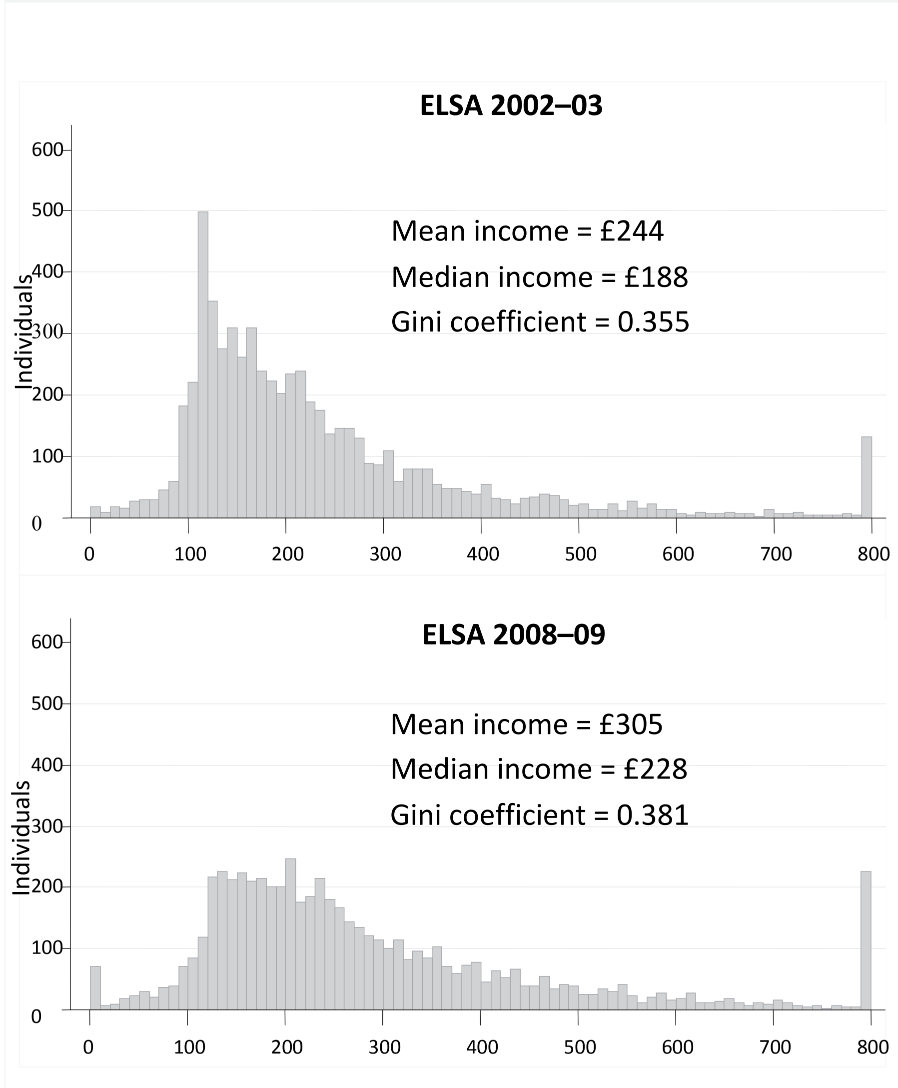


Figure 3.1B. The income distribution among individuals above the state pension age, 2002–03 and 2008–09



Notes: In all income distribution figures, incomes above £790 have been grouped together in the right-most bar. The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample size for wave 1 is 4,861 below SPA and 6,330 above SPA. The sample size for wave 4 is 3,697 below SPA and 5,908 above SPA.

take into account family size using the modified OECD equivalence scale) among individuals between 50 and the state pension age (currently 60 years old for women, 65 for men), in pounds per week (constant 2008–09 prices), in ELSA in 2002–03 and 2008–09. Individuals have been placed into £10 income bands. Negative incomes (such as self-employment losses) have been set to zero – the left-most bar in the distributions – while incomes greater than £790 per week have been grouped together into the right-most bar (at £790–£800). Figure 3.1B shows the income distribution for individuals aged above the state pension age. Both figures also show measures of average income (mean and median), as well as a measure of inequality – the Gini coefficient, which varies between 0 and 1, with higher values signifying greater inequality.

The figures make clear that average income has increased, at both the mean and the median, in both age groups, implying that real incomes have increased. Incomes are also somewhat more unequally distributed in 2008–09 than they were in 2002–03, with both age groups showing a modest rise in the Gini coefficient.[6]

Unsurprisingly, average incomes are higher among individuals below the SPA in both 2002–03 and 2008–09, though the gap between the two is smaller in 2008–09 (the mean income of pensioners is 33% below the mean for individuals aged 50 to the SPA in 2002–03, but 26% below it by 2008–09). The distribution of income among pensioners shows a particularly dramatic shift: the 2002–03 pensioner income distribution has a notable spike at around £120 per week, due to clustering around the value of the Minimum Income Guarantee, but by 2008–09 this spike has flattened out somewhat, with a mass between about £130 and £250 per week but no pronounced spike. This lack of a spike in the 2008–09 distribution may be partly due to a change in the structure of the Minimum Income Guarantee, which was reformed (and renamed the ‘Pension Credit’) in 2003. While the notion of a guaranteed minimum income was maintained in the Pension Credit (known as the ‘Guarantee Credit’), the Pension Credit also paid additional money to pensioners who had put aside some savings of their own towards their retirement (attempting to address the disincentive to save created by the Minimum Income Guarantee). This element of the Pension Credit (the ‘Savings Credit’) seems likely to have made benefit payments less tightly bunched around a single value. Moreover, there are fewer individuals in the 2008–09 income distribution whose incomes are derived solely from the state pension (topped up with the Pension Credit) than there were in 2002–03, suggesting that private sources of income are becoming more important in this age group (a possibility that we investigate further below).

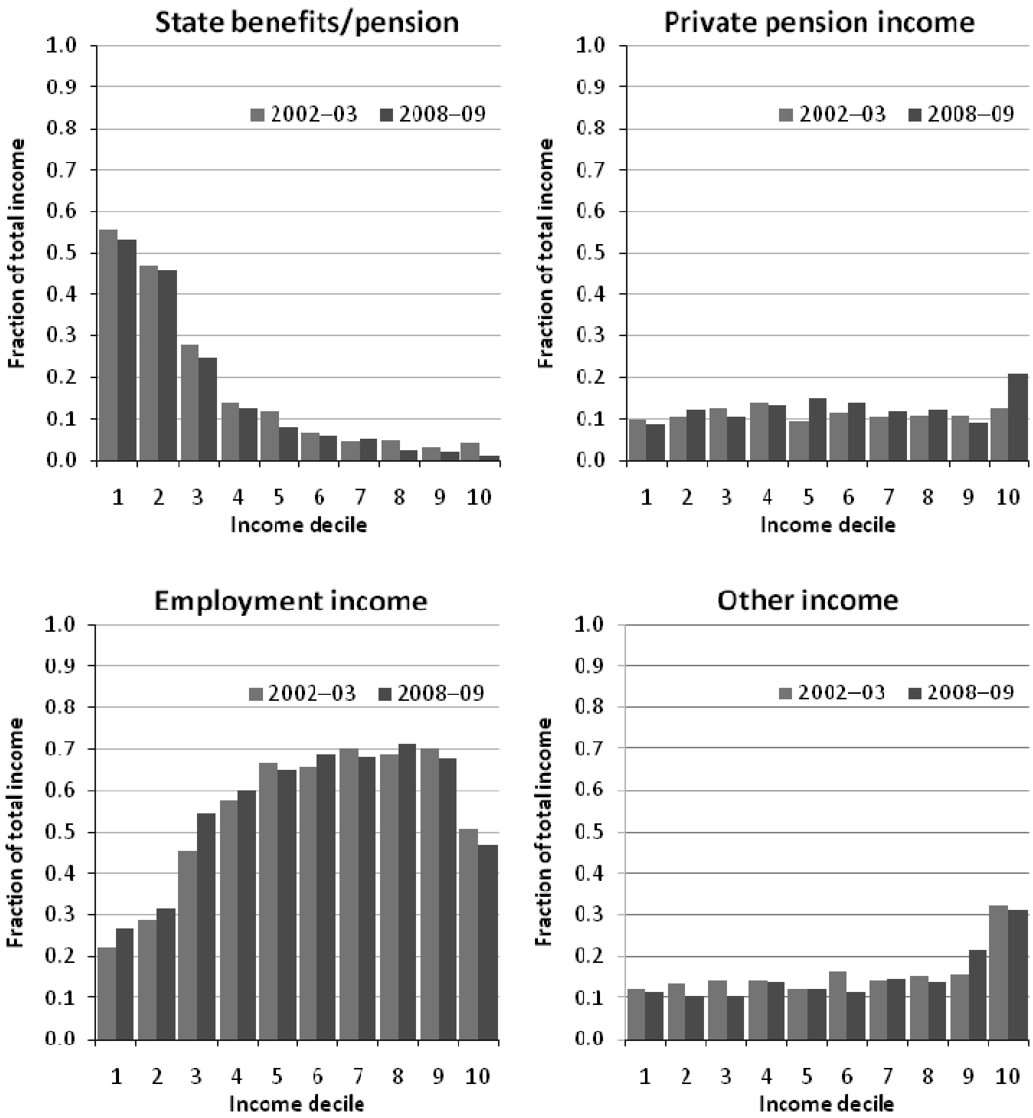
Families derive their income from many different sources, such as earnings from employment, income from the state (benefits and the state pension) and income from private pensions. In Figure 3.2, we examine how different sources of income have changed between 2002–03 and 2008–09, at different points in the income distribution. As in Figure 3.1, we have separated the population into those below the SPA (but aged 50 or over), shown in Figure 3.2A, and those above the SPA, shown in Figure 3.2B. For both age groups,

[6]Increasing inequality is also seen in these age groups in the Family Resources Survey, at least up to 2006–07. See appendix A of Brewer, Muriel and Wren-Lewis (2009).

we have divided individuals into 10 equally sized groups (decile groups) based on their family income, from those with the lowest incomes (decile 1) to those with the highest (decile 10).[7]

Figure 3.2A makes clear the extent to which state benefit income matters for individuals below the SPA on low incomes, making up more than half of the income of individuals in the bottom decile of the income distribution in both 2002–03 and 2008–09. Unsurprisingly, however, it is employment income

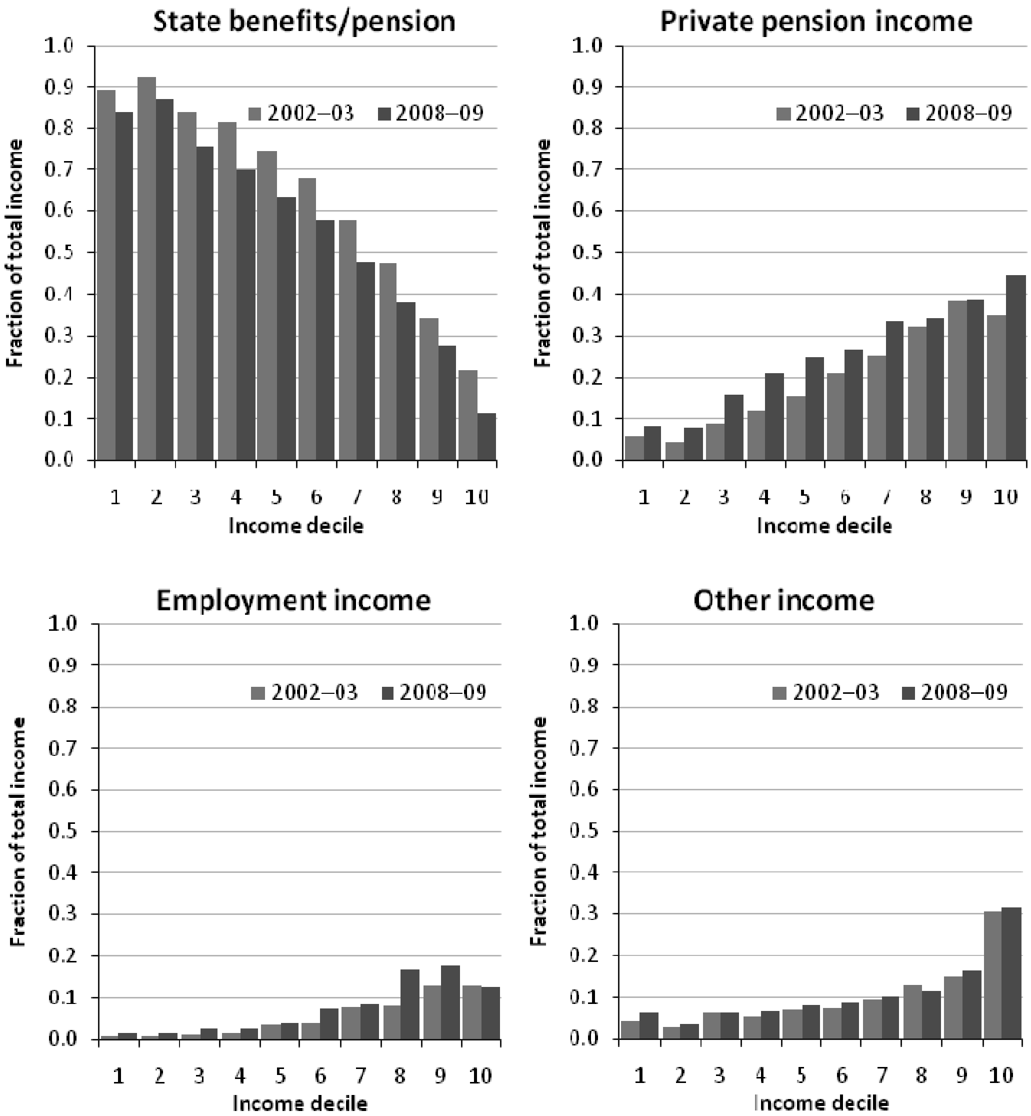
Figure 3.2A. Sources of income among individuals aged between 50 and the state pension age, 2002–03 and 2008–09



Notes: Other income includes income from assets, self-employment and other payments into the household. The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample size for wave 1 (2002–03) is 4,861 and for wave 4 (2008–09) is 3,697.

[7]Note that income sources in these figures are still measured at the family unit level, so even individuals below the SPA may be gaining some income from the state pension if their partner is above the SPA, and retired individuals may still be gaining income from employment if their partner is still working.

Figure 3.2B. Sources of income among individuals above the state pension age, 2002–03 and 2008–09



Notes: Other income includes income from assets, self-employment and other payments into the household. The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample size for wave 1 (2002–03) is 6,330 and for wave 4 (2008–09) is 5,908.

which forms the largest income source for most individuals in this age group. The trends over time are not large, but we do see some variation in the sources at different points in the income distribution. It interesting to note that income from employment has become a larger share of income for individuals towards the bottom of the income distribution, but a smaller share of income among those towards the top. Individuals towards the top of the income distribution are instead deriving an increased fraction of their income from private pensions, though ‘other’ sources of income (including income from assets) remain an important income source for the top decile.

Figure 3.2B shows just how important income from the state (in the form of both pensions and benefits) is for families containing individuals above the SPA. For such families in the bottom two-thirds of the income distribution,

state benefits/pensions form the largest single income source in both 2002–03 and 2008–09. However, the share of state income in total pensioner income has fallen slightly, across the income distribution, as other income sources have grown in importance.

The most significant increase is seen in private pension income, which makes up a larger share of pensioners' incomes in 2008–09 than it did in 2002–03 right across the income distribution. Indeed, towards the bottom of the income distribution, the share of private pension income in total income has almost doubled since 2002–03 (from an admittedly low base). There has also been a significant increase in the share of income coming from private pensions at the top of the pensioner income distribution, with private pension income now comprising nearly half of all income for the top decile.

Interestingly, among individuals in the top half of the pensioner income distribution (but not at the very top), income from employment has also grown as a share of total income. This may reflect the fact that individuals are now able to work and draw a pension from their employer at the same time, following a reform in 2005.

These changes in the shares of different income sources are largely driven by the changing composition of the pensioner population, rather than by changes in the income sources of existing pensioners. Many of the oldest individuals in the 2002–03 ELSA wave have subsequently died, and their 'replacements' in the pensioner age group (individuals reaching the SPA by 2008–09) are a younger cohort, who have been more exposed to changes in the pension system which saw an increased emphasis on private (rather than state) pension provision. When we repeat the analysis in Figure 3.2B using only the cohort of individuals aged above the SPA in 2002–03 (excluding the 'youngest' pensioners from the sample), the fraction of income derived from the state barely changes at all between 2002–03 and 2008–09.[8] Even this sensitivity test will understate the full composition effect, since it ignores the impact of members of the cohort dying between 2002–03 and 2008–09. Nonetheless, it supports the suggestion that these changes are driven largely by composition effects, rather than by changes in the income sources of existing pensioners.

The picture that emerges from Figures 3.1B and 3.2B, then, is of a pensioner population that has become better off, on average, between 2002–03 and 2008–09, though much of this will be due to composition changes rather than to changing circumstances of existing pensioners. An increasing share of their income comes from private sources (both employment and pensions) rather than the state, but the state remains a hugely important income source for all but the highest-income pensioners.

3.2.3 The wealth distribution

Having examined the flow of income among older people in England, we now move on to consider their stock of wealth. Figures 3.3A and 3.3B show the cumulative distribution of net total wealth, excluding pensions, for two age groups (aged 50 to the SPA, and SPA plus), in all four ELSA waves to date.

[8]Results available from the authors on request.

Figure 3.3A. Cumulative distribution of net total wealth (excluding pensions) among individuals aged between 50 and the state pension age, 2002–03 to 2008–09

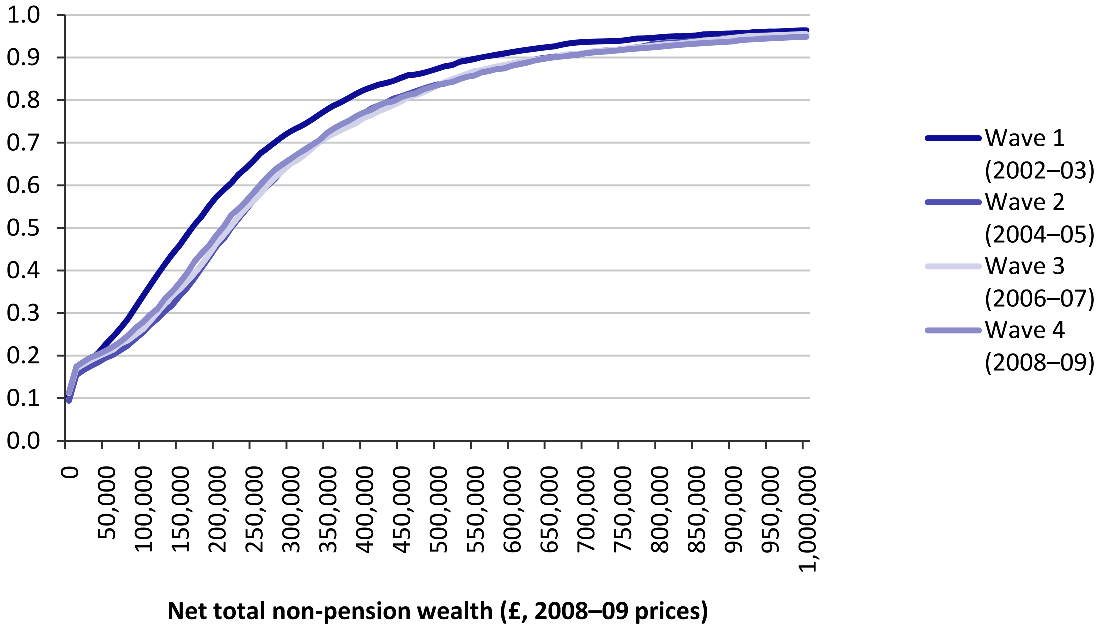
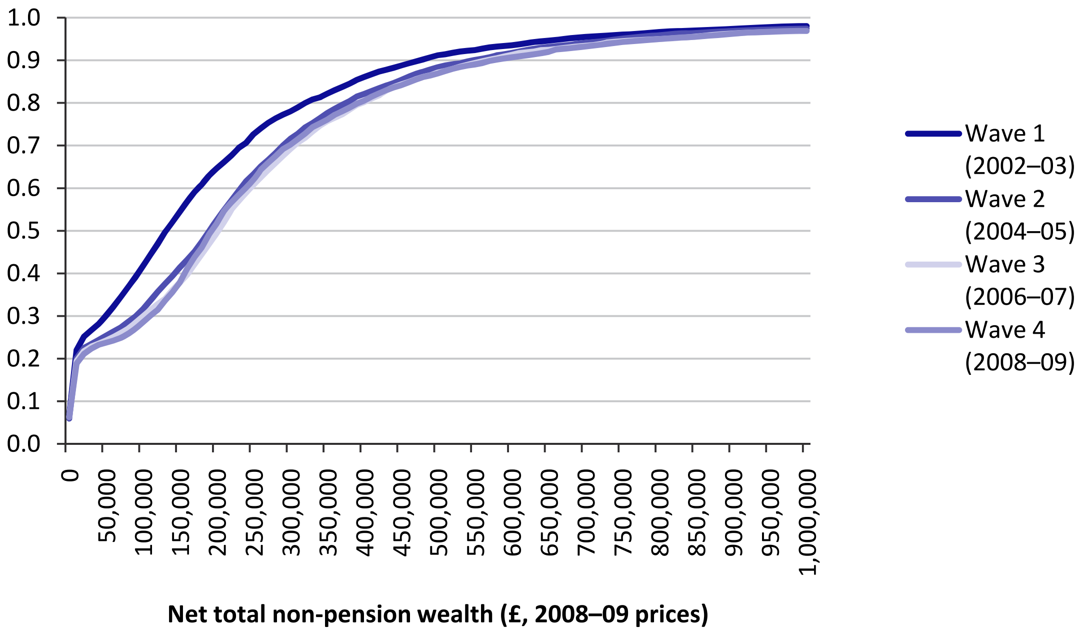


Figure 3.3B. Cumulative distribution of net total wealth (excluding pensions) among individuals above the state pension age, 2002–03 to 2008–09



Notes: The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample sizes for those below SPA in waves 1, 2, 3 and 4 are 4,860, 3,798, 3,610 and 3,697 respectively. The sample sizes for those above SPA in waves 1, 2, 3 and 4 are 6,329, 5,461, 4,963 and 5,908 respectively.

Figure 3.4A. Cumulative distribution of net non-housing wealth (excluding pensions) among individuals aged between 50 and the state pension age, 2002–03 to 2008–09

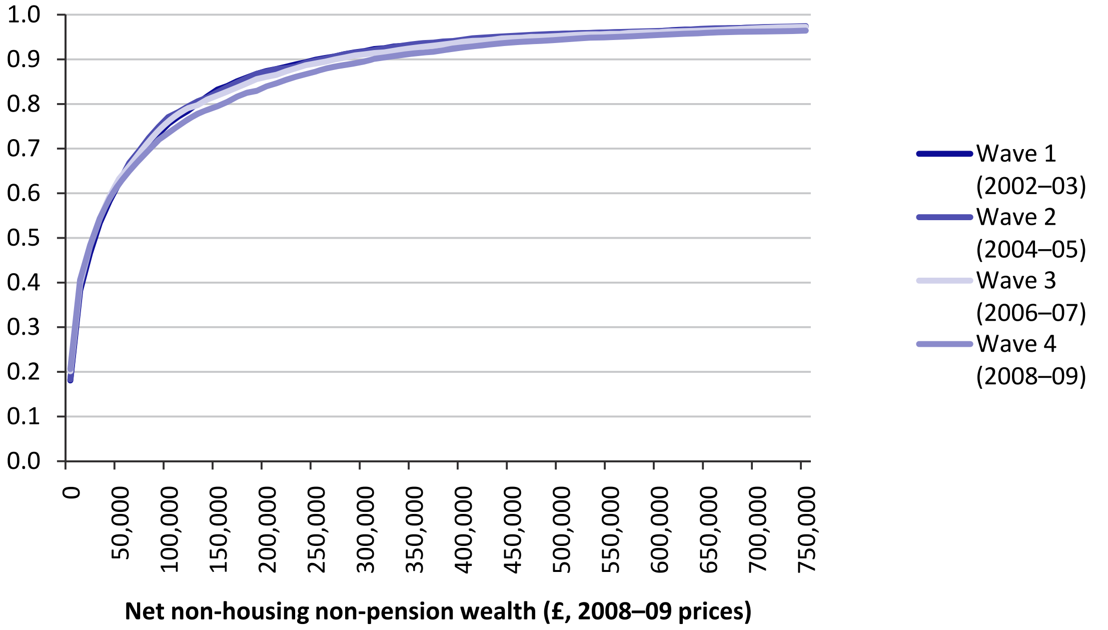
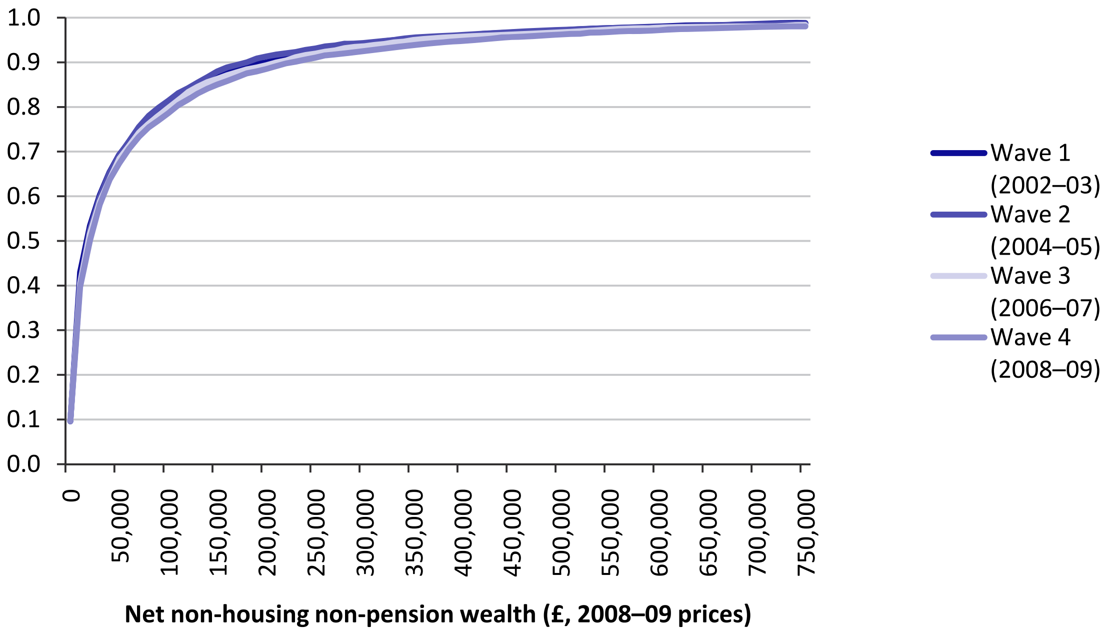


Figure 3.4B. Cumulative distribution of net non-housing wealth (excluding pensions) among individuals above the state pension age, 2002–03 to 2008–09



Notes: The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample sizes for those below SPA in waves 1, 2, 3 and 4 are 4,860, 3,798, 3,610 and 3,697 respectively. The sample sizes for those above SPA in waves 1, 2, 3 and 4 are 6,329, 5,461, 4,963 and 5,908 respectively.

Figure 3.5A. Cumulative distribution of net housing wealth among individuals aged between 50 and the state pension age, 2002–03 to 2008–09

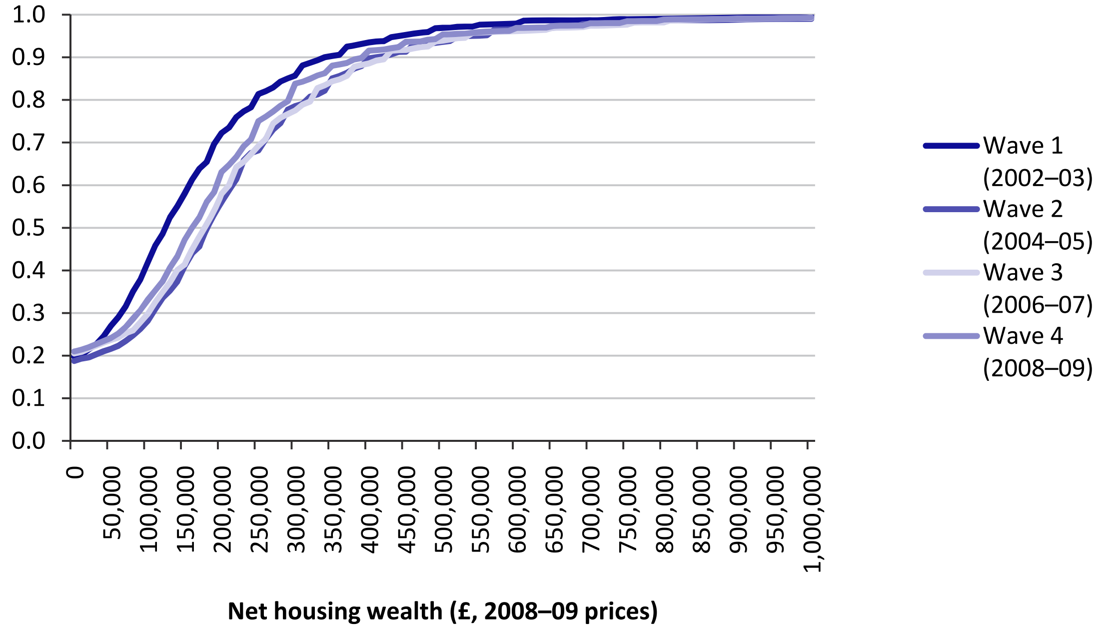
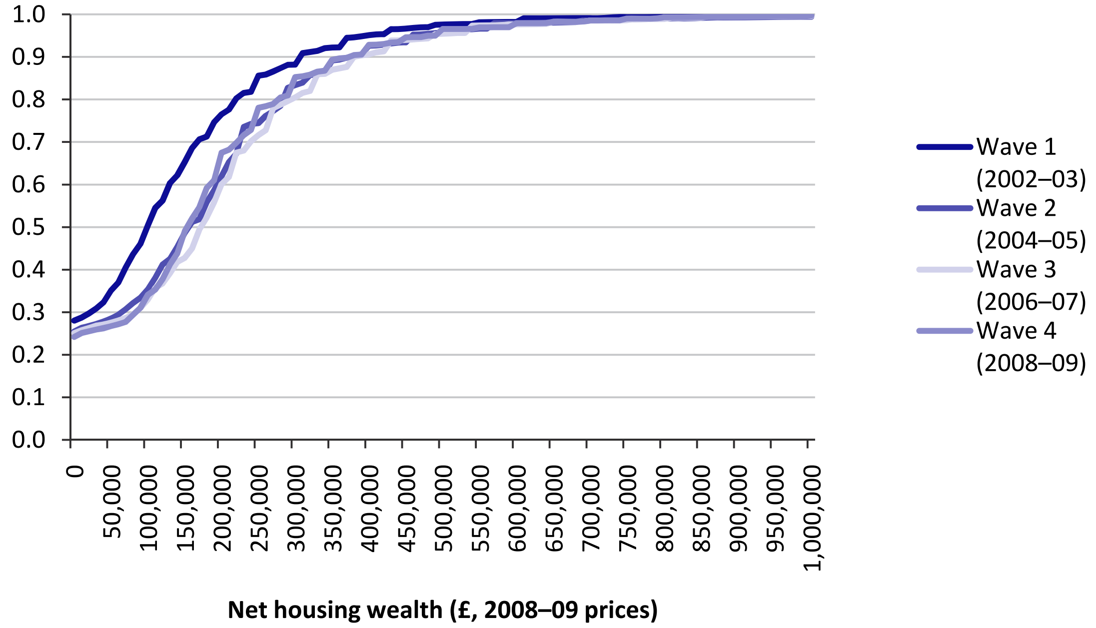


Figure 3.5B. Cumulative distribution of net housing wealth among individuals over the state pension age, 2002–03 to 2008–09



Notes: The sample is the cross-sectional sample in each wave as described in Section 3.2.1. The sample sizes for those below SPA in waves 1, 2, 3 and 4 are 4,861, 3,799, 3,610 and 3,697 respectively. The sample sizes for those above SPA in waves 1, 2, 3 and 4 are 6,330, 5,462, 4,964 and 5,908 respectively.

The lines in these figures show the fraction of individuals who have a given level of wealth or less. For example, the line for ELSA wave 1 in Figure 3.3A shows that half of individuals aged between 50 and the SPA had net total wealth of £175,000 or less in 2002–03. When these lines shift to the right (as they do in both figures), it means that individuals are getting wealthier, on average. The figures make clear that the largest shift in the wealth distribution occurred between 2002–03 and 2004–05, with comparatively little change thereafter.

It is worth considering which sources of wealth were responsible for the large increase in wealth between 2002–03 and 2004–05. Looking solely at the distribution of non-housing wealth, in Figures 3.4A and 3.4B, we see that it barely changed between 2002–03 and 2004–05, for both those above and those below the SPA. This suggests that the increase between 2002–03 and 2004–05 was driven by housing wealth – a possibility confirmed by Figures 3.5A and 3.5B. We see that housing wealth grew very strongly between 2002–03 and 2004–05 (across the distribution), but remained largely static thereafter. However, housing wealth fell slightly in real terms between 2006–07 and 2008–09, across most of the distribution, reflecting the recent decline in house prices across the country.

3.2.4 Income replacement rates and retirement

The panel nature of the ELSA survey allows us to look at more than just cross-sectional income and wealth distributions; we can also look at the evolution of respondents' financial circumstances over time, at the individual level. In this section, we consider the important question of how individuals' incomes change when they enter retirement.

After four waves, ELSA now includes over a thousand respondents who have been observed both before and after retirement. Taking as an initial sample the individuals who were in work in 2002–03 but no longer working in 2008–09, we are able to compare their pre-retirement (2002–03) net income with their post-retirement (2008–09) net income. Table 3.1 shows average pre-retirement and post-retirement incomes for this sample, as well as the distribution of 'replacement rates' – the ratio of post-retirement income to pre-retirement income. A replacement rate of less than 1 implies that an individual's income fell after retirement, while a rate of greater than 1 implies that their income increased. To avoid our results being driven entirely by outliers, we trim the top and bottom 1% of incomes in each wave before calculating replacement rates. As discussed under the heading 'Sample' in Section 3.2.1, we also remove individuals whose income sources have been subject to imputation without a definite upper bound ('open band' imputation), leaving a full sample of just over 600 individuals.

The first row of Table 3.1 shows average incomes (per week) and replacement rates for all retirees.[9] It shows that, on average, pre-retirement incomes in ELSA are substantially higher than post-retirement incomes – around £389 per

[9]Defined simply as those who were in the labour force in 2002–03 but had left the labour force by 2008–09.

Table 3.1. Income replacement rates among retirees

Group	Pre-retirement mean weekly income	Post-retirement mean weekly income	Replacement rates (post-retirement income/pre-retirement income)						
			Mean	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile
All retirees	388.92	287.39	0.86	0.38	0.52	0.72	1.01	1.45	1.86
of whom:									
Men	392.10	286.80	0.86	0.36	0.52	0.72	1.04	1.51	2.01
Women	385.95	287.96	0.87	0.40	0.52	0.72	0.99	1.37	1.73
By highest qualification:									
Degree	595.91	466.44	0.75	0.36	0.51	0.71	0.88	1.23	1.52
A level	440.55	315.17	0.75	0.38	0.47	0.64	0.94	1.31	1.53
O level/CSE	348.41	277.18	0.95	0.37	0.53	0.74	1.16	1.62	2.06
By age in 2008–09:									
Above state pension age	432.33	317.12	0.88	0.28	0.45	0.71	1.15	1.82	2.33
Below state pension age	374.98	277.16	0.86	0.41	0.53	0.72	0.98	1.37	1.65
Pre-retirement equivalised income:									
<£150 per week	108.92	188.40	1.75	0.82	1.02	1.39	2.11	2.69	3.03
Between £150 and £250 p.w.	206.85	201.37	0.87	0.45	0.61	0.84	1.06	1.42	1.52
> £250 p.w.	487.01	330.78	0.71	0.33	0.46	0.64	0.83	1.15	1.30

Notes: Incomes are measured net of direct taxes and state benefits. Individuals whose incomes were imputed using 'open band' imputation in 2002–03 or 2008–09 have been excluded from the sample. Incomes are in real terms, 2008–09 prices. The sample is ELSA sample members who were in work in 2002–03 and who were still in the ELSA sample in 2008–09 but who were not working at this time. The sample size is 1,116.

week before retirement, but £287 after retirement (in real terms, constant 2008–09 prices).The mean replacement rate is significantly less than 1 (0.86), implying that post-retirement income is more than 10% lower than pre-retirement income, on average. The median replacement rate is lower still, at around 0.72, implying that the majority of retirees enjoy incomes less than three-quarters of their pre-retirement income.

The next rows of Table 3.1 show the same statistics for different subgroups of the population. We begin by separating men and women, but see little variation between the two – though this is likely to reflect the fact that men and women in couples are allocated the same family incomes, so that any differences would be driven by single men and women.

We next subdivide retirees up according to their level of education, and see that among lower-educated retirees (those with O levels or lower) replacement rates are substantially higher – close to 1 at the mean, with the top 5% of replacement rates being in excess of 2. Individuals with these replacement rates have substantially lower pre-retirement incomes, however, so even without significant private pension savings, their state pension and benefit entitlements may well be enough to replace much of their previous earnings.

We also divide retirees according to their age in 2008–09 – whether they were above or below the SPA. We see that retirees below the SPA (those who have, presumably, retired somewhat early) had lower average incomes, both before and after retirement, than those who were above the SPA in 2008–09. Replacement rates for the two groups, however, are not significantly different at the mean or median.

Finally, we divide retirees according to their pre-retirement income in 2002–03, using three categories: income below £150 per week (after adjusting for family size), income between £150 and £250 per week, and income above £250 per week. This division makes clear the extent to which low-income individuals can see their income increase after retirement. Among the low-income (<£150) group, replacement rates are very high (over 1.7 at the mean and nearly 1.4 at the median). These high replacement rates at the bottom of the distribution could partly reflect state entitlements, such as the state pension and Pension Credit, boosting the incomes of individuals with very low pre-retirement incomes. They may also, however, be due to measurement error in individuals' pre-retirement income, leading to 'reversion to the mean' (a statistical problem, in which an extreme measurement in one period – such as a very low income measurement – tends to be closer to the average when measured again at a later period). While we have taken many steps to minimise measurement error, such as trimming the income distribution and removing imputed incomes from the sample, we can never eliminate it entirely.

3.3 Consumption

So far in this chapter, we have looked at what has happened to income and wealth between 2002–03 and 2008–09. Income and wealth tell us about the levels of resources that individuals have available to allocate to consumption goods and services and to saving. Why might we be interested in consumption

in addition to income and wealth? Income, wealth and expenditure are clearly interrelated but they can tell us different stories about people's standard of living. Two individuals with the same income and the same wealth may have very different patterns of expenditure. Take two identical retired individuals as an example. The first may be drawing down their savings quickly in order to meet their consumption requirements, whereas the other individual may prefer to draw down their savings either not at all or more slowly and will therefore have lower consumption. Differences in the willingness to draw down savings may reflect differences in the levels of uncertainty regarding future circumstances or differences in life expectancy. Looking at levels and patterns of expenditure can inform us about individuals' welfare over and above simply looking at their income and wealth. This may be particularly true for elderly individuals, who may have low incomes but are using savings that they have accumulated over their lifetime in order to fund their consumption. Consumption often tells us more about long-term living standards than the shorter-term snapshot picture that income gives us.

Measures of expenditure have been included in all waves of ELSA. In wave 1 (2002–03), the main items of (non-housing) expenditure were food inside and outside the home and durable ownership, but since wave 2 (2004–05), additional measures on domestic fuel, clothing, leisure and durable purchase have also been included. These measures of spending are certainly not comprehensive and cannot compare to the measures obtained from specialist expenditure surveys such as the Living Costs and Food Survey (formerly the Expenditure and Food Survey and the Family Expenditure Survey). Detailed analysis of expenditure patterns of the elderly using the Expenditure and Food Survey has been carried out by, for example, Leicester, O'Dea and Oldfield (2009). However, the advantage of using ELSA to analyse spending is twofold. First, because the survey is longitudinal, it allows us to look at changes in spending at the individual level.[10] Second, having a measure of spending in a multidisciplinary survey means that we can look at how spending is correlated with other aspects of well-being and outcomes.

In Section 3.3.1, we describe the measure of expenditure we have in ELSA. In Sections 3.3.2 and 3.3.3, we look at levels of expenditure and ask what happened to spending between 2004–05 and 2008–09, particularly in the light of large increases in the price of food and domestic fuel seen over this period. In Section 3.3.4, we look at the issue of spending around the time of retirement.

3.3.1 Methods

Measurement of expenditure in ELSA

Since wave 2 of ELSA (2004–05), information on a range of expenditure items has been collected. Food inside the home, food outside the home, domestic fuel, clothing and durable purchases were recorded in waves 2, 3 and 4. Expenditure on leisure and money given to people outside the home

[10]Although the British Household Panel Survey also contains measures of food spending and expenditure on domestic fuel, spending on food after the first wave is reported as a banded amount.

(including charity) were recorded in waves 2 and 4 (2004–05 and 2008–09). It is important to note that it is *expenditure* that is measured, not *consumption.* This is an important distinction because some items of expenditure provide consumption services over a longer period of time. From an economic point of view, it is consumption that provides households with welfare. As with all surveys, measuring consumption is very difficult. However, much of our analysis in this section is based on a measure of expenditure on 'basics' (food, fuel and clothing), and for food and fuel at least, the distinction between expenditure and consumption is less important since they are not typically stored over long periods.

Expenditure is collected at the household level. The expenditure items that are measured and used in this chapter are:

- *Food inside the home:* Respondents are asked how much they usually spend on weekly groceries, including all food brought into the home but excluding pet food, alcohol, cigarettes, takeaways and meals out.
- *Food outside the home:* Respondents are asked how much they usually spend in a month on takeaways and food consumed out of the home, including in restaurants and meals consumed at the workplace.
- *Clothing:* Respondents are asked how much they or members of their household actually spent in the last four weeks (whether for themselves or someone else) on clothes, including outerwear, underwear, footwear and accessories.
- *Leisure:* Respondents are asked how much they or members of their household actually spent in the last four weeks (whether for themselves or someone else) on leisure excluding eating out (respondents are told to include items such as cinema, theatre, sport, subscriptions, internet and television subscriptions, and TV licences).
- *Domestic fuel:* Respondents are asked a series of very detailed questions on fuel expenditure. The questions are designed to take account of the different ways that households pay for domestic fuel and the seasonal nature of spending on fuel.

For all items of expenditure, we use the information available and convert all values to a weekly equivalent.

Expenditure, like many of the monetary variables in ELSA (including income), is collected via a two-stage process. First, respondents are asked to report a precise value for each category of spending. Any respondent who either refuses to report or who does not know the exact amount is then asked a series of questions designed to elicit an upper and lower bound for their spending on that category. Over 98% of ELSA sample members reported a precise value for food in, food out, clothing or leisure in wave 4 (2008–09) and around 93% had a precise value for fuel spending. Where respondents have an upper and lower bound rather than a precise value, we calculate the mean value of expenditure within that band from the households that do report a continuous value and assign that value to the household with bounds. We exclude individuals living in households that have a completely missing value (that is, they refuse, or they report that they do not know even after completing

the questions designed to obtain an upper or lower bound, or they do not complete the set expenditure questions at all).

As in our earlier analysis of incomes, we analyse our expenditure data at the individual level for the purposes of the tabulations and figures, even though expenditure is measured at a higher level (household level for expenditure, family unit level for incomes).This is partly driven by the fact that when we look at *changes* in spending, because a 'household' is a unit that can change across time, it becomes less meaningful to look at changes in the spending at the household level. In addition, when we are thinking about welfare, it matters how many people live in any particular household (if two individuals live in a household that has experienced a large increase in the share of income devoted to basics, we care about the welfare of both those individuals). This approach follows traditional analysis of poverty such as the 'Households Below Average Income' series.[11]

Sample

For the purposes of our cross-sectional analysis, we use the wave 2 (2004–05) and wave 4 (2008–09) samples, choosing only core members of the study. For longitudinal analysis, we use core members interviewed in 2004–05 who also gave an interview in 2008–09. However, there are two further selection criteria that we also use to restrict our samples.

First, we restrict our sample to households in ELSA where all individuals are eligible for a full interview. The reason for this is that in the ELSA survey, only ELSA sample members and their partners are given a full interview. Any non-sample members living in the household do not complete an interview although information on the characteristics of the non-sample members is collected via the main interview. Because of the lack of detailed income information on non-eligible individuals, we cannot compute a *household*-level measure of income for households that have non-eligible individuals residing within them. Because expenditure is measured at the household level, it is important to take into account the household's income rather than the income of the family (defined as either a single person or a couple). By restricting our analysis to households in ELSA where all individuals are eligible for a full interview, it is possible to use a household measure of income. This excludes around 18% of ELSA sample members in 2008–09 and 16% in 2004–05.

Second, we exclude individuals living in households that have a missing expenditure value. As described above, households that refuse to report or do not know how much they spend on any particular expenditure item are asked a set of questions designed to reveal an upper and lower bound. If a respondent is unable or unwilling even to provide an upper and lower bound, we exclude that household when we analyse that expenditure item. These make up a small percentage of respondents if we take any single item of expenditure (less than 4% for domestic fuel and less than 1% for the other items of expenditure). If we sum all items of expenditure together (food in, food out, fuel, clothing and leisure), the percentage of ELSA sample members living in households with missing spending is around 4%.

[11]See Brewer et al. (2009).

To summarise, we have two basic samples:

- *Wave 4 cross-sectional sample:* ELSA sample members interviewed in wave 4 (2004–05) who (i) have a non-missing value for expenditure in wave 4 and (ii) live in households where all members of the household are ELSA sample members in wave 4.
- *Wave 2 to wave 4 longitudinal sample:* ELSA sample members interviewed in wave 2 (2004–05) and in wave 4 (2008–09) who (i) have a non-missing value for expenditure in waves 2 and 4 and (ii) live in households where all members of the household are ELSA sample members in waves 2 and 4.

Analysis

All analysis is carried out at the individual level although spending is defined at the household level. Any analysis that looks at changes in spending exploits the longitudinal nature of the data. Because of the additional sample selection criteria that we use in this section, all analysis is unweighted.

Most of the analysis in this section is based on longitudinal data. Individuals aged 50–53 in 2008–09 were not part of the ELSA sample in wave 2 (2004–05) because they were too young. For this reason, throughout this section, our youngest age group is those aged 55–59.

3.3.2 What has happened to levels of spending between 2004–05 and 2008–09?

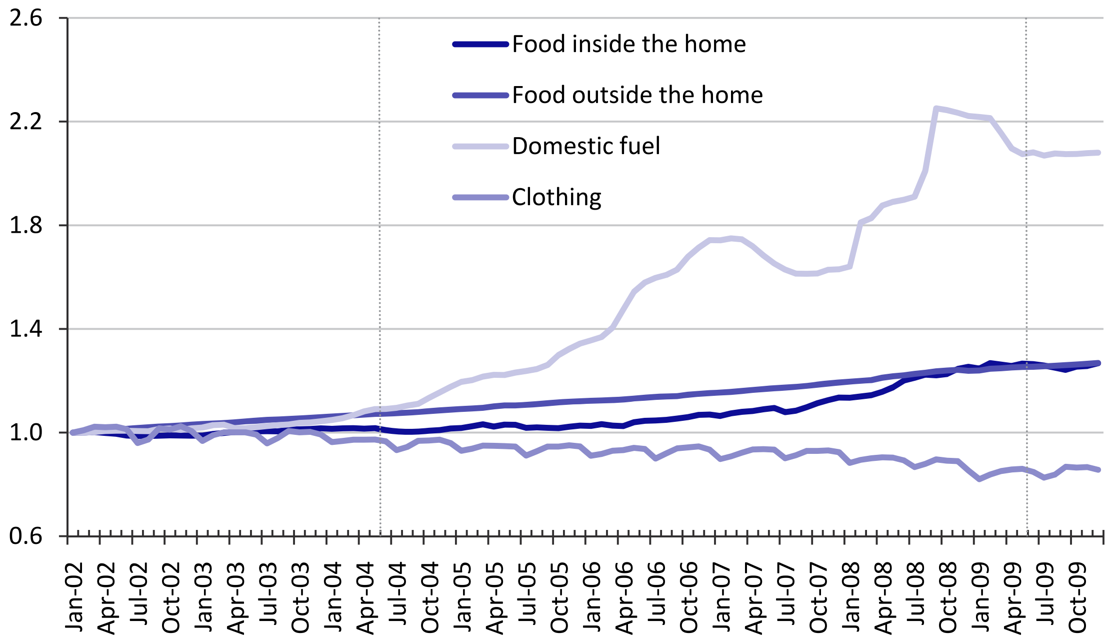
The amount that households spend and the pattern of their expenditure are determined by many different factors, including demographics, tastes and prices. Over the last few years, there have been steep rises in the prices of food and domestic fuel. These goods, which are deemed to be 'necessities', typically make up a larger proportion of the budget for poorer households than richer households and for elderly households than younger households.[12] This has led to concern over the impact of the price increases on vulnerable households. Leicester, O'Dea and Oldfield (2009) looked at the impact of price increases in domestic fuel using waves 2 and 3 of ELSA (2004–05 and 2006–07). They found that spending on fuel increased the most over that period for individuals living in households at the top and bottom of the income distribution. Since this study, we have an additional wave of ELSA data, which covers a period when there were further increases in the prices of both food and fuel. Using the retail price index (RPI),[13] Figure 3.6 shows what has happened to the prices of food inside and outside the home, domestic fuel and clothing over the period from January 2002 to December 2009. The plotted lines show the monthly index for each of the four goods. The vertical lines show the start of the wave 2 ELSA fieldwork period and the end of the wave 4 ELSA fieldwork period. Over that period (June 2004 to June 2009), the price of food inside the home increased by 25% and the price of food outside the home increased by 17%. In the light of wholesale energy price increases, the retail price of domestic fuel increased by 91%. The price of clothes, on the

[12] This was first highlighted by Engel (1857).

[13] For more details, see http://www.statistics.gov.uk/cci/nugget.asp?ID=21.

other hand, fell by 12%. The all-items RPI increased by 14%. Taking into account the month in which each respondent was interviewed in waves 2 and 4 (roughly two years apart), the average price increase that ELSA respondents experienced between their two interviews for each of the four goods is shown in Table 3.2 both in nominal terms and in real terms.

Figure 3.6. Price indices of food, domestic fuel and clothing, January 2002 to December 2009



Source: Office for National Statistics, http://www.statistics.gov.uk/statbase/tsdtables1.asp?vlnk=mm23.

Table 3.2. Mean increase in price experienced by ELSA respondents between their wave 2 and wave 4 interviews

Expenditure item	% increase in price (nominal terms)	% increase in price above inflation (real terms)
Food in	22%	7%
Food out	14%	0%
Clothing	–9%	–20%
Domestic fuel	80%	59%

Notes: The sample is ELSA sample members living in households where all sample members are eligible in waves 2 and 4 as described in Section 3.3.1. Sample size = 4,603.

The impact of these price changes will differ across households depending on the importance of each of the goods in their overall budget. Households that spend very little on fuel, for example, will be less affected than those that spend a large part of their budget on fuel. Typically, poorer and older households spend a larger share of their total budget on necessities. The Expenditure and Food Survey 2007 tells us that pensioner households, on average, spend 25% of their total budget on food inside the home, compared with 17% for non-pensioners. Similarly, pensioners spend 11% of their total budget on domestic fuel, compared with 7% for non-pensioners. In this

section, we look at what has happened to expenditures on four goods that we refer to as 'basics' (food in, food out, clothing and domestic fuel) between 2004–05 and 2008–09.

Typically, when the price of a good increases, the quantity consumed falls. However, the extent of this fall in demand will vary across households. If spending on the more expensive good increases after the price increase, households will have to reallocate spending from other goods and/or from savings. Each household's response to the change in prices will be different depending on their observable characteristics and on their tastes. We will look at averages across subgroups to see how different types of households have responded to these price changes. Different responses may lead to differing levels of concern – consuming less fuel or food might be more worrying than eating out less, for example.

We look now at spending levels and changes in spending by age, before looking at spending levels and changes in spending by income. All changes in spending are calculated at the individual level using the longitudinal aspect of the data.

Spending levels and changes in spending by age

Table 3.3 shows spending on food inside the home, food outside the home, domestic fuel and clothing. For each good, we show the level of spending in 2008–09 and the mean change in spending[14] between 2004–05 and 2008–09. All changes in spending are calculated at the individual level exploiting the longitudinal nature of the data. That is, for each individual, we take the difference in spending between 2008–09 and 2004–05 and express this as a percentage of spending in 2004–05. To calculate the mean percentage change in spending for each good, we include only individuals who had positive spending in both waves.[15] The final two columns show total basics defined as the sum of food in, food out, fuel and clothing. All values are expressed in real terms (July 2009 prices) and are adjusted to take account of different household sizes and the economies of scale involved in living with additional people in a household using an equivalence scale. An equivalence scale estimates how much expenditure or income different household types need to be equivalently well off. We express values relative to a single-adult household and the equivalence scale uses a value of 0.5 for second and subsequent adults. This means that to convert the numbers to the equivalent amount that a childless couple spends, numbers should be multiplied by 1.5.

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[14]Note that we calculate the mean of the changes, not the change in the mean. The calculation of percentage differences inevitably leads to some very large outliers, particularly for goods where spending can be rather low, such as food out and clothing. For this reason, the means in Tables 3.3 and 3.4 are trimmed to exclude households where spending on each good more than triples across waves. For goods other than food in, this represents around 5% of the sample. For food in, it represents less than 1% of the sample.

[15]Observations with zero spending in 2004–05 are necessarily excluded because the percentage change in spending is not defined because of the zero in the denominator. Including observations with zero spending in 2008–09 would lead to a downwards bias in the mean percentage change because these individuals can only have experienced a fall in spending. To overcome this, we exclude observations with zero spending in *either* of the two waves. In practice, this only has a noticeable effect for food out and clothing, where zero spending is more commonly observed.

Table 3.3. Real equivalised weekly spending in 2008–09 and changes in spending between 2004–05 and 2008–09, by age group

Age group (2008–09)	Food in		Food out		Domestic fuel		Clothing		Total basics	
	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending
55–59	45.86	5.8%	9.61	0.5%	16.10	32.9%	15.65	–12.7%	86.98	9.0%
60–64	46.75	3.5%	8.56	5.7%	16.25	40.4%	13.81	–5.7%	85.09	10.6%
65–69	45.37	3.5%	6.86	3.9%	15.60	32.7%	11.65	–15.7%	79.27	8.2%
70–74	43.25	5.2%	5.81	3.4%	15.46	37.8%	9.02	–9.5%	73.76	8.9%
75–79	41.05	5.1%	4.79	–3.0%	15.46	39.5%	7.93	–4.4%	69.31	9.9%
80–84	38.84	1.0%	4.34	5.4%	15.22	39.0%	4.98	–10.3%	64.11	8.9%
85+	36.81	2.2%	3.66	7.6%	14.83	37.7%	5.47	6.4%	61.85	9.9%
All	43.87	3.9%	6.89	3.2%	15.71	37.3%	11.03	–8.8%	77.66	9.4%
N	*6,909*	*4,519*	*6,930*	*2,425*	*6,693*	*4,044*	*6,919*	*1,721*	*6,664*	*4,262*

Table 3.4. Real equivalised weekly spending in 2008–09 and changes in spending between 2004–05 and 2008–09, by income quintile

Income quintile (2008–09)	Food in		Food out		Domestic fuel		Clothing		Total basics	
	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending	Spending in 2008–09, £	% increase in spending
Lowest	38.17	3.7%	3.55	2.1%	14.91	34.2%	6.81	–13.6%	63.60	9.0%
2	40.30	3.7%	4.39	6.9%	14.32	34.3%	7.60	–1.7%	66.62	9.5%
3	42.38	2.9%	6.02	1.9%	15.11	41.2%	10.52	–9.9%	73.41	9.6%
4	46.72	4.8%	8.16	0.7%	16.04	37.9%	12.38	–6.9%	83.76	8.8%
Highest	52.74	4.7%	12.96	5.0%	18.44	39.9%	18.59	–12.8%	103.21	10.1%
All	43.87	3.9%	6.89	3.2%	15.71	37.3%	11.03	–8.8%	77.66	9.4%
N	*6,909*	*4,519*	*6,930*	*2,425*	*6,693*	*4,044*	*6,919*	*1,721*	*6,664*	*4,262*

Notes to Tables 3.3 and 3.4: The sum of food in, food out, domestic fuel and clothing does not exactly match total basics because of trimming. The sample for the levels of spending is the wave 4 sample as described in Section 3.3.1. The sample for the change in spending is the panel of households present in waves 2 and 4 that had positive spending on the relevant item in both waves, as described in Section 3.3.1.

We can see from Table 3.3 that average spending on food inside the home falls with age, with the youngest age groups spending around £46 per week on food and the oldest age groups spending around £37 per week – a difference of around 25%. It is also important to note that older individuals are, on average, poorer than their younger counterparts,[16] which will also be driving the differences (along with many other factors). We look at spending by income in the next subsection. Spending on food inside the home has increased across the time period by 3.9% on average overall. Smaller increases have been seen by the oldest two age groups.

Average spending on food outside the home is much lower than average spending on food inside the home and this is particularly true for older households. Although the real price of food outside the home has remained constant on average for our ELSA sample, spending on it has risen on average by around 3.2% for those households that spend at least something on food outside the home in both 2004–05 and 2008–09.

Domestic fuel is where we have seen very dramatic increases in price. Spending on domestic fuel does not vary very much by age, although the oldest spent slightly less than younger households. All households in the sample on average have increased spending on fuel by 37%. Differences in the extent of increases in spending are not dramatic across the age distribution. If anything, there is a slight hump-shaped profile, where those in the middle age groups have increased their spending more than the youngest and oldest age groups. The fact that expenditure on fuel has increased by less than the increase in the price implies that, on average, households have cut back on the quantity of fuel that they purchase. It is important to remember that there are ways in which households can reduce their fuel consumption without any serious impact on their living standards. For example, households could remember to turn off lights or equipment or become more fuel efficient. However, the dramatic nature of the increase in the price and the subsequent fall in spending would suggest that it is very unlikely that the reduction in consumption could entirely be explained by small changes in behaviour around the home and it is highly likely that some households will have responded by reducing their fuel consumption to a level that means that their home is less warm.

The price of clothes fell over the period of our data and this follows a steady fall in prices over a much longer period of time. Spending on clothing, for those who spend at least something in each of the two waves, fell in all age groups except the oldest. The reduction in spending is less than the fall in price over the same period, suggesting that households are now purchasing more clothing items (and/or items of a higher quality).

The final pair of columns in Table 3.3 show how spending on total basics (the sum of all food, domestic fuel and clothing) has changed over the period. Across the whole age range, spending on necessities has increased by 9.4%. There is no strong pattern across the age distribution.

[16]See, for example, Department for Work and Pensions (2010).

Spending levels and changes in spending by income

Table 3.4 shows levels and changes in spending by (2008–09) household income quintile. Table 3.5 shows average real equivalised household income in each income quintile. As in the previous subsection, the analysis of changes in spending is longitudinal.

Table 3.5. Mean real equivalised weekly household income by income quintile, 2008–09

Income quintile	Mean equivalised income
Lowest	£121
2	£194
3	£266
4	£372
Highest	£684

Notes: The sample is the wave 4 sample as described in Section 3.3.1. Sample size = 6,962.

We can see from Table 3.4 that spending on food inside the home increases with income, with the poorest spending an average of around £38 per week and the richest spending over £50. However, because food spending increases more slowly as we move up the income distribution than does income itself, this implies that the poorest spend proportionately more, on average, of their income on food in than the richest. Spending on food inside the home increased the most for those at the top of the income distribution. Spending on food inside the home has increased by less than the increase in price, which suggests that, on average, households have cut back their food consumption in terms of quantity and/or quality.

Spending on food outside the home increases steeply with income. For those who spent at least something in both periods, average spending on food outside the home rose between 2004–05 and 2008–09, with those in the second and richest quintiles increasing spending by the most.

Whilst spending on domestic fuel does increase with income, the richest group spends only around 24% more on fuel than the poorest group, despite average incomes being over five times greater at the top than the bottom. As with food, this implies that fuel expenditure makes up a much larger proportion of income at the bottom of the income distribution than at the top. The increase in spending over the period does not vary greatly over the income distribution. As with age, there is evidence of a slight hump shape whereby those in the middle of the income distribution have increased their spending by more than those at the top and the bottom.

Average spending on clothing is around two-and-a-half times higher at the top of the income distribution than at the bottom. Those at the bottom and top of the income distribution have reduced their spending on clothing by more than those in the middle.

Looking at total basics, we see that spending has increased on average across the whole income distribution but with no strong pattern across the quintiles.

3.3.3 What has happened to spending as a proportion of income between 2004–05 and 2008–09?

In this chapter, we focus mainly on expenditure on items that can be deemed to be 'necessities'. As the total budget rises, households typically increase their spending on necessities by less than the increase in total budget. This means that spending on necessities as share of total spending (the 'budget share') can be used as a measure of welfare. We do not have a measure of total expenditure, but because total budget and incomes are closely related, we can use total income as a proxy for total expenditure. Using the share of income devoted to necessities as a measure of welfare, we might conclude that a household that experienced a large increase in the budget share of necessities between wave 2 and wave 4 could be considered to have become worse off (other things being equal).

In this section, we look at how spending on each of our four basic goods varies as a proportion of income across the age and income distributions. We then look at the extent to which spending on basics as a proportion of income has changed between 2004–05 and 2008–09. Using the share of income devoted to basics as a yardstick of welfare, we ask what factors are associated with a large increase in this share.

Spending as a proportion of income

Table 3.6 shows that spending on food inside the home represents, on average, 18% of income. This percentage is lowest (16%) for the youngest age group and tends to rise across the age distribution. If we look at how this 'budget share' varies with income (Table 3.7), the differences are very marked. Nearly a third of income, on average, is devoted to spending on food in the home for those in the poorest income quintile, but this falls to just 8.4% for the richest quintile.

Spending on food outside the home makes up 2.4% of total income and this percentage falls as we move up the current age distribution. Perhaps surprisingly (since food out is often thought of as a luxury), this percentage is slightly higher for the poorest income group than for the highest. Part of the explanation for this might be that food outside the home includes not just restaurant meals but also any food eaten or prepared outside the home, including meals eaten at work.

Nearly 7% of income is devoted to spending on domestic fuel. Whilst this proportion does not vary very much by age, we can see substantial differences by income, with the lowest income quintile spending 13.5% of their income on domestic fuel and the richest income quintile spending just 2.9%.

Overall, clothing takes up around 4% of income on average. There is a fair amount of variation by both age and income, with the youngest and the poorest having higher 'budget shares' than their older and richer counterparts.

Table 3.6. Real equivalised weekly spending as a percentage of income in 2008–09 and percentage point change in spending as a percentage of income between 2004–05 and 2008–09, by age group

Age group (2008–09)	Food in	Food out	Domestic fuel	Clothing	Total basics	
	Spending as a % of income	Spending as a % of income	Spending as a % of income	Spending as a % of income	Spending as a % of income	Percentage point change in spending as a % of income, 2004–05 to 2008–09
55–59	16.2	2.9	6.2	4.6	27.4	2.0
60–64	17.1	2.8	6.2	4.2	28.5	1.4
65–69	18.6	2.4	6.5	4.3	30.0	1.0
70–74	19.3	2.3	7.1	3.7	31.1	1.1
75–79	19.9	2.0	7.8	3.6	31.9	0.5
80–84	20.0	1.9	7.9	2.5	31.2	–0.6
85+	19.0	1.6	7.9	2.4	29.9	–1.8
All	18.2	2.4	6.8	3.9	29.7	0.7
N	*6,870*	*6,928*	*6,691*	*6,910*	*6,525*	*4,155*

Table 3.7. Real equivalised weekly spending as a percentage of income in 2008–09 between 2004–05 and 2008–09 and percentage point change in spending as a percentage of income between 2004–05 and 2008–09, by income quintile

Income quintile (2008–09)	Food in	Food out	Domestic fuel	Clothing	Total basics	
	Spending as a % of income	Spending as a % of income	Spending as a % of income	Spending as a % of income	Spending as a % of income	Percentage point change in spending as a % of income, 2004–05 to 2008–09
Lowest	32.5	3.3	13.5	5.4	48.3	12.5
2	20.9	2.3	7.5	3.9	34.4	2.2
3	15.9	2.3	5.7	3.8	27.6	–1.5
4	12.7	2.2	4.4	3.4	22.6	–4.1
Highest	8.4	2.1	2.9	2.9	16.4	–7.1
All	18.2	2.4	6.8	3.9	29.7	0.7
N	*6,870*	*6,928*	*6,691*	*6,910*	*6,525*	*4,155*

Notes to Tables 3.6 and 3.7: The sum of food in, food out, domestic fuel and clothing does not exactly match total basics because of trimming. The sample for the levels of spending is the wave 4 sample as described in Section 3.3.1. The sample for the change in spending is the panel of households present in waves 2 and 4 that had positive spending on total basics in both waves, as described in Section 3.3.1.

The final pair of columns in Tables 3.6 and 3.7 show the proportion of income that is devoted to total basics. On average, households devote around a third of their income to total basics and, whilst this proportion does not vary very much by age, we see a big difference across the income distribution. At the very bottom of the income distribution, on average, just under a half of income is devoted to spending on basics. At the top of the income distribution, we see that only 16.4% of income, on average, is devoted to basics.

How has spending as a proportion of income changed between 2004–05 and 2008–09?

The observation that the fraction of household budgets allocated to necessities falls with income led Engel (1857) to argue that the budget share of necessities, or more specifically food, can be used as a yardstick of living standards. Tables 3.8 and 3.9 show how the percentage of income devoted to basics has changed between waves 2 and 4 of ELSA (2004–05 and 2008–09), by age group and income quintile respectively. On average, across all households in our sample, the change in the share is very small (0.7 percentage points). However, this average number masks a distribution where some

Table 3.8. Percentage point changes in spending on basics as a percentage of income, by age

Age group (2008–09)	Mean	25th percentile	Median	75th percentile	*N*
55–59	2.0	–6.0	1.2	10.3	*382*
60–64	1.4	–7.1	1.6	10.4	*850*
65–69	1.0	–7.5	1.3	11.1	*724*
70–74	1.1	–7.4	1.2	10.9	*802*
75–79	0.5	–8.9	0.9	10.2	*642*
80–84	–0.6	–9.7	–0.9	9.0	*427*
85+	–1.8	–13.2	–1.2	10.1	*328*
All	0.7	–8.2	0.9	10.3	*4,155*

Notes: The sample is the panel of households present in waves 2 and 4 as described in Section 3.3.1. In addition, only those households that spent less than 100% of their income on basics in both waves are included.

Table 3.9. Percentage point changes in spending on basics as a percentage of income, by income quintile

Income quintile (2008–09)	Mean	25th percentile	Median	75th percentile	*N*
Lowest	12.5	–2.3	11.3	25.5	*827*
2	2.2	–7.1	2.7	12.0	*962*
3	–1.5	–8.8	0.3	9.0	*882*
4	–4.1	–10.7	–0.9	5.3	*809*
Highest	–7.1	–12.7	–3.5	2.6	*675*
All	0.7	–8.2	0.9	10.3	*4,155*

Notes: The sample is the panel of households present in waves 2 and 4 as described in Section 3.3.1. In addition, only those households that spent less than 100% of their income on basics in both waves are included.

households have seen large increases in the proportion of their income devoted to basics. If we look at the mean change in the proportion of income devoted to basics by income (Table 3.9), we see that the very bottom of the income distribution has seen, on average, a 12.5 percentage point increase in the share of their income devoted to spending on basics. The top of the income distribution has seen a fall in the share of their income devoted to basics.

If we look at the 75th percentile point for changes in spending, we find that, overall, 25% of respondents saw at least a 10.3 percentage point increase in the share of income devoted to basics. If we look at the 75th percentile point by income quintile, we find that in the poorest group, 25% of individuals saw at least a 25.5 percentage point increase in the share of their income devoted to basics.

One important point to note, however, is that across the period, in addition to spending on basics having changed, households may also have seen changes in their income. Other things being equal, an increase in income will be associated with a fall in the share of income devoted to basics and a fall in income will lead to a rise in this share. One possible reason why some individuals at the top of the wave 4 income distribution have seen a fall in the share of income devoted to basics on average is that they may have seen a rise in their income over the period. Similarly, some individuals at the bottom of the income distribution may have seen an increase in their share of income devoted to basics because of a fall in their income over the period.

Table 3.10 uses multivariate analysis to analyse what factors are associated with a large change in the proportion of income devoted to basics. In doing so, we can look at each (observed) factor in isolation. For the purposes of our analysis, we divide households into two groups: those whose share of income devoted to basics increased by more than 10 percentage points (we refer to this as ‘a large increase’ for simplicity) and those who did not experience such a large increase. Overall, around 25% of our sample experienced a ‘large’ increase, according to this definition.

To investigate the characteristics that are associated with experiencing such a large increase in income share devoted to basics, Table 3.10 shows the results of an ordinary least squares (OLS) regression of a ‘large increase’ indicator variable on a set of observable characteristics that might be correlated with the budget share of basics, including controls for a change in income quintile (not reported). The resulting coefficients show the increase in the likelihood of experiencing a large increase in the income share devoted to basics that is associated with a given characteristic. For example, even after controlling for the change in income, we see a significant correlation with the initial level of income (defined in quintiles). Relative to the richest quintile, the poorest are 16.7 percentage points more likely to have seen a large increase in their budget share (and this is significant at the 0.1% level). There is no significant difference between the higher quintiles and the richest group in the likelihood of having seen a large increase.

Moving from being in a couple to being single (relative to remaining in a couple) leads to a 6.9 percentage point increase in the likelihood of seeing a large increase in the share of income devoted to basics. The only other factor that is significantly correlated with a large increase is the transition from

working to not working (retirement).Those who retire are 7.1 percentage points more likely to experience a large increase in the share of basics.

The issue of change in consumption upon retirement is an important and interesting issue and is one in which we turn to in the next section.

Table 3.10. Multivariate analysis of 'large' increase in the percentage of income devoted to basics

Dependent variable: >10 percentage point increase in the percentage of income devoted to basics	Coefficient	t-statistic
Age 55–59	reference	
Age 60–64	0.020	0.64
Age 65–69	0.003	0.11
Age 70–74	–0.003	–0.10
Age 75–79	0.007	0.27
Age 80–84	–0.003	–0.12
Age 85+	–0.019	–0.72
Income quintile		
Poorest	0.167	6.92‡
2nd	0.025	1.14
3rd	0.012	0.56
4th	–0.011	–0.53
Richest	reference	
Changes in household composition		
Couple–Couple	reference	
Couple–Single	0.069	2.31*
Single–Couple	–0.007	–0.11
Single–Single	–0.010	–0.77
Change in number of children in household	0.019	0.35
Work transitions		
Work–Work	reference	
Work–Not work	0.071	3.10†
Not work–Work	–0.022	–0.41
Not work–Not work	0.011	0.58
Education		
High education	reference	
Low education	0.007	0.51
Health		
Excellent or very good health	reference	
Good, fair or poor health	0.008	0.57
Constant	0.090	2.87†

Notes: Also included but not reported are controls for change in income quintile and dummies for missing education and missing health. Low education is defined as O levels/equivalent or below. The sample is the panel of households present in waves 2 and 4 as described in Section 3.3.1. In addition, only those households that spent less than 100% of their income on basics in both waves are included. Sample size = 4,155. Significance at 5%, 1% and 0.1% levels indicated by *, † and ‡ respectively.

3.3.4 Changes in spending around retirement

The issue of what happens to spending around retirement has attracted much research across the world.[17] Retirement is a time of much change in an individual's life and can be associated with changes in living standards. There are (at least) two reasons that we might expect expenditure or consumption to change around retirement. First, according to the life-cycle model of consumption, individuals should allocate consumption across their lifetime in order to maximise lifetime welfare. Roughly speaking, this means that even though income typically falls on retirement, we do not expect to see a corresponding fall in consumption of the same magnitude. Whether or not consumption is smoothed across retirement is an issue on which there is mixed evidence. Some studies have found that consumption falls by more than can be explained by observed factors of the model (e.g. Bernheim et al., 2001). However, other studies argue that the fall in consumption can be explained by extensions to the life-cycle model (e.g. Hurd and Rohwedder, 2003). Because of the lack of panel data on consumption, much of the research on changes in consumption around retirement in the UK has been done using repeated cross-sections of expenditure data. ELSA will allow us to study this topic more directly. Here, we carry out some preliminary analysis which will provide the starting point for future in-depth research.

The second reason why we might expect to see changes in expenditure around retirement is that retirement is a time when individuals might change the allocation of their spending across different goods. When individuals stop work, they have additional leisure time, which means they may spend more on goods that are associated with having that increased leisure. For example, spending more time at home might lead to a higher proportion of the budget to be spent on domestic fuel and leisure goods and services. For food inside the home, it is not clear in which direction the effect of having more leisure would work. On the one hand, more may be spent on food inside the home simply because of being at home for more hours. But on the other hand, having more time to prepare food from scratch rather than consume pre-prepared meals might lead to lower expenditures and hence a smaller proportion of the budget being spent on food. In this subsection, in addition to the four basic goods that we have used so far (food in, food out, clothing and domestic fuel), we also analyse the change in the share of leisure, because of its complementarity with retirement.

In addition to these general reasons why we might expect to see changes in expenditure around retirement, in the light of the large price increases in food and fuel, analysing what happens to the share of income devoted to spending on our four basic items around retirement is an issue that is important from the point of view of living standards.

Changes in the share of spending out of income around retirement

Tables 3.11 and 3.12 show the results of a set of OLS regressions for each of the four basic goods, for total basics and for leisure. The idea behind these

[17]See, for example, Banks, Blundell and Tanner (1998), Bernheim, Skinner and Weinberg (2001), Ameriks, Caplin and Leahy (2002), Hurd and Rohwedder (2003) and Haider and Stephens (2004).

regressions is to look at what happened to the share of spending on each of the goods around retirement. For each of the goods, we take spending as a share of income in 2008–09 and spending as a share of income in 2004–05. We then take the difference between the two shares to obtain the 'change in share'. A positive number would indicate that the share of spending out of income had increased. Table 3.11 takes the sample of workers only in wave 2 (the sample size varies slightly depending on which good we are looking at but is around 1,300). In the top section of the table, we regress the change in share on a retirement dummy with no further controls (except for age dummies and a dummy for each year/quarter, which are included in all regressions but not reported) so we can understand what happened to spending around retirement unconditional on any other characteristics. In the lower panel of the table, in addition to a retirement dummy, we also include a set of other controls. These include whether the individual had a partner who retired between waves, the change in income (in logs) and some controls for change in family composition.

Looking first of all at the unconditional effect of retirement on the change in the shares of each of the goods, we can see that, except for clothing and food out, there is a statistically significant increase in the share of all the goods on retirement. However, one of the biggest changes at retirement that will also affect the share of spending is change in income. If income falls, even if spending remains constant, we would see an increase in the share of spending out of income. In the lower section of the table, once we control for the other factors that influence the change in the shares of the goods, we can see that, in fact, for domestic fuel and for food out, there is a statistically significant *decline* in the share of spending out of income and that for the other goods there is no significant effect of retirement on the change in share. There is no significant change in the share of total basics on retirement. Using the share of spending on basics out of income as a yardstick of welfare, this suggests that there is no large change in this measure associated with retirement.

Not surprisingly, the largest single factor that affects the change in share is the change in household income that occurs on retirement. There are very few other observed factors associated with a change in any of the goods. Having a partner who retired between waves is significantly negatively correlated with the change in share of domestic fuel and significantly positively correlated with the change in share of leisure, while moving from being a couple to being single is significantly negatively correlated with the change in share of food inside the home.

Table 3.12 shows the results of a similar set of regressions but, instead of using the sample of those who were working in wave 2, we use the whole panel (subject to the selection criteria detailed in Section 3.2.1) regardless of whether they were working. Because there are other transitions into and out of work that might be correlated with the change in share, in addition to controlling for retirement we also include a control for moving into work ('not work–work') and being out of work in both waves ('not work–not work'). The base group is those in work in both waves. As with Table 3.11, the top part of the table shows the unconditional effect of the work transitions on the share of each of the goods out of income and the lower panel shows the effect of the

Table 3.11. OLS regression results of the change in share of basics and leisure between 2004–05 and 2008–09: workers only in 2004–05

Dependent variable is the change in share of ...	Food in		Food out		Domestic fuel		Clothing		Total basics		Leisure	
	Coeff.	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**	**Coeff.**	**t-stat**
Retired	5.54	6.61‡	0.56	1.87	1.60	4.08‡	0.74	1.11	9.50	8.37‡	1.57	2.76‡
Constant	12.83	0.80	0.65	0.11	7.59	1.13	12.64	0.93	34.48	1.81	2.42	0.24
N	*1,325*		*1,336*		*1,282*		*1,334*		*1,228*		*1,333*	
Retired	–0.45	–0.80	–0.71	–2.55*	–0.66	–2.09*	–1.16	–1.74	0.70	0.83	0.16	0.27
Partner retired	–1.08	–1.51	–0.60	–1.68	–1.03	–2.59†	0.10	0.12	–0.57	–0.54	1.72	2.32*
Change in ln household income	–17.99	–43.44‡	–3.91	–19.45‡	–6.88	–30.57‡	–5.43	–11.46‡	–24.77	–35.13‡	–3.34	–8.01‡
Couple–Single	–4.15	–2.52*	–0.01	–0.01	0.57	0.61	1.85	0.94	1.17	0.47	–0.92	–0.54
Single–Couple	1.21	0.57	1.40	1.30	–0.96	–0.81	1.41	0.55	–1.01	–0.32	3.70	1.66
Single–Single	0.51	0.82	–0.04	–0.11	0.12	0.33	0.82	1.11	0.35	0.37	0.13	0.21
Change in no. of children in household	–1.12	–0.71	0.74	0.93	–0.83	–0.93	–0.50	–0.26	–0.22	–0.09	–2.05	–1.25
Constant	2.16	0.21	–1.23	–0.24	3.57	0.70	8.44	0.65	17.52	1.31	–1.31	–0.14
N	*1,325*		*1,336*		*1,282*		*1,334*		*1,228*		*1,333*	

Notes: Age dummies and year/quarter dummies are also included. Significance at 5%, 1% and 0.1% levels indicated by *, † and ‡ respectively.

Table 3.12. OLS regression results of the change in share of basics and leisure between 2004–05 and 2008–09: workers and non-workers in 2004–05

Dependent variable is the change in share of ...	Food in		Food out		Domestic fuel		Clothing		Total basics		Leisure	
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Retired	5.59	6.75‡	0.44	1.57	1.55	3.52‡	0.73	1.13	9.33	7.91‡	1.44	2.63†
Not work–Work	–1.97	–1.00	–0.57	–0.85	–1.91	–1.83	0.40	0.26	–5.38	–1.90	–1.23	–0.96
Not work–Not work	–0.91	–1.33	–0.24	–1.03	–0.60	–1.64	–1.54	–2.89†	–2.25	–2.30*	–0.27	–0.60
Constant	–0.32	–0.05	–0.38	–0.18	0.23	0.07	4.32	0.92	–1.92	–1.06	–2.39	–0.60
N	*4,528*		*4,584*		*4,328*		*4,569*		*4,155*		*4,573*	
Retired	–0.78	–1.38	–0.60	–2.23*	–0.92	–2.46*	–0.90	–1.40	–0.35	–0.41	0.16	0.28
Not work–Work	2.96	2.25*	0.35	0.57	–0.22	–0.26	1.81	1.23	2.27	1.15	–0.38	–0.30
Not work–Not work	0.61	1.29	0.10	0.45	0.07	0.22	–0.95	–1.78	0.14	0.20	0.08	0.17
Partner retired	–1.11	–1.75	–0.65	–2.16*	–1.39	–3.35‡	–0.67	–0.93	–1.87	–1.97*	1.02	1.65
Partner not work–work	0.19	0.13	–0.08	–0.11	–0.11	–0.12	1.08	0.67	–0.24	–0.12	0.45	0.33
Partner not work–not work	0.69	1.39	–0.26	–1.10	–0.35	–1.08	–0.46	–0.82	–0.27	–0.37	–0.07	–0.14
Change in ln household income	–19.11	–74.68‡	–3.21	–27.66‡	–7.45	–45.55‡	–5.13	–18.55‡	–27.50	–65.86‡	–3.30	–13.77‡
Couple–Single	–1.42	–1.94	0.83	2.39*	2.11	4.36‡	1.03	1.24	3.21	2.89†	0.59	0.82
Single–Couple	0.29	0.17	2.15	2.60†	–1.12	–1.00	0.03	0.01	–1.08	–0.42	1.16	0.68
Single–Single	–0.32	–0.94	0.20	1.25	0.57	2.55*	0.29	0.76	0.49	0.97	0.49	1.50
Change in no. of children in household	–3.52	–2.57*	0.65	1.02	0.14	0.16	–1.71	–1.13	–2.21	–1.10	–1.92	–1.47
Constant	5.98	1.48	0.69	0.36	2.36	0.91	5.92	1.31	0.37	0.27	–1.96	–0.50
N	*4,528*		*4,584*		*4,328*		*4,569*		*4,155*		*4,573*	

Notes: Age dummies and year/quarter dummies are also included. Significance at 5%, 1% and 0.1% levels indicated by *, † and ‡ respectively.

work transitions after controlling for other changes that might be correlated with the change in share. The results are similar to what we found for the sample of workers only. Looking at the unconditional correlation of retirement with the change in share, we find a statistically significant effect for all goods except clothing and food out. However, once we control for the other factors, a statistically significant correlation remains only for domestic fuel and food out, where we see a decline in the share.

Having a partner who retired between waves has a negative effect on the share of domestic fuel and food out. Changes in family composition also appear to be correlated with changes in shares. Going from being in a couple to being single (relative to remaining in a couple) is associated with an increase in the share of food outside the home, domestic fuel and total basics. This is not surprising (particularly for fuel and total basics) given the economies of scale involved in living as a couple.

Overall, the results suggest that the reallocation of spending around retirement across different goods is minimal once we control for the changes in income and other factors that occur around the time of retirement. Whilst the regressions for the individual goods show how spending is reallocated across the basic goods, what matters most for welfare is spending on total basics. Whether we use the sample of workers (Table 3.11) or the sample of workers and non-workers (Table 3.12), we find that retirement is not a factor associated with changes in welfare, to the extent that welfare can be proxied by the share of spending on total basics out of income.

Changes in the level of spending on basics around retirement

Changes in the share of spending out of income are interesting both as a measure of welfare and as an indication of how spending is reallocated on retirement. In this subsection, we turn to the issue of the path of expenditure around retirement. To do this, we use the change in level of spending (in logs) as our dependent variable and estimate a simple OLS regression. As in Tables 3.11 and 3.12, we include indicators of retirement to understand what happens to spending on basics around retirement. If individuals did smooth expenditure across retirement, we would expect to see no significant effect of retirement on the change in the level of consumption on basics. The results are shown in Tables 3.13 and 3.14. As before, the top part of each table shows the effect of retirement without controlling for any other factors (except age dummies and year/quarter dummies, which, again, are included in all regressions) and the bottom panel shows the effect of retirement after controlling for other factors. In addition to the controls that we included in Tables 3.11 and 3.12, we also include some controls that are designed to differentiate between different types of retirement. The first is whether the individual retired before the state pension age. This coefficient will pick up any differential effect of retiring before the SPA. The second is the retirement dummy interacted with high education (defined as any qualification higher than O levels or equivalent). This will pick up whether individuals with higher education who retire smooth their consumption across retirement more or less than those with low education.

Table 3.13. OLS regression results of the change in level (ln) of spending on basics between 2004–05 and 2008–09: workers only in 2004–05

Dependent variable is the change in the ln of spending on ...	Total basics	
	Coeff.	**t-statistic**
Retired	0.01	0.29
Constant	0.03	0.07
N	*1,277*	
Retired	0.04	1.32
Retired before SPA	–0.02	–0.55
Retired × High education	–0.07	–1.51
Post SPA at wave 2	0.00	–0.07
Partner retired	–0.02	–0.51
Change in ln household income	0.03	1.42
Couple–Single	–0.33	–4.42‡
Single–Couple	0.37	3.94‡
Single–Single	0.03	0.94
Change in number of children in household	0.21	2.98†
Constant	0.08	0.20
F-tests		
Retired + Retired before SPA + Retired×High education = 0		1.13
Retired + Retired before SPA = 0		0.37
Retired + Retired×High education = 0		0.42
N	*1,277*	

Notes: Age dummies and year/quarter dummies are also included. High education is defined as having qualifications higher than O levels or equivalent. Significance at 5%, 1% and 0.1% levels indicated by *, † and ‡ respectively.

Table 3.13, which is based on the sample of workers only at wave 2, shows that, unconditionally, retirement is not significantly associated with a change in the level of spending on total basics. Once we control for other factors, we still find no significant effect of retirement on the change in the level of spending on basics. We also find no differential effect of the different types of retirement. Carrying out a joint test of significance of different combinations of the retirement dummies (for example, for someone who retired after state pension age but with high education, we would need to sum the coefficients on Retired and RetiredxHigh education), we also find no statistically significant effect of retirement on the change in the level of spending on basics.

The only factors that are associated with a change in the level of spending on basics are changes in family composition. Going from being a couple to being single is associated with a fall in spending on total basics and the opposite is true for forming a partnership. A decrease in the number of children in the household is associated with a decrease in spending on basics.

Table 3.14. OLS regression results of the change in level (ln) of spending on basics between 2004–05 and 2008–09: workers and non-workers in 2004–05

Dependent variable is the change in the ln of spending on ...	**Total basics**	
	Coeff.	**t-statistic**
Retired	0.01	0.27
Not work–Work	0.14	2.44*
Not work–Not work	0.01	0.42
Constant	0.28	1.66
N	*4,305*	
Retired	0.04	1.38
Not work–Work	0.13	2.21*
Not work–Not work	0.01	0.56
Retired × High education	–0.03	–0.83
Retired before SPA	–0.07	–1.52
Post SPA at wave 2	0.00	–0.06
Partner retired	–0.01	–0.50
Partner not work–work	0.06	0.91
partner not work–not work	0.01	0.42
Change in ln household income	0.02	1.51
Couple–Single	–0.33	–10.44‡
Single–Couple	0.32	4.37‡
Single–Single	0.02	1.01
Change in number of children in household	0.16	2.81†
Constant	0.26	1.56
F-tests		
Retired + Retired before SPA + Retired×High education = 0		1.59
Retired + Retired before SPA = 0		0.32
Retired + Retired×High education = 0		0.13
N	*4,305*	

Notes: Age dummies and year/quarter dummies are also included. High education is defined as having qualifications higher than O levels or equivalent. Significance at 5%, 1% and 0.1% levels indicated by *, † and ‡ respectively.

Table 3.14 shows the results of an OLS regression of the change in the level of spending on basics for the whole of the sample present in waves 2 and 4 regardless of whether they were working in wave 2. Again, we find no significant effect of retirement either individually or using joint tests. We do find a significantly positive effect of returning to work on the change in the level of spending on basics. As with the sample of workers only, we find significant effects of changes in family composition (couple–single, single–couple and change in the number of children).

Finding no association of retirement with the change in the level of spending on basics is consistent with the life-cycle model of consumption whereby

individuals (broadly speaking) smooth their consumption across retirement.[18] However, this analysis is descriptive and further, more structural research in this area would be desirable in order to investigate these conclusions further.

3.4 Conclusions

The analysis in this chapter has shown that average income and wealth increased among older people in England between 2002–03 and 2008–09. At the same time, however, the prices of items that make up a large share of pensioners' expenditure – especially domestic fuel – increased well above the rate of inflation. It is important, therefore, to consider both income and expenditure information when attempting to understand whether older people were 'better off' in 2008–09 than they were in 2002–03, when the ELSA survey began.

Looking at the income distribution (separately for ELSA respondents above and below the state pension age), we see that average incomes increased and income inequality rose somewhat (in both age groups) between 2002–03 and 2008–09. For individuals aged between 50 and the SPA, income from employment has become a more significant source of income towards the bottom of the income distribution, but a smaller share of income for those towards the top. Among individuals above the SPA, income from private pensions has grown in importance right across the income distribution – although income from the state (in the form of benefits and the state pension) remains the largest source of income for most pensioners.

Turning to the wealth distribution, we see most changes in households' real wealth being driven by changes in their housing wealth. During the 'boom' years (and especially between 2002–03 and 2004–05), we see significant increases in housing wealth driving an increase in total net wealth across the distribution. However, recent declines in house prices have started to reverse this trend (though average wealth levels remain substantially higher in 2008–09 than they were in 2002–03). The distribution of non-housing wealth has changed little over the four waves of the ELSA survey.

Focusing on individuals who have retired over the course of the ELSA survey, we see that most people experience a significant drop in income on entering retirement. However, individuals with low pre-retirement incomes (less than £150 per week) actually tend to see an increase in their income on entering retirement, perhaps as a result of state support for pensioners on low incomes (such as the Pension Credit) and the state pension.

Turning to the consumption expenditure of older people, we begin by noting the significant increases in prices (over and above inflation) of goods that typically make up a large portion of elderly households' budgets: food and domestic fuel. The average real-terms prices of these goods rose by 7% and 59%, respectively, between the 2004–05 and 2008–09 ELSA interviews. Because these goods make up a large part of elderly households' budgets, any

[18]Provided that there are no preference changes at retirement and if there are no links (or 'non-separabilities') between labour market participation and consumption expenditures in people's preferences.

price increases are likely to have a large impact on the well-being of these households.

Looking at spending on 'basics' (food, domestic fuel and clothing), we find that mean spending went up by 9.4%, while spending on domestic fuel increased by 37.3% between 2004–05 and 2008–09. Spending on basics as a percentage of income (which can be used as a measure of welfare) has stayed the same at the mean, but this disguises the fact that 25% of households experienced a 10 percentage point or more increase in the share of their income devoted to basics.

Individuals in the bottom income quintile (after controlling for other factors) are 17 percentage points more likely to experience an increase of more than 10 percentage points in the share of their income devoted to basics than those in the top income quintile. If we choose to use spending on basics as a percentage of income as a yardstick of welfare, this implies that the poorest have been affected the most by the rise in prices.

We then examined whether retirement is associated with a significant change in consumption, by comparing the shares of income devoted to spending on basic goods and on leisure before and after retirement. Once other factors (such as changes in income) have been accounted for, we find no significant association between these changes in shares and retirement.

Taken together, then, our results suggest that most individuals experience a fall in income on entering retirement, but that the share of their income they devote to spending on basics, which is sometimes considered as a measure of household welfare, does not change.

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4. Well-being in older age: a multidimensional perspective

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There is increasing interest in well-being as a key indicator of the success of public policy initiatives, since it is relevant to physical and mental health, social relationships, work and resource distribution. The approach used in this analysis of wave 4 of ELSA (2008–09) views well-being as a multidimensional construct, including satisfaction with life, sense of autonomy, control and self-realisation, and the absence of negative feelings of depression and loneliness. Comparisons are made with wave 2 of ELSA (2004–05), since the same well-being measures were available, in order to assess how well-being has changed over these four years in older adults in England. It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which may have affected the distributions of many of the measures collected.

Among other findings the analysis presented in this chapter shows that:

- There was little change in depression between wave 2 (2004–05) and wave 4 (2008–09). By contrast, life satisfaction and quality of life deteriorated, while loneliness increased over this period.
- Wealth is associated with all aspects of well-being. More affluent individuals have fewer depressive symptoms, greater life satisfaction, better quality of life and lower levels of loneliness.
- There is no evidence that the deterioration in life satisfaction, quality of life and loneliness measured between 2004–05 and 2008–09 is related to wealth. The extent of deterioration is the same in each wealth quintile.
- Depressive symptoms and loneliness rise with age, particularly among women, while quality of life decreases. Interestingly, however, life satisfaction is greater in men aged 65 and older than in younger men. This may be an age effect, or result from improvements in life satisfaction after retirement.
- Women aged 75 and older have particularly poor well-being, with high rates of depressive symptoms, low life satisfaction, poor quality of life and high levels of loneliness.
- The proportion of people with depressive symptoms decreased, while mean life satisfaction and quality of life increased, with an increasing number of close relationships.
- The likelihood of having persistent depressive symptoms (in both 2004–05 and 2008–09) decreased with the number of close personal relationships

that respondents reported in 2004–05. The strength of this relationship appeared to decrease with age.

- Frequency of contact with friends and relatives was positively associated with life satisfaction and quality of life. Its association with elevated depressive symptoms was only seen among those aged 50–64.
- People who perceived that their spouse was able to give them high levels of social support reported much higher levels of well-being than either married people who did not perceive their spouse gave them high levels of social support or people without a spouse or partner.
- Limitations in Activities of Daily Living (ADL) are a major correlate of well-being in middle-aged and older people. The differences in depressive symptoms, life satisfaction, quality of life and loneliness associated with impaired ADL are among the greatest observed in this chapter irrespective of age.
- People aged 50–64 with two or more limitations in ADL reported the lowest well-being levels. They had very low ratings of life satisfaction and quality of life and high levels of loneliness, while the majority of this group reported elevated depressive symptoms.
- Poor well-being is also related to cardiovascular diseases and related clinical risk factors (i.e. hypertension and diabetes), though differences are smaller than those associated with limitations in ADL.
- People with two or more cardiovascular diseases (or cardiovascular risk factors) reported considerably lower quality of life and higher rates of depressive symptoms compared to those without cardiovascular disease.

4.1 Introduction

One of the aims of public policy has been to promote the subjective well-being of the population (Cross-Government Strategy: Mental Health Division, 2009; Dolan and White, 2007; Layard, 2006). This means improving how people feel on a day-to-day basis, and how people evaluate their lives (Kahneman and Riis, 2005). There is growing evidence that high levels of well-being are associated with greater economic success, better social relationships and reduced risk of physical illness (Lyubomirsky, King and Diener, 2005; Pressman and Cohen, 2005). This is perhaps not surprising, since people who are successful in their jobs or have good family relationships feel better, while serious illness frequently leads to deterioration in mood and vitality. But intriguingly, longitudinal evidence is accumulating which suggests that high levels of well-being engender success in many domains of life. For example, longitudinal studies of initially healthy populations indicate that individuals who are happier, or less depressed, have reduced risk of developing serious physical illnesses such as coronary heart disease, even after other risk factors are taken into account (Chida and Steptoe, 2008; Davidson, Mostofsky and Whang, 2010). These findings have led to a growth in research over the past decade into understanding the determinants of well-being, and its consequences for social life, economic standing and health. Well-being is particularly important as people grow older, since it may contribute to

resilience (defined as the ability to cope with and flourish under adversity) in the face of stress and ill health (Ong, Bergeman and Boker, 2009). It should be remembered that the World Health Organization defines health as ‘a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity’.

Well-being is a multidimensional concept that has an affective or feeling component (how happy or unhappy the person is), and a reflective, judgemental component (how satisfied people are with their lives). Well-being also incorporates the notion of functioning effectively and general quality of life, involving issues such as realising one’s potential, having some sense of control over one’s life and having a sense of purpose (Ryan and Deci, 2001). Understanding well-being at older ages therefore requires a multidimensional approach to measurement, and this is what we have developed in ELSA. In this chapter, we analyse the affective, feeling component in terms of depressive symptoms, the reflective component through measures of life satisfaction, and effective functioning through the CASP-19 measure. We have also included analyses of loneliness. Loneliness is the feeling that emerges when social relationships are felt to be deficient, and may arise from a perceived lack of emotional intimacy or a lack of companionship. For many people, these feelings become more common when they grow older, since loved ones die or move away, and restrictions in mobility or economic circumstances limit social activities. Loneliness is therefore another important aspect of well-being.

This chapter describes how the different components of well-being vary with factors such as age, gender, wealth, social relationships, disability and health. We also describe differences in well-being between wave 2 (2004–05) and wave 4 (2008–09), to explore whether changes in circumstances over these years are associated with changes in well-being. Although old age is a time when these different economic, social and health forces conspire to impair quality of life, it is striking that some individuals maintain high levels of well-being. It is also apparent that the components of well-being sometimes show different patterns of change over time. Understanding these variations better would help the development of policies that promote the well-being of older people.

4.2 Methods

Sample

Three different samples were used in these analyses. Two samples from wave 2 (2004–05) and wave 4 (2008–09), respectively, were used for the needs of the cross-sectional analyses, while the group of people who participated in both 2004–05 and 2008–09 constituted the sample for the longitudinal analysis. The cross-sectional wave 2 sample was used exclusively in the cross-wave comparative analysis and consisted of all members of the original ELSA cohort who had participated in wave 2. The complete wave 4 sample was used in cross-sectional analysis to present the new well-being ELSA data that were collected in 2008–09. It was also used in the comparative cross-wave analysis of cohort and period differences in well-being between 2004–05 and 2008–09.

The complete wave 4 dataset included people from three different cohorts: (a) the original ELSA cohort that was drawn in 2002–03 and consisted of people then aged 50 or older; (b) the refreshment sample that was added to ELSA in 2006–07 and consisted of people then aged 50–54 years; and (c) a new cohort that was added to ELSA in 2008–09 and comprised people aged 50–75 years.

The longitudinal analysis aimed at highlighting changes in well-being at individual level. The sample employed for this analysis consisted of all members of the original ELSA cohort who had not dropped out of the study by 2008–09. Since there was some attrition from the study, the numbers in the longitudinal analysis were smaller than those in the cross-sectional wave 2 sample.

All samples included exclusively core members of the study (that is eligible members of any of the three ELSA cohorts who participated in at least one wave of the study) for whom a weighting factor to correct for non-response had been estimated. The cross-sectional wave 2 sample consisted of 8,780 individuals (55% women), the cross-sectional wave 4 sample of 9,805 individuals (55.1% women) and the longitudinal sample of 6,152 individuals (55.8% women). Information that was available for partners of core members of the study, who were not themselves core members of the study, was not used.

Well-being measures

Four different well-being-related measures were the outcome measures of our analysis: depression, life satisfaction, quality of life and loneliness.

(1) Negative affect is one of the main components of subjective well-being (Diener et al., 1999). In this chapter we measured negative affect as elevated depressive symptoms on the shortened version of the Center for Epidemiological Studies-Depression (CES-D) scale (Radloff, 1977; Steffick, 2000). The scale included eight questions about depressive symptoms experienced during the week before the ELSA interview. Each item was answered with a yes/no response, and responses were summed to create a scale ranging from 0 to 8. A dichotomous variable distinguishing between those with elevated depressive symptoms and those without elevated depressive symptoms was derived. The criterion used to distinguish between the two groups was the presence of four or more depressive symptoms. This is a well-known and validated cut point (Steffick, 2000). Thus, participants who reported four or more depressive symptoms were classified as having elevated depressive symptoms and therefore as possible cases of depression, while participants who reported fewer than four depressive symptoms were classified as free of elevated depressive symptoms.

(2) Life satisfaction is another central component of well-being. Unlike positive and negative affective states, which refer to the emotional dimension of well-being, life satisfaction reflects the cognitive-judgemental aspect of well-being (Diener et al., 1985). In ELSA, life satisfaction is measured with the Satisfaction with Life Scale (SWLS) (Diener et al., 1985). The scale consisted of five statements about overall satisfaction with life. Possible responses to these statements ranged from

7 (strongly agree) to 1 (strongly disagree) (mid-point 4: neither agree nor disagree). The life satisfaction summary score ranged from 5 to 35 with higher values reflecting greater satisfaction with life.

(3) Quality of life is another concept that is closely related to well-being. The main measure of quality of life in ELSA is CASP-19, which contains 19 questions on four domains of quality of life in early old age: control, autonomy, self-realisation and pleasure (Hyde et al., 2003). The four-point response scale ranged from 3 (often) to 0 (never). The possible range of the CASP-19 summary score was from 0 (worst/lowest possible score) to 57 (best/highest possible score).

(4) The ELSA questionnaire included four questions on loneliness (Hughes et al., 2004) that were selected from the 20-item revised UCLA loneliness scale (Russell, 1996) on the basis of their importance as constituent parts of the construct of loneliness. The four-item loneliness scale assesses the frequency with which ELSA respondents felt isolated and cut off from other people. The three-point response scale ranged from 1 (hardly ever/never) to 3 (often). The possible range of the loneliness summary score was from 4 (least lonely) to 12 (loneliest).

Classificatory measures

Three main classificatory variables were employed to analyse the four well-being measures: age, gender and wealth. Measures of social support, social networks, physical disability, cardiovascular morbidity and access to basic services and amenities were also used to analyse the well-being measures.

(1) Age was coded into the following three groups: 50–64 years, 65–74 years and 75 years or older. In longitudinal analyses, age in 2004–05 was used to classify participants.

(2) The socioeconomic variable used in the analysis was wealth. Wealth reflects command over material resources much better than any other measure of socioeconomic status (Oliver and Shapiro, 1997) and has been found to be the best socioeconomic predictor of health in the ELSA sample (Demakakos et al., 2008). For the purposes of analysis, wealth was categorised into quintiles of net total non-pension wealth measured at benefit unit level (benefit unit is a couple or single person along with their dependent children). The variable of net total non-pension wealth in ELSA reflected the value of all assets at the disposition of the benefit unit (i.e. houses or other property, businesses and any form of savings and investment) except pension wealth, minus debts owed by it. The longitudinal analyses employed wealth data from 2004–05, while the cross-sectional cross-wave analyses used wave-specific wealth data.

(3) Positive social support received by partner/spouse was measured by three questions on perceptions of support availability. Responses to each question ranged from ‘not at all’ to ‘a lot’. For the purposes of analysis, we derived a variable that categorised respondents by their marital status and further distinguished married respondents who reported the highest possible score of positive spouse/partner support from those who did not. Support from one’s spouse or partner was categorised in this way

because of the distribution of the social support data in ELSA, and because it is known that the mean score of this scale tends to be very close to the upper (positive) end of the possible range (Schuster, Kessler and Aseltine, 1990).

(4) Social networks were measured as the number of close relationships respondents had with other people and as the frequency of contact (either face to face or over the phone) they had with people not living with them.

Number of close relationships

Number of close relationships was measured as the sum of all close relationships respondents reported having with any of their children, relatives and friends. So as not to exclude respondents whose only close relationship with another person was that with their spouse, we also included spouse/partner as an additional close relationship in our variable, provided that the respondent characterised their relationship with their spouse/partner as 'very close' or 'quite close'. For the needs of analysis we used an ordinal variable that categorised the number of close relationships, as follows: 0–1, 2–3, 4–5, 6–9 and ≥10.

Frequency of contact

The frequency of contact (either face to face or over the phone) with friends, relatives and children who did not live with the respondent was assessed with a dichotomous variable. The objective was to identify respondents who had no frequent contact with anyone outside their household. Respondents who met (arranged or chance meetings) or spoke over the phone with any of their children, relatives or friends who did not live with them at a rate of twice a month or less often were identified as having no frequent social contacts. They were compared with the remainder of the sample who reported more frequent contact with people outside their household.

(5) Disability is used in this chapter as one of the main correlates of well-being because of its key role for older people's independence and quality of life. It was measured as limitations in Activities of Daily Living (ADL). The ELSA questionnaire included six ADL questions and an ADL summary score was derived by summing responses to all six questions. For the purposes of analysis, we derived an ordinal variable of ADL limitations with the following categories: no ADL limitation, one ADL limitation and two or more ADL limitations.

(6) Cardiovascular disease is an important health problem in middle and older ages. It was selected as the main health variable in our analysis because: (a) it is highly prevalent among older people; (b) it is a common cause of many health-related problems in older age; (c) it is known to impact on depression and well-being; and (d) positive affect and high levels of well-being may be protective (Davidson, Mostofsky and Whang, 2010). We explored the potential impact of cardiovascular morbidity on well-being at older ages by computing a variable that recorded the number of cardiovascular diseases our respondents reported having out of the following list: hypertension, diabetes, heart attack

(including myocardial infarction and coronary thrombosis), congestive heart failure, heart murmur, abnormal heart rhythm and stroke. The relationship between this cardiovascular morbidity index and the four well-being measures was then analysed.

(7) Access to basic amenities and services was assessed by asking the respondents how easy or difficult it was for them to get to the following places: bank, general practitioner, hospital and supermarket, using the usual forms of transport. The response options were: 'do not wish to go', 'very easy', 'quite easy', 'quite difficult', 'very difficult' and 'unable to go'. Any occurrence of any of the last three response options was coded as an access problem. Responses to all four questions were combined into a summary score. For the needs of the analysis all respondents who reported having more than two problems in accessing amenities and services were coded as having two problems. Thus, the ordinal variable we used had the following categories: no problem accessing any of the four amenities/services, problematic access to one of them and problematic access to two or more of them.

Analysis

The cross-wave analysis compared the cross-sectional distributions of the well-being characteristics in 2004–05 and 2008–09, and examined whether these varied with age, gender, wealth and number of close relationships. The aim was to explore possible period effects on the well-being of middle-aged and older people in England, given the major economic crisis that took place over the time ELSA wave 4 data were collected. For the needs of this analysis 2004–05 and 2008–09 cross-sectional samples were juxtaposed.

In parallel with the cross-wave analysis, we also examined the longitudinal changes in well-being between 2004–05 and 2008–09. The aim was to examine the extent of change and stability over time of the well-being of middle-aged and older people, analysing the same people at the two time points. Also, our longitudinal analyses aimed to identify key determinants of well-being and to describe the characteristics of people who consistently scored high on the well-being measures over the four-year period.

The objective of the wave 4 cross-sectional analyses was to examine the associations of well-being in 2008–09 with selected social and health variables.

Chi-square and ANOVA tests were used to assess the statistical significance of the observed differences in cross-sectional and longitudinal analyses. The level of statistical significance was $p \leq 0.05$. The analytic samples may vary because of the differing numbers of missing values. All analyses were weighted for non-response.

4.3 Well-being in 2004–05 and 2008–09

Well-being and age and gender

There is at present limited evidence about the pattern of well-being in older men and women in England. Women tend to have higher scores on measures of psychological distress and depression than men, but also report slightly higher levels of happiness and life satisfaction as well. One possible explanation is that women experience both positive and negative emotions more strongly than men do. Alternatively, women's greater social connectedness may expose them to a greater extent to the positive and negative experiences of those close to them (Donovan and Halpern, 2002). The relationship with age is also complex. Studies using simple one-item ratings of life satisfaction find lower levels in middle-aged than younger or older individuals, resulting in a U-shaped pattern across adult life (Blanchflower and Oswald, 2008). Conversely, depression levels tend to be lower in older individuals, as is the prevalence of clinical depression (Fiske, Wetherell and Gatz, 2009). It has been argued that the majority of people in their 70s and 80s enjoy high levels of well-being (Scheibe and Carstensen, 2010). However, some large population-based surveys of people over 65 have shown an increase in symptoms of depression with age (Prince et al., 1999). One British community study found that psychological distress was greatest among women over 65, while positive well-being declined with age (Huppert and Whittington, 2003).

The findings for the four measures of well-being in waves 2 and 4 of ELSA are shown in Figure 4.1 and Tables 4A.1a–4A.4b. Over the complete cohort, 18.7% of women and 11.5% of men had depressive symptoms above threshold in 2008–09, compared with 19.1% of women and 12.2% of men in 2004–05. This indicates stable levels of depression across the two waves analysed. Depression scores increased with age among women, but remained constant across the age spectrum in men. By contrast, life satisfaction and quality of life were lower in 2008–09 than in 2004–05, while levels of loneliness were higher in 2008–09 than in 2004–05. Thus, in every age category, participants reported lower life satisfaction, reduced quality of life and greater loneliness in 2008–09. It is tempting to speculate that this pattern may relate to the changing economic circumstances between 2004–05 and 2008–09 but this is an issue that requires a more detailed analysis, which is beyond the scope of this report. In addition, there were differences related to age and gender. Life satisfaction varied with age in men, being lower in the 50–64 age group. However, quality of life and loneliness showed a different pattern, being worse in the oldest age category (75 and older) for both men and women. Women reported feeling lonelier than men in both waves of ELSA, but there was little difference between sexes in quality of life. These cross-sectional cross-wave comparisons were largely corroborated in longitudinal analyses of individuals who participated in both waves.

Figure 4.1. Cross-wave comparison of the associations between well-being measures and age and gender

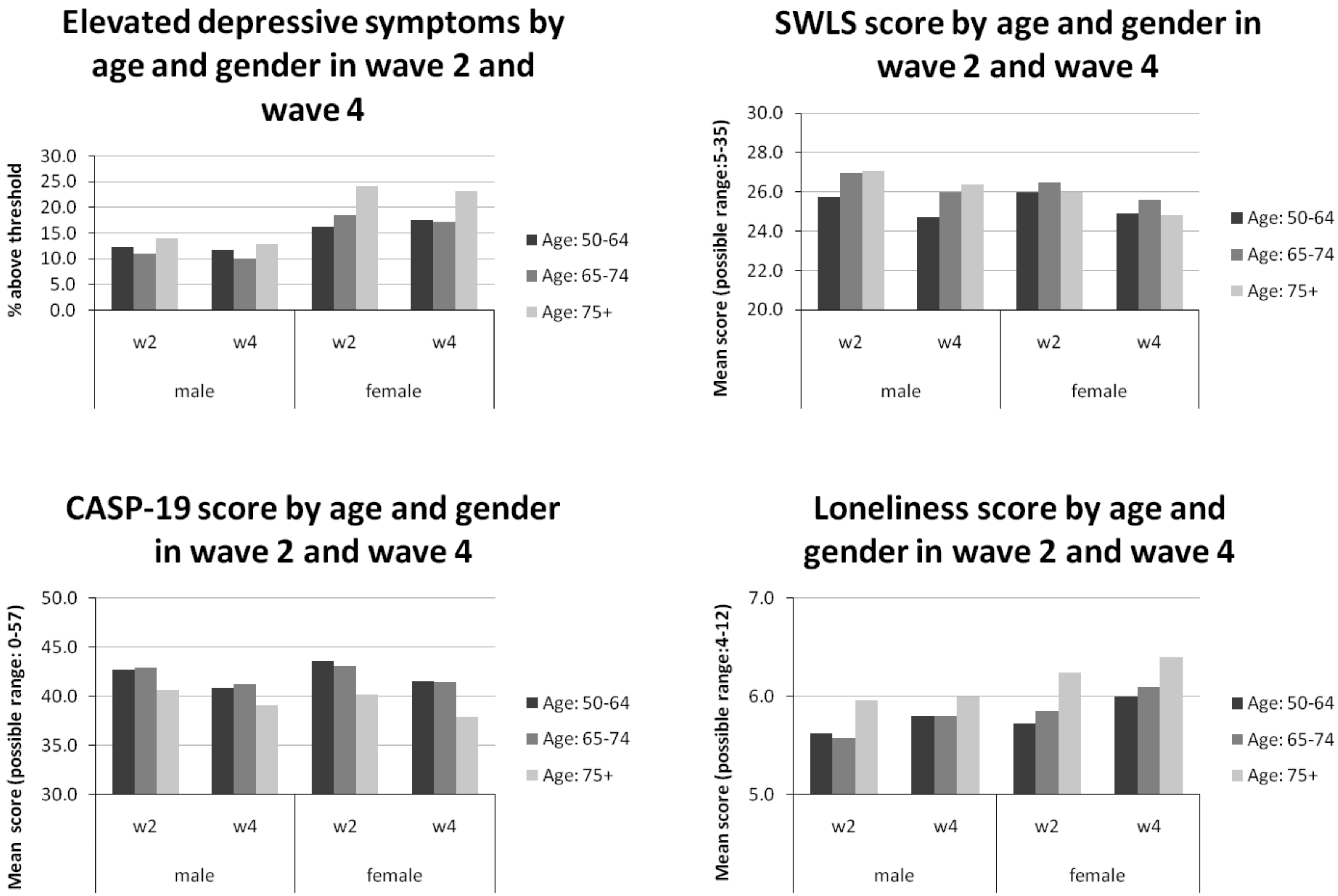
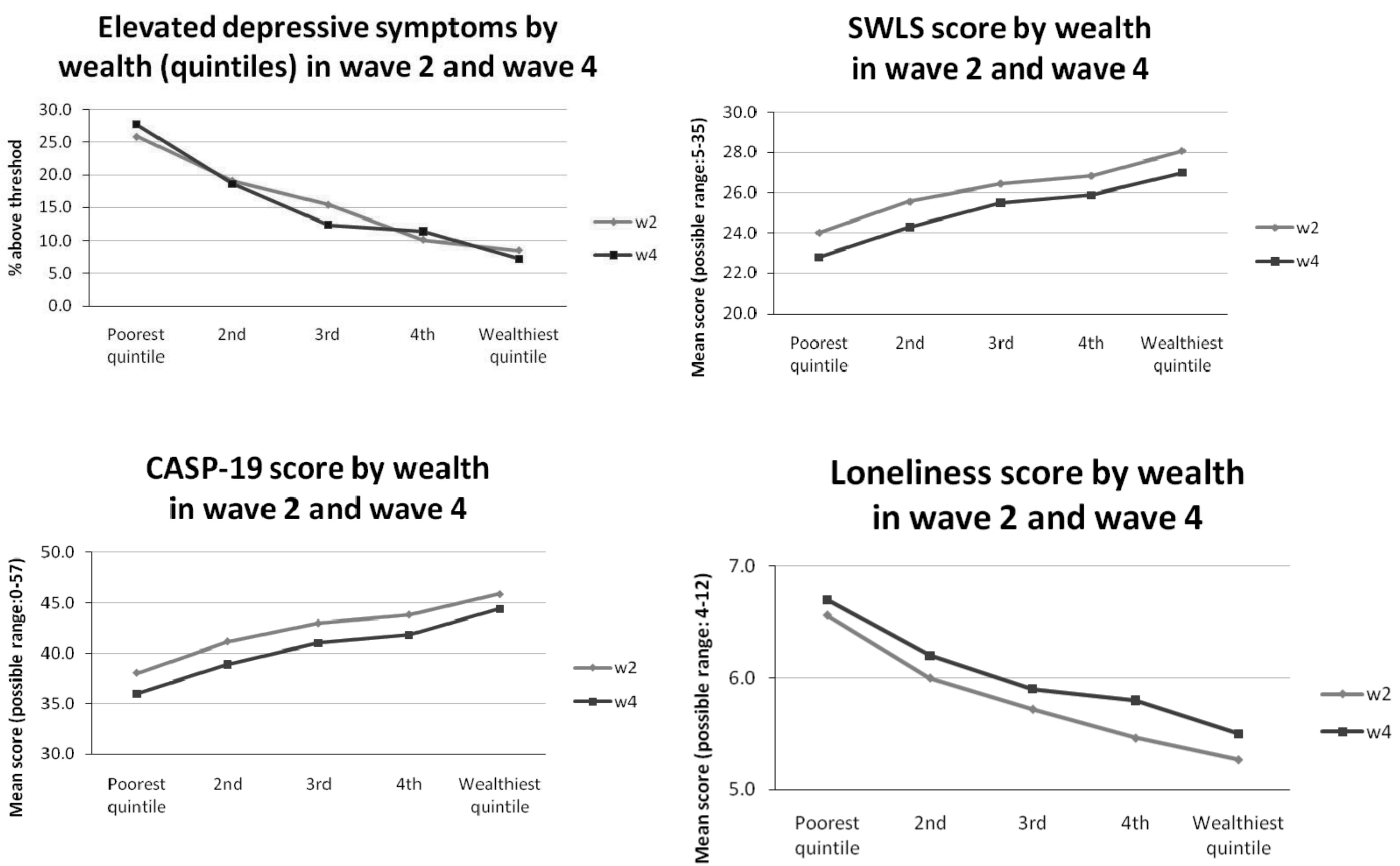


Figure 4.2. Cross-wave comparison of the associations between well-being measures and total net non-pension household wealth (quintiles)



The varying patterns of results for these measures emphasise that they are not equivalent, but tap different aspects of well-being. The reduced levels of life satisfaction and quality of life in 2008–09 compared with 2004–05 suggest deterioration in positive well-being among older people, but this is not translated into greater levels of depression. The fact that life satisfaction is maintained at older ages in men while quality of life deteriorates and levels of loneliness increase suggests that overall satisfaction is sustained despite loss of autonomy and social relationships. The most vulnerable group across the whole spectrum of well-being measures is women aged 75 and older, and their lower life satisfaction and quality of life and greater levels of loneliness appear to have intensified in 2008–09. The high levels of loneliness in this group may be an unwanted consequence of greater investment in social relationships earlier in life, resulting in a greater sense of isolation when these relationships are no longer present.

Well-being and wealth

There is a consistent negative association between socioeconomic markers such as wealth or occupational status and depression, with greater depression in less affluent groups (Lorant et al., 2003). Well-being and life satisfaction are positively related to income, though some authorities argue that relative rather than absolute income is more important (Dolan, Peasgood and White, 2008). In ELSA, we found that wealth is associated with greater well-being in all measures irrespective of gender (Tables 4A.5a–4A.8b). Figure 4.2 shows that wealthier participants had a lower prevalence of depression, greater life satisfaction, better quality of life and lower levels of loneliness than did less affluent groups. The differences are substantial: 27.5% of people in the poorest quintile in 2008–09 had depression scores above threshold, compared with only 7.2% of the wealthiest group. Similarly, CASP-19 quality of life scores were 22% higher in the wealthiest than in the poorest category. There is a clear gradient in all four measures, rather than a dichotomy between the poor and the remainder. So participants in the intermediate wealth quintiles had levels of well-being that fell on average between the most and least wealthy groups. The results in Figure 4.2 also indicate that the difference between waves in life satisfaction, quality of life and loneliness were present across the wealth spectrum. There is no evidence that the well-being of poorer individuals was especially affected by changes in household wealth between 2004–05 and 2008–09; instead decline was in parallel across wealth categories.

4.4 Well-being and social relationships

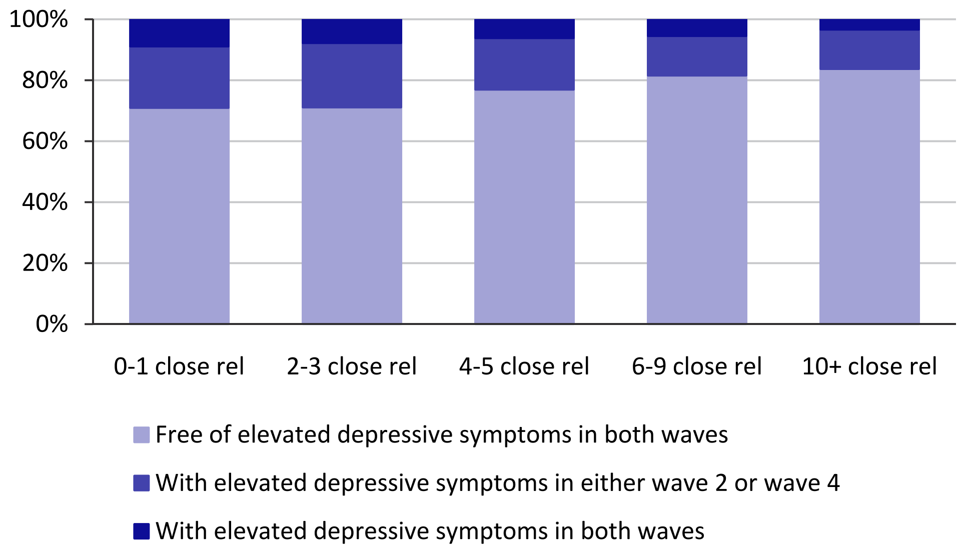
Social relationships are consistently shown to account for much of the variation in people's well-being (Bok, 2010). Indeed, it has been argued that close relationships with others contribute more to well-being than other factors (Antonucci, Lansford and Akiyama, 2001; Demir and Weitekamp, 2007; Diener and Biswas-Diener, 2008). In this section we looked at cross-wave, longitudinal and cross-sectional relationships between well-being and close personal relationships. We also examined the cross-sectional associations between well-being and frequency of contact with family and friends, and the amount of positive support people receive from their spouses or partners. Life

satisfaction, quality of life and depressive symptoms are the well-being indicators examined. Loneliness is not included in this section as we felt that conceptual overlap with social relationships was too great.

Well-being and number of close relationships in wave 4 (2008–09)

Over a quarter (about 28%) of respondents reported having ten or more close relationships, and only about 4% reported having one or no close relationships in 2008–09 (Tables 4A.9b–4A.11b). Table 4A.9b shows that the relationship between number of close relationships and depressive symptoms was stronger for those under the age of 75 than for those aged 75 or older. For example, among those aged 65–74, 9.5% of respondents with ten or more close relationships had depressive symptoms compared with 29.1% of those with one or fewer. The equivalent numbers for those aged 75 or older were 14.8% and 20.4%, respectively. The strength of relationships between number of close relationships and life satisfaction or quality of life also decreased with increasing age, but not as strikingly as for depressive symptoms (Tables 4A.10b–4A.11b).

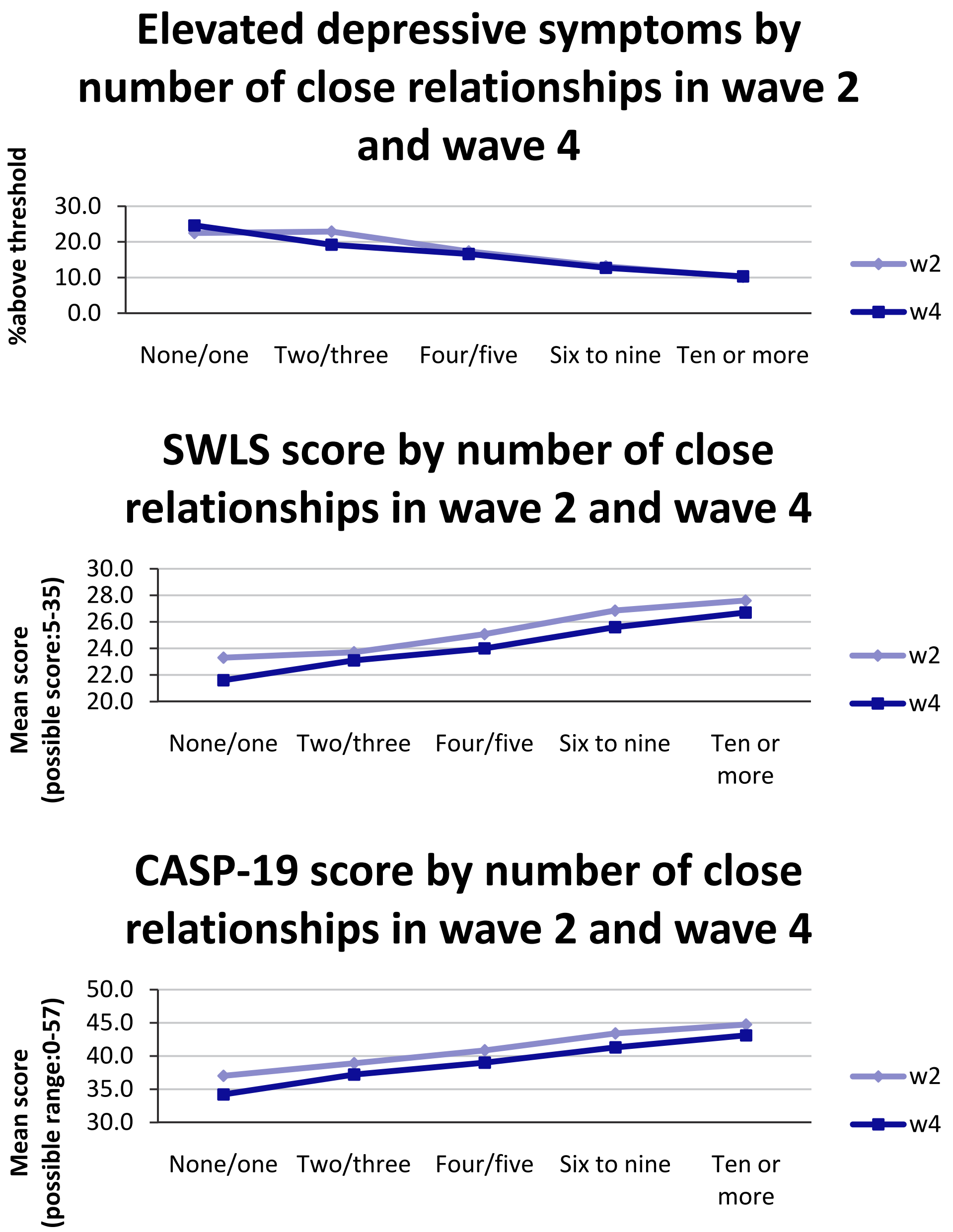
Figure 4.3. The longitudinal association between elevated depressive symptoms and number of close relationships



Well-being and number of close relationships in wave 2 (2004–05) and wave 4 (2008–09)

Comparisons between 2004–05 and 2008–09 showed that the association between close relationships and well-being did not change over time (Figure 4.4 and Tables 4A.9a–4A.11b). However, longitudinal analysis among those who responded at both waves showed that having fewer close relationships was associated with persistent depression (defined as elevated [≥4] depressive symptoms on the CES-D in both 2004–05 and 2008–09) (Figure 4.3). The strength of this relationship appeared to decrease with increasing age. Levels

Figure 4.4. Cross-wave associations between well-being measures and number of close relationships



of life satisfaction and quality of life increased, and the prevalence of elevated depressive symptoms decreased with the number of close personal relationships equally in both 2004–05 and 2008–09 (Figure 4.4).

Well-being and frequency of contact with friends and family in wave 4 (2008–09)

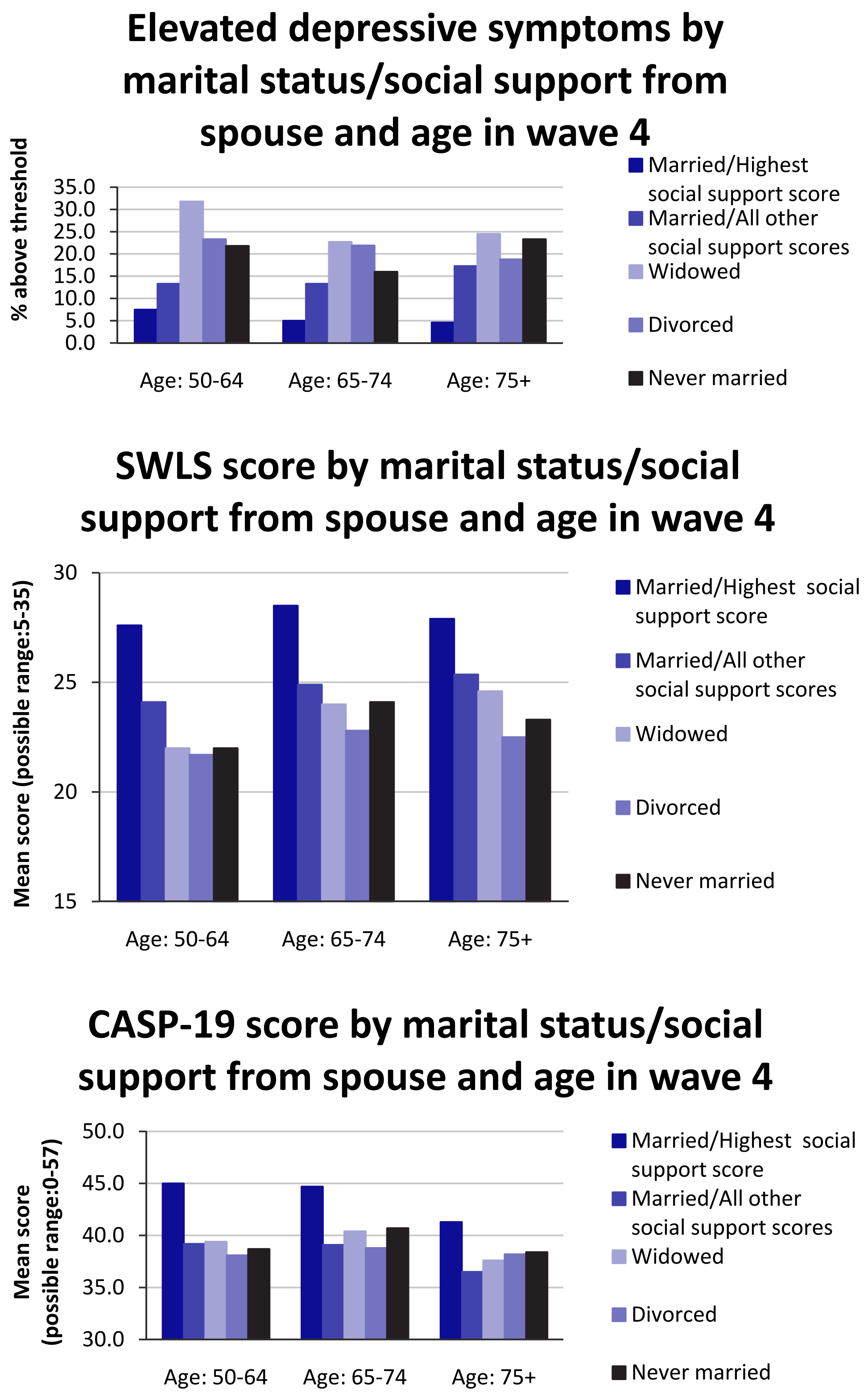
Cross-sectional relationships in 2008–09 show that people with infrequent social contact had slightly lower mean life satisfaction and quality of life scores than those with more frequent social contact. Table 4A.13 shows that those with infrequent social contact had a mean life satisfaction score of 23.4 compared with 25.3 for those with more frequent social contact. Similarly,

Table 4A.14 shows that those with infrequent contact with friends and family had a mean quality of life score of 38 compared with 40.9 for those who reported more frequent contact. Moreover, Table 4A.12 shows that, while there was no significant difference in prevalence of elevated depressive symptoms by frequency of social contact overall, younger respondents (aged 50–64) who had frequent contact with friends and relatives were less likely to have depressive symptoms, at 13.1%, compared with 17.9% of those who had infrequent contact with friends and family.

Well-being and marital status/positive support from spouse or partner in wave 4 (2008–09)

Many studies have shown that married couples are more satisfied with their lives (Diener and Diener-McGavran, 2008; Myers, 1999) and less likely to become depressed (Cochrane, 1996) than never or previously married individuals. In ELSA wave 4, 63% of people were living with a partner or spouse and, of those, half reported the highest possible levels of positive support from their spouse or partner. Those who reported high levels of support from their spouse or partner were the least likely to report elevated depressive symptoms at 6.4%, but those who reported lower levels of support from their partner or spouse were still less likely than those not living with a spouse or partner to have elevated depressive symptoms, at 13.8% compared with 21% for never married single people, 22.6% for separated or divorced people and 25.1% for widowed people. People who reported high levels of support from their partner or spouse had higher mean life satisfaction and quality of life scores than those who reported lower levels of support and those who were not living with a partner or spouse (Tables 4A.15–4A.17). Figure 4.5 shows that the prevalence of elevated depressive symptoms was particularly high among widows who were aged 50–64, and decreased with age for divorced people. Perhaps these age patterns reflect people's adjustment to these life events over time. The difference in the prevalence of elevated depressive symptoms between those reporting highest and lower levels of spouse or partner support increases across age groups. The higher levels of life satisfaction and quality of life among those who report the highest levels of support from their spouse or partner compared with those who do not or are not living with a spouse or partner are fairly consistent across age groups.

Figure 4.5. Associations between well-being measures and marital status/social support from spouse by age



4.5 Well-being, disability and health in wave 4 (2008–09)

Well-being and disability in wave 4 (2008–09)

It is well established that health is a major correlate of well-being (Chida and Steptoe, 2008; Ryan & Deci, 2001; Ryff, Singer and Love, 2004; Steptoe, Wardle and Marmot, 2005). In this section we capitalise on previous work on the association between health and well-being by exploring the association between health and disability and well-being in a large national sample. We used limitations in ADL and existence of cardiovascular diseases and related risk factors, which are two common problems in older ages, to analyse the four well-being measures: depression, life satisfaction, quality of life and loneliness (see Figures 4.6 and 4.7).

Table 4A.18 presents the distribution of depressive symptoms by age and categories of limitations in ADL. It shows that there is large variation in the rates of elevated depressive symptoms by ADL. Almost half of the people with two or more limitations in ADL (45.2%) reported elevated depressive symptoms, while the respective rate for those with no ADL limitations was much lower at 11.1%. People who reported one ADL limitation also reported an increased rate of elevated depressive symptoms (23.9%). The proportion of people with elevated depressive symptoms among those with two or more ADL limitations was one of the highest observed in this report, and indicates the detrimental impact of disability on happiness and well-being. Further analysis of this association by age was even more revealing. Differences in the rates of elevated depressive symptoms by ADL were large in the two older age groups (65–74 and 75 or older) but it was in the youngest age group (50–64 years) that they were the greatest with 56.2% of participants with two or more ADL limitations reporting elevated depressive symptoms compared with 28.3% of those with one ADL limitation and 10.7% of those without ADL limitations.

Table 4A.19 presents the association between ADL and life satisfaction by age category. As with elevated depressive symptoms, experiencing limitations in ADL was strongly related to poorer life satisfaction. The association was broadly linear, with people without any ADL limitation scoring on average 25.7 on the life satisfaction scale, those experiencing one ADL limitation having a lower mean score (23.8) and those with two or more ADL limitations having a mean score of 21. The average difference of 4.7 points between the two extreme categories was large (given that the possible range of the SWLS score was from 5 to 35) and reflected the influence of severe disability on people's satisfaction with their lives. A breakdown of this association by age did not reveal any major age-related differences, although in the youngest age group (50–64 years) the difference in life satisfaction by ADL was somewhat greater than in the oldest age group (75 years or older) (5.9 and 3.9 points, respectively). The mean life satisfaction score of those aged 50–64 years with two or more ADL limitations (19.4) is one of the lowest observed in this report.

Figure 4.6. Well-being measures by ADL and age in wave 4 (2008–09)

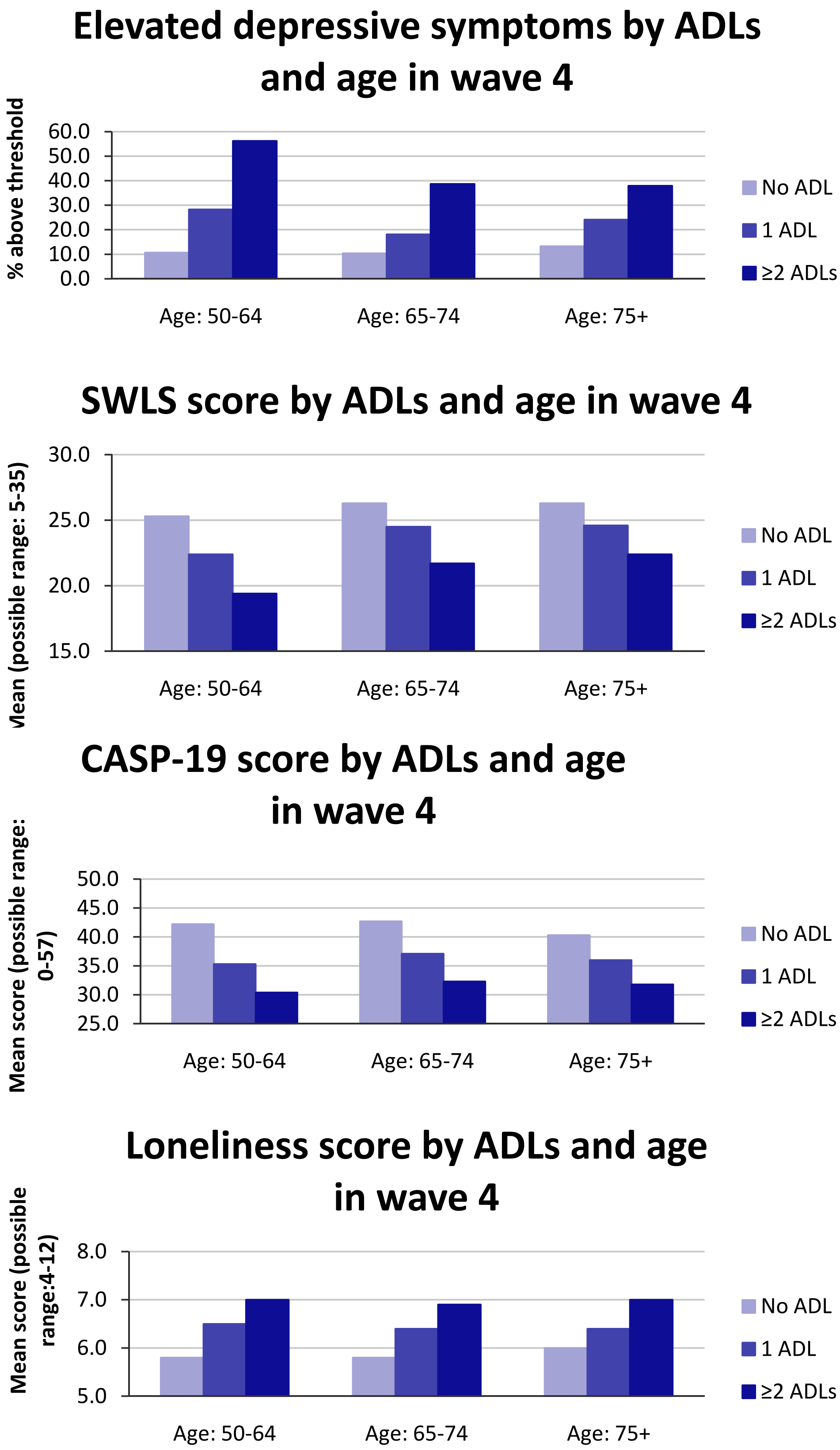


Figure 4.7. Well-being measures by cardiovascular comorbidities and age in wave 4 (2008–09)

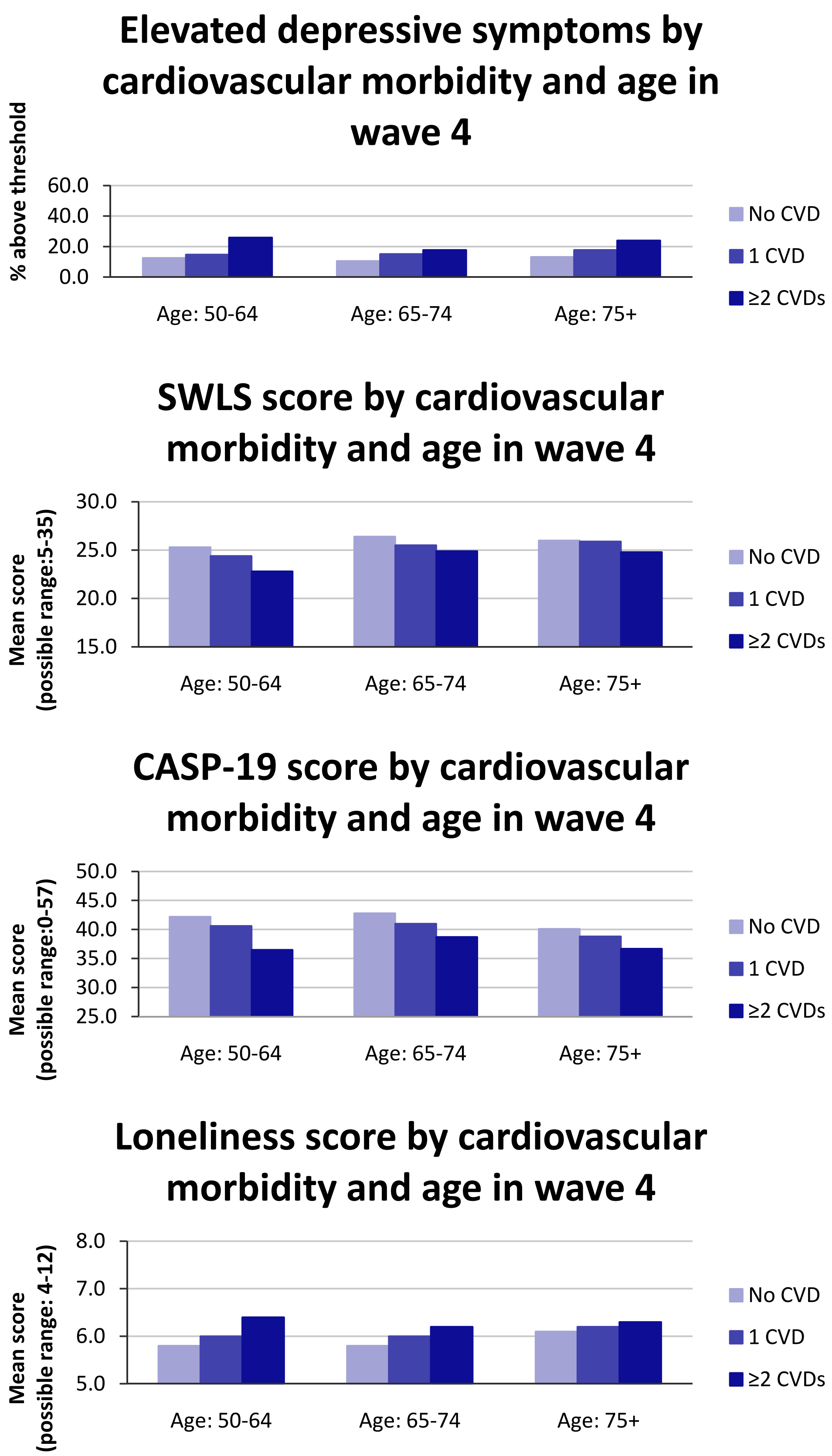


Table 4A.20 presents an analysis of CASP-19 scores by ADL and age categories. As expected, disability measured by ADL was a major correlate of quality of life at older ages. People with two or more ADL limitations had a very low mean CASP-19 score of 31.4. People experiencing one ADL limitation reported on average a somewhat higher CASP-19 score (36) than that of the people with two or more ADL limitations, but still this was considerably lower than that of people without problems in performing ADL (42.1). The mean difference between those without problems in performing ADL and those with two or more ADL problems was 10.7. As with life satisfaction and depression, it was in the youngest age group (50–64 years) that the greatest difference in the mean CASP-19 scores by ADL was observed (11.8 points). But, in general, differences in quality of life in relation to ADL status were comparable across the three age categories.

Table 4A.21 examines the association between ADL and loneliness by age. As with the other three measures, ADL limitations are a major correlate of loneliness in middle-aged and older people. People without problems performing ADL had on average a much lower loneliness score (5.8 points) than those with two or more ADL problems (7 points), while people with one ADL problem reported a mean loneliness score of 6.4. The association between ADL and loneliness did not vary much with age.

Well-being and cardiovascular morbidity in wave 4 (2008–09)

Cardiovascular diseases and related risk factors (i.e. hypertension and diabetes) were also important correlates of the four well-being measures but they were not as strongly related to them as limitations in ADL. Table 4A.22 analyses the association between elevated depressive symptoms and categories of cardiovascular morbidity by age. Differences in the rates of elevated depressive symptoms by cardiovascular disease status were large irrespective of age. On average, older people with two or more cardiovascular diseases reported almost double the rate of elevated depressive symptoms of older people who were free of cardiovascular disease (22.8% and 12.2%, respectively). The analysis of this association by age showed that in the youngest age group (50–64 years) differences in the rates of elevated depressive symptoms were slightly larger than in the other two age groups and that people in the intermediate age group had the lowest rates of elevated depressive symptoms.

The analysis of the association between life satisfaction and cardiovascular diseases according to age categories is presented in Table 4A.23. The existence of cardiovascular diseases or related risk factors was associated with life satisfaction, but differences in life satisfaction by category of cardiovascular morbidity on average were not large. The average difference between those without any cardiovascular disease and those with two or more cardiovascular diseases was 1.4 points (the respective difference for the association between ADL and life satisfaction was 4.7 points). As above, it was people aged 50–64 years with two or more cardiovascular health problems who reported the lowest mean life satisfaction score (22.8 points). Also, interestingly, differences in life satisfaction by cardiovascular disease almost disappear in the two older age groups (65–74 years and 75 years or older).

Table 4A.24 shows the association between quality of life and cardiovascular disease categories broken down by age categories. Cardiovascular morbidity was related to quality of life in all age groups. Differences in quality of life according to the number of cardiovascular diseases were less pronounced among those aged 65 years or older compared with those younger than 65 years. In the youngest age group the difference in quality of life between those without any cardiovascular disease and those with two or more was greater than 5 points and thus of potential clinical and social importance. An analysis of loneliness by cardiovascular morbidity and age is presented in Table 4A.25. Overall there were not any great differences in the loneliness score by cardiovascular disease category. Only those with two or more cardiovascular diseases had a slightly higher loneliness score compared with the other two categories of cardiovascular morbidity. As in Table 4A.24, differences were slightly more pronounced in the youngest age group than in the other two age groups.

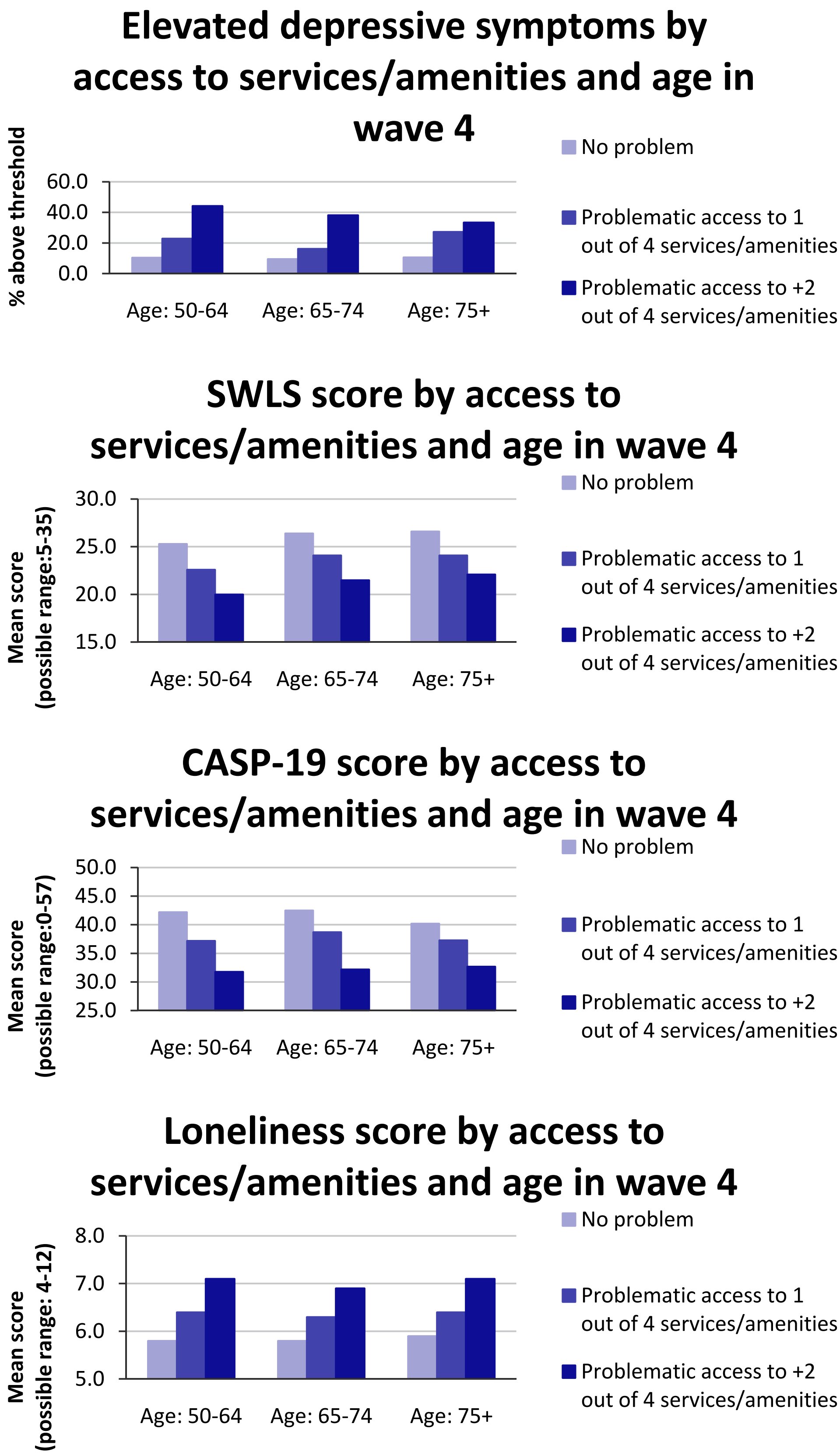
4.6 Well-being and access to services and amenities in wave 4 (2008–09)

Access to basic amenities and services is expected to be closely related to well-being at older ages. A friendly neighbourhood that provides easy access to all necessary amenities and services will enhance older people's ability to live independently and contribute to their well-being, while any obstacles in accessing basic amenities and services most probably will worsen older people's ability to be independent and impact negatively on their well-being.

In this section we explored the associations between well-being measures and access to four selected amenities and services (i.e. bank, general practitioner, hospital and supermarket) (Tables 4A.26–4A.29 and Figure 4.8). Our results show that problems in accessing amenities/services had a negative relationship with well-being in middle and older ages. The associations between well-being and access to the four selected amenities/services were linear and graded with people with most restricted access to amenities/services reporting considerably higher rates of depressive symptoms, higher loneliness score and poorer quality of life and satisfaction with life compared with those without any problems in accessing services and amenities.

Table 4A.26 shows that there was a strong positive association between elevated depressive symptoms and number of problems in accessing the selected amenities/services in people aged 50 years or older. People with problematic access to two or more of the selected amenities and services reported on average an almost four times higher rate of elevated depressive symptoms than those without difficulties in accessing any of the selected amenities/services (38.2% and 10.3%, respectively). As with ADL and cardiovascular comorbidities earlier, the differences in the rate of elevated depressive symptoms by number of difficulties with access to services and amenities were greater in the youngest age group (50–64 years) and less intense in the oldest age group (75 years or older). This is mostly due to a steady decrease in the rate of elevated depressive symptoms among those with

Figure 4.8. Well-being measures by access to services/amenities and age in wave 4 (2008–09)



problematic access to two or more amenities as age increases. Interestingly, the rate of elevated depressive symptoms among people without problems in accessing any of the selected amenities is stable at around 10% in all three age groups.

Table 4A.27 examines the association between satisfaction with life and access to amenities. This association is evenly graded with the differences in the mean SWLS score between those without any problems and those with two or more access problems in all three age groups being around 5 points (5.3, 4.9 and 4.5 in the youngest, intermediate and oldest age group, respectively). A noteworthy characteristic of this association is the steady increase in the SWLS scores by age for all categories of access to amenities. Table 4A.27 clearly indicates that the restrictions in accessing basic amenities and services have a considerable impact on middle-aged and older people's well-being that does not vary by age.

Ease of access to services and amenities is also inversely related to quality of life (Table 4A.28). The observed differences in quality of life by number of access problems are considerable in all three age groups but greater in the two younger ones (they range from 10.4 in the youngest age group to 7.5 in the oldest age group). These differences highlight difficulties in accessing the selected amenities and services as a major correlate of quality of life in middle-aged and older adults. The association between loneliness and access to amenities is presented in Table 4A.29. It has the same characteristics as the associations of the latter with satisfaction with life and quality of life. The average difference in loneliness score between the two extreme categories of access to amenities is quite considerable at 1.3 points and is almost the same in all three age groups.

4.7 Concluding remarks

The cross-wave and longitudinal analyses showed that quality of life and life satisfaction of middle-aged and older people in England have decreased within the period of four years that have elapsed between wave 2 and wave 4, while loneliness levels have increased. They also showed that there was no major systematic change in the rates of elevated depressive symptoms in the same period of time. Further analysis of the non-affective dimension of well-being (i.e. quality of life and life satisfaction) over time did not reveal any systematic variation with age, gender, wealth and number of close relationships. To the extent that the observed changes in the non-affective dimension of well-being between 2004–05 and 2008–09 are not random, they might indicate a period effect that is possibly related to the global financial crisis of 2008. But this possibility has not been tested directly in these analyses. It should also be pointed out that data had been collected from many ELSA participants in 2008–09 before the extent of the economic crisis became apparent, while others were assessed afterwards. A finer-grained analysis is therefore required to investigate associations between well-being and participants' experience of the economic downturn.

The cross-sectional analysis of wave 4 data showed that factors related to social networks, social support and physical disability and health were closely related to well-being.

The number of close relationships was related to well-being measures in a graded manner, with considerable differences between the two extreme categories (those having no or just one close relationship and those having ten or more). The frequency of contact with friends or relatives (either face to face or over the phone) was also a significant correlate of the non-affective dimensions of well-being (i.e. satisfaction with life and quality of life) but not of depression. These findings highlight the significance of the structural dimension of social relationships (as opposed to the functional dimension of social relationships, which primarily refers to social support and more generally to the content of social relationships) for well-being and indicate the importance of having an adequate and active personal social network in the pursuit of happiness.

Perceived social support from spouse/partner and marital status were also powerful correlates of well-being. People who perceived their spouse/partner as able to offer them the support they need had higher levels of well-being, compared with people who felt that their spouse/partner was not adequately supportive in times of need or those without a spouse. The latter two groups were different from each other in terms of elevated depressive symptoms (especially up to the age of 75 years) but were not much different in relation to the non-affective dimensions of well-being (quality of life and satisfaction with life). Interestingly, our analysis suggested that age influenced the association between depressive symptoms and social support and marital status to a greater extent than the associations of social support and marital status with life satisfaction and quality of life. Our findings suggest that having a high-quality relationship with one's spouse or partner is related to particularly high levels of well-being in middle and older ages. They also show the importance of perceived social support from spouse/partner for the emotional well-being of the oldest old. The findings indicate that being married but not receiving the highest possible amount of social support from one's partner or spouse leads to impaired levels of non-affective well-being that are comparable to those of people without a spouse/partner.

The close associations between physical disability and cardiovascular morbidity and well-being are important findings in this chapter. Physical disability was a powerful correlate of well-being, with differences in well-being according to disability (ADL) status being greater than differences according to age, gender or wealth. The magnitude of these differences can, at least in part, be attributed to the impact of severe physical disability on independence and the sense of control of older people. The association between cardiovascular morbidity and well-being was also strong (especially the association with depression), but less marked than the association between physical disability and well-being. This may be because conditions such as hypertension may have much less impact on quality of life and well-being than other conditions like heart failure. From a policy perspective, both associations are important for different reasons. Severe physical disability should be the target of preventive strategies aiming to enhance well-being in older ages because of its very close association with the quality of life of older people.

Cardiovascular diseases should also be targeted as a major set of preventable causes of ill health, with effects not only on premature mortality but also on well-being in older ages.

There were striking associations between all aspects of well-being and ability to access services and amenities such as shops and healthcare. Participants who reported difficulty accessing these amenities with the usual forms of transport had higher depression and loneliness levels, poorer quality of life and lower life satisfaction. These relationships are likely to be two-way. On the one hand, individuals with poor well-being may live in locations that are less accessible, or perceive greater difficulties in transportation. On the other hand, limited transport options may make everyday tasks like going to the supermarket or accessing health and financial services more difficult, leading to a deterioration in well-being. The causal sequence cannot be teased out from these cross-sectional findings. However, further analyses using the longitudinal components of the ELSA dataset will permit clearer conclusions to be drawn about the extent to which problems of access to services and amenities due to transportation difficulties impair well-being and quality of life.

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Appendix 4A
Tables on well-being in older age

Table 4A.1a. Elevated depressive (CES-D) symptoms by age and gender in wave 2 (2004–05)

		52–64	65–74	75+	All
		%	%	%	%
Men	<4 CES-D symptoms	87.8	89.0	86.0	87.8
	≥4 CES-D symptoms	12.2	11.0	14.0	12.2
	Weighted N	*1,985*	*1,146*	*798*	*3,929*
	Unweighted N	*1,833*	*1,199*	*808*	*3,840*
Women	<4 CES-D symptoms	83.9	80.9	76.0	80.9
	≥4 CES-D symptoms	16.1	19.1	24.0	19.1
	Weighted N	*2,081*	*1,249*	*1,276*	*4,606*
	Unweighted N	*2,181*	*1,367*	*1,171*	*4,719*

Note: Differences by age group and sex were statistically significant: $p \leq 0.001$.

Table 4A.1b. Elevated depressive (CES-D) symptoms by age and gender in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
Men	<4 CES-D symptoms	88.3	90.0	87.1	88.5
	≥4 CES-D symptoms	11.7	10.0	12.9	11.5
	Weighted N	*2,483*	*1,114*	*803*	*4,401*
	Unweighted N	*2,119*	*1,318*	*774*	*4,211*
Women	<4 CES-D symptoms	82.5	82.8	76.8	81.3
	≥4 CES-D symptoms	17.5	17.2	23.2	18.7
	Weighted N	*2,605*	*1,241*	*1,155*	*5,001*
	Unweighted N	*2,624*	*1,536*	*1,062*	*5,222*

Note: Differences by age group and sex were statistically significant: $p \leq 0.001$.

Table 4A.2a. SWLS score by gender and age in wave 2 (2004–05)

		52–64	65–74	75+	All
Men	Mean	25.7	27.0	27.1	26.3
	Std Deviation	6.3	5.8	5.7	6.1
	Weighted N	*1,760*	*1,019*	*623*	*3,402*
	Unweighted N	*1,642*	*1,074*	*638*	*3,354*
Women	Mean	26.0	26.5	26.0	26.1
	Std Deviation	6.4	6.1	6.1	6.3
	Weighted N	*1,885*	*1,076*	*934*	*3,895*
	Unweighted N	*1,983*	*1,185*	*871*	*4,039*

Note: Differences by age group were statistically significant: p≤0.001. Differences by sex were not: p=0.137.

Table 4A.2b. SWLS score by gender and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Men	Mean	24.7	26.0	26.4	25.3
	Std Deviation	6.4	5.8	5.7	6.2
	Weighted N	*2,128*	*966*	*633*	*3,727*
	Unweighted N	*1,845*	*1,156*	*621*	*3,622*
Women	Mean	24.9	25.6	24.8	25.1
	Std Deviation	6.6	6.1	6.2	6.4
	Weighted N	*2,271*	*1,074*	*856*	*4,201*
	Unweighted N	*2,309*	*1,344*	*810*	*4,463*

Note: Differences by age group were statistically significant: p≤0.001. Differences by sex were not: p=0.069.

Table 4A.3a. CASP-19 score by gender and age in wave 2 (2004–05)

		52–64	65–74	75+	All
Men	Mean	42.7	42.9	40.6	42.4
	Std Deviation	8.7	8.4	8.8	8.6
	Weighted N	*1,690*	*936*	*542*	*3,167*
	Unweighted N	*1,579*	*991*	*557*	*3,127*
Women	Mean	43.6	43.1	40.1	42.7
	Std Deviation	8.5	8.7	9.1	8.8
	Weighted N	*1,800*	*968*	*769*	*3,537*
	Unweighted N	*1,897*	*1,075*	*721*	*3,693*

Note: Differences by age group were statistically significant: p≤0.001. Differences by sex were not: p=0.187.

Table 4A.3b. CASP-19 score by gender and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Men	Mean	40.8	41.2	39.1	40.6
	Std Deviation	9.2	8.5	8.1	8.9
	Weighted N	*2,129*	*958*	*606*	*3,693*
	Unweighted N	*1,843*	*1,147*	*597*	*3,587*
Women	Mean	41.5	41.4	37.9	40.8
	Std Deviation	9.1	8.3	8.2	8.8
	Weighted N	*2,226*	*1,052*	*817*	*4,095*
	Unweighted N	*2,262*	*1,319*	*782*	*4,363*

Note: Differences by age group were statistically significant: p≤0.001. Differences by sex were not: p=0.429.

Table 4A.4a. Loneliness score by gender and age in wave 2 (2004–05)

		52–64	65–74	75+	All
Men	Mean	5.6	5.6	6.0	5.7
	Std Deviation	1.7	1.6	1.8	1.7
	Weighted N	*1,781*	*1,041*	*645*	*3,467*
	Unweighted N	*1,659*	*1,097*	*658*	*3,414*
Women	Mean	5.7	5.8	6.2	5.9
	Std Deviation	1.8	1.8	1.9	1.8
	Weighted N	*1,917*	*1,095*	*982*	*3,994*
	Unweighted N	*2,014*	*1,209*	*912*	*4,135*

Note: Differences by age group and sex were statistically significant: $p \leq 0.001$.

Table 4A.4b. Loneliness score by gender and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Men	Mean	5.8	5.8	6.0	5.9
	Std Deviation	1.7	1.7	1.6	1.7
	Weighted N	*2,147*	*978*	*653*	*3,778*
	Unweighted N	*1,859*	*1,168*	*639*	*3,666*
Women	Mean	6.0	6.1	6.4	6.1
	Std Deviation	1.8	1.8	1.8	1.8
	Weighted N	*2,286*	*1,103*	*885*	*4,274*
	Unweighted N	*2,323*	*1,381*	*838*	*4,542*

Note: Differences by age group and sex were statistically significant: $p \leq 0.001$.

Table 4A.5a. Elevated depressive (CES-D) symptoms by gender and wealth in wave 2 (2004–05)

			52–64	65–74	75+	All
			%	%	%	%
Men	Poorest quintile	<4 CES-D symptoms	74.5	78.5	80.4	77.2
		≥4 CES-D symptoms	25.5	21.5	19.6	22.8
		Weighted N	*332*	*217*	*192*	*741*
		Unweighted N	*274*	*206*	*180*	*660*
	2nd	<4 CES-D symptoms	85.2	86.3	82.0	84.8
		≥4 CES-D symptoms	14.8	13.7	18.0	15.2
		Weighted N	*370*	*220*	*169*	*759*
		Unweighted N	*335*	*230*	*168*	*733*
	3rd	<4 CES-D symptoms	89.6	89.9	88.7	89.5
		≥4 CES-D symptoms	10.4	10.1	11.3	10.5
		Weighted N	*386*	*241*	*151*	*779*
		Unweighted N	*358*	*250*	*156*	*764*
	4th	<4 CES-D symptoms	91.4	96.1	89.7	92.5
		≥4 CES-D symptoms	8.6	3.9	10.3	7.5
		Weighted N	*431*	*235*	*145*	*811*
		Unweighted N	*406*	*252*	*153*	*811*
	Wealthiest quintile	<4 CES-D symptoms	94.7	93.1	91.7	93.7
		≥4 CES-D symptoms	5.3	6.9	8.3	6.3
		Weighted N	*437*	*215*	*131*	*784*
		Unweighted N	*435*	*243*	*141*	*819*

Continues

Table 4A.5a continued

			52–64	65–74	75+	All
			%	%	%	%
Women	Poorest quintile	<4 CES-D symptoms	70.7	73.6	72.0	72.0
		≥4 CES-D symptoms	29.3	26.4	28.0	28.0
		Weighted N	*350*	*269*	*436*	*1055*
		Unweighted N	*346*	*278*	*377*	*1001*
	2nd	<4 CES-D symptoms	79.9	77.4	74.5	77.7
		≥4 CES-D symptoms	20.1	22.6	25.5	22.3
		Weighted N	*409*	*261*	*258*	*928*
		Unweighted N	*425*	*285*	*242*	*952*
	3rd	<4 CES-D symptoms	83.0	81.9	74.7	80.3
		≥4 CES-D symptoms	17.0	18.1	25.3	19.7
		Weighted N	*405*	*241*	*252*	*899*
		Unweighted N	*423*	*271*	*236*	*930*
	4th	<4 CES-D symptoms	90.6	84.8	83.7	87.4
		≥4 CES-D symptoms	9.4	15.2	16.3	12.6
		Weighted N	*406*	*249*	*184*	*839*
		Unweighted N	*426*	*276*	*182*	*884*
	Wealthiest quintile	<4 CES-D symptoms	91.4	88.8	83.8	89.4
		≥4 CES-D symptoms	8.6	11.2	16.2	10.6
		Weighted N	*456*	*217*	*141*	*813*
		Unweighted N	*504*	*246*	*130*	*880*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.5b. Elevated depressive (CES-D) symptoms by gender and wealth in wave 4 (2008–09)

			50–64	65–74	75+	All
			%	%	%	%
Men	Poorest quintile	<4 CES-D symptoms	73.6	78.1	76.0	75.3
		≥4 CES-D symptoms	26.4	21.9	24.0	24.7
		Weighted N	*411*	*203*	*172*	*785*
		Unweighted N	*315*	*209*	*138*	*662*
	2nd	<4 CES-D symptoms	85.4	87.7	86.8	86.2
		≥4 CES-D symptoms	14.6	12.3	13.2	13.8
		Weighted N	*483*	*188*	*157*	*828*
		Unweighted N	*397*	*213*	*151*	*761*
	3rd	<4 CES-D symptoms	92.5	92.9	88.2	91.8
		≥4 CES-D symptoms	7.5	7.1	11.8	8.2
		Weighted N	*468*	*219*	*166*	*854*
		Unweighted N	*392*	*258*	*160*	*810*
	4th	<4 CES-D symptoms	90.8	92.8	91.2	91.4
		≥4 CES-D symptoms	9.2	7.2	8.8	8.6
		Weighted N	*511*	*235*	*163*	*910*
		Unweighted N	*460*	*289*	*170*	*919*
	Wealthiest quintile	<4 CES-D symptoms	96.0	95.6	95.5	95.8
		≥4 CES-D symptoms	4.0	4.4	4.5	4.2
		Weighted N	*544*	*249*	*128*	*921*
		Unweighted N	*501*	*322*	*138*	*961*

Continues

Table 4A.5b continued

			50–64	65–74	75+	All
			%	%	%	%
Women	Poorest quintile	<4 CES-D symptoms	66.1	71.1	74.6	70.1
		≥4 CES-D symptoms	33.9	28.9	25.4	29.9
		Weighted N	*456*	*219*	*355*	*1030*
		Unweighted N	*428*	*249*	*296*	*973*
	2nd	<4 CES-D symptoms	78.7	78.5	74.1	77.4
		≥4 CES-D symptoms	21.3	21.5	25.9	22.6
		Weighted N	*514*	*228*	*270*	*1011*
		Unweighted N	*502*	*285*	*250*	*1037*
	3rd	<4 CES-D symptoms	85.1	84.6	81.0	84.0
		≥4 CES-D symptoms	14.9	15.4	19.0	16.0
		Weighted N	*490*	*278*	*216*	*984*
		Unweighted N	*493*	*341*	*208*	*1042*
	4th	<4 CES-D symptoms	88.7	88.2	75.6	85.9
		≥4 CES-D symptoms	11.3	11.8	24.4	14.1
		Weighted N	*499*	*248*	*193*	*941*
		Unweighted N	*514*	*314*	*185*	*1013*
	Wealthiest quintile	<4 CES-D symptoms	91.4	88.9	83.4	89.7
		≥4 CES-D symptoms	8.6	11.1	16.6	10.3
		Weighted N	*560*	*252*	*115*	*927*
		Unweighted N	*601*	*328*	*117*	*1046*

Note: Differences by wealth quintile were statistically significant in men and women: p≤0.001.

Table 4A.6a. SWLS by wealth and age in wave 2 (2004–05)

			52–64	65–74	75+	All
Men	Poorest quintile	Mean	22.0	24.2	25.9	23.5
		Std Deviation	7.8	6.9	6.5	7.4
		Weighted N	*258*	*174*	*128*	*560*
		Unweighted N	*217*	*165*	*121*	*503*
	2nd	Mean	25.1	26.0	26.8	25.7
		Std Deviation	6.4	6.2	6.7	6.4
		Weighted N	*324*	*184*	*121*	*630*
		Unweighted N	*297*	*194*	*122*	*613*
	3rd	Mean	26.2	27.8	27.3	26.9
		Std Deviation	5.8	5.1	5.3	5.5
		Weighted N	*348*	*217*	*122*	*687*
		Unweighted N	*324*	*226*	*126*	*676*
	4th	Mean	26.4	27.8	27.1	26.9
		Std Deviation	5.5	5.0	5.1	5.3
		Weighted N	*405*	*226*	*129*	*759*
		Unweighted N	*381*	*244*	*136*	*761*
	Wealthiest quintile	Mean	27.7	28.6	28.4	28.1
		Std Deviation	5.1	4.8	4.3	4.9
		Weighted N	*409*	*203*	*115*	*727*
		Unweighted N	*408*	*230*	*124*	*762*

Continues

Table 4A.6a continued

			52–64	65–74	75+	All
Women	Poorest quintile	Mean	23.0	25.2	25.3	24.4
		Std Deviation	7.5	6.3	6.5	6.9
		Weighted N	*289*	*207*	*285*	*781*
		Unweighted N	*290*	*213*	*250*	*753*
	2nd	Mean	25.3	25.5	25.9	25.5
		Std Deviation	6.7	6.3	6.3	6.5
		Weighted N	*361*	*208*	*197*	*765*
		Unweighted N	*375*	*230*	*188*	*793*
	3rd	Mean	25.9	26.4	26.0	26.1
		Std Deviation	6.4	6.5	6.2	6.4
		Weighted N	*388*	*222*	*177*	*787*
		Unweighted N	*406*	*250*	*167*	*823*
	4th	Mean	26.6	26.9	26.9	26.8
		Std Deviation	5.8	6.1	4.9	5.7
		Weighted N	*377*	*232*	*152*	*762*
		Unweighted N	*395*	*257*	*153*	*805*
	Wealthiest quintile	Mean	28.2	28.5	27.0	28.1
		Std Deviation	5.0	4.7	5.5	5.0
		Weighted N	*424*	*200*	*115*	*739*
		Unweighted N	*469*	*227*	*107*	*803*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.6b. SWLS by wealth and age in wave 4 (2008–09)

			50–64	65–74	75+	All
Men	Poorest quintile	Mean	21.4	23.7	25.6	22.9
		Std Deviation	7.2	6.7	6.2	7.0
		Weighted N	*310*	*154*	*123*	*587*
		Unweighted N	*240*	*161*	*102*	*503*
	2nd	Mean	23.5	25.5	25.8	24.4
		Std Deviation	6.8	6.0	5.8	6.5
		Weighted N	*403*	*157*	*116*	*673*
		Unweighted N	*339*	*182*	*115*	*636*
	3rd	Mean	24.8	26.3	27.2	25.7
		Std Deviation	6.1	5.1	5.4	5.8
		Weighted N	*396*	*201*	*126*	*723*
		Unweighted N	*336*	*235*	*122*	*693*
	4th	Mean	25.7	26.2	26.1	25.9
		Std Deviation	6.0	5.8	5.9	6.0
		Weighted N	*476*	*210*	*143*	*828*
		Unweighted N	*429*	*263*	*149*	*841*
	Wealthiest quintile	Mean	26.8	27.5	27.0	27.0
		Std Deviation	5.0	4.9	4.9	5.0
		Weighted N	*497*	*229*	*113*	*839*
		Unweighted N	*463*	*295*	*122*	*880*

Continues

Table 4A.6b continued

			50–64	65–74	75+	All
Women	Poorest quintile	Mean	21.5	23.7	24.0	22.7
		Std Deviation	7.8	6.8	6.8	7.4
		Weighted N	*345*	*168*	*213*	*726*
		Unweighted N	*334*	*195*	*186*	*715*
	2nd	Mean	24.0	24.6	24.3	24.2
		Std Deviation	6.7	6.2	6.2	6.5
		Weighted N	*445*	*190*	*189*	*825*
		Unweighted N	*436*	*241*	*179*	*856*
	3rd	Mean	25.0	25.6	25.6	25.3
		Std Deviation	6.0	6.0	5.6	5.9
		Weighted N	*431*	*248*	*185*	*864*
		Unweighted N	*435*	*307*	*179*	*921*
	4th	Mean	25.8	26.3	25.2	25.8
		Std Deviation	5.9	5.6	6.1	5.9
		Weighted N	*463*	*217*	*167*	*847*
		Unweighted N	*477*	*274*	*162*	*913*
	Wealthiest quintile	Mean	27.1	27.0	26.0	26.9
		Std Deviation	5.7	5.4	5.8	5.6
		Weighted N	*513*	*238*	*96*	*846*
		Unweighted N	*553*	*311*	*98*	*962*

Note: Differences by wealth quintile were statistically significant in men and women: p≤0.001.

Table 4A.7a. CASP-19 score by wealth and age in wave 2 (2004–05)

			52–64	65–74	75+	All
Men	Poorest quintile	Mean	36.7	37.8	37.9	37.3
		Std Deviation	10.3	9.7	9.8	10.0
		Weighted N	*237*	*162*	*107*	*506*
		Unweighted N	*199*	*154*	*102*	*455*
	2nd	Mean	41.3	41.1	38.7	40.8
		Std Deviation	8.6	8.0	9.2	8.6
		Weighted N	*306*	*168*	*106*	*580*
		Unweighted N	*280*	*179*	*106*	*565*
	3rd	Mean	43.2	43.2	41.6	42.9
		Std Deviation	7.9	7.4	7.5	7.7
		Weighted N	*342*	*196*	*103*	*640*
		Unweighted N	*319*	*203*	*107*	*629*
	4th	Mean	44.1	44.7	41.0	43.8
		Std Deviation	7.8	7.4	8.9	7.9
		Weighted N	*388*	*207*	*113*	*708*
		Unweighted N	*365*	*224*	*120*	*709*
	Wealthiest quintile	Mean	45.8	46.6	43.7	45.7
		Std Deviation	7.0	6.9	7.4	7.0
		Weighted N	*403*	*189*	*105*	*697*
		Unweighted N	*402*	*217*	*114*	*733*

Continues

Table 4A.7a continued

			52–64	65–74	75+	All
Women	Poorest quintile	Mean	37.9	40.0	38.0	38.5
		Std Deviation	10.0	8.7	9.4	9.5
		Weighted N	*264*	*181*	*216*	*661*
		Unweighted N	*266*	*189*	*186*	*641*
	2nd	Mean	42.7	41.2	39.4	41.5
		Std Deviation	8.4	9.3	9.2	9.0
		Weighted N	*339*	*193*	*164*	*696*
		Unweighted N	*353*	*214*	*157*	*724*
	3rd	Mean	43.9	43.1	41.0	43.1
		Std Deviation	8.2	9.1	9.3	8.8
		Weighted N	*372*	*193*	*149*	*713*
		Unweighted N	*389*	*219*	*141*	*749*
	4th	Mean	44.5	44.2	42.1	43.9
		Std Deviation	7.9	7.9	8.1	8.0
		Weighted N	*363*	*204*	*139*	*706*
		Unweighted N	*381*	*228*	*139*	*748*
	Wealthiest quintile	Mean	46.8	46.9	41.8	46.1
		Std Deviation	6.4	6.8	8.5	7.0
		Weighted N	*418*	*189*	*95*	*702*
		Unweighted N	*462*	*217*	*93*	*772*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.7b. CASP-19 score by wealth and age in wave 4 (2008–09)

			50–64	65–74	75+	All
Men	Poorest quintile	Mean	34.3	36.3	38.7	35.7
		Std Deviation	10.3	8.9	8.8	9.8
		Weighted N	*304*	*151*	*113*	*568*
		Unweighted N	*233*	*159*	*95*	*487*
	2nd	Mean	39.0	39.2	36.4	38.7
		Std Deviation	9.1	8.7	8.9	9.0
		Weighted N	*410*	*160*	*105*	*675*
		Unweighted N	*343*	*184*	*103*	*630*
	3rd	Mean	41.2	41.8	39.2	41.0
		Std Deviation	9.0	7.4	7.0	8.3
		Weighted N	*399*	*197*	*133*	*728*
		Unweighted N	*339*	*230*	*128*	*697*
	4th	Mean	42.3	41.7	39.4	41.7
		Std Deviation	8.2	8.5	7.7	8.2
		Weighted N	*474*	*211*	*138*	*823*
		Unweighted N	*428*	*261*	*145*	*834*
	Wealthiest quintile	Mean	44.4	44.8	41.3	44.1
		Std Deviation	6.9	7.1	8.0	7.2
		Weighted N	*498*	*225*	*109*	*831*
		Unweighted N	*463*	*293*	*117*	*873*

Continues

Table 4A.7b continued

			50–64	65–74	75+	All
Women	Poorest quintile	Mean	35.3	37.9	36.4	36.2
		Std Deviation	10.2	8.4	8.3	9.3
		Weighted N	*334*	*169*	*207*	*710*
		Unweighted N	*324*	*196*	*182*	*702*
	2nd	Mean	39.8	39.5	37.1	39.1
		Std Deviation	9.5	8.9	8.2	9.1
		Weighted N	*432*	*182*	*183*	*797*
		Unweighted N	*425*	*231*	*175*	*831*
	3rd	Mean	42.0	41.1	38.5	41.0
		Std Deviation	8.2	8.4	8.3	8.4
		Weighted N	*425*	*239*	*174*	*838*
		Unweighted N	*428*	*297*	*170*	*895*
	4th	Mean	43.1	42.6	38.0	42.0
		Std Deviation	7.9	7.3	8.3	8.1
		Weighted N	*453*	*219*	*160*	*833*
		Unweighted N	*467*	*277*	*157*	*901*
	Wealthiest quintile	Mean	45.2	44.7	41.1	44.6
		Std Deviation	7.1	7.1	7.1	7.2
		Weighted N	*509*	*231*	*87*	*828*
		Unweighted N	*546*	*302*	*92*	*940*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.8a. Loneliness score by wealth and age in wave 2 (2004–05)

			52–64	65–74	75+	All
Men	Poorest quintile	Mean	6.7	6.3	6.6	6.6
		Std Deviation	2.1	1.8	1.9	2.0
		Weighted N	*266*	*183*	*140*	*589*
		Unweighted N	*223*	*173*	*132*	*528*
	2nd	Mean	5.8	5.8	6.2	5.9
		Std Deviation	1.7	1.7	2.0	1.7
		Weighted N	*329*	*190*	*126*	*645*
		Unweighted N	*301*	*201*	*126*	*628*
	3rd	Mean	5.6	5.5	5.7	5.6
		Std Deviation	1.7	1.4	1.6	1.6
		Weighted N	*353*	*223*	*126*	*702*
		Unweighted N	*329*	*232*	*130*	*691*
	4th	Mean	5.3	5.3	5.8	5.4
		Std Deviation	1.5	1.4	1.7	1.5
		Weighted N	*405*	*227*	*132*	*763*
		Unweighted N	*381*	*245*	*139*	*765*
	Wealthiest quintile	Mean	5.2	5.2	5.4	5.2
		Std Deviation	1.4	1.3	1.5	1.4
		Weighted N	*411*	*203*	*112*	*726*
		Unweighted N	*410*	*230*	*121*	*761*

Continues

Table 4A.8a continued

			52–64	65–74	75+	All
Women	Poorest quintile	Mean	6.6	6.4	6.6	6.6
		Std Deviation	2.1	2.0	2.1	2.1
		Weighted N	*297*	*212*	*301*	*810*
		Unweighted N	*298*	*220*	*263*	*781*
	2nd	Mean	6.0	6.1	6.4	6.1
		Std Deviation	1.9	1.9	1.8	1.9
		Weighted N	*370*	*216*	*209*	*795*
		Unweighted N	*384*	*239*	*197*	*820*
	3rd	Mean	5.8	5.8	6.1	5.9
		Std Deviation	1.8	1.8	1.8	1.8
		Weighted N	*390*	*225*	*191*	*806*
		Unweighted N	*408*	*254*	*180*	*842*
	4th	Mean	5.3	5.7	6.0	5.6
		Std Deviation	1.6	1.7	1.8	1.7
		Weighted N	*384*	*231*	*156*	*771*
		Unweighted N	*402*	*256*	*156*	*814*
	Wealthiest quintile	Mean	5.2	5.3	5.8	5.3
		Std Deviation	1.4	1.5	1.8	1.5
		Weighted N	*430*	*204*	*120*	*753*
		Unweighted N	*474*	*232*	*111*	*817*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.8b. Loneliness score by wealth and age in wave 4 (2008–09)

			50–64	65–74	75+	All
Men	Poorest quintile	Mean	6.8	6.6	6.6	6.7
		Std Deviation	2.0	2.0	1.9	2.0
		Weighted N	*309*	*153*	*128*	*590*
		Unweighted N	*238*	*161*	*104*	*503*
	2nd	Mean	5.9	6.0	6.0	5.9
		Std Deviation	1.8	1.8	1.5	1.8
		Weighted N	*418*	*163*	*114*	*697*
		Unweighted N	*349*	*188*	*114*	*651*
	3rd	Mean	5.8	5.6	6.0	5.8
		Std Deviation	1.7	1.5	1.4	1.6
		Weighted N	*403*	*203*	*136*	*743*
		Unweighted N	*342*	*238*	*133*	*713*
	4th	Mean	5.6	5.6	5.9	5.7
		Std Deviation	1.6	1.6	1.7	1.6
		Weighted N	*472*	*212*	*147*	*831*
		Unweighted N	*428*	*263*	*154*	*845*
	Wealthiest quintile	Mean	5.4	5.5	5.5	5.4
		Std Deviation	1.5	1.4	1.4	1.5
		Weighted N	*498*	*230*	*115*	*843*
		Unweighted N	*464*	*297*	*123*	*884*

Continues

Table 4A.8b continued

			50–64	65–74	75+	All
Women	Poorest quintile	Mean	7.0	6.6	6.5	6.7
		Std Deviation	2.1	2.0	1.9	2.0
		Weighted N	*353*	*177*	*228*	*759*
		Unweighted N	*341*	*204*	*198*	*743*
	2nd	Mean	6.2	6.4	6.7	6.4
		Std Deviation	1.8	2.0	2.0	1.9
		Weighted N	*448*	*196*	*202*	*846*
		Unweighted N	*439*	*247*	*193*	*879*
	3rd	Mean	5.8	6.1	6.3	6.0
		Std Deviation	1.8	1.8	1.7	1.8
		Weighted N	*431*	*251*	*185*	*868*
		Unweighted N	*436*	*313*	*178*	*927*
	4th	Mean	5.7	5.9	6.5	5.9
		Std Deviation	1.7	1.7	1.8	1.8
		Weighted N	*465*	*227*	*169*	*861*
		Unweighted N	*480*	*287*	*165*	*932*
	Wealthiest quintile	Mean	5.5	5.6	5.6	5.5
		Std Deviation	1.5	1.6	1.6	1.5
		Weighted N	*514*	*239*	*94*	*847*
		Unweighted N	*553*	*313*	*98*	*964*

Note: Differences by wealth quintile were statistically significant in men and women: $p \leq 0.001$.

Table 4A.9a. Elevated depressive (CES-D) symptoms by age and number of close relationships in wave 2 (2004–05)

		52–64	65–74	75+	All
		%	%	%	%
0–1 close relationships	<4 CES-D symptoms	74.8	76.0	81.0	77.5
	≥4 CES-D symptoms	25.2	24.0	19.0	22.5
	Weighted N	*140*	*105*	*153*	*398*
	Unweighted N	*129*	*105*	*138*	*372*
2–3 close relationships	<4 CES-D symptoms	75.5	80.0	76.7	77.1
	≥4 CES-D symptoms	24.5	20.0	23.3	22.9
	Weighted N	*350*	*228*	*270*	*848*
	Unweighted N	*342*	*245*	*262*	*849*
4–5 close relationships	<4 CES-D symptoms	83.0	82.8	81.9	82.7
	≥4 CES-D symptoms	17.0	17.2	18.1	17.3
	Weighted N	*659*	*382*	*324*	*1,366*
	Unweighted N	*662*	*415*	*313*	*1,390*
6–9 close relationships	<4 CES-D symptoms	89.0	86.5	81.7	86.9
	≥4 CES-D symptoms	11.0	13.5	18.3	13.1
	Weighted N	*1,530*	*808*	*568*	*2,905*
	Unweighted N	*1,525*	*874*	*549*	*2,948*
10+ close relationships	<4 CES-D symptoms	91.1	91.1	84.3	89.8
	≥4 CES-D symptoms	8.9	8.9	15.7	10.2
	Weighted N	*1,038*	*673*	*399*	*2,109*
	Unweighted N	*1,033*	*726*	*390*	*2,149*

Note: Differences by number of close relationships were statistically significant: $p \leq 0.001$.

Table 4A.9b. Elevated depressive (CES-D) symptoms by age and number of close relationships in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
0–1 close relationships	<4 CES-D symptoms	74.4	70.9	79.6	75.4
	≥4 CES-D symptoms	25.6	29.1	20.4	24.6
	Weighted N	*139*	*75*	*113*	*326*
	Unweighted N	*122*	*87*	*101*	*310*
2–3 close relationships	<4 CES-D symptoms	77.9	86.1	80.9	80.8
	≥4 CES-D symptoms	22.1	13.9	19.1	19.2
	Weighted N	*404*	*219*	*244*	*868*
	Unweighted N	*387*	*259*	*222*	*868*
4–5 close relationships	<4 CES-D symptoms	84.3	83.7	80.4	83.4
	≥4 CES-D symptoms	15.7	16.3	19.6	16.6
	Weighted N	*839*	*380*	*309*	*1,529*
	Unweighted N	*795*	*462*	*304*	*1,561*
6–9 close relationships	<4 CES-D symptoms	87.6	88.4	84.5	87.3
	≥4 CES-D symptoms	12.4	11.6	15.5	12.7
	Weighted N	*1,866*	*803*	*555*	*3,225*
	Unweighted N	*1,774*	*995*	*538*	*3,307*
10+ close relationships	<4 CES-D symptoms	90.7	90.5	85.2	89.7
	≥4 CES-D symptoms	9.3	9.5	14.8	10.3
	Weighted N	*1,206*	*650*	*401*	*2,257*
	Unweighted N	*1,121*	*795*	*380*	*2,296*

Note: Differences by number of close relationships were statistically significant: $p \leq 0.001$.

Table 4A.10a. SWLS by number of close relationships and age in wave 2 (2004–05)

		52–64	65–74	75+	All
0–1 close relationships	Mean	21.0	23.9	25.4	23.3
	Std Deviation	8.2	7.2	7.5	7.9
	Weighted N	*133*	*89*	*120*	*341*
	Unweighted N	*124*	*91*	*109*	*324*
2–3 close relationships	Mean	22.4	24.6	24.8	23.7
	Std Deviation	7.5	7.1	6.4	7.2
	Weighted N	*340*	*212*	*246*	*798*
	Unweighted N	*333*	*229*	*238*	*800*
4–5 close relationships	Mean	24.7	25.4	25.5	25.1
	Std Deviation	6.7	6.4	6.1	6.5
	Weighted N	*640*	*366*	*298*	*1,304*
	Unweighted N	*643*	*397*	*289*	*1,329*
6–9 close relationships	Mean	26.6	27.2	27.2	26.8
	Std Deviation	5.8	5.6	5.2	5.6
	Weighted N	*1,502*	*774*	*517*	*2,792*
	Unweighted N	*1,499*	*837*	*504*	*2,840*
10+ close relationships	Mean	27.3	28.1	27.5	27.6
	Std Deviation	5.4	5.0	5.5	5.3
	Weighted N	*1,032*	*651*	*373*	*2,056*
	Unweighted N	*1,026*	*703*	*365*	*2,094*

Note: Differences by number of close relationships were statistically significant: $p \leq 0.001$.

Table 4A.10b. SWLS by number of close relationships and age in wave 4 (2008–09)

		50–64	65–74	75+	All
0–1 close relationships	Mean	20.1	21.9	23.2	21.6
	Std Deviation	8.9	8.0	7.4	8.0
	Weighted N	*130*	*60*	*97*	*287*
	Unweighted N	*115*	*73*	*88*	*276*
2–3 close relationships	Mean	22.3	23.6	24.1	23.1
	Std Deviation	7.3	6.5	6.5	6.9
	Weighted N	*399*	*209*	*222*	*830*
	Unweighted N	*382*	*249*	*204*	*835*
4–5 close relationships	Mean	23.4	24.6	25.1	24.0
	Std Deviation	6.9	6.3	6.0	6.6
	Weighted N	*828*	*370*	*292*	*1,490*
	Unweighted N	*785*	*449*	*289*	*1,523*
6–9 close relationships	Mean	25.3	26.2	25.6	25.6
	Std Deviation	6.1	5.5	5.7	5.9
	Weighted N	*1,846*	*768*	*507*	*3,121*
	Unweighted N	*1,756*	*954*	*495*	*3,205*
10+ close relationships	Mean	26.5	27.0	27.1	26.7
	Std Deviation	5.6	5.3	5.5	5.5
	Weighted N	*1,193*	*632*	*370*	*2,195*
	Unweighted N	*1,112*	*773*	*354*	*2,239*

Note: Differences by number of close relationships were statistically significant: $p \leq 0.001$.

Table 4A.11a. CASP-19 score by number of close relationships and age in wave 2 (2004–05)

		52–64	65–74	75+	All
0–1 close relationships	Mean	36.4	38.9	36.3	37.0
	Std Deviation	9.6	10.2	10.1	9.9
	Weighted N	*123*	*74*	*92*	*289*
	Unweighted N	*115*	*76*	*82*	*273*
2–3 close relationships	Mean	38.9	39.8	37.9	38.9
	Std Deviation	9.9	9.1	9.4	9.5
	Weighted N	*321*	*194*	*192*	*707*
	Unweighted N	*317*	*209*	*186*	*712*
4–5 close relationships	Mean	41.3	41.5	38.9	40.8
	Std Deviation	9.2	8.9	9.3	9.2
	Weighted N	*607*	*334*	*244*	*1,185*
	Unweighted N	*613*	*365*	*237*	*1,215*
6–9 close relationships	Mean	44.0	43.3	41.5	43.4
	Std Deviation	8.0	8.4	8.5	8.3
	Weighted N	*1,447*	*710*	*447*	*2,605*
	Unweighted N	*1,445*	*773*	*439*	*2,657*
10+ close relationships	Mean	45.3	45.2	42.3	44.7
	Std Deviation	7.2	7.3	7.8	7.4
	Weighted N	*990*	*590*	*332*	*1,912*
	Unweighted N	*985*	*642*	*330*	*1,957*

Note: Differences by number of close relationships were statistically significant: $p \leq 0.001$.

Table 4A.11b. CASP-19 score by number of close relationships and age in wave 4 (2008–09)

		50–64	65–74	75+	All
0–1 close relationships	Mean	33.7	35.8	33.9	34.2
	Std Deviation	11.9	9.7	10.0	10.9
	Weighted N	*130*	*61*	*86*	*277*
	Unweighted N	*114*	*72*	*80*	*266*
2–3 close relationships	Mean	37.2	38.4	36.1	37.2
	Std Deviation	9.7	9.1	8.8	9.3
	Weighted N	*392*	*201*	*197*	*790*
	Unweighted N	*375*	*240*	*186*	*801*
4–5 close relationships	Mean	39.3	39.4	37.4	39.0
	Std Deviation	9.7	9.0	7.8	9.2
	Weighted N	*808*	*362*	*268*	*1,438*
	Unweighted N	*766*	*439*	*267*	*1,472*
6–9 close relationships	Mean	41.7	41.8	38.8	41.3
	Std Deviation	8.7	7.9	7.7	8.4
	Weighted N	*1,844*	*762*	*502*	*3,107*
	Unweighted N	*1,750*	*948*	*491*	*3,189*
10+ close relationships	Mean	43.6	43.3	40.8	43.1
	Std Deviation	7.8	7.5	7.7	7.7
	Weighted N	*1,181*	*624*	*370*	*2,175*
	Unweighted N	*1,099*	*767*	*354*	*2,220*

Note: Differences by number of close relationships were statistically significant: p≤0.001.

Table 4A.12. Elevated depressive (CES-D) symptoms by age and frequency of social contact in wave 4 (2008–09)

		50–64	65-74	75+	All
		%	%	%	%
Non-frequent (twice/month or less often) contact with others	<4 CES-D symptoms	82.1	85.7	85.4	83.5
	≥4 CES-D symptoms	17.9	14.3	14.6	16.5
	Weighted N	*341*	*145*	*87*	*573*
	Unweighted N	*307*	*165*	*82*	*554*
Frequent (twice/week or more often) contact with others	<4 CES-D symptoms	86.9	87.5	82.9	86.2
	≥4 CES-D symptoms	13.1	12.5	17.1	13.8
	Weighted N	*4,114*	*1,979*	*1,535*	*7,628*
	Unweighted N	*3,892*	*2,429*	*1,463*	*7,784*

Note: Differences by frequency of social contact were not statistically significant: p=0.080.

Table 4A.13. SWLS by frequency of social contact and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Non-frequent (twice/month or less often) contact with others	Mean	23.0	24.7	22.8	23.4
	Std Deviation	7.2	6.5	6.8	7.0
	Weighted N	*338*	*135*	*80*	*552*
	Unweighted N	*307*	*157*	*75*	*539*
Frequent (twice/week or more often) contact with others	Mean	25.0	25.8	25.7	25.3
	Std Deviation	6.4	5.9	5.9	6.2
	Weighted N	*4,058*	*1,902*	*1,407*	*7,366*
	Unweighted N	*3,843*	*2,339*	*1,354*	*7,536*

Note: Differences by frequency of social contact were statistically significant: p≤0.001.

Table 4A.14. CASP-19 score by frequency of social contact and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Non-frequent (twice/month or less often) contact with others	Mean	37.9	39.9	34.7	38.0
	Std Deviation	10.0	8.9	10.0	9.8
	Weighted N	*325*	*134*	*69*	*527*
	Unweighted N	*295*	*155*	*65*	*515*
Frequent (twice/week or more often) contact with others	Mean	41.4	41.4	38.6	40.9
	Std Deviation	9.0	8.3	8.0	8.8
	Weighted N	*4,029*	*1,875*	*1,353*	*7,257*
	Unweighted N	*3,809*	*2,309*	*1,312*	*7,430*

Note: Differences by frequency of social contact were statistically significant: $p \leq 0.001$.

Table 4A.15. Elevated depressive (CES-D) symptoms by age and social support from spouse/partner in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
Highest support from partner	<4 CES-D symptoms	92.5	95.0	95.4	93.6
	≥4 CES-D symptoms	7.5	5.0	4.6	6.4
	Weighted N	*1,617*	*742*	*404*	*2,763*
	Unweighted N	*1,502*	*915*	*401*	*2,818*
Lower support from partner	<4 CES-D symptoms	86.7	86.7	82.7	86.2
	≥4 CES-D symptoms	13.3	13.3	17.3	13.8
	Weighted N	*1,659*	*691*	*333*	*2,683*
	Unweighted N	*1,561*	*838*	*323*	*2,722*
Widowed	<4 CES-D symptoms	68.2	77.3	75.5	74.9
	≥4 CES-D symptoms	31.8	22.7	24.5	25.1
	Weighted N	*229*	*413*	*896*	*1,538*
	Unweighted N	*220*	*486*	*801*	*1,507*
Divorced/separated	<4 CES-D symptoms	76.7	78.1	81.2	77.4
	≥4 CES-D symptoms	23.3	21.9	18.8	22.6
	Weighted N	*756*	*243*	*96*	*1,094*
	Unweighted N	*733*	*304*	*97*	*1,134*
Never married	<4 CES-D symptoms	78.2	84.0	76.7	79.0
	≥4 CES-D symptoms	21.8	16.0	23.3	21.0
	Weighted N	*398*	*108*	*83*	*590*
	Unweighted N	*367*	*132*	*86*	*585*

Note: Differences by social support category were statistically significant: $p \leq 0.001$.

Table 4A.16. SWLS by social support from spouse/partner and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Highest support from partner	Mean	27.6	28.5	27.9	27.9
	Std Deviation	5.1	4.5	4.9	4.9
	Weighted N	*1,597*	*724*	*377*	*2,698*
	Unweighted N	*1,485*	*893*	*377*	*2,755*
Lower support from partner	Mean	24.1	24.9	25.4	24.5
	Std Deviation	6.1	5.7	6.1	6.0
	Weighted N	*1,648*	*663*	*319*	*2,630*
	Unweighted N	*1,553*	*805*	*310*	*2,668*
Widowed	Mean	22.0	24.0	24.6	24.0
	Std Deviation	7.3	6.1	6.0	6.3
	Weighted N	*182*	*328*	*631*	*1,140*
	Unweighted N	*179*	*392*	*576*	*1,147*
Divorced/separated	Mean	21.7	22.8	22.5	22.0
	Std Deviation	7.2	6.8	6.6	7.1
	Weighted N	*584*	*195*	*64*	*843*
	Unweighted N	*576*	*251*	*68*	*895*
Never married	Mean	22.0	24.1	23.2	22.6
	Std Deviation	7.2	6.6	6.9	7.1
	Weighted N	*316*	*88*	*62*	*466*
	Unweighted N	*296*	*111*	*65*	*472*

Note: Differences by social support category were statistically significant: $p \leq 0.001$.

Table 4A.17. CASP-19 score by social support from spouse/partner and age in wave 4 (2008–09)

		50–64	65–74	75+	All
Highest social support from partner	Mean	45.0	44.7	41.3	44.4
	Std Deviation	7.4	7.3	7.3	7.5
	Weighted N	*1,588*	*709*	*363*	*2,660*
	Unweighted N	*1,479*	*876*	*362*	*2,717*
Lower support from partner	Mean	39.2	39.1	36.5	38.9
	Std Deviation	8.8	8.0	8.7	8.7
	Weighted N	*1,637*	*658*	*304*	*2,598*
	Unweighted N	*1,540*	*799*	*296*	*2,635*
Widowed	Mean	39.4	40.4	37.6	38.7
	Std Deviation	9.4	8.4	8.0	8.5
	Weighted N	*180*	*327*	*596*	*1,103*
	Unweighted N	*176*	*391*	*553*	*1,120*
Divorced/separated	Mean	38.1	38.8	38.2	38.3
	Std Deviation	10.1	9.2	8.5	9.7
	Weighted N	*569*	*191*	*68*	*829*
	Unweighted N	*559*	*248*	*72*	*879*
Never married	Mean	38.7	40.7	38.4	39.0
	Std Deviation	10.5	8.7	8.7	10.0
	Weighted N	*313*	*86*	*61*	*460*
	Unweighted N	*293*	*107*	*64*	*464*

Note: Differences by social support category were statistically significant: $p \leq 0.001$.

Table 4A.18. Elevated depressive (CES-D) symptoms by age and ADL in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
No ADL	<4 CES-D symptoms	89.3	89.6	86.7	88.9
	≥4 CES-D symptoms	10.7	10.4	13.3	11.1
	Weighted N	*4,447*	*1,893*	*1,309*	*7,649*
	Unweighted N	*4,156*	*2,309*	*1,250*	*7,715*
One ADL	<4 CES-D symptoms	71.7	81.9	75.9	76.1
	≥4 CES-D symptoms	28.3	18.1	24.1	23.9
	Weighted N	*322*	*255*	*355*	*931*
	Unweighted N	*301*	*306*	*323*	*930*
Two or more ADL	<4 CES-D symptoms	43.8	61.3	62.1	54.8
	≥4 CES-D symptoms	56.2	38.7	37.9	45.2
	Weighted N	*320*	*208*	*295*	*822*
	Unweighted N	*286*	*239*	*263*	*788*

Note: Differences by ADL category were statistically significant: p≤0.001.

Table 4A.19. SWLS score by age and ADL in wave 4 (2008–09)

		50–64	65–74	75+	All
No ADL	Mean	25.3	26.3	26.3	25.7
	Std Deviation	6.2	5.5	5.6	5.9
	Weighted N	*3,880*	*1,660*	*1,029*	*6,569*
	Unweighted N	*3,672*	*2,048*	*1,001*	*6,721*
One ADL	Mean	22.4	24.5	24.6	23.8
	Std Deviation	7.3	6.3	6.0	6.6
	Weighted N	*270*	*212*	*250*	*731*
	Unweighted N	*255*	*256*	*235*	*746*
Two or more ADL	Mean	19.4	21.7	22.4	21.0
	Std Deviation	7.6	7.3	7.2	7.5
	Weighted N	*249*	*168*	*210*	*628*
	Unweighted N	*227*	*196*	*195*	*618*

Note: Differences by ADL category were statistically significant: p≤0.001.

Table 4A.20. CASP-19 score by age and ADL in wave 4 (2008–09)

		50–64	65–74	75+	All
No ADL	Mean	42.2	42.7	40.3	42.1
	Std Deviation	8.5	7.6	7.5	8.2
	Weighted N	*3,850*	*1,641*	*991*	*6,483*
	Unweighted N	*3,638*	*2,027*	*971*	*6,636*
One ADL	Mean	35.3	37.1	36.0	36.0
	Std Deviation	9.4	7.8	8.1	8.6
	Weighted N	*265*	*205*	*234*	*704*
	Unweighted N	*250*	*249*	*224*	*723*
Two or more ADL	Mean	30.4	32.3	31.8	31.4
	Std Deviation	9.4	8.9	7.9	8.8
	Weighted N	*239*	*165*	*198*	*602*
	Unweighted N	*217*	*190*	*184*	*591*

Note: Differences by ADL category were statistically significant: p≤0.001.

Table 4A.21. Loneliness score by age and ADL in wave 4 (2008–09)

		50–64	65–74	75+	All
No ADL	Mean	5.8	5.8	6.0	5.8
	Std Deviation	1.7	1.7	1.7	1.7
	Weighted N	*3,905*	*1,693*	*1,064*	*6,661*
	Unweighted N	*3,694*	*2,089*	*1,035*	*6,818*
One ADL	Mean	6.5	6.4	6.4	6.4
	Std Deviation	2.0	1.9	1.7	1.9
	Weighted N	*274*	*215*	*260*	*749*
	Unweighted N	*258*	*260*	*244*	*762*
Two or more ADL	Mean	7.0	6.9	7.0	7.0
	Std Deviation	2.1	1.9	1.9	2.0
	Weighted N	*254*	*173*	*215*	*641*
	Unweighted N	*230*	*200*	*198*	*628*

Note: Differences by ADL category were statistically significant: p≤0.001.

Table 4A.22. Elevated depressive (CES-D) symptoms by age and cardiovascular morbidity in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
No CVD	<4 CES-D symptoms	87.4	89.4	86.8	87.8
	≥4 CES-D symptoms	12.6	10.6	13.2	12.2
	Weighted N	*3,108*	*1,029*	*523*	*4,660*
	Unweighted N	*2,883*	*1,247*	*493*	*4,623*
One CVD	<4 CES-D symptoms	85.2	84.9	82.2	84.4
	≥4 CES-D symptoms	14.8	15.1	17.8	15.6
	Weighted N	*1,417*	*778*	*681*	*2,876*
	Unweighted N	*1,331*	*956*	*633*	*2,920*
Two or more CVDs	<4 CES-D symptoms	74.1	82.2	76.0	77.2
	≥4 CES-D symptoms	25.9	17.8	24.0	22.8
	Weighted N	*564*	*546*	*754*	*1,864*
	Unweighted N	*528*	*649*	*710*	*1,887*

Note: Differences by CVD category were statistically significant: p≤0.001.

Table 4A.23. SWLS score by age and cardiovascular morbidity in wave 4 (2008–09)

		50–64	65–74	75+	All
No CVD	Mean	25.3	26.4	26.0	25.6
	Std Deviation	6.2	5.7	6.1	6.1
	Weighted N	*2,731*	*910*	*407*	*4,048*
	Unweighted N	*2,553*	*1,109*	*388*	*4,050*
One CVD	Mean	24.4	25.5	25.9	25.0
	Std Deviation	6.7	6.1	5.9	6.4
	Weighted N	*1,198*	*679*	*519*	*2,397*
	Unweighted N	*1,151*	*848*	*495*	*2,494*
Two or more CVDs	Mean	22.8	24.9	24.8	24.2
	Std Deviation	7.0	6.1	6.1	6.5
	Weighted N	*470*	*449*	*562*	*1,482*
	Unweighted N	*449*	*542*	*548*	*1,539*

Note: Differences by CVD category were statistically significant: p≤0.001.

Table 4A.24. CASP-19 score by age and cardiovascular morbidity in wave 4 (2008–09)

		50–64	65–74	75+	All
No CVD	Mean	42.2	42.8	40.1	42.1
	Std Deviation	8.7	7.9	8.2	8.5
	Weighted N	*2,698*	*899*	*396*	*3,993*
	Unweighted N	*2,520*	*1,096*	*380*	*3,996*
One CVD	Mean	40.6	41.0	38.8	40.3
	Std Deviation	9.2	8.5	8.1	8.8
	Weighted N	*1,191*	*664*	*495*	*2,351*
	Unweighted N	*1,142*	*831*	*477*	*2,450*
Two or more CVDs	Mean	36.5	38.7	36.7	37.3
	Std Deviation	10.0	8.6	8.1	8.9
	Weighted N	*465*	*447*	*532*	*1,444*
	Unweighted N	*442*	*538*	*522*	*1,502*

Note: Differences by CVD category were statistically significant: p≤0.001.

Table 4A.25. Loneliness score by age and cardiovascular morbidity in wave 4 (2008–09)

		50–64	65–74	75+	All
No CVD	Mean	5.8	5.8	6.1	5.8
	Std Deviation	1.7	1.7	1.7	1.7
	Weighted N	*2,743*	*926*	*421*	*4,090*
	Unweighted N	*2,565*	*1,128*	*400*	*4,093*
One CVD	Mean	6.0	6.0	6.2	6.0
	Std Deviation	1.9	1.8	1.8	1.8
	Weighted N	*1,208*	*691*	*535*	*2,434*
	Unweighted N	*1,158*	*862*	*513*	*2,533*
Two or more CVDs	Mean	6.4	6.2	6.3	6.3
	Std Deviation	1.9	1.8	1.8	1.9
	Weighted N	*481*	*463*	*582*	*1,527*
	Unweighted N	*458*	*558*	*564*	*1,580*

Note: Differences by CVD category were statistically significant: p≤0.001.

Table 4A.26. Elevated depressive (CES-D) symptoms by age and access to amenities and services in wave 4 (2008–09)

		50–64	65–74	75+	All
		%	%	%	%
No access problem	<4 CES-D symptoms	89.5	90.4	89.3	89.7
	≥4 CES-D symptoms	10.5	9.6	10.7	10.3
	Weighted N	*3,728*	*1,663*	*976*	*6,368*
	Unweighted N	*3,521*	*2,050*	*951*	*6,522*
Problem accessing 1 out of 4 amenities	<4 CES-D symptoms	77.1	83.8	72.7	77.8
	≥4 CES-D symptoms	22.9	16.2	27.3	22.2
	Weighted N	*407*	*217*	*198*	*822*
	Unweighted N	*387*	*267*	*190*	*844*
Problem accessing 2+ out of 4 amenities	<4 CES-D symptoms	55.8	61.8	66.6	61.8
	≥4 CES-D symptoms	44.2	38.2	33.4	38.2
	Weighted N	*210*	*133*	*267*	*611*
	Unweighted N	*185*	*154*	*240*	*579*

Note: Differences by access to services and amenities were statistically significant: p≤0.001.

Table 4A.27. SWLS score by age and access to amenities and services in wave 4 (2008–09)

		50–64	65–74	75+	All
No access problem	Mean	25.3	26.4	26.6	25.8
	Std Deviation	6.2	5.6	5.4	5.9
	Weighted N	*3,677*	*1,617*	*924*	*6,219*
	Unweighted N	*3,481*	*1,996*	*907*	*6,384*
Problem accessing 1 out of 4 amenities	Mean	22.6	24.1	24.1	23.3
	Std Deviation	7.2	6.2	6.4	6.8
	Weighted N	*406*	*208*	*186*	*800*
	Unweighted N	*385*	*257*	*178*	*820*
Problem accessing 2+ out of 4 amenities	Mean	20.0	21.5	22.1	21.2
	Std Deviation	7.7	7.1	6.8	7.2
	Weighted N	*209*	*129*	*245*	*583*
	Unweighted N	*184*	*149*	*222*	*555*

Note: Differences by access to services and amenities were statistically significant: p≤0.001.

Table 4A.28. CASP-19 score by age and access to amenities and services in wave 4 (2008–09)

		50–64	65–74	75+	All
No access problem	Mean	42.2	42.5	40.2	42.0
	Std Deviation	8.5	7.8	7.5	8.2
	Weighted N	*3,661*	*1,591*	*891*	*6,143*
	Unweighted N	*3,459*	*1,965*	*876*	*6,300*
Problem accessing 1 out of 4 amenities	Mean	37.2	38.7	37.3	37.6
	Std Deviation	9.8	8.3	7.5	9.0
	Weighted N	*394*	*207*	*171*	*772*
	Unweighted N	*374*	*255*	*167*	*796*
Problem accessing 2+ out of 4 amenities	Mean	31.8	32.2	32.7	32.2
	Std Deviation	10.8	8.9	8.4	9.4
	Weighted N	*197*	*123*	*227*	*547*
	Unweighted N	*172*	*143*	*211*	*526*

Note: Differences by access to services and amenities were statistically significant: p≤0.001.

Table 4A.29. Loneliness score by age and access to amenities and services in wave 4 (2008–09)

		50–64	65–74	75+	All
No access problem	Mean	5.8	5.8	5.9	5.8
	Std Deviation	1.7	1.7	1.6	1.7
	Weighted N	*3,709*	*1,639*	*940*	*6,288*
	Unweighted N	*3,508*	*2,021*	*920*	*6,449*
Problem accessing 1 out of 4 amenities	Mean	6.4	6.3	6.4	6.4
	Std Deviation	2.0	1.9	1.9	1.9
	Weighted N	*404*	*213*	*188*	*805*
	Unweighted N	*384*	*263*	*182*	*829*
Problem accessing 2+ out of 4 amenities	Mean	7.1	6.9	7.1	7.1
	Std Deviation	2.2	2.1	1.9	2.0
	Weighted N	*208*	*134*	*261*	*604*
	Unweighted N	*183*	*155*	*237*	*575*

Note: Differences by access to services and amenities were statistically significant: p≤0.001.

5. Sleep duration and sleep disturbance

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This chapter describes the association between patterns of sleep and a range of factors, including age, sex, marital status, economic position, health, well-being and cognitive function. Amongst other things, the analyses in this chapter show:

- Mean sleep duration reported in ELSA is 6 hours 51 minutes per night. Ten per cent of participants reported short sleep duration (5 hours or less) and 10% reported long sleep duration (8 hours or more).
- Sleep disturbance was defined as being in the highest quartile of a score created from questions covering delay in falling asleep, inability to stay asleep, waking up tired and disturbed sleep. Sleep disturbance is associated with sleep duration, such that those participants who report sleep duration of between 7 and 8 hours are the least likely to report sleep disturbance. Evidence suggests that short sleep duration, long sleep duration and sleep disturbance may be associated with adverse health outcomes. Consequently, we characterise poor sleep quality using three distinct measures: short sleep duration, long sleep duration and sleep disturbance.
- Women are more likely to report poor sleep quality than men; they are more likely to report short sleep duration, long sleep duration and score in the worst quartile of the sleep disturbance scale.
- The association of sleep quality with age is complex, with no linear association apparent for short sleep duration (5 hours or less). However, long sleep duration (8 hours or more) increases with age, while sleep disturbance reduces with age.
- Divorced respondents report both short sleep duration and disturbed sleep, while widowed respondents are most likely to report long sleep duration. These associations were independent of age.
- Increasing wealth is associated with better sleep quality across all three measures. Conversely, household debt is associated with poor sleep quality; participants reporting having debts are more likely to report both short sleep and long sleep duration and are more likely to report increased sleep disturbance, although the magnitude of debt does not appear to make a difference either to sleep duration or to sleep disturbance. With regard to employment status, working respondents were less likely to report both sleep of 5 hours or less and 8 hours or more and were less likely to report sleep disturbance.

- Poor health, assessed by self-rated health, doctor-diagnosed heart disease, chronic respiratory disease, pain, hypertension (identified from self-reported hypertension and directly measured blood pressure), is associated with all three measures of poor sleep. This means that participants who have poor health are more likely to report short sleep, long sleep and sleep disturbance than participants who do not report poor health.
- Similarly, poor sleep quality is associated with poorer quality of life, lower life satisfaction and with an increased likelihood of reporting depression.
- The health of the respondent's partner also influences the respondent's sleep. For example, respondents report short sleep and sleep disturbance when partners report poor self-rated health, or if the partner reports bodily pain.
- Caring for someone in the last month was associated with sleep disturbance only, while living with the cared-for person influences short sleep, long sleep and sleep disturbance.
- Poorer cognitive function, assessed by memory score, verbal fluency and numeracy, was associated with sleep disturbance, short sleep duration and long sleep duration.

5.1 Introduction

Questions on sleep duration and sleep disturbance were introduced into the wave 4 (2008–09) data collection of ELSA. This provides a rare opportunity to examine sleep and various aspects of sleep quality among older people and the factors associated with sleep and sleep quality, using a nationally representative population. Research on sleep has traditionally examined the effects of sleep quantity; however, a more recent distinction has been made between the amount of sleep people get and the quality of that sleep. As more waves of data are collected we will be able to examine changes in sleep duration and disturbance as people age and the causes and consequences of these changes.

Problems with sleep are reported to be widespread (Foley et al., 2004) and have many health and other implications. For example, sleep deprivation (short sleep duration), insomnia and daytime sleepiness have considerable economic ramifications. A recent economic analysis estimated the costs of sleep disturbance to be around 1% of GDP in Organisation for Economic Co-operation and Development (OECD) countries. This is made up of direct healthcare costs, together with work-related injuries, motor vehicle accidents and loss of productivity attributable to sleep problems and daytime sleepiness (Hillman et al., 2006). The wider consequences of low sleep quality and short sleep duration include an increased risk of accidents (Leger, 1994) and poor cognitive function (Ancoli-Israel, 2009). The causes and consequences of short sleep and poor sleep quality have received increasing attention recently with researchers beginning to investigate social (for example, marital status) (Arber, Hislop and Williams, 2007) and environmental (for example, latitude) (Bliwise, 2008) correlates of sleep behaviours.

Several epidemiological studies have highlighted the increase in sleep disturbances among elderly people, with some studies suggesting that sleep disturbance reaches up to 50% in specific parts of the population (Maggi et al., 1998; Ohayon, 2002). How sleep disturbances relate to reported sleep duration in older age groups is unclear; although there is a lay perception that sleep quality and duration diminishes with age, surveys examining sleep duration in different age groups have shown that, in general, older adults report sleeping around 7 hours a night, an amount not very different from that reported by younger adults (Ancoli-Israel, 2009). However, age-related changes in sleep quality have been documented, with increased disturbed sleep (Ohayon et al., 2004) being higher at older ages. These measures are likely to impact on well-being and functioning in older age groups (Ancoli-Israel, 2009; Leger et al., 2008; Nasermoaddeli et al., 2005). Normative data on sleep duration and sleep disturbance in healthy populations have been described recently in the United States (Ohayon and Vecchierini, 2005), but comparable normative data from national cohorts in England are unavailable.

The link between social and economic circumstances and health is well established, and understanding the mechanisms involved in these relationships is a key aim in ELSA. Sleep behaviour, in particular short sleep duration, has been suggested to play a role in the association between social position and health by increasing the risk of chronic health conditions prevalent among those with low social position (Van Cauter and Spiegel, 1999; Moore et al., 2002). However, evidence for the association of sleep duration and sleep disturbance with measures of social position is equivocal (Nasermoaddeli et al., 2007).

Sleep quality is also associated with psychological well-being and mental illness, and with physical health, although in both cases causal connections are complex. Extensive observational and epidemiological evidence indicates that optimal sleep duration of 7–8 hours is associated with the maintenance of good health. Both short and long sleep duration are consistently found to be associated with increased mortality (Kripke et al., 2002; Youngstedt and Kripke, 2004; Patel et al., 2006; Hublin et al., 2007; Stamatakis, Kaplan and Roberts, 2007; Kronholm et al., 2008; Cappuccio et al., 2010), but the mechanisms by which these associations occur are unclear. Currently, the literature concentrates on the association of short sleep with health and morbidity outcomes, such as obesity and hypertension, which may explain increases in mortality (Cappuccio et al., 2007; Gangwisch et al., 2007; Hall et al., 2008; Stranges et al., 2008; Van Cauter et al., 2008). However, many studies are cross-sectional and thus it is not possible to disentangle cause and effect. For example, short sleep could be a cause, consequence or component of poor mental health, and physical health problems could lead both to poor-quality sleep and to poor mental health. The association between long sleep duration and increased mortality has also posed a conundrum, because few studies have examined potential mechanisms by which long sleep could be associated with increased mortality. There has been a suggestion that findings for long sleep reflect reverse causation; that is, that long sleep reflects, rather than causes, poor health (Gangwisch et al., 2007). Further, long sleep may be subject to reporting error because self-reported sleep duration is poorly correlated with objective measures of sleep in older age groups (Unruh et al.,

2008). However, a recent study, using data from an 11-year follow-up of a middle-aged cohort with sleep duration measured at two time points, found that long sleep and increasing length of sleep beyond 7 hours was associated with increased mortality independently of a wide variety of covariates (Ferrie et al., 2007). These issues require further investigation.

In a similar manner to that for health, short and long sleep duration are reported to be associated with poorer cognitive performance in older populations (Faubel et al., 2009; Kronholm et al., 2009). The mechanisms underlying these associations are yet to be explained.

In this chapter we will use the cross-sectional data from wave 4 (2008–09) to begin to explore these issues. The analyses are divided into five sections: the first will describe how sleep duration and sleep disturbance are related to each other; the second, how sleep duration and sleep disturbance vary by age, sex and marital status. The third section will explore the association of these measures with household wealth and debt, work status and stress at work. We will go on to examine how sleep duration and sleep disturbance vary with health and health behaviours. The fifth section will explore sleep behaviours by respondents' partners' health and caring responsibilities. The final section will describe the association of sleep with cognitive performance.

5.2 Methods

Sample

The complete ELSA sample consists of people from three different cohorts: (a) the original ELSA cohort that was drawn in 2002–03 and consisted of people then aged 50 or older; (b) the refreshment sample that was added to ELSA in 2006–07 and consisted of people then aged 50–54 years; and (c) a new cohort that was added to ELSA in 2008–09 and comprised people aged 50–75 years. The analyses presented in this chapter use all core members[1] for whom the relevant information was available. A weighting factor to correct for non-response is used in all the analyses.

It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected.

Measurements

Sleep duration and sleep disturbance

Measures of sleep duration and disturbance were assessed within the main questionnaire in ELSA. For **sleep duration,** participants were asked to report the number of hours they slept per weeknight. Responses were open ended and then re-coded into 5 hours or less, to 6 hours, to 7 hours, to 8 hours and then 8 hours or more. Five hours or less sleep was categorised as short sleep duration and 8 hours or more as long sleep duration.

[1] 'Core members' are defined in Chapter 10.

To assess **sleep disturbance,** participants were asked about the frequency of delay in falling asleep, inability to stay asleep, waking up tired, and disturbed sleep in the previous month. Response categories were no difficulties, less than once a week, once or twice a week and three times or more a week. These response codes were given a numerical score (1 to 4) and then items were summed and a total score created. The total score ranged between 4 and 16, and showed a normal distribution, with a mean score of 8.8 (standard deviation 3.2). A higher score represented greater sleep disturbance. The total score was then categorised into quartiles, with a score in the worst quartile considered to represent disturbed sleep.

Age, sex and marital status

Characteristics of the respondents assessed included **age** in 5-year bands, **gender** and **marital status** (single/never married, first marriage/civil partnership, remarried, legally separated/divorced or widowed). All of these characteristics were assessed in the main questionnaire in ELSA.

Participant work status, pressure at work, household wealth and debt, geographical region of residence

Participants in ELSA wave 4 (2008–09) were asked about their main activities during the last month, and those who had stated that they were in paid work or self-employed were defined as being in work.

We used an item from the Effort Reward Imbalance scale (Siegrist et al., 2004) to examine **pressure at work**. Participants were asked whether they felt under constant pressure at work due to a heavy workload in the self-completion questionnaire. Those who answered yes to this question were defined as experiencing pressure at work.

Household wealth was defined as described in Chapter 3 and was categorised into quintiles.

Amount of **household debt** was calculated by adding the amount owed on credit or store cards, to family and friends and in commercial loans, but not including mortgage debt.

Health, well-being and caring

Measures of health and illness include self-reported general health (from excellent to poor), self-reported pain (whether often troubled by pain), diagnosed cardiovascular disease (consisting of high blood pressure, angina, myocardial infarction, congestive heart failure, heart murmur, abnormal heart rhythm, diabetes or high blood sugar, stroke, high cholesterol or other heart disease), diagnosed non-cardiovascular disease (consisting of lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson's disease, psychiatric illness, Alzheimer's disease or dementia) and diagnosed chronic respiratory disease (consisting of lung disease or asthma).

Health behaviours: questions on physical activity and smoking were taken from the main ELSA questionnaire and included frequency of doing vigorous, moderate and mild sports or other physical activities (more than once a week, once a week, one to three times a month or hardly ever/never) and smoking (never smoked, ex-smoker or current smoker). Alcohol intake was assessed by questions included in the self-completion questionnaire which asked how often

the respondent had an alcoholic drink during the last 12 months (almost every day, five or six days a week, three or four days a week, once or twice a week, once or twice a month, once every couple of months, once or twice a year, or not at all in the last 12 months).

Body mass index: height and weight measurements were made during the nurse visit in wave 4 (2008–09). Height was measured using a portable stadiometer with a sliding headplate, a base plate and three connecting rods marked with a metric scale. Respondents were asked to remove their shoes. One measurement was taken with the respondent stretching to the maximum height and the head in the Frankfort plane.[2] The reading was recorded to the nearest millimetre. Weight was measured using a portable electronic scale. Respondents were asked to remove their shoes and any bulky clothing. A single measurement was recorded to the nearest 0.1 kg. Respondents 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. The weight and height measures were then used to calculate a measure of obesity, the body mass index (BMI), which is weight divided by height squared, and then categorised into underweight, normal weight, overweight and obese (WHO, 2000; NICE, 2007). In addition to the measurement of obesity, waist circumference was measured (defined as the mid-point between the lower rib and upper margin of the iliac crest). The measurements were taken twice and recorded to the nearest millimetre. When waist measurement differed by more than 3 cm, a further measurement was made. The mean of the two closest measurements was used in the analysis. Waist circumference was categorised as high, medium or low based on previously published sex-specific cut points (Flegal, 2007). BMI does not distinguish between mass due to body fat and mass due to muscular physique and does not take account of the distribution of fat. It has therefore been postulated that waist circumference may be a better measure than BMI or waist-to-hip ratio (WHO, 2000) to identify those with a health risk from their body shape. Among older people the fat distribution changes considerably and abdominal fat tends to increase with age. Therefore waist circumference can be considered an appropriate indicator of body fatness and central fat distribution among the elderly.

High blood pressure, or hypertension, was defined as doctor-diagnosed hypertension or directly measured blood pressure, with a systolic blood pressure/diastolic blood pressure ≥140/90 mmHg as recommended by IV British Hypertension Society Guidelines 2004 (Williams et al., 2004).

Well-being was assessed using a range of measures: the CASP-19 score (a 19-item scale measuring degree of control, autonomy, self-realisation and pleasure experienced by respondents [Hyde et al., 2003]), the life satisfaction scale (a 5-item scale measuring satisfaction with life) and the depressive symptoms score (CES-D, an 8-item scale measuring levels of depression).

[2]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. This line must be parallel with the floor. This gives the maximum vertical distance from the floor to the highest point of the skull.

These are described more fully in Chapter 4. All three of these were divided into tertiles for analysis.

Partner's health, and caring for household members

Partner's health was measured using the respondent's partner's self-reported general health (from excellent to poor), and the partner's self-reported level of pain (whether often troubled by pain).

Caring for household members was assessed in the main questionnaire using questions asking whether the respondent has cared for anyone in the last month, and whether the respondent lives with the person they cared for.

Cognitive performance

Cognitive function was assessed using tests of immediate and delayed recall of ten common nouns. A list of ten words was presented orally to study respondents, who were then asked to recall as many words as possible immediately after the list was read, and then again after an approximately 5-minute delay, during which they completed other survey questions. Orientation to the day, date, month and year were also assessed. These three tests resulted in a cognitive scale ranging from 0 to 24 possible points (10 points for immediate recall, 10 points for delayed recall and 4 points for orientation). If a respondent refused to provide an answer for any of the three tests, they were assigned a score of '0' for that test (Langa et al., 2009).

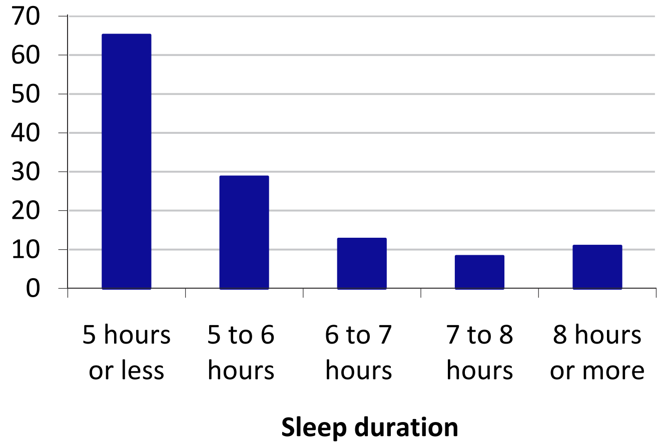
Verbal fluency was assessed as in earlier waves of ELSA. Participants were asked to name as many animals as possible in 1 minute. Numerical ability was assessed by asking participants to perform simple mental calculations. The test begins with three moderately easy items to provide a rapid assessment of ability level. Respondents who make errors on all these items are then asked an easier question. Respondents who get any of the first three questions correct are then asked two progressively more difficult questions (and given credit for the easiest question). A score of 1 is given for correct answers on the first five questions, and for the final question (calculation of compound interest), a score of 1 is given if the answer is almost correct and a score of 2 if the answer is fully correct.

5.3 Results

Sleep duration and sleep disturbance

The average sleep duration reported in ELSA in 2008–09) was 6 hours 53 minutes per night in men and 6 hours 49 minutes in women. Respondents who reported sleep duration of between 7 and 8 hours were least likely to be classified with high sleep disturbance (Figure 5.1). Given the associations between sleep duration and sleep disturbance and previously reported non-linear associations of sleep duration with mortality (Ferrie et al., 2008), we present descriptions of short sleep (5 hours or less), long sleep (8 hours or more) and sleep disturbance (highest quartile in sleep disturbance) separately in this chapter.

Figure 5.1. Percentage classified as reporting high sleep disturbance (worst quartile) by sleep duration (2008–09)



Age, gender and marital status

Women were more likely than men to report short sleep duration (5 hours or less) across all age groups (16.0% for women compared with 12.1% for men), and were more likely to report long sleep duration (8.2% of women and 6.8% of men) (Table 5A.1). Figure 5.2 shows that the association of short sleep duration with age was non-linear, with men aged 60–64 and women aged 65–69 least likely to report short sleep. In contrast, long sleep duration increased linearly with increasing age (Figure 5.3). For example, 2.1% of men aged 50–54 reported long sleep duration rising to 13.0% in those aged 80 and over, a

Figure 5.2. Percentage of men and women who report short sleep duration (5 hours or less) by age group (2008–09)

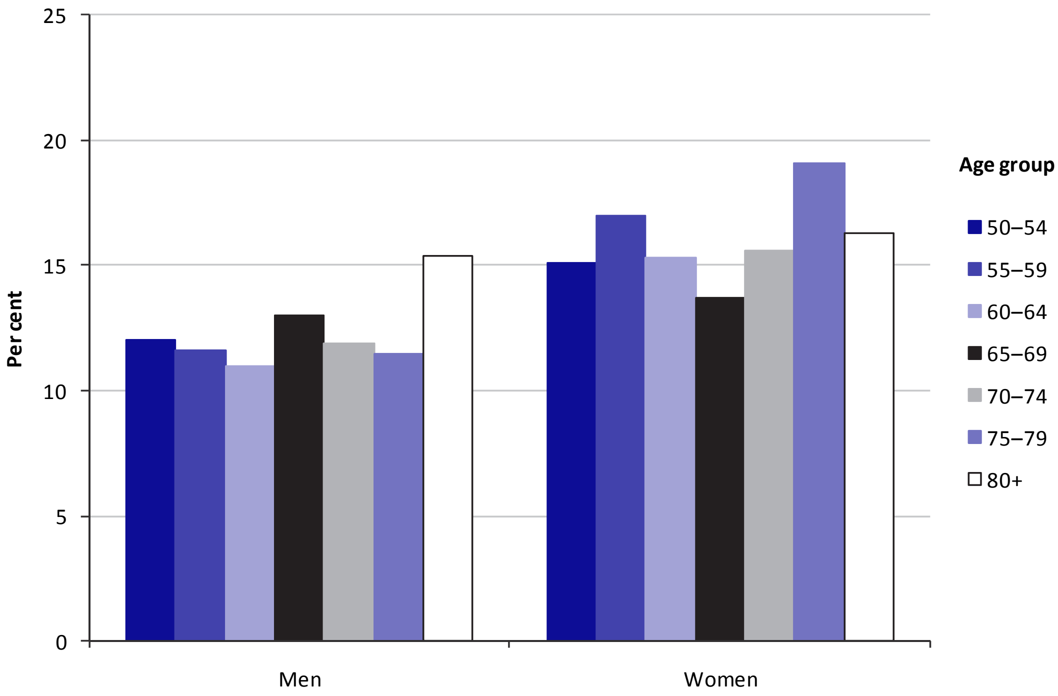
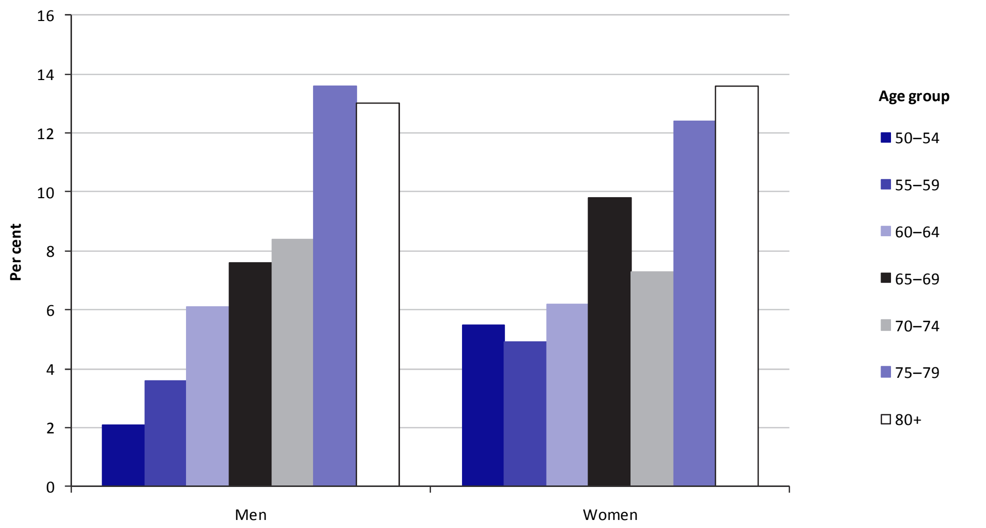


Figure 5.3. Percentage of men and women who report long sleep duration (8 hours or more) by age group (2008–09)



difference which in the older ages may be likely to relate to an increasing proportion of the cohort no longer being in paid employment. However, both short and long sleep duration were most prevalent among the oldest participants (short sleep duration among men aged 80+ and women aged 75–79, and long sleep duration among those aged 75 and over), suggesting that other processes may also be involved.

Sleep disturbance was much more likely to be reported by women than men, at 27.7% in women versus 15.8% in men (see Table 5A.1) and this was consistent across age groups (Figure 5.4 and Table 5A.1). However, in contrast to reports in selected rather than representative populations, our data

Figure 5.4. Percentage of men and women in the worst quartile of sleep disturbance by age group (2008–09)

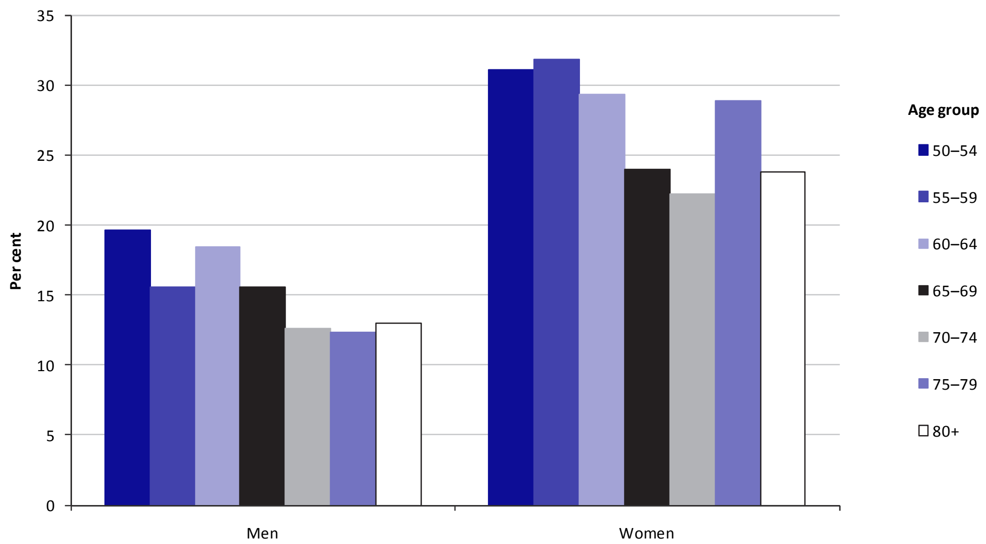
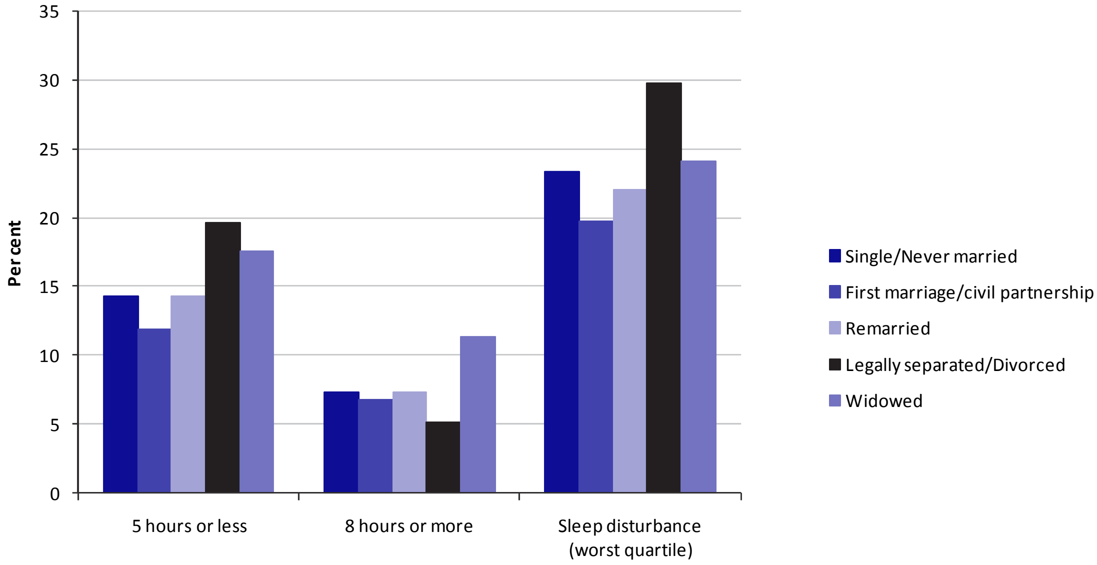


Figure 5.5. Percentage of respondents who report short sleep (5 hours or less), long sleep (8 hours or more) and sleep disturbance (score in highest quartile) by marital status (2008–09)



suggested that reports of sleep disturbance tend to decrease with increasing age in men and women. For example, 19.6% of men aged 50–54 reported disturbed sleep compared to 13.0% of men aged 80 or over.

Figure 5.5 shows that those in their first marriage or civil partnership reported less sleep disturbance than other groups. Those who are legally separated or divorced, or who are widowed, were the most likely to report sleep disturbance. These groups were also most likely to report short sleep duration. In addition, those who have been widowed were more likely to report long sleep duration (see also Table 5A.2).

Respondents' work status, pressure at work, household wealth and debt

With respect to sleep duration, ELSA respondents who are currently working reported shorter mean sleep duration than those who are not working. However, working respondents were less likely to report both sleep of 5 hours or less and 8 hours or more (Figure 5.6). For example, only 10.5% of participants in paid work reported short sleep duration, compared to 23.1% of participants not in work (Table 5A.3).

With respect to sleep disturbance, working respondents were more likely to have low sleep disturbance compared to those who were not working (Figure 5.6). The proportion of respondents who had high sleep disturbance was 18.1% for working respondents and 38.7% for those who were not working (Table 5A.3). Employment status is unlikely to contribute to the relationship of sleep disturbance with age, because older people are less likely to be working and sleep disturbance was found to decrease with increasing age (Figure 5.4).

Figure 5.6. Percentage of respondents who report short sleep (5 hours or less), long sleep (8 hours or more) and sleep disturbance (score in highest quartile) by employment status (2008–09)

Respondents who feel under pressure at work were more likely to report short sleep and sleep disturbance than other respondents who were working. For example, 21.4% of those who reported being under constant pressure at work had high sleep disturbance, compared to 14.9% of other working participants (Table 5A.4). However, they still had better quality sleep on average than those who were not working, indicating that not being in employment may be more of a risk factor for poor sleep than having a stressful job.

Greater household wealth was associated with better sleep quality assessed by all three measures examined (Figures 5.7, 5.8 and 5.9). Thus, greater wealth was associated with decreased reporting of both short and long sleep duration and reduced sleep disturbance in men and women (see also Table 5A.5). For example, 36.3% of women in the poorest wealth quintile reported high sleep disturbance compared to 18.3% in the richest wealth quintile.

Figure 5.7. Percentage of respondents who report short sleep (5 hours or less) by household wealth quintile (2008–09)

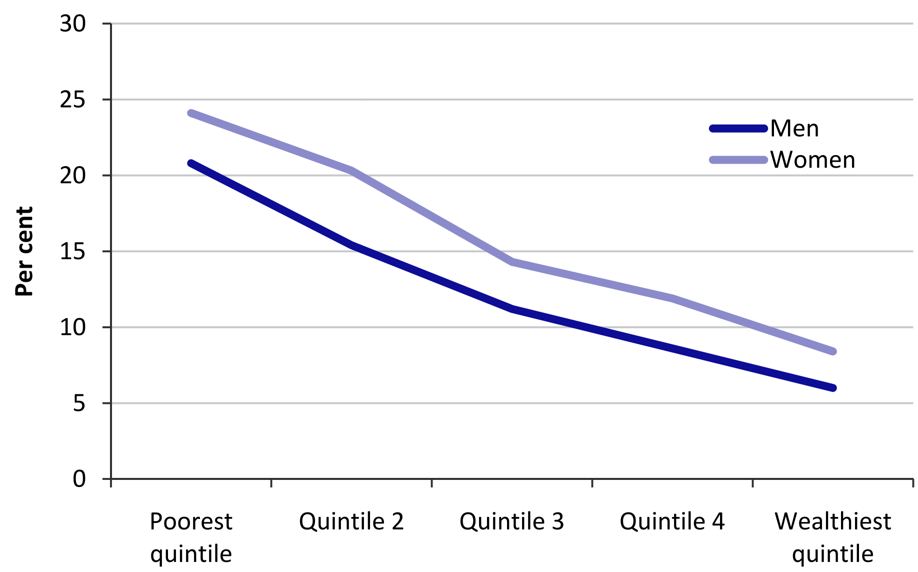


Figure 5.8. Percentage of respondents who report long sleep duration (8 hours or more) by household wealth quintile (2008–09)

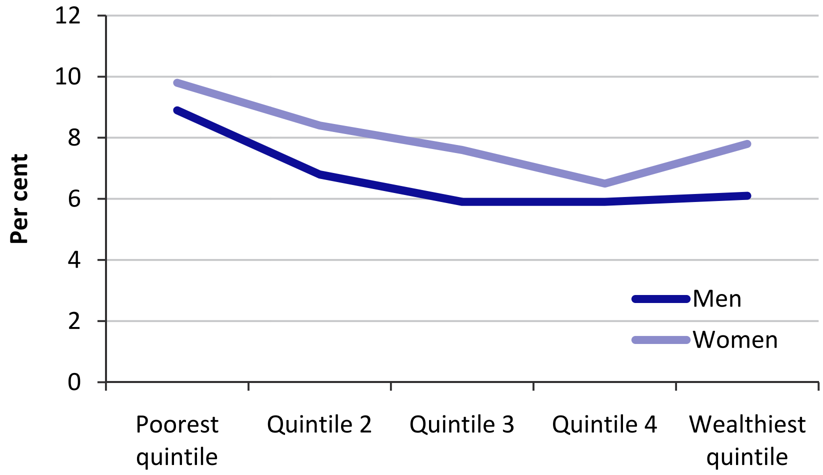
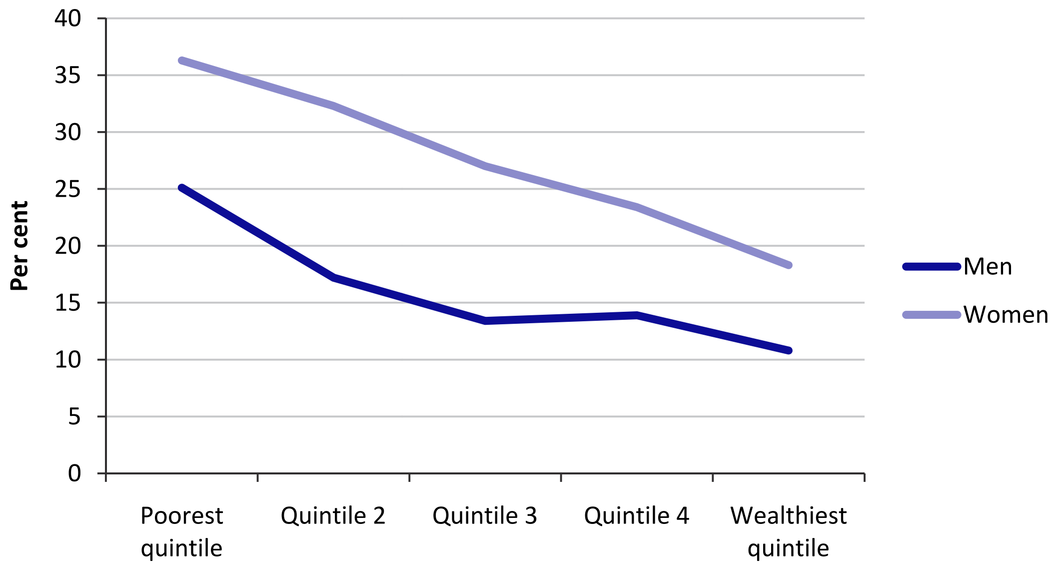
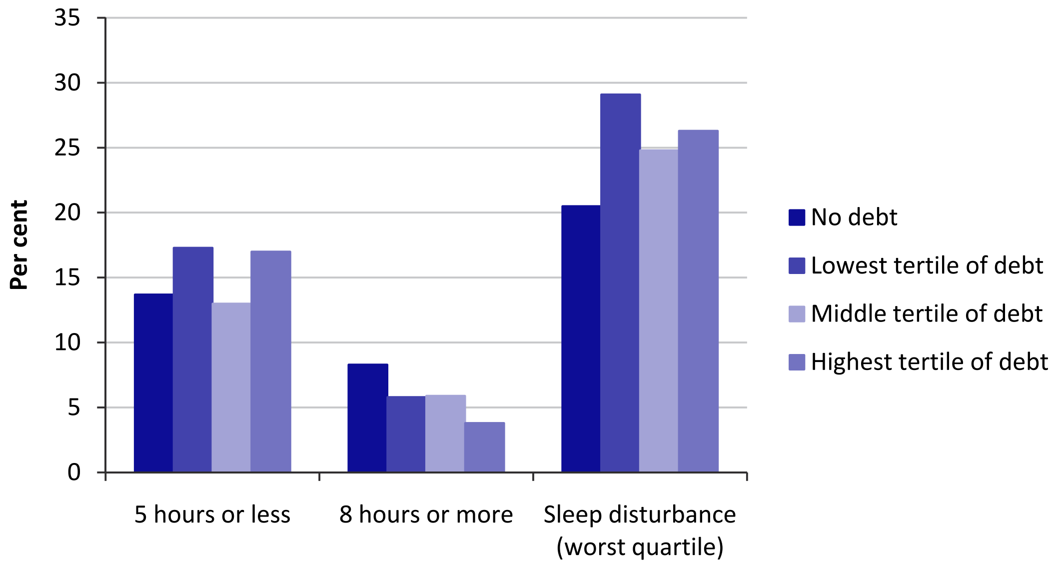


Figure 5.9. Percentage of respondents who report sleep disturbance (score in worst quartile of sleep disturbance scale) by household wealth quintile (2008–09)



ELSA respondents living in households with no debt (excluding mortgages) were less likely to have short sleep duration and more likely to have long sleep duration than other respondents (Figure 5.10). They were also less likely to report sleep disturbance than those with debts, with 29.1% of respondents in the lower tertile of household debt having sleep disturbance compared with 20.5% of respondents with no household debt (Table 5A.6). However, the amount of debt did not seem to be linked with sleep problems. Respondents in the upper tertile of household debt had similar sleep duration and sleep disturbance to those in the lower and middle tertiles of household debt.

Figure 5.10. Percentage of respondents who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by household non-mortgage debt levels, including respondents recording no debt or increasing tertiles of debt (2008–09)



Health and well-being

Poor sleep quality was strongly associated with poor self-rated health (Figure 5.11 and Table 5A.7). This was apparent for all three measures of sleep, with risk of short sleep duration, long sleep duration and sleep disturbance all increasing as self-rated health decreases – for example, 55.1% of respondents who had poor health reported high sleep disturbance, compared to only 9.4% of respondents who reported excellent health.

Additionally, participants who reported bodily pain also tended to report poor sleep (Table 5A.8). For example, 35.0% of those who reported that they were often troubled by pain had high sleep disturbance, compared to 13.6% of those who did not report pain.

In Tables 5A.9 to 5A.11 we see that those with poor health according to a range of indicators (diagnosed cardiovascular disease, diagnosed non-cardiovascular disease and chronic respiratory disease) were more likely to report adverse sleep outcomes (less than 5 hours, more than 8 hours and high sleep disturbance). Participants with directly assessed hypertension also reported poorer sleep (Table 5A.12 and Figure 5.12) and, to a lesser extent, so did those with obesity (Table 5A.13). For example, amongst the obese group 8.6% reported long sleep compared to 2.1% in the underweight group; however the underweight group was more likely to report short sleep duration and sleep disturbance than the obese group. Further, waist circumference was not associated with sleep quality either when examined in the total population or when examined separately in men and women (not shown), although a small association was apparent for sleep duration (Table 5A.14).

Figure 5.11. Percentage of respondents who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by self-rated health (2008–09)

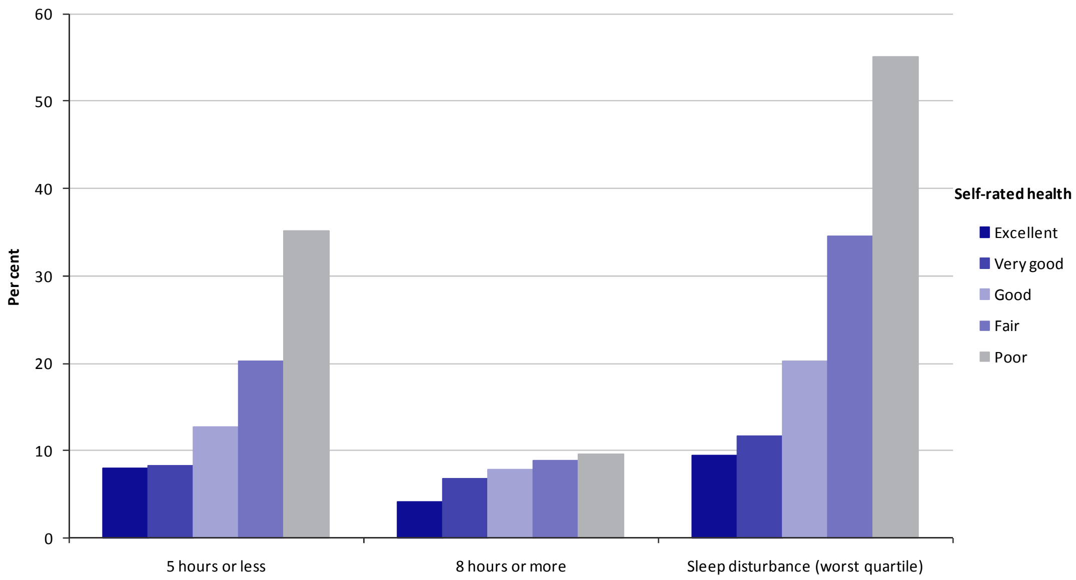
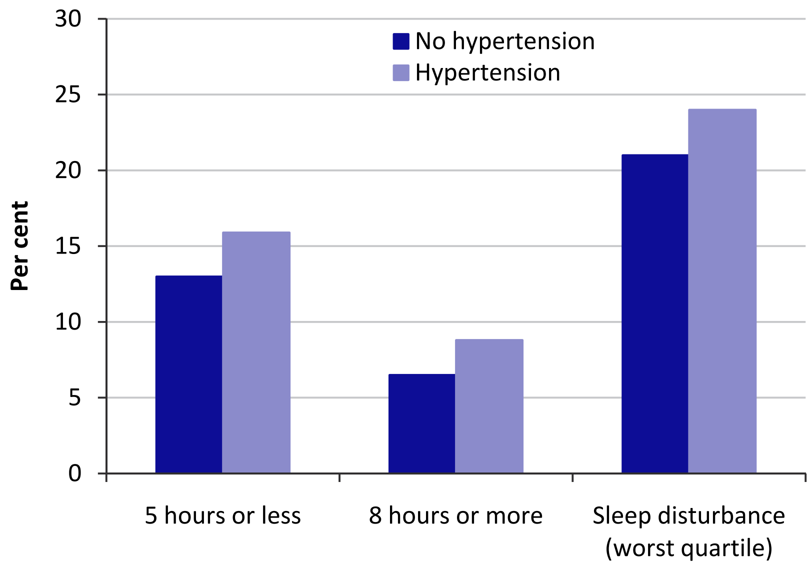
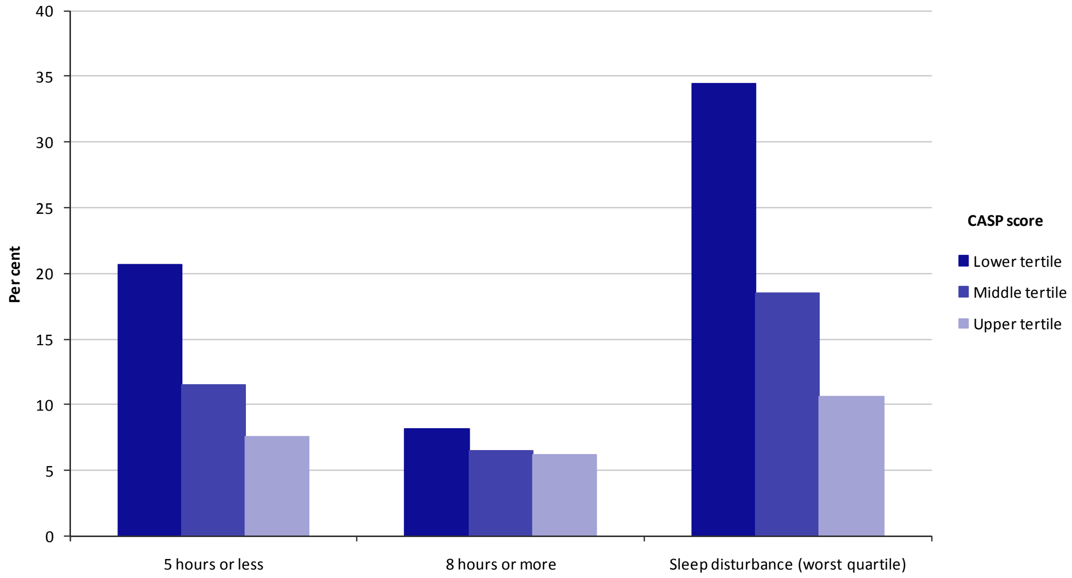


Figure 5.12. Percentage of respondents who reported short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by hypertension status (2008–09)



Poor well-being, assessed by CASP-19 (Figure 5.13 and Table 5A.15), life satisfaction (Table 5A.16) and depressive symptoms score (Table 5A.17) were also associated with measures of poor sleep (sleep duration 5 hours or less, 8 hours or more and particularly with high levels of sleep disturbance). For example, 10.6% of respondents in the upper tertile of CASP-19 score had high sleep disturbance, compared with 34.5% in the lower tertile of CASP-19 score.

Figure 5.13. Percentage of respondents who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by quality of life based on tertile of score in CASP-19 (2008–09)



Short sleep and sleep disturbance were both associated with current smoking, although not with having previously smoked (Table 5A.18). Of the respondents who had never smoked, 20.3% reported high sleep disturbance, compared to 30.4% of current smokers. This is unsurprising, as nicotine is a stimulant and smoking is associated with a number of other health problems that may impede sleep. These findings may also reflect the association of short sleep duration with wealth, as current smoking is found in greater prevalence in less wealthy groups. However, we found no relationship between long sleep duration and smoking status.

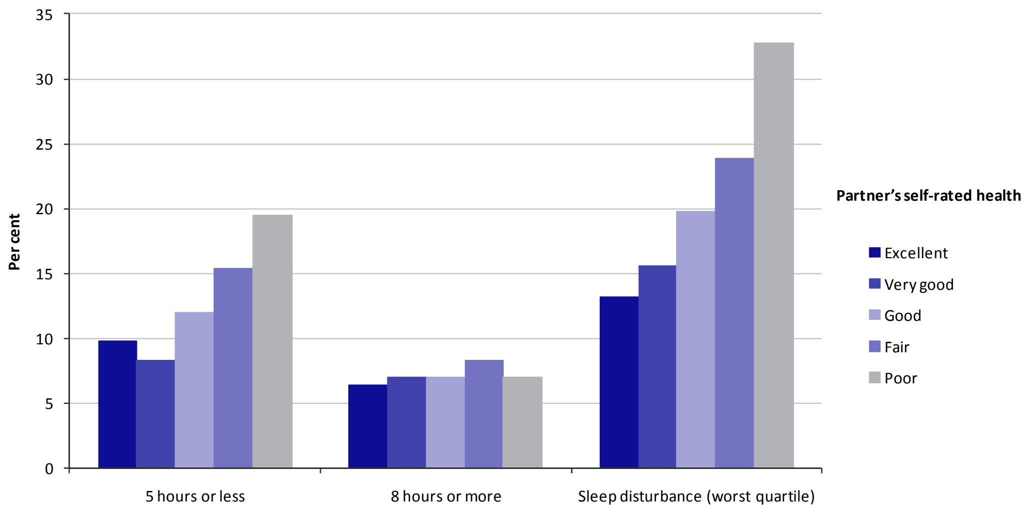
Both sleep disturbance and sleep duration were linearly associated with lower alcohol intake, in that respondents who did not drink at all in the previous 12 months were more likely to have short and long sleep duration and also higher levels of sleep disturbance (Table 5A.19). Among those who do not drink, 29.5% had high sleep disturbance compared to 16.7% of those who drink almost every day. Reasons behind these results are unclear since drinking large amounts of alcohol, like smoking, is associated with a number of health problems that would be expected to decrease sleep quality. Because on average women tend to drink less and also have poorer-quality sleep we examined whether alcohol intake was associated with measures of sleep differently in men and women. Our data show similar associations in men and women (data not shown) pointing to other reasons for this observation.

Lack of exercise was also associated with sleep duration and quality, with respondents who reported frequent moderate or vigorous sports or activities being less likely to have short or long sleep duration, and less likely to have poor-quality sleep (Tables 5A.20 to 5A.22). For example, 15.2% of respondents who reported vigorous exercise more than once a week had sleep disturbance, compared to 25.7% of those who reported hardly ever or never doing vigorous exercise.

Partner's health, and caring for household members

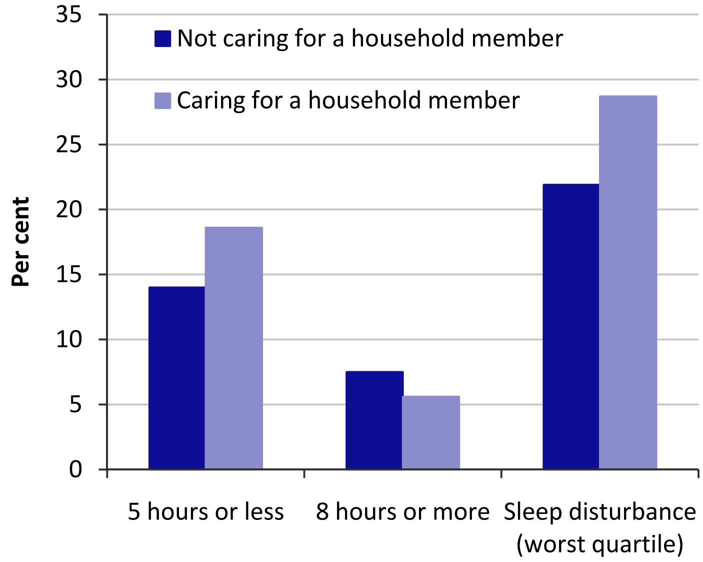
Measures of sleep were influenced by the health characteristics of the participant's partner. For example, we see that partner's self-reported health (Figure 5.14) was related to the respondent's short sleep duration and sleep disturbance, although in contrast to the association with own self-rated health, partner's health was not associated with long sleep duration (Table 5A.23). For example, 32.8% of respondents whose partners reported having poor health had high sleep disturbance, compared with only 13.2% of respondents whose partners reported excellent health. Similarly, participants whose partners reported pain had poorer-quality sleep than those with partners not reporting pain (Table 5A.24).

Figure 5.14. Percentage of respondents who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by partner's self-rated health (2008–09)



ELSA sample members who reported caring for someone in the last month were more likely to have high levels of sleep disturbance, but there was little difference in sleep duration between carers and non-carers (Table 5A.25). Those who lived with the person they cared for in the last week, however, were more likely to have short sleep duration than those who did not live with the person they cared for (Figure 5.15 and Table 5A.26). They were also a little more likely to have higher levels of sleep disturbance, such that 28.6% of respondents who lived with the person they cared for had high sleep disturbance, compared with 24.9% who do not live with the person they care for. The relationship with long sleep duration is likely to be related to age, as older ELSA respondents are much more likely to live with the person they are caring for (usually their spouse) and are also likely to sleep for longer, but the relationships with short sleep duration and sleep disturbance are more likely to be a reflection of sleep difficulties caused by 24-hour caring duties.

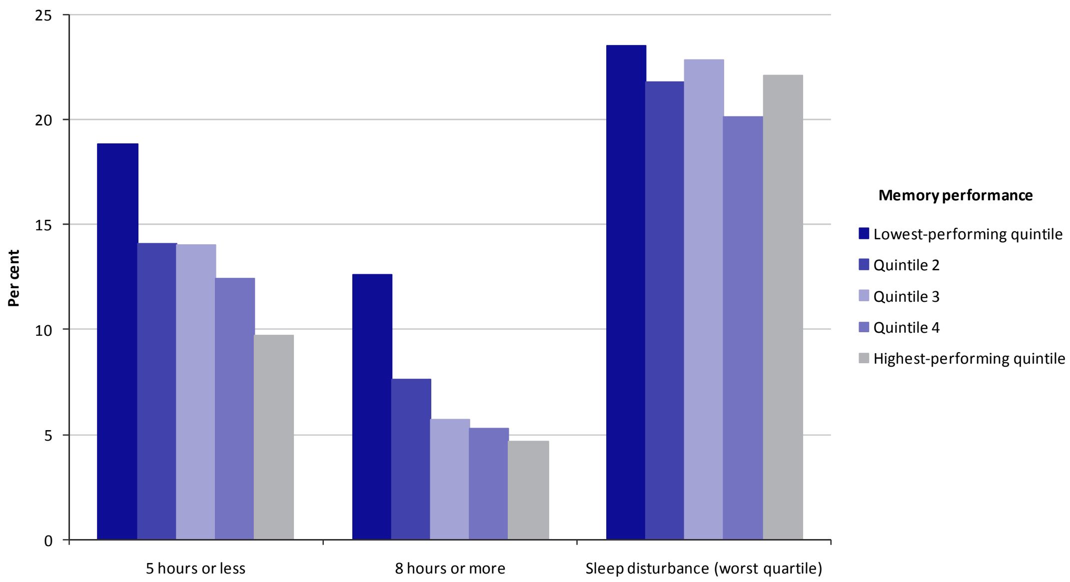
Figure 5.15. Percentage of respondents who report caring for someone in the last month who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by caring for a household member (2008–09)



Cognitive performance

Measures of cognition (memory score, Figure 5.16 and Table 5A.27; poor verbal fluency, Table 5A.28; and numeracy, Table 5A.29) were related to all three measures of poor sleep, with poorer performance associated with sleep quality. This confirms findings from previous studies (Faubel et al., 2009; Kronholm et al., 2009).

Figure 5.16. Percentage of respondents who report short sleep duration (5 hours or less), long sleep duration (8 hours or more) and sleep disturbance (score in highest quartile) by increasing memory score (2008–09)



5.4 Conclusions

Wave 4 of ELSA (2008–09) included measures of sleep duration and sleep disturbance for the first time, providing data for these measures in a national English cohort. These nationally representative data support some previous findings; for example we see that women report poorer sleep than men, measured as short sleep duration, long sleep duration or sleep disturbance. Further, our data support previous evidence that poor sleep is associated with poor clinical and mental health and cognitive function. However, despite these findings for poor health and cognition, our data suggest that ageing is not associated with poor or disrupted sleep, but that sleep improves with age; this is apparent in ELSA when examining sleep disturbance. Further, our findings suggest that sleep behaviour is associated with well-being in the over-50s. Additional work is required to understand the mechanisms by which these associations occur; currently our findings suggest roles for hypertension and possibly obesity, but not central obesity.

Quality of sleep was associated not only with a number of measures of the respondent's characteristics but also with the respondent's partner's characteristics. Sleep studies with a psychological or biological focus concentrate on respondent characteristics and their association with sleep; a wider focus is currently lacking. Our data provide some evidence that wider factors, such as household wealth and debt, or partner's characteristics, also impact on sleep behaviours.

It is currently not possible to examine the direction of association for any of the observations made for sleep characteristics, because sleep was assessed for the first time in wave 4 of ELSA (2008–09). However, a follow-up of the study in waves 5 and 6 will allow us to examine these associations and possible causal direction more fully.

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Appendix 5A
Tables on sleep duration and sleep disturbance

Table 5A.1. Sleep difficulties, by age and sex (2008–09)

All ELSA sample members, wave 4

	Age							Total
	50–54	55–59	60–64	65–69	70–74	75–79	80+	
	%	%	%	%	%	%	%	%
Number of hours on average weeknight								
Men								
5 or less	12.0	11.6	11.0	13.0	11.9	11.5	15.4	12.1
Up to 6	24.5	22.6	20.5	17.1	16.8	19.0	17.3	20.2
Up to 7	37.0	35.3	35.5	33.2	30.7	26.9	24.3	32.9
Up to 8	24.3	26.9	26.9	29.1	32.2	29.0	30.0	27.9
8+	2.1	3.6	6.1	7.6	8.4	13.6	13.0	6.8
Women								
5 or less	15.1	17.0	15.3	13.7	15.6	19.1	16.3	16.0
Up to 6	19.3	20.8	19.9	19.7	21.4	21.1	20.8	20.4
Up to 7	32.7	31.5	29.0	27.2	28.5	23.2	26.2	28.7
Up to 8	27.4	25.8	29.7	29.7	27.3	24.2	23.1	26.7
8+	5.5	4.9	6.2	9.8	7.3	12.4	13.6	8.2
Sleep disturbance								
Men								
1 (least disturbance)	32.9	34.5	30.6	29.9	28.6	26.7	25.3	30.7
2	24.4	25.5	27.5	32.4	35.4	32.9	36.9	29.6
3	23.1	24.4	23.5	22.1	23.3	28.0	24.8	24.0
4 (most disturbance)	19.6	15.6	18.4	15.6	12.6	12.3	13.0	15.8
Women								
1 (least disturbance)	24.0	18.9	20.0	21.8	23.4	20.6	25.9	21.8
2	19.4	20.1	21.3	24.6	20.8	23.8	26.6	22.1
3	25.4	29.2	29.4	29.6	33.7	26.7	23.7	28.3
4 (most disturbance)	31.1	31.8	29.3	24.0	22.2	28.9	23.8	27.7
Unweighted N								
Men	*488*	*836*	*941*	*711*	*673*	*449*	*436*	*4,534*
Women	*602*	*1,007*	*1,108*	*793*	*777*	*504*	*638*	*5,429*
All	*1,090*	*1,843*	*2,049*	*1,504*	*1,450*	*953*	*1,074*	*9,963*

Table 5A.2. Sleep difficulties, by marital status (2008–09)

All ELSA sample members, wave 4

	Marital status					Total
	Single – never married	First marriage / civil partnership	Remarried	Legally separated / divorced	Widowed	
	%	%	%	%	%	%
Number of hours on average weeknight						
5 or less	14.3	11.9	14.3	19.6	17.5	14.2
Up to 6	20.5	19.5	21.7	22.1	20.6	20.3
Up to 7	33.0	32.1	30.4	29.1	26.9	30.7
Up to 8	24.9	29.6	26.3	24.2	23.7	27.3
8+	7.3	6.8	7.3	5.1	11.3	7.5
Sleep disturbance						
1 (least sleep disturbance)	26.7	27.4	25.5	22.4	24.0	26.0
2	23.3	27.2	23.3	22.3	25.3	25.6
3	26.7	25.7	29.1	25.6	26.5	26.3
4 (most sleep disturbance)	23.3	19.7	22.0	29.7	24.1	22.1
Unweighted N						
Men	*309*	*2,802*	*626*	*440*	*380*	*4,557*
Women	*298*	*2,693*	*608*	*731*	*1,177*	*5,507*
All	*607*	*5,495*	*1,234*	*1,171*	*1,557*	*10,064*

Table 5A.3. Sleep difficulties, by work status (2008–09)

All ELSA sample members, wave 4

	Work status			Total
	Retired	In paid work	Not in paid work	
	%	%	%	%
Number of hours on average weeknight				
5 or less	14.5	10.5	23.1	14.1
Up to 6	19.1	21.7	20.7	20.3
Up to 7	28.0	37.7	21.8	30.8
Up to 8	28.5	26.7	25.0	27.4
8+	9.9	3.3	9.4	7.4
Sleep disturbance				
1 (least sleep disturbance)	24.8	30.1	19.0	26.0
2	27.5	25.9	17.4	25.6
3	26.9	25.9	24.9	26.3
4 (most sleep disturbance)	20.8	18.1	38.7	22.2
Unweighted N				
Men	*2,484*	*2,028*	*403*	*4,915*
Women	*3,059*	*2,019*	*1,043*	*6,121*
All	*5,543*	*4,047*	*1,446*	*11,036*

Table 5A.4. Sleep difficulties, by pressure of workload (2008–09)

ELSA sample members currently working, wave 4

	Whether respondent feels under constant pressure due to a heavy workload		**Total**
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	11.8	9.3	10.3
Up to 6	24.1	18.5	20.8
Up to 7	37.3	39.3	38.5
Up to 8	24.1	28.6	26.7
8+	2.8	4.3	3.7
Sleep disturbance			
1 (least sleep disturbance)	27.0	31.5	29.6
2	24.0	27.2	25.9
3	27.6	26.4	26.9
4 (most sleep disturbance)	21.4	14.9	17.6
Unweighted N			
Men	*673*	*972*	*1,645*
Women	*755*	*1,010*	*1,765*
All	*1,428*	*1,982*	*3,410*

Table 5A.5. Sleep difficulties, by household wealth quintiles (2008–09)

All ELSA sample members, wave 4

	Household wealth quintile					Total
	1 (lowest)	2	3	4	5 (highest)	
	%	%	%	%	%	%
Number of hours on average weeknight						
Men						
5 or less	20.8	15.4	11.2	8.6	6.0	12.1
Up to 6	21.5	21.6	19.9	19.4	17.9	20.0
Up to 7	23.0	33.1	34.7	36.7	37.1	33.1
Up to 8	25.8	23.2	28.3	29.4	32.9	28.1
8+	8.9	6.8	5.9	5.9	6.1	6.7
Women						
5 or less	24.1	20.3	14.3	11.9	8.4	16.0
Up to 6	20.7	21.4	22.6	19.2	17.7	20.4
Up to 7	23.0	25.1	30.1	33.2	33.1	28.7
Up to 8	22.4	24.8	25.4	29.1	33.0	26.8
8+	9.8	8.4	7.6	6.5	7.8	8.1
Sleep disturbance						
Men						
1 (least sleep disturbance)	25.7	29.0	32.6	30.5	34.6	30.6
2	24.0	30.3	29.8	31.7	31.8	29.6
3	25.1	23.4	24.2	24.0	22.9	23.9
4 (most sleep disturbance)	25.1	17.2	13.4	13.9	10.8	15.9
Women						
1 (least sleep disturbance)	18.6	20.0	21.9	21.0	28.0	21.8
2	20.7	20.5	22.5	24.2	23.7	22.2
3	24.4	27.3	28.6	31.3	29.9	28.2
4 (most sleep disturbance)	36.3	32.3	27.0	23.4	18.3	27.8
Unweighted N						
Men	*380*	*493*	*580*	*658*	*742*	*2,853*
Women	*604*	*689*	*719*	*756*	*819*	*3,587*
All	*984*	*1,182*	*1,299*	*1,414*	*1,561*	*6,440*

Table 5A.6. Sleep difficulties, by household debt levels (2008–09)

All ELSA sample members, wave 4

	Tertile of household debt (non-mortgage)				**Total**
	No debt	Lower tertile	Middle tertile	Upper tertile	
	%	%	%	%	%
Number of hours on average weeknight					
5 or less	13.7	17.3	13.0	17.0	14.2
Up to 6	19.3	22.5	22.3	23.8	20.3
Up to 7	30.2	30.2	33.3	32.8	30.7
Up to 8	28.5	24.2	25.5	22.7	27.4
8+	8.3	5.8	5.9	3.8	7.5
Sleep disturbance					
1 (least sleep disturbance)	27.0	18.2	25.4	24.7	26.0
2	26.3	26.3	22.5	23.0	25.7
3	26.2	26.4	27.2	26.1	26.3
4 (most sleep disturbance)	20.5	29.1	24.8	26.3	22.1
Unweighted N					
Men	*3,348*	*300*	*420*	*461*	*4,529*
Women	*4,176*	*423*	*441*	*424*	*5,464*
All	*7,524*	*723*	*861*	*885*	*9,993*

Table 5A.7. Sleep difficulties, by self-reported general health (2008–09)

All ELSA sample members, wave 4

	Self-reported general health					Total
	Excellent	Very good	Good	Fair	Poor	
	%	%	%	%	%	%
Number of hours on average weeknight						
5 or less	8.0	8.3	12.7	20.3	35.2	14.1
Up to 6	17.9	18.3	21.7	22.3	20.6	20.3
Up to 7	35.7	35.9	30.9	25.4	17.7	30.8
Up to 8	34.2	30.7	27.0	23.2	16.9	27.4
8+	4.2	6.8	7.8	8.9	9.6	7.4
Sleep disturbance						
1 (least sleep disturbance)	43.9	31.7	25.0	15.1	8.8	26.0
2	25.8	30.8	26.7	21.0	14.2	25.6
3	20.9	25.8	28.0	29.3	21.9	26.3
4 (most sleep disturbance)	9.4	11.7	20.3	34.6	55.1	22.1
Unweighted N						
Men	*624*	*1,361*	*1,476*	*858*	*370*	*4,689*
Women	*729*	*1,730*	*1,899*	*1,136*	*411*	*5,905*
All	*1,353*	*3,091*	*3,375*	*1,994*	*781*	*10,594*

Table 5A.8. Sleep difficulties, by self-reported pain (2008–09)

All ELSA sample members, wave 4

	Whether often troubled by pain		Total
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	21.5	9.3	14.1
Up to 6	22.4	18.9	20.3
Up to 7	26.5	33.6	30.8
Up to 8	22.8	30.4	27.4
8+	6.9	7.8	7.4
Sleep disturbance			
1 (least sleep disturbance)	15.4	33.1	26.0
2	20.7	28.9	25.6
3	28.9	24.5	26.3
4 (most sleep disturbance)	35.0	13.6	22.2
Unweighted N			
Men	*1,656*	*3,032*	*4,688*
Women	*2,524*	*3,381*	*5,905*
All	*4,180*	*6,413*	*10,593*

Table 5A.9. Sleep difficulties, by cardiovascular disease (2008–09)

All ELSA sample members, wave 4

	Cardiovascular disease		Total
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	16.0	11.8	14.1
Up to 6	20.4	20.1	20.3
Up to 7	29.0	32.9	30.8
Up to 8	26.2	28.8	27.4
8+	8.3	6.4	7.4
Sleep disturbance			
1 (least sleep disturbance)	23.3	29.2	26.0
2	25.2	26.1	25.6
3	26.5	26.0	26.3
4 (most sleep disturbance)	25.0	18.8	22.2
Unweighted N			
Men	*2,154*	*2,771*	*4,925*
Women	*2,925*	*3,200*	*6,125*
All	*5,079*	*5,971*	*11,050*

Table 5A.10. Sleep difficulties, by non-cardiovascular chronic disease (2008–09)

All ELSA sample members, wave 4

	Non-cardiovascular chronic disease		Total
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	18.7	12.8	14.1
Up to 6	21.4	20.0	20.3
Up to 7	27.5	31.7	30.8
Up to 8	24.5	28.2	27.4
8+	7.8	7.3	7.4
Sleep disturbance			
1 (least sleep disturbance)	17.8	28.5	26.0
2	23.2	26.3	25.6
3	27.7	25.8	26.3
4 (most sleep disturbance)	31.4	19.4	22.2
Unweighted N			
Men	*3,861*	*1,064*	*4,925*
Women	*4,548*	*1,577*	*6,125*
All	*8,409*	*2,641*	*11,050*

Table 5A.11. Sleep difficulties, by chronic respiratory disease (2008–09)

All ELSA sample members, wave 4

	Chronic respiratory disease		Total
	Yes	**No**	
	%	%	%
Number of hours on average weeknight			
5 or less	22.2	13.5	14.2
Up to 6	22.8	20.1	20.3
Up to 7	24.9	31.3	30.8
Up to 8	22.4	27.8	27.3
8+	7.7	7.4	7.4
Sleep disturbance			
1 (least sleep disturbance)	15.7	26.9	26.0
2	19.7	26.1	25.6
3	29.3	26.0	26.3
4 (most sleep disturbance)	35.4	21.0	22.1
Unweighted N			
Men	*388*	*4,162*	*4,550*
Women	*431*	*5,072*	*5,503*
All	*819*	*9,234*	*10,053*

Table 5A.12. Sleep difficulties, by hypertension[a] (2008–09)
All ELSA sample members, wave 4

	Hypertension		
	Yes	**No**	**Total population**
	%	%	%
Sleep duration			
Men			
5 hours or less	15.9	13.0	14.2
Up to 6	20.6	19.8	20.1
Up to 7	29.8	32.1	30.9
Up to 8	25.9	28.6	27.5
8+	8.8	6.5	7.4
Sleep disturbance			
Men			
1 (least sleep disturbance)	23.8	27.4	25.6
2	26.1	25.4	25.7
3	26.2	26.2	26.2
4 (most sleep disturbance)	24.0	21.0	22.2
Unweighted N			
Men	*1,794*	*2,706*	*4,500*
Women	*1,986*	*3,102*	*5,088*
All	*3,780*	*5,808*	*9,588*

[a]Hypertension defined from doctor-diagnosed hypertension in the main questionnaire and from blood pressure assessment in nurse visit.

Table 5A.13. Sleep difficulties, by obesity status (2008–09)

All ELSA sample members, wave 4

	Body mass index				
	Underweight (20 or less)	**Normal weight (to 25)**	**Overweight (to 30)**	**Obese (over 30)**	**Total population**
	%	%	%	%	%
Sleep duration					
5 hours or less	14.4	15.1	14.7	12.9	14.2
Up to 6	20.8	20.1	19.1	21.4	20.1
Up to 7	33.9	30.4	31.8	29.8	30.9
Up to 8	28.8	26.5	27.5	27.4	27.3
8+	2.1	7.8	6.9	8.6	7.5
Sleep disturbance					
1 (least sleep disturbance)	30.1	24.9	27.2	24.6	25.9
2	23.9	26.5	25.2	25.0	25.4
3	25.0	26.6	26.8	27.2	26.8
4 (most sleep disturbance)	21.1	22.1	20.9	23.2	21.9
Unweighted N					
Men	*77*	*725*	*1,193*	*899*	*2,894*
Women	*98*	*819*	*1,426*	*1,024*	*3,367*
All	*175*	*1,544*	*2,619*	*1,923*	*6,263*

Table 5A.14. Sleep difficulties, by waist circumference (2008–09)

All ELSA sample members, wave 4

	Waist circumference			
	Low	**Medium**	**High**	**Total population**
	%	%	%	%
Sleep duration				
5 hours or less	15.5	14.3	12.9	14.2
Up to 6	20.6	18.0	21.5	20.0
Up to 7	31.1	31.9	29.9	31.0
Up to 8	25.5	28.1	27.9	27.2
8+	7.3	7.6	7.9	7.5
Sleep disturbance				
1 (least sleep disturbance)	25.8	24.5	25.7	25.3
2	25.8	24.2	25.5	25.2
3	25.8	29.2	31.9	27.1
4 (most sleep disturbance)	22.6	22.2	22.5	22.4
Unweighted N				
Men	*970*	*981*	*965*	*2,916*
Women	*1,148*	*1,136*	*1,115*	*3,398*
All	*2,118*	*2,117*	*2,080*	*6,315*

Note: Sex-specific waist circumference tertiles are presented.

Table 5A.15. Sleep difficulties, by CASP-19 score (2008–09)

All ELSA sample members, wave 4

	Tertiles of CASP-19 score			Total
	Lower tertile	Middle tertile	Upper tertile	
	%	%	%	%
Number of hours on average weeknight				
5 or less	20.7	11.5	7.6	13.5
Up to 6	22.1	19.6	16.8	19.6
Up to 7	27.0	32.9	37.0	32.1
Up to 8	22.1	29.6	32.4	27.8
8+	8.2	6.5	6.2	7.0
Sleep disturbance				
1 (least sleep disturbance)	16.5	25.2	37.2	26.0
2	20.5	27.7	29.7	25.8
3	28.4	28.5	22.5	26.6
4 (most sleep disturbance)	34.5	18.5	10.6	21.6
Unweighted N				
Men	*1,383*	*1,328*	*1,345*	*4,056*
Women	*1,662*	*1,710*	*1,733*	*5,105*
All	*3,045*	*3,038*	*3,078*	*9,161*

Table 5A.16. Sleep difficulties, by life satisfaction score (2008–09)

All ELSA sample members, wave 4

	Tertiles of life satisfaction score			Total
	Lower tertile	**Middle tertile**	**Upper tertile**	
	%	%	%	%
Number of hours on average weeknight				
5 or less	18.2	12.8	9.1	13.5
Up to 6	22.2	20.1	16.8	19.7
Up to 7	29.4	32.6	34.5	32.1
Up to 8	23.3	28.4	32.3	27.9
8+	6.9	6.1	7.3	6.9
Sleep disturbance				
1 (least sleep disturbance)	19.6	25.5	32.9	26.0
2	21.2	27.2	29.5	25.8
3	28.4	27.1	24.3	26.6
4 (most sleep disturbance)	30.8	20.2	13.2	21.7
Unweighted N				
Men	*1,441*	*1,054*	*1,558*	*4,053*
Women	*1,931*	*1,263*	*1,915*	*5,109*
All	*3,372*	*2,317*	*3,473*	*9,162*

Table 5A.17. Sleep difficulties, by depression score (2008–09)

All ELSA sample members, wave 4

	Tertiles of depression score			Total
	Lower tertile	Middle tertile	Upper tertile	
	%	%	%	%
Number of hours on average weeknight				
5 or less	4.1	19.0	27.4	14.1
Up to 6	16.6	23.8	23.8	20.3
Up to 7	36.0	29.1	23.2	30.8
Up to 8	35.8	21.8	17.5	27.4
8+	7.5	6.2	8.2	7.4
Sleep disturbance				
1 (least sleep disturbance)	40.2	15.8	9.6	25.9
2	34.0	20.0	16.1	25.7
3	21.2	34.8	28.2	26.3
4 (most sleep disturbance)	4.6	29.3	46.1	22.0
Unweighted N				
Men	*2,665*	*959*	*1,004*	*4,628*
Women	*2,514*	*1,500*	*1,815*	*5,829*
All	*5,179*	*2,459*	*2,819*	*10,457*

Table 5A.18. Sleep difficulties, by smoking (2008–09)

All ELSA sample members, wave 4

	Smoking			Total
	Never smoked	Ex-smoker	Current smoker	
	%	%	%	%
Number of hours on average weeknight				
5 or less	13.3	12.9	19.0	14.1
Up to 6	20.1	20.5	21.2	20.3
Up to 7	31.0	32.3	28.5	30.8
Up to 8	28.1	27.8	23.7	27.4
8+	7.5	6.6	7.7	7.4
Sleep disturbance				
1 (least sleep disturbance)	26.1	26.6	24.8	26.0
2	26.3	27.0	21.1	25.6
3	27.2	23.1	23.7	26.3
4 (most sleep disturbance)	20.3	23.3	30.4	22.2
Unweighted N				
Men	*3,647*	*591*	*687*	*4,925*
Women	*4,784*	*483*	*858*	*6,125*
All	*8,431*	*1,074*	*1,545*	*11,050*

Table 5A.19. Sleep difficulties, by alcohol consumption (2008–09)

All ELSA sample members, wave 4

	How often respondent has had an alcoholic drink during the last 12 months								Total
	Almost every day	**Five or six days a week**	**Three or four days a week**	**Once or twice a week**	**Once or twice a month**	**Once every couple of months**	**Once or twice a year**	**Not at all in the last 12 months**	
	%	%	%	%	%	%	%	%	%
Number of hours on average weeknight									
5 or less	10.9	9.4	9.5	11.4	13.5	15.5	18.3	22.2	13.4
Up to 6	19.5	17.7	18.7	19.3	19.5	20.7	20.6	22.1	19.7
Up to 7	34.7	36.3	37.3	34.8	31.5	29.1	27.9	20.9	32.1
Up to 8	28.4	31.8	27.9	28.1	27.3	28.2	25.0	26.3	27.8
8+	6.4	4.9	6.6	6.4	8.2	6.5	8.3	8.5	7.0
Sleep disturbance									
1 (least sleep disturbance)	28.4	33.0	27.5	26.0	27.5	21.6	21.6	22.0	26.0
2	28.8	22.9	27.2	27.2	24.9	23.8	23.3	23.5	25.9
3	26.1	27.8	29.8	26.6	25.3	26.7	25.5	25.0	26.6
4 (most sleep disturbance)	16.7	16.3	15.6	20.1	22.2	28.0	29.6	29.5	21.6
Unweighted N									
Men	*841*	*352*	*641*	*1,099*	*384*	*203*	*196*	*302*	*4,018*
Women	*643*	*269*	*600*	*1,160*	*647*	*439*	*595*	*732*	*5,085*
All	*1,484*	*621*	*1,241*	*2,259*	*1,031*	*642*	*791*	*1,034*	*9,103*

Table 5A.20. Sleep difficulties, by frequency of doing vigorous sports or activities (2008–09)

All ELSA sample members, wave 4

	Frequency of doing vigorous sports or activities				Total
	More than once a week	Once a week	One to three times a month	Hardly ever, or never	
	%	%	%	%	%
Number of hours on average weeknight					
5 or less	10.3	9.3	11.3	16.4	14.1
Up to 6	18.5	19.0	20.9	20.9	20.3
Up to 7	36.6	35.0	33.9	27.9	30.8
Up to 8	29.2	31.2	28.5	26.1	27.4
8+	5.3	5.5	5.5	8.6	7.4
Sleep disturbance					
1 (least sleep disturbance)	30.2	30.6	30.8	23.3	26.0
2	29.4	26.8	25.4	24.3	25.6
3	25.2	27.1	25.3	26.6	26.3
4 (most sleep disturbance)	15.2	15.5	18.4	25.7	22.1
Unweighted N					
Men	*1,109*	*499*	*540*	*2,769*	*4,917*
Women	*1,055*	*536*	*519*	*4,012*	*6,122*
All	*2,164*	*1,035*	*1,059*	*6,781*	*11,039*

Table 5A.21. Sleep difficulties, by frequency of doing moderate sports or activities (2008–09)

All ELSA sample members, wave 4

	Frequency of doing moderate sports or activities				Total
	More than once a week	**Once a week**	**One to three times a month**	**Hardly ever, or never**	
	%	%	%	%	%
Number of hours on average weeknight					
5 or less	11.1	11.9	17.2	23.6	14.1
Up to 6	20.1	19.5	24.0	20.0	20.3
Up to 7	32.8	34.8	26.6	23.3	30.8
Up to 8	29.7	26.0	25.4	22.3	27.4
8+	6.3	7.7	6.8	10.8	7.4
Sleep disturbance					
1 (least sleep disturbance)	28.2	25.8	22.4	21.0	26.0
2	27.5	25.9	24.2	20.4	25.6
3	26.6	29.2	24.8	23.8	26.3
4 (most sleep disturbance)	17.8	19.2	28.6	34.9	22.1
Unweighted N					
Men	*3,107*	*708*	*331*	*771*	*4,917*
Women	*3,506*	*870*	*437*	*1,309*	*6,122*
All	*6,613*	*1,578*	*768*	*2,080*	*11,039*

Table 5A.22. Sleep difficulties, by frequency of doing mild sports or activities (2008–09)

All ELSA sample members, wave 4

	Frequency of doing mild sports or activities				Total
	More than once a week	Once a week	One to three times a month	Hardly ever, or never	
	%	%	%	%	%
Number of hours on average weeknight					
5 or less	12.8	15.1	16.2	21.4	14.1
Up to 6	20.2	20.8	20.9	20.3	20.3
Up to 7	31.8	29.8	34.0	23.6	30.8
Up to 8	28.4	27.3	20.6	23.0	27.4
8+	6.8	7.0	8.4	11.8	7.4
Sleep disturbance					
1 (least sleep disturbance)	26.0	26.6	27.4	25.0	26.0
2	26.4	25.6	21.3	21.5	25.6
3	26.7	26.0	27.1	23.3	26.3
4 (most sleep disturbance)	20.9	21.7	24.1	30.2	22.1
Unweighted N					
Men	*3,361*	*641*	*289*	*625*	*4,916*
Women	*5,008*	*419*	*101*	*595*	*6,123*
All	*8,369*	*1,060*	*390*	*1,220*	*11,039*

Table 5A.23. Sleep difficulties, by partner's self-reported general health (2008–09)

All ELSA sample members, wave 4

	Partner's self-reported general health					Total
	Excellent	Very good	Good	Fair	Poor	
	%	%	%	%	%	%
Number of hours on average weeknight						
5 or less	9.8	8.3	12.0	15.4	19.5	11.7
Up to 6	14.9	18.6	17.7	18.0	28.6	18.4
Up to 7	35.1	34.6	32.3	31.7	21.1	32.5
Up to 8	33.8	31.5	31.0	26.7	23.8	30.3
8+	6.4	7.0	7.0	8.3	7.0	7.1
Sleep disturbance						
1 (least sleep disturbance)	34.9	28.9	28.5	23.5	18.3	27.9
2	26.2	28.5	25.9	26.6	24.2	26.7
3	25.7	26.9	25.9	26.0	24.7	26.1
4 (most sleep disturbance)	13.2	15.6	19.8	23.9	32.8	19.2
Unweighted N						
Men	*231*	*525*	*576*	*260*	*95*	*1,687*
Women	*210*	*470*	*502*	*278*	*112*	*1,572*
All	*441*	*995*	*1,078*	*538*	*207*	*3,259*

Table 5A.24. Sleep difficulties, by partner's self-reported pain (2008–09)

All ELSA sample members, wave 4

	Whether partner is often troubled by pain		Total
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	13.7	10.0	11.9
Up to 6	18.7	18.9	18.8
Up to 7	30.0	34.7	32.2
Up to 8	30.3	30.2	30.2
8+	7.4	6.2	6.8
Sleep disturbance			
1 (least sleep disturbance)	24.6	30.6	27.5
2	26.0	27.9	26.9
3	27.1	24.8	26.0
4 (most sleep disturbance)	22.3	16.7	19.6
Unweighted N			
Men	*874*	*867*	*1,741*
Women	*921*	*751*	*1,672*
All	*1,795*	*1,618*	*3,413*

Table 5A.25. Sleep difficulties, by caring (2008–09)

All ELSA sample members, wave 4

	Whether cared for someone during the last month		Total
	Yes	No	
	%	%	%
Number of hours on average weeknight			
5 or less	15.0	14.0	14.2
Up to 6	21.0	20.2	20.3
Up to 7	30.4	30.7	30.7
Up to 8	28.8	27.2	27.4
8+	4.8	7.9	7.5
Sleep disturbance			
1 (least sleep disturbance)	23.1	26.4	26.0
2	22.7	26.1	25.6
3	29.1	25.8	26.2
4 (most sleep disturbance)	25.0	21.7	22.1
Unweighted N			
Men	*457*	*4,459*	*4,916*
Women	*916*	*5,208*	*6,124*
All	*1,373*	*9,667*	*11,040*

Table 5A.26. Sleep difficulties, by caring for household members (2008–09)

ELSA sample members who are carers, wave 4

	Whether lives with person cared for in last week		Total
	Yes	**No**	
	%	%	%
Number of hours on average weeknight			
5 or less	18.5	14.8	16.5
Up to 6	23.6	20.5	21.9
Up to 7	26.4	31.0	28.9
Up to 8	25.9	29.7	28.0
8+	5.6	4.0	4.7
Sleep disturbance			
1 (least sleep disturbance)	19.7	23.6	21.9
2	22.0	23.4	22.8
3	29.6	28.1	28.8
4 (most sleep disturbance)	28.6	24.9	26.6
Unweighted N			
Men	*179*	*152*	*331*
Women	*256*	*411*	*667*
All	*435*	*563*	*998*

Table 5A.27. Sleep difficulties, by memory score (2008–09)

All ELSA sample members, wave 4

	Memory score					
	Lowest quintile	**Q2**	**Q3**	**Q4**	**Highest quintile**	**Total population**
	%	%	%	%	%	%
Number of hours on average per weeknight						
5 or less	18.8	14.1	14.0	12.4	9.7	14.1
Up to 6	19.4	20.5	20.7	21.3	19.5	20.2
Up to 7	23.0	30.6	31.4	34.0	37.7	30.9
Up to 8	26.2	27.3	28.2	27.0	28.4	27.4
8+	12.6	7.6	5.7	5.3	4.7	7.4
Sleep quality quartiles						
1 (least disturbed sleep)	26.5	24.7	25.9	24.4	28.2	25.9
2	25.7	26.9	26.1	26.1	23.3	25.7
3	24.2	26.6	25.2	29.4	26.5	26.3
4 (most disturbed sleep)	23.5	21.8	22.8	20.1	22.1	22.2
Unweighted N						
Men	*1,099*	*878*	*980*	*802*	*651*	*4,410*
Women	*1,118*	*837*	*1,126*	*977*	*952*	*5,011*
All	*2,217*	*1,715*	*2,107*	*1,779*	*1,603*	*9,421*

Table 5A.28. Sleep difficulties, by verbal fluency (2008–09)

All ELSA sample members, wave 4

	Verbal fluency score					
	Lowest quintile	**Q2**	**Q3**	**Q4**	**Highest quintile**	**Total population**
	%	%	%	%	%	%
Sleep duration						
5 hours or less	18.2	15.0	13.6	13.0	10.0	14.1
Up to 6	19.9	20.7	20.5	20.2	20.1	20.3
Up to 7	24.6	29.0	31.6	34.3	36.0	30.9
Up to 8	25.4	27.7	27.2	27.4	29.5	27.3
8+	11.9	7.6	7.1	5.1	4.4	7.4
Sleep disturbance						
1 (least sleep disturbance)	26.3	24.2	23.3	28.0	28.3	25.9
2	24.4	26.8	27.7	24.3	25.2	25.7
3	24.6	26.7	25.8	26.9	27.7	26.2
4 (most sleep disturbance)	24.8	22.3	23.3	20.8	18.8	22.2
Unweighted N						
Men	*928*	*723*	*1,013*	*896*	*835*	*4,394*
Women	*1,205*	*867*	*1,212*	*890*	*824*	*4,997*
All	*2,132*	*1,590*	*2,225*	*1,785*	*1,658*	*9,391*

Table 5A.29. Sleep difficulties, by numeracy (2008–09)

All ELSA sample members, wave 4

	Numeracy score					
	0, 1, 2 (low)	**3**	**4**	**5**	**6 (high)**	**Total population**
	%	%	%	%	%	%
Sleep duration						
Men						
5 hours or less	18.9	18.2	15.2	11.0	8.5	14.1
Up to 6	21.1	20.9	20.1	19.8	19.7	20.2
Up to 7	22.1	25.8	29.7	35.9	37.6	30.9
Up to 8	25.1	26.3	28.1	27.1	30.2	27.4
8+	12.8	8.9	7.0	6.2	4.0	7.4
Sleep disturbance						
Men						
1 (least sleep disturbance)	25.7	23.6	23.8	26.6	31.3	25.9
2	22.7	25.5	25.4	26.0	28.1	25.7
3	23.8	25.3	27.6	27.3	25.7	26.3
4 (most sleep disturbance)	27.9	25.6	23.3	20.0	15.0	21.5
Unweighted N						
Men	*336*	*718*	*924*	*1,402*	*1,034*	*4,414*
Women	*882*	*1,280*	*1,257*	*1,192*	*431*	*5,042*
All	*1,218*	*1,968*	*2,177*	*2,593*	*1,464*	*9,420*

6. Health and social engagement among the oldest old

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Definition: For the purpose of this chapter we have defined the 'oldest old' as people aged 80 and over.

Below are some of the main findings from the chapter:

- Around 12% of the oldest old experienced widowhood between 2002–03 and 2008–09.
- There is no association between age and home ownership in men, but renting one's home becomes more prevalent in older ages among women, reaching 37% in those aged 85 and over.
- Almost 50% of men and women aged 80–84 report severe limitations in activities (with or without accompanying mild limitations). Among those aged 85 and over, the figures rise to 55% and 72%, respectively. A total of 35% of those who reached age 80 years by 2008–09 experienced an increase in severity of limitations over the 6-year period from 2002–03. However, 10% showed an improvement (less severe limitations in 2008–09).
- A total of 26% of women aged 80–84 and 23% of those aged 85 and over had levels of depressive symptoms indicative of clinical relevance. Almost 13% of men and women aged 80 and over had high levels of depressive symptoms in 2008–09 but not in 2002–03.
- Longitudinal analyses comparing 2002–03 and 2008–09 show that most of the oldest old experienced a substantial decrease in quality of life over the period. Just over 10% experienced a substantial improvement of 5 or more points.
- Over 20% of men and women aged 80 and over use public transport often. Whilst 24% of those aged 85 and over with no car often use public transport, 64% only occasionally or never do so, which could indicate a lack of independence in this group to move around outside the immediate area.
- Just under 10% of the oldest old took up membership of organisations (such as political, environmental, religious and charitable groups) between 2002–03 and 2008–09. Around 15% stopped being a member of any organisations over the period. Over 50% were members of at least one

organisation in 2002–03 and in 2008–09. Contact with children, other family and friends was also stable for the great majority of the oldest old between 2002–03 and 2008–09.

- Longitudinal analysis of change between waves 1 and 4 showed that stopping membership of organisations between 2002–03 and 2008–09 was associated with a decrease in quality of life over the same period. Increasing disability between 2002–03 and 2008–09 was also associated with a decrease in quality of life though this did not attain statistical significance.

6.1 Background

Mortality is falling rapidly throughout the developed world, leading to higher proportions of people surviving to old and very old ages. One of the most remarkable contemporary demographic developments is the progressive demographic ageing of the older population itself (Gwozdz and Sousa-Poza, 2009). In almost all countries, the proportion of those who are often referred to as the ‘oldest old’ is growing faster than that of the younger population. According to United Nations Population Division (UNPD, 2002) the average annual population growth of people aged 80 years or over is currently twice as high as the growth rate of the population over 60 years of age. Moreover, the proportion of those older than 80 is projected to increase almost fourfold over the next 50 years. The 2009-based national population projections show that population growth at the oldest ages is likely to continue. As the population ages, the numbers at the oldest ages will increase the fastest. In 2009, there were 1.4 million people in the UK aged 85 and over; this number is projected to increase to 3.5 million by 2033, doubling over 25 years (ONS, 2010a). Projections from the Office for National Statistics show that the number of people aged 90 and above is projected to more than triple by 2033, the number of people aged 95 and over is projected to more than quadruple, and the number of centenarians is projected to rise from 11,000 in 2008 to 80,000 in 2033, a more than sevenfold increase (ONS, 2009). It should however be pointed out that these projections rest on a number of assumptions, and that alternative assumptions concerning gender differentials, healthcare advances and the impact of lifestyle factors generate variations on these scenarios, as detailed in the Modelling Ageing Populations to 2030 (MAP2030) research programme (http://www.lse.ac.uk/collections/MAP2030/).

Most of this increase is due to improvements in economic and social conditions and to ongoing medical advances (Riley, 2001). This is well illustrated by the ‘natural experiment’ of the German unification. Following the unification of East and West Germany (1989–90), mortality in the East declined toward prevailing levels in the West, especially among the elderly (Gjonça, Brockmann and Maier, 2000; Vaupel, Carey and Christensen, 2003). Thus, factors associated with mortality in older people seem to be highly influenced by changeable environmental factors. Greater female longevity also means that women currently have a higher share of the oldest old population. However, this is changing. While the proportion of all older people is expected to increase this is particularly so for older men. The projected increase by

2031 is 93% for women aged 85 and over and 220% for men aged 85 and over (Bayliss and Sly, 2010; Wise, 2010).

Like other sections of the population, the oldest old are heterogeneous in terms of demographic, social and health characteristics. As such, comprehensive information about their characteristics is needed. However, even given the growth of this age group in the population described above, most of the current national surveys (with a few exceptions) do not have sufficiently large sample sizes to allow analysis by other characteristics. ELSA provides unique information about the economic and social circumstances surrounding the health and quality of life of the oldest old, as was emphasised in the House of Lords Select Committee on Science and Technology report on Scientific Aspects of Ageing.[1] At wave 4 (2008–09) there were almost 1,250 participants aged 80 and over. Although this does not provide a sufficient sample size for more fine-grained analysis by narrower age bands, we are able to examine those aged 80–84 and 85 and over separately. The chapter is descriptive in nature and is a starting point for documenting the characteristics of the oldest old. Much more detailed work will undoubtedly be required to understand fully the health, economic and social domains and their interplay subsequent to the work undertaken for this report.

The aims of the chapter are:

(1) To describe health, quality of life and social engagement among the over-80s in comparison with younger old people (taken as those aged 65–79 in this chapter). We will examine whether these characteristics are linearly patterned by age or whether there is evidence of accelerated change in the oldest old.

(2) To document changes in health and social engagement between 2002–03 and 2008–09 experienced by those who are over 80 years old by 2008–09, and to investigate their contribution to changes in quality of life over the same period.

6.2 Data and methods

Sample

We use 80 years as the cut-off point for defining the oldest old in this chapter. However, several definitions for the oldest old have been used (for example 65 years and over, or 75 years and over), or the chronological age at which 50% of the birth cohort are no longer alive (Baltes and Smith, 2003). An increase in life expectancy over the last century means that reaching very advanced ages is no longer rare. Recent research has used the definition of 80 or 85 years and over to detail the demographic and social characteristics of the oldest old (Tomassini, 2005; 2007; Andersen-Ranberg et al., 2005; Dini and Goldring, 2008). Setting an age limit to identify the oldest old should reflect the dynamic process of population ageing. In this chapter, we contrast three groups: those aged 65–79 years (the ‘younger old’), those aged 80–84 years and those aged 85 and over.

[1]http://www.publications.parliament.uk/pa/ld200506/ldselect/ldsctech/20/2009.htm.

Table 6.1. Number (%) of participants in institutions and interviewed by proxy, by age and sex (2008–09)

	65–79 years	80–84 years	85+ years
Men			
Not in institution	1,897 (99.6)	277 (99.3)	170 (96.1)
Interviewed in institution	7 (0.4)	2 (0.7)	7 (4.0)
Not interviewed by proxy	1,830 (96.1)	264 (94.6)	158 (89.3)
Interviewed by proxy	74 (3.9)	15 (5.4)	19 (10.7)
Total included in analyses in this chapter	1,904	279	177
Women			
Not in institution	2,120 (99.7)	339 (97.1)	312 (91.2)
Interviewed in institution	7 (0.3)	10 (2.9)	30 (8.8)
Not interviewed by proxy	2,076 (97.6)	330 (94.6)	285 (83.3)
Interviewed by proxy	51 (2.4)	19 (5.4)	57 (16.7)
Total included in analyses in this chapter	2,127	349	342

The data used in the analyses are all the ELSA core sample members participating in wave 4 (2008–09). It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected. This includes respondents whose interview was conducted by proxy. It also includes those who were interviewed while in institutions. The number and percentage of respondents who were interviewed by proxy or while in an institution is broken down by age and sex in Table 6.1.

Measures of health

Self-rated health

Self-rated general health was measured at wave 1 (2002–03) and wave 4 (2008–09), using the following question: 'Would you say your health is …' with reply alternatives: excellent, very good, good, fair or poor. Responses were combined into three groups: excellent and very good (referred to here as 'high'), good ('medium') and fair or poor ('low').

Long-term limiting illness

During the interview participants were asked whether they have any long-standing illness that has troubled them or that is likely to affect them over a period of time. If the answer was yes they were then asked whether the illness limited their activities in any way. From answers to these questions a dummy variable was derived to indicate presence or absence of a long-standing illness that is limiting.

Disability index

The activity limitation index combined information on difficulties walking for a quarter of a mile, activities of daily living (ADL), some instrumental activities of daily living (IADL) and mobility difficulties. From answers to

these questions we derived the activity limitation index with three mutually exclusive categories defined as follows:

- no limitations;
- mild but not severe limitations; some or any of the following: some or much difficulty walking a quarter of a mile; difficulty climbing several flights of stairs without resting; difficulty taking medications; difficulty preparing a hot meal;
- severe limitations (either with or without accompanying mild limitations): difficulty with all ADL; difficulty climbing one flight of stairs without resting; difficulty shopping for groceries; difficulty doing work around house and garden.

Gait speed

Respondents aged 60 and over were eligible for the walking (or gait) speed test, which was performed as part of the main ELSA interview. The test involved timing how long it took to walk a distance of 8 feet. Respondents were asked to walk (not race) to the other end of the course at their usual speed, just as if they were walking down the street to the shops, and to walk all the way past the other end of the tape before stopping. The interviewer timed how long they took to get to the other end and then timed them again walking in the other direction. The average of the two times is used for analysis. A lower gait speed indicates greater physical limitation.

Depression

An eight-item version of the Center for Epidemiologic Studies Depression Scale (CES-D) was used to capture depressive symptoms in the interview (see Box 6.1). We used the well-validated threshold of four or more symptoms to define significant depressive symptoms, in line with previous studies (Steffick, 2000).

Box 6.1. Eight-item version of the Center for Epidemiologic Studies Depression Scale

Now think about the past week and the feelings you have experienced.

Please tell me if each of the following was true for you much of the time during the past week …

… you felt depressed?

… you felt that everything you did was an effort?

… your sleep was restless?

… you were happy? [reverse coded]

… you felt lonely?

… you enjoyed life? [reverse coded]

… you felt sad?

… you could not get going?

1 point was given for each affirmative response up to a total of 8.

Quality of life

The CASP-19 contains 19 questions on four domains of quality of life in old age: control, autonomy, self-realisation and pleasure (Hyde et al., 2003). The 4-point response scale ranged from 3 (often) to 0 (never). The possible range of the CASP-19 summary score was from 0 (worst/lowest possible score) to 57 (best/highest possible score).

Public transport

Public transport categories are 'uses often' if people use public transport two to three times per week or more often; 'uses sometimes' if people use public transport once per week or up to two to three times a month. Finally people who report using public transport once a month or less are categorised as 'uses occasionally or never'. Participants were also asked about whether they owned a car or had access to other private cars (a family or friend's car for example). They were grouped into those that had access to a private car (own or someone else's) and those that did not.

Analysis

The analyses in this chapter are both cross-sectional and longitudinal. The sample is analysed and described with respect to their:

- demographic characteristics (including sex, age, marital status, whether they were living alone and housing tenure);
- health and quality of life (including self-reported health, long-standing limiting illness, walking speed, depression and the CASP-19 quality of life scale);
- social engagement (including membership of organisations and contact with family and friends).

The data are first analysed cross-sectionally for wave 4 (2008–09) and we examine whether there is any indication of a non-linear trend by age group. Analyses are weighted using cross-sectional weights which allow for sample selection and survey non-response.

We also conduct panel analyses looking at changes to the above characteristics between waves 1 (2002–03) and 4 (2008–09) among the group of people aged 80 or older in 2008–09. The aim of this section of the chapter is to describe the changes in health, quality of life and social engagement experienced in later life among the oldest old. Longitudinal analyses are weighted using longitudinal weights which allow for sample selection and survey non-response throughout follow-up.

Finally, we estimate the impact of changes in social engagement and disability on quality of life in 2008–09. Since quality of life at one point in time is likely to be correlated with quality of life at another time point for the same person, we use regression modelling to examine the relationship between quality of life in 2008–09 and the exposures of interest whilst controlling for quality of life in 2002–03. Regression models include age and sex (all models), change in social engagement (Model 1) or change in disability (Model 2) as the exposures of interest.

6.3 Results and discussion

Demographic characteristics and living arrangements of the oldest old

Marital status and living alone

Table 6A.1 shows the distribution of the oldest old in ELSA by marital status in 2008–09. Almost 70% of men aged 80–84 are married. This percentage declines dramatically with age and at ages 85 and over only 49.3% of men are married and 49.6% are widowed. At all ages, widowhood is more prevalent for women than for men. By age 80, the majority of women are widowed and only one-third are married. Whilst being married is relatively common up to age 84 for men, this is not the case for women.

The high rates of widowhood among older women are reflected in the percentages of women living alone (77.3% of those aged 85 and over compared with 43.8% of men aged 85 and over) (Table 6A.1). One reason for the concern over older people living alone is the greater use of health and social care services in that group (Bertakis et al., 2000; Waldron, 1976; Gjonça, Tabassum and Breeze, 2009). At present, older women (especially those aged 75 and over – see Chapter 9 of this report) are the highest consumers of health and social care. The ONS 2008-based marital status projections showed that there could be a fall in the number of widows aged 80–84 and a rise in the number of elderly women with partners at ages over 80 (ONS, 2010b). This could have implications for rising levels of 'spouse carers' (Pickard et al., 2000) and could signal a potential changing profile of care provision although future data will be needed to track those changes. Receipt and giving of care is taken up in more detail in Chapter 9.

Longitudinal analyses comparing marital status change between 2002–03 and 2008–09 show that in over 85% of the sample there was no marital status change and that there was a 12-percentage point increase in widowhood (transition from married to widowed). The percentage experiencing widowhood between 2002–03 and 2008–09 was the same for those aged 80–84 and those aged 85 and over. Future work using the ELSA data set will examine the impact of experiencing widowhood on health and well-being.

Housing tenure is important because of its links to housing equity, security and housing conditions (Dunn, 2002; Smith et al., 2003). Over 70% of men aged 80 and over own their own home outright and this figure does not materially decrease with age (Table 6A.2). Among women, there is a drop in owner occupancy from 71.4% to 58.7% between the ages of 80–84 and 85+. The proportion of women aged 85 and over who rent their accommodation is 36.6% compared with 21.1% for men in the same age group.

Housing tenure is strongly associated with marital status. While only 13.0% of those who are married or cohabiting rent their home, 43.4% of those who are separated and 29.5% of those who are widowed do so (Table 6A.3). The association between housing tenure and age seen among women may be partly due to differences in marital status. However, adjusting for marital status (using a regression model that included marital status, age, gender and an age by gender interaction as independent variables), women aged 85 and over

were found to be more likely to be renting their home compared to those aged 65–79 (OR 2.01 95% CI 1.48, 2.74). Decisions on moving into rented accommodation in older age are complex and likely to depend on multiple factors. Future work could investigate health changes before and subsequent to residential changes.

Health and quality of life of the oldest old

Table 6A.4 shows the distribution of self-rated health among the oldest old in 2008–09. Between the ages of 65–79 and 80–84 there is an increase in the percentage reporting low self-rated health. However, there is no further decline in self-rated health beyond age 80–84.

Looking at self-reported long-standing limiting illness for the period 2008–09 (Table 6A.5), 49.0% of men aged 80–84 and 51.1% of women of the same age report having any long-standing limiting illness. The prevalence of reported illness is not substantially higher for the 85+ group compared with the 80–84-year-old group (6.6 percentage points higher for men and 1.2 percentage points lower for women).

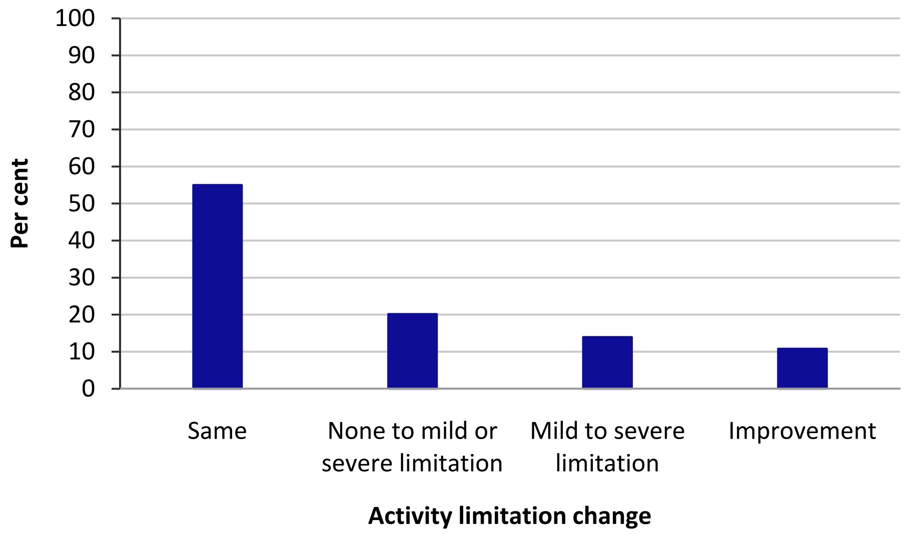
For both genders there is an increase in reporting difficulties in activities by age group (Table 6A.6). This is clear when comparing both the oldest old with the younger cohort (65–79) and when comparing 80–84-year-olds with those aged 85 and over. Around 47% of men and 55% of women aged 80–84 report severe limitations (with or without accompanying mild limitations) to their daily activities. The percentages are much higher for the oldest cohort (85 and over), especially so for women (55% for men and 72% for women).

The findings for the relationships between age and self-rated health, long-standing limiting illness and difficulties in activities together present a somewhat complex picture. They suggest that older people have greater difficulties in activities and, to a lesser extent, greater prevalence of long-standing limiting illness but that this is not necessarily translated into poorer self-ratings of health. One possible explanation might be that the anchoring points for self-ratings of health change with age (Martin et al., 2000; Poon et al., 1992). In other words, people may compare themselves against their peers of similar age and rate themselves as better than they would if they used the general population or younger people as the comparison group.

Despite the higher prevalence of difficulties in activities seen for older age groups in 2008–09, the panel analyses show that over 55% of those who reached 80 and over in 2008–09 had no change in difficulties in the preceding 6 years. However, 21% report an increase in limitation from ‘none’ to ‘mild’ or ‘severe’ and a further 14% report an increase in limitation from ‘mild’ to ‘severe’. A small percentage (10%) report an improvement in their activity limitation (Figure 6.1).

One objective measure of functioning is gait speed (described more fully in Chapter 7). At all ages, women have lower gait speed (indicating lower physical functioning) than men (Table 6A.7). Gait speed decreases fairly steadily by age group among men. Among women, there is a greater differential in gait speed between the age groups 65–79 and 80–84 and less of

Figure 6.1. Per cent change in activity limitation of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)



a differential between those aged 80–84 and 85+ years. However, the mean statistic hides a considerable proportion of women who could not complete the walking test (most notably because they were unable to do so, or the interviewer considered it would be unsafe to attempt the test). It is therefore important also to examine the prevalence of non-completion of the test and this rises sharply with age for women (from 5.0% in the 65–79 age group to 16.9% in the 85+ group).

Table 6A.8 looks at reported depression in 2008–09. Over 40% of men aged 80–84 and over 30% of men aged 85+ report no depressive symptoms. The prevalence of reporting four or more symptoms (which is an indicator of significant depressive symptomatology) is slightly higher for those aged 80 and over compared with the younger old. The discrepancy in prevalence of significant depressive symptoms is evident between those aged 65–79 and those aged 80–84 but no further increase in prevalence is evident at ages 85 and above. A smaller percentage of oldest old women (29.4% of those aged 80–84 and 27.8% of those aged 85 and over) report no symptoms and the prevalence of significant depressive symptoms is also higher for the oldest old women compared with the oldest old men. A total of 26.3% of women aged 80–84 and 23.1% of those aged 85 and over have significant depressive symptoms.

Almost 13% of the oldest old have significant depressive symptoms in 2008–09 but not in 2002–03 (Figure 6.2). However, 8% of the oldest old experience a reduction in the number of depressive symptoms over the same period and over 70% do not have significant depressive symptoms at either wave.

Quality of life, measured by the CASP-19, is summarised in Table 6A.9 and Figure 6.3. A drop in mean CASP-19 (indicating lower quality of life) between the ages of 80–84 and 85+ is evident for men. Among women, the drop in quality of life by age group is more evident between the ages of 65–79 and 80–84.

Figure 6.2. Per cent change in depression (four or more symptoms) of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)

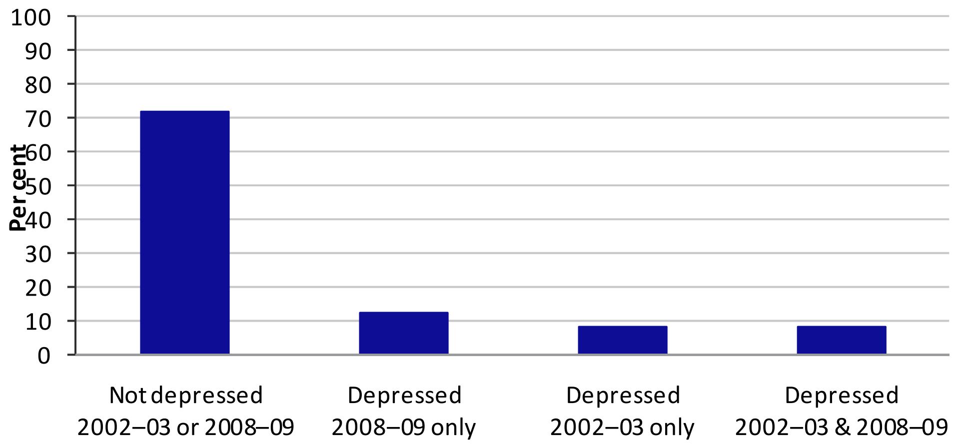
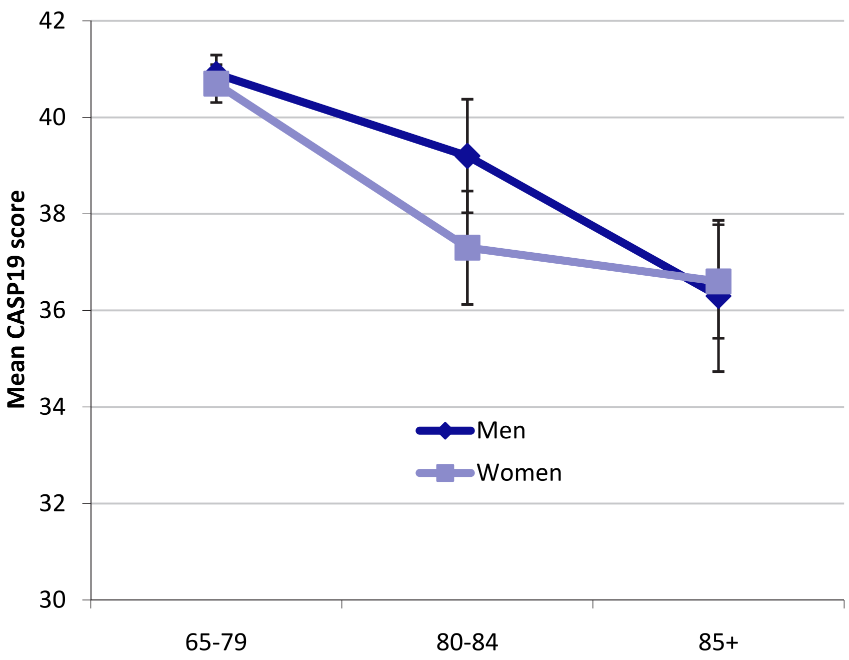
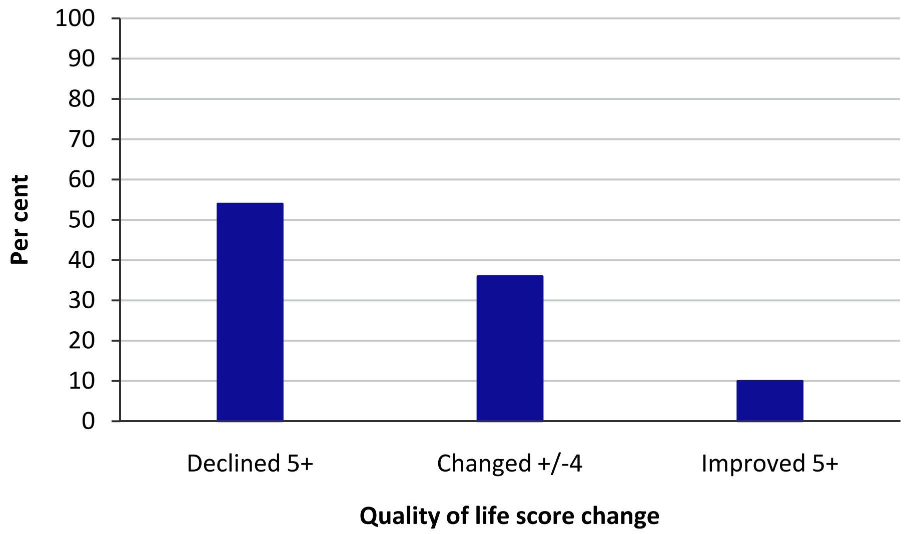


Figure 6.3. Quality of life (mean CASP-19 score) by age and sex (2008–09)



Longitudinal analyses comparing 2002–03 and 2008–09 show that most of the oldest old experienced a decrease in quality of life over the period. Over 53% experienced a decrease of 5 points or more. A decrease of 5 points has been found for those who have (compared with those who do not have) a long-standing limiting illness (Blane et al., 2004) and we have taken this to be indicative of a substantively relevant level of change. Just over 10% experienced an improvement of 5 or more points. Around 36% experienced a change of fewer than 5 points (in either direction) between 2002–03 and 2008–09 (Figure 6.4).

Figure 6.4. Per cent change in quality of life score of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)



Social engagement of the oldest old

Use of public transport is potentially important in facilitating independence to move around and go to the shops, leisure activities, health and other services and visiting family or friends. It may be especially important for those who do not own a car or cannot drive, for example because of visual disability. Over 20% of men aged 80 and over use public transport often (Table 6.2). This figure is not different for those in the 65–79 age bracket and does not appear to decline with age. Up to age 80–84, around 30% of women use public transport often, but there is a marked drop in regular use for women aged 85 and over. Frequent use of public transport is more common among those who do not have access to a private car compared with those who do have access (Table

Table 6.2. Use of public transport by age and sex (2008–09)

	65–79	80–84	85+	Total
	%	%	%	%
Men				
Uses public transport often	22.0	21.0	22.7	21.9
Uses public transport sometimes	18.9	13.1	10.8	17.4
Uses public transport occasionally or never	59.1	65.9	66.4	60.7
Women				
Uses public transport often	29.0	30.5	20.5	27.9
Uses public transport sometimes	21.6	12.9	10.1	18.6
Uses public transport occasionally or never	49.5	56.5	69.4	53.4
Unweighted N				
Men	*1,903*	*279*	*177*	*2,359*
Women	*2,127*	*349*	*342*	*2,818*
Total	*4,030*	*628*	*519*	*5,177*

Table 6.3. Use of public transport by age and access to private car (2008–09)

	65–79	80–84	85+	Total
	%	%	%	%
No access to private car				
Uses public transport often	54.1	46.0	24.7	44.8
Uses public transport sometimes	17.5	14.3	11.7	15.3
Uses public transport occasionally or never	28.4	39.6	63.6	39.9
Access to private car				
Uses public transport often	19.5	15.6	17.4	18.9
Uses public transport sometimes	20.9	12.3	8.8	19.0
Uses public transport occasionally or never	59.5	72.1	73.8	62.1
Unweighted N				
No access to private car	*641*	*210*	*272*	*1,123*
Access to private car	*3,389*	*418*	*247*	*4,054*
Total	*4,030*	*628*	*519*	*5,177*

6.3). A total of 24.7% of those aged 85 and over with no car often use public transport. However, 63.6% of this age group with no access to a private car use public transport only occasionally or never, which could indicate a lack of independence in this group to move around outside the immediate area.

Membership of organisations is highest for church and other religious groups and for social clubs (Table 6A.10 and Figure 6.5). A higher percentage of women compared with men are members of church or other religious groups and, for both men and women, membership was higher in the older age groups. Membership of sports clubs, gyms and exercise classes, on the other hand, is lower in the older age groups. However, the extent of involvement in each organisation was not measured at wave 4 (2008–09).

Around one-third of respondents are not members of any organisation but this does not differ by age group or sex (28%, 33% and 32.9% for those aged 65–79, 80–84 and 85+, respectively, for men and 29%, 31% and 26% for women).

Figure 6.5. Organisational membership by age and sex (2008–09)

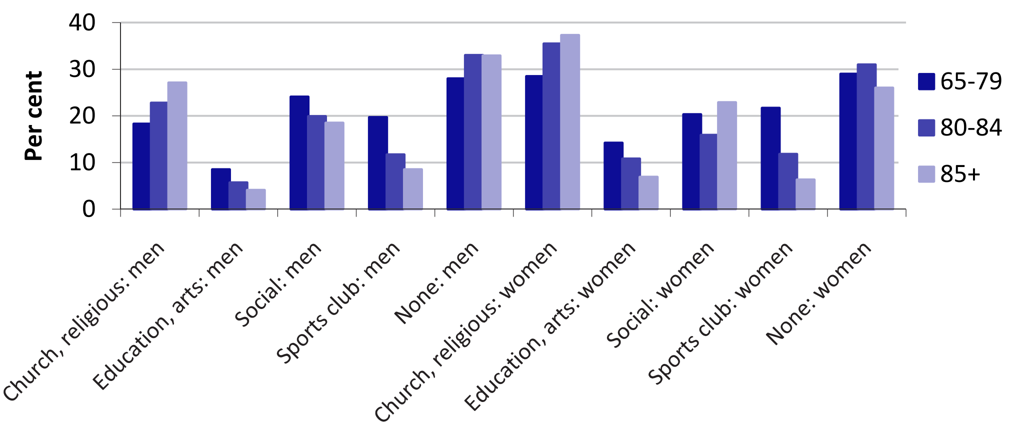
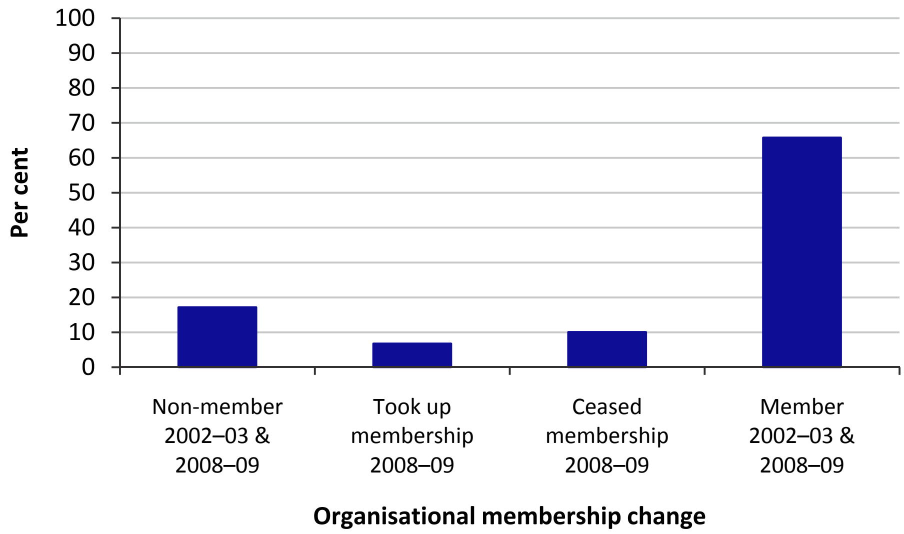


Figure 6.6. Per cent change in organisational membership of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)



A small percentage of the oldest old sample changed organisational membership between 2002–03 and 2008–09 (Figure 6.6). Just less than 10% of respondents took up membership of any groups over the period. A slightly larger percentage (15%) stopped being a member of any of these groups over the period. Over 50% were members of at least one of these groups in both 2002–03 and 2008–09. These figures highlight essentially fairly stable levels of participation over time.

Contact with family and friends is summarised in Tables 6A.11–6A.16. Around 50% of men and 60% of women aged 80 and over who have children meet their children frequently and there is no drop with age (Table 6A.11). The frequency of seeing other family members is a little lower but again does not appear to drop off among older age groups (Table 6A.13). Friends appear to be as important for social contact as children and again the frequency of contact with friends does not appear to drop off with age (Table 6A.16).

Levels of face-to-face contact with children have essentially remained stable between 2002–03 and 2008–09 for the majority of participants aged 80 and over by 2008–09 (Figure 6.7). Fewer than 10% had frequent contact with their children at the start of the period but infrequent contact by 2008–09. Just over 11% had more frequent contact in 2008–09 compared with the start of the study. Similarly, the amount of contact with friends and other family members remained relatively consistent between 2002–03 and 2008–09 (Figures 6.8 and 6.9). Both more and less frequent face-to-face contact may be explained by deteriorating health and increasing limitation in activities. On the one hand, deterioration could signal a greater need for help and support and be linked with greater contact. On the other hand, limitations could impede a person's ability to meet face to face. Detailed exploration of the link between health, functioning and social participation is not included in the current chapter but it would be of interest to determine the factors that predict continued social participation in both formal and informal activities.

There are clear links between social relationships (including contact with friends and family and organisational participation) and survival (Holt-Lunstad, Smith and Layton, 2010), such that those with stronger social relationships have increased likelihood of survival. The findings presented here suggest that social relationships are relatively stable at ages 80 and over. This could indicate that patterns of social behaviour are set earlier in life, although this is an observational study and does not negate the possibility that interventions to increase social contact for older people could be linked to changes in social contact. The findings also indicate that social contacts in a wide variety of settings (including organisations, family and friends) are the norm well into older age (80 and over).

Figure 6.7. Per cent change in contact with children of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)

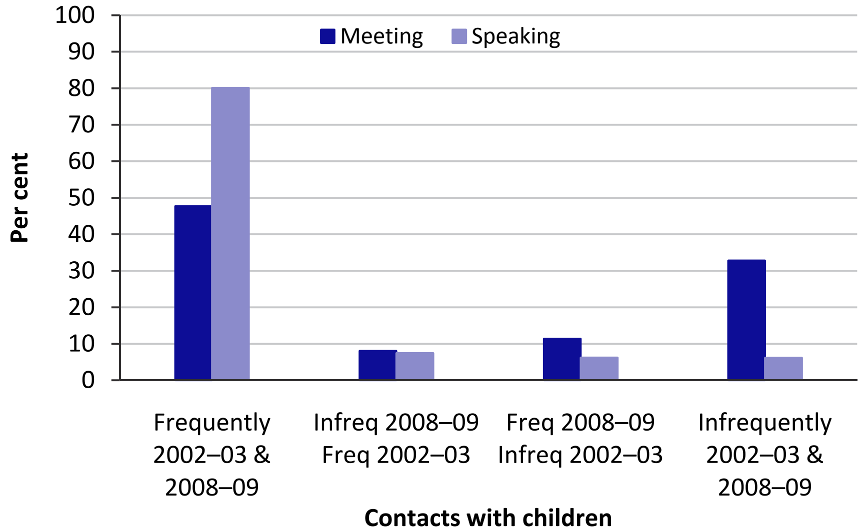


Figure 6.8. Per cent change in contact with family (other than children and spouse/partner) of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)

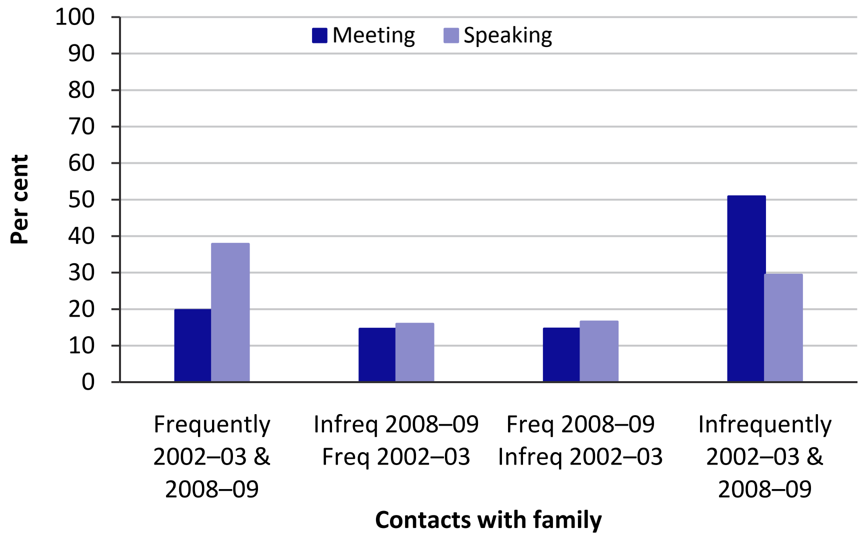
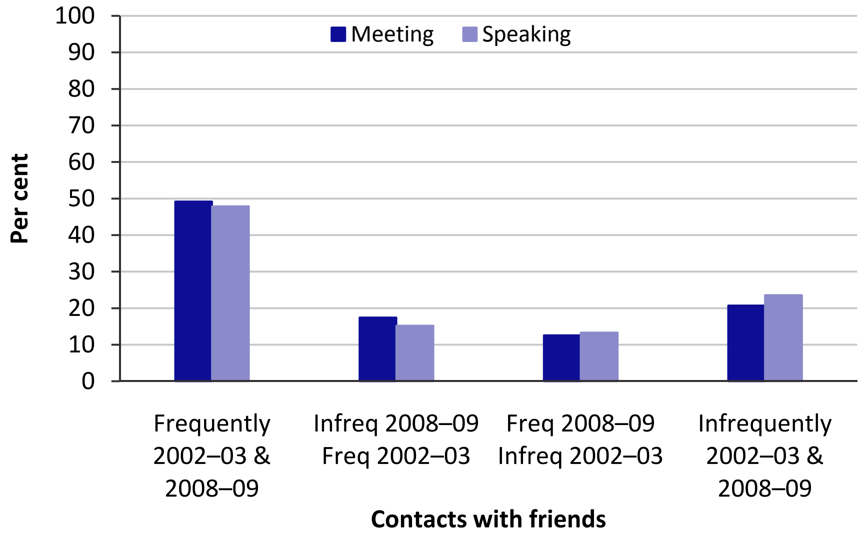


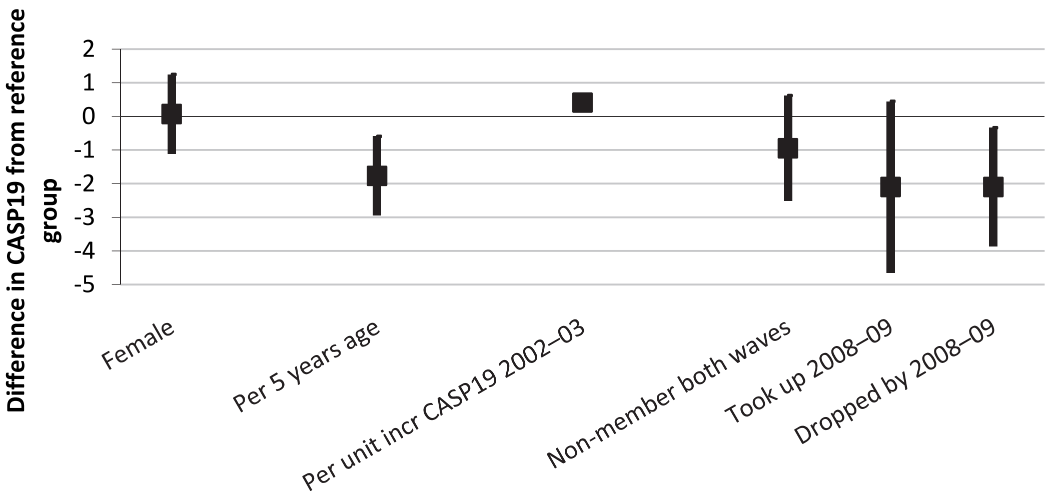
Figure 6.9. Per cent change in contact with friends of the oldest old in ELSA in the period between wave 1 (2002–03) and wave 4 (2008–09)



Changes in functioning, social engagement and quality of life

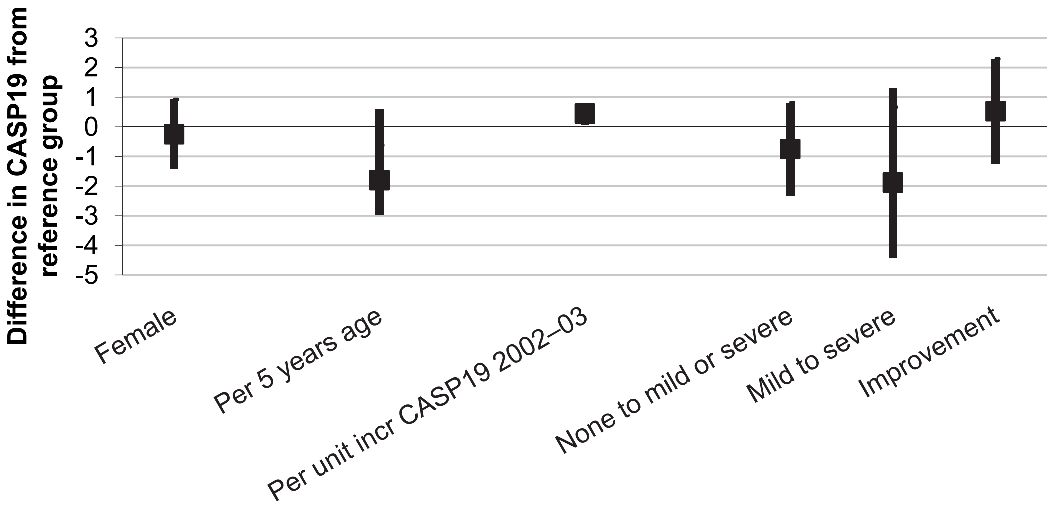
Declines in health, functioning and social engagement are of interest in their own right and they may additionally impact on quality of life. A preliminary investigation of the effect of change in social engagement (captured by organisational membership) and change in functional limitations (captured by the disability index) on change in quality of life among those aged 80 and over by 2008–09 is summarised in Figures 6.10 and 6.11. This analysis is based on two regression models. The first includes change in organisational membership, gender, age and quality of life in 2002–03 as predictors of quality of life in 2008–09. The second includes change in functional limitations, gender, age and quality of life in 2002–03 as predictors of quality of life in 2008–09.

Figure 6.10. Quality of life (captured by CASP-19 score) by change in organisational membership[a] between 2002–03 and 2008–09



[a]Adjusted for sex, age and CASP-19 in 2002–03.

Figure 6.11. Quality of life (captured by CASP-19 score) by change in disability index[a] between 2002–03 and 2008–09



[a]Adjusted for sex, age and CASP-19 in 2002–03.

Figure 6.10 shows that CASP-19 did not differ between men and women. Each 5-year increment in age is associated with a decline of 1.8 points on the CASP-19 scale. This means that older respondents had a lower quality of life. Respondents who had higher CASP-19 scores in 2002–03 had higher scores in 2008–09 also. Of central interest here, compared with being a member of at least one of the listed organisations in both 2002–03 and 2008–09, ceasing membership was associated with a drop of around 2 points on the CASP-19 scale. In other words, ceasing membership was associated with a (small) decline in quality of life between 2002–03and 2008–09.

Figure 6.11 shows the change in CASP-19 by change in disability. Those who experienced an increase in disability index from mild symptoms to severe symptoms experienced a decline in CASP-19 between 2002–03 and 2008–09 of 1.9 points (although this was not statistically significant). This indicates that increasing disability is associated with a corresponding decrease in quality of life. Chapter 4 showed that having limitations with daily activities is a strong correlate of well-being. The analyses presented here complement that work and utilise longitudinal data to illustrate the contribution of increasing functional limitations on declining quality of life. This is an initial exploration of the impact of functional decline and withdrawal from social engagement on changes in quality of life in the oldest old. Future work could examine other changes in the social, economic and health domains and how these combine to impact on quality of life and well-being.

6.4 Summary and conclusion

The oldest old are the fastest growing segment of the population and this has very important implications for policymakers with regard to their marital status and living arrangements, health status, well-being and quality of life, and social participation. The oldest old make up about 10% of the whole ELSA sample. Being married is reasonably prevalent among men in these

cohorts as is living with a partner, but much less prevalent for women. Gender differences in living arrangements of the oldest old in ELSA are clear, with women being more likely to be living alone and more likely to be widowed compared to men.

Compared with the younger old (aged 65–79), the prevalence of high self-rated health, absence of long-standing limiting illness and freedom from limitations in activities is lower among the oldest old. But there was no clear evidence that reaching age 85 and over signalled a sudden decline in health on the indicators examined here. Ongoing data collection in future waves of ELSA will allow more detailed characterisation of individual trajectories of health and functioning, but the preliminary evidence here is of gradual change among the oldest old (at least up to age 85, beyond which we did not analyse age groups separately).

Despite the age-related declining levels of health noted above, social participation in the form of organisational membership and informal contact with family and friends was largely maintained at older ages.

This chapter also highlights the implications of declining social engagement and physical functioning for quality of life. These longitudinal analyses indicate the potential to promote quality of life through initiatives to help people stay socially and physically active into their 80s.

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Appendix 6A

Tables on health and social engagement among the oldest old

Table 6A.1. Marital status and living arrangements by age and sex (2008–09)

Core wave 4 respondents aged 65 and over

Marital status	**65–79**	**80–84**	**85+**	**Total**
Male	%	%	%	%
Single	5.6	3.5	0.7	4.9
Married	74.4	68.1	49.3	71.3
Separated/divorced	8.3	2.5	0.4	6.8
Widowed	11.6	25.8	49.6	17.0
Live alone	21.0	27.3	43.8	23.9
Live with others	79.0	72.7	56.2	76.1
Female				
Single	3.0	6.3	7.7	4.1
Married	56.9	28.8	13.5	46.4
Separated/divorced	10.5	4.2	2.8	8.5
Widowed	29.7	60.7	76.0	41.0
Live alone	35.5	60.4	77.3	45.3
Live with others	64.5	39.6	22.7	54.7
Unweighted N				
Men	*1,904*	*279*	*177*	*2,360*
Women	*2,127*	*349*	*342*	*2,818*
Total	*4,031*	*628*	*519*	*5,178*

Table 6A.2. Housing tenure by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with valid housing tenure

Housing tenure	65–79	80–84	85+	Total
Male	%	%	%	%
Owner occupied	74.4	77.0	71.9	74.5
Buying with mortgage	6.4	2.8	4.5	5.8
Renting	17.9	17.6	21.1	18.2
Living rent-free	1.3	2.7	2.5	1.6
Female				
Owner occupied	74.8	71.4	58.7	71.9
Buying with mortgage	5.8	4.6	2.9	5.2
Renting	17.9	21.6	36.6	21.2
Living rent-free	1.6	2.3	1.8	1.7
Unweighted N				
Men	*1,892*	*278*	*172*	*2,342*
Women	*2,114*	*338*	*311*	*2,763*
Total	*4,006*	*616*	*483*	*5,105*

Table 6A.3. Housing tenure by marital status (2008–09)

Core wave 4 respondents aged 65 and over with valid housing tenure

Housing tenure	Single	Married	Separated	Widowed	Total
	%	%	%	%	%
Owner occupied	57.4	81.1	49.3	66.0	73.1
Buying with mortgage	3.7	5.8	7.3	4.6	5.4
Renting	37.1	11.9	40.7	27.1	19.9
Living rent-free	1.6	1.1	2.7	2.4	1.7
Unweighted N					
Total	*239*	*3,096*	*422*	*1,348*	*5,105*

Table 6A.4. Self-rated health by age and sex (2008–09)

Core wave 4 respondents aged 65 and over

Self-rated health	65–79	80–84	85+	Total
Male	%	%	%	%
High	36.5	29.9	24.6	34.6
Medium	33.0	29.1	39.4	33.0
Low	30.5	41.0	36.0	32.3
Female				
High	34.1	26.0	25.6	31.8
Medium	33.5	29.8	36.4	33.4
Low	32.3	44.2	38.0	34.8
Unweighted N				
Men	*1,904*	*279*	*177*	*2,360*
Women	*2,127*	*349*	*342*	*2,818*
Total	*4,031*	*628*	*519*	*5,178*

Table 6A.5. Long-standing limiting illness by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with valid limiting illness

Long-standing limiting illness	65–79	80–84	85+	Total
Male	%	%	%	%
No	64.2	51.0	44.4	60.6
Yes	35.8	49.0	55.6	39.4
Female				
No	58.8	48.9	50.1	55.1
Yes	41.2	51.1	49.9	43.9
Unweighted N				
Men	*1,903*	*278*	*177*	*2,358*
Women	*2,127*	*349*	*342*	*2,818*
Total	*4,030*	*627*	*519*	*5,176*

Table 6A.6. Activity limitation index by age and sex (2008–09)

Core wave 4 respondents aged 65 and over

Activity limitation index	**65–79**	**80–84**	**85+**	**Total**
Male	%	%	%	%
None	52.9	32.2	20.3	47.2
Mild	17.4	20.8	24.3	18.5
Severe/mild	29.7	47.0	55.3	34.4
Female				
None	39.2	22.1	11.8	32.7
Mild	23.8	23.0	16.0	22.5
Severe/mild	37.0	54.9	72.3	44.8
Unweighted N				
Men	*1,904*	*279*	*177*	*2,360*
Women	*2,127*	*349*	*342*	*2,818*
Total	*4,031*	*628*	*519*	*5,178*

Table 6A.7. Gait speed by age and sex (2008–09)

Core wave 4 respondents aged 65 and over

Gait speed	**65–79**	**80–84**	**85+**	**Total**
Men				
Problems completing walking test (%)	3.4	4.6	5.9	3.8
Mean (s.e.) gait speed (m/s)	0.89 (0.01)	0.73 (0.02)	0.60 (0.02)	0.86 (0.01)
Women				
Problems completing walking test (%)	5.0	9.9	16.9	7.4
Mean (s.e.) gait speed (m/s)	0.83 (0.01)	0.63 (0.01)	0.55 (0.02)	0.78 (0.01)
Unweighted N				
Men				
Problems completing	*1,904*	*279*	*177*	*2,360*
Completed	*1,658*	*229*	*131*	*2,018*
Women				
Problems completing	*2,127*	*349*	*342*	*2,818*
Completed	*1,862*	*275*	*212*	*2,349*

Table 6A.8. Symptoms of depression by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with valid depressive symptoms

Frequency of depressive symptoms	65–79	80–84	85+	Total
Male	%	%	%	%
0 symptoms	55.1	43.6	30.9	51.5
1–3 symptoms	34.9	41.4	53.1	37.3
4+ symptoms	10.0	15.0	16.0	11.2
Female				
0 symptoms	38.5	29.4	27.8	35.8
1–3 symptoms	43.2	44.4	49.0	44.2
4+ symptoms	18.3	26.3	23.1	20.1
Unweighted N				
Men	*1,503*	*181*	*105*	*1,789*
Women	*1,762*	*240*	*191*	*2,193*
Total	*3,265*	*421*	*296*	*3,982*

Table 6A.9. Quality of life (CASP-19) by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with valid CASP-19

CASP-19	65–79	80–84	85+
Male			
mean (s.e.)	40.9 (0.2)	39.2 (0.6)	36.3 (0.8)
Female			
mean (s.e.)	40.7 (0.2)	37.3 (0.6)	36.6 (0.6)
Unweighted N			
Men	*1,503*	*181*	*105*
Women	*1,762*	*240*	*191*
Total	*3,265*	*421*	*296*

Table 6A.10. Membership of organisations by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with valid organisational membership

Membership of organisations	65–79	80–84	85+	Total
Male				
Political, environmental	12.5	9.3	13.2	12.2
Resident group	19.8	14.8	18.6	19.1
Church, religious: men	18.0	22.7	26.8	19.2
Charitable	15.8	12.3	16.7	15.5
Education, arts: men	8.3	5.6	3.9	7.7
Social: men	24.3	20.4	19.0	23.5
Sports club: men	19.6	11.3	8.0	17.7
Other: men	26.8	22.5	24.3	26.1
Female				
Political, environmental	5.6	7.6	4.6	5.8
Resident group	17.3	18.5	19.8	17.8
Church, religious: women	28.4	34.9	36.6	30.2
Charitable	19.5	18.7	16.3	19.0
Education, arts: women	13.8	10.3	6.6	12.5
Social: women	20.5	16.1	22.6	20.2
Sports club: women	21.6	11.5	6.1	18.3
Other	21.5	19.6	22.3	21.3
Unweighted N				
Male	*1,558*	*193*	*114*	*1,865*
Female	*1,747*	*255*	*202*	*2,204*

Table 6A.11. Meeting children by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with children

Meeting with children	65–79	80–84	85+	Total
Male	%	%	%	%
Frequent	53.2	49.8	58.4	53.2
Infrequent	46.8	50.2	41.6	46.8
Female				
Frequent	60.2	61.6	66.0	61.0
Infrequent	39.8	38.4	34.0	39.0
Unweighted N				
Men	*1,384*	*176*	*106*	*1,666*[a]
Women	*1,621*	*211*	*155*	*1,987*[b]
Total	*3,005*	*387*	*261*	*3,653*

[a] 1,717 men have children and 1,666 responded to question on frequency of meeting children.
[b] 2,057 women have children and 1,987 responded to question on frequency of meeting children.

Table 6A.12. Speaking with children by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with children

Speaking with children	65–79	80–84	85+	Total
Male	%	%	%	%
Frequent	82.9	79.8	82.8	82.5
Infrequent	17.2	20.2	17.2	17.5
Female				
Frequent	89.0	88.6	94.3	89.5
Infrequent	11.0	11.4	5.7	10.5
Unweighted N				
Men	*1,395*	*176*	*106*	*1,677*[a]
Women	*1,629*	*213*	*159*	*2,001*[b]
Total	*3,024*	*389*	*265*	*3,678*

[a] 1,717 men have children and 1,677 responded to question on frequency of speaking with children.
[b] 2,057 women have children and 2,001 responded to question on frequency of speaking with children.

Table 6A.13. Meeting other family (besides children and spouse/partner) by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with other family

Meeting with family	65–79	80–84	85+	Total
Male	%	%	%	%
Frequent	30.4	34.4	34.5	31.1
Infrequent	69.6	65.6	65.5	68.9
Female				
Frequent	37.7	43.0	31.9	37.8
Infrequent	62.3	57.0	68.1	62.2
Unweighted N				
Men	*1,438*	*163*	*94*	*1,695*[a]
Women	*1,650*	*216*	*160*	*2,026*[b]
Total	*3,088*	*379*	*254*	*3,721*

[a] 1,725 men have other family and 1,695 responded to question on frequency of meeting other family.

[b] 2,112 women have other family and 2,026 responded to question on frequency of meeting other family.

Table 6A.14. Speaking with other family (besides children and spouse/partner) by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with other family

Speaking with family	65–79	80–84	85+	Total
Male	%	%	%	
Frequent	42.8	51.9	52.6	44.4
Infrequent	57.2	48.1	47.4	55.6
Female				
Frequent	59.6	64.5	59.0	60.1
Infrequent	40.4	35.5	41.0	39.9
Unweighted N				
Men	*1,437*	*164*	*93*	*1,694*[a]
Women	*1,667*	*217*	*168*	*2,052*[b]
Total	*3,104*	*381*	*261*	*3,746*

[a] 1,725 men have other family and 1,694 responded to question on frequency of speaking with other family.

[b] 2,112 women have other family and 2,052 responded to question on frequency of speaking with other family.

Table 6A.15. Meeting friends by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with friends

Meeting with friends	**65–79**	**80–84**	**85+**	**Total**
Male	%	%	%	%
Frequent	58.2	50.0	57.8	57.3
Infrequent	41.8	50.0	42.2	42.7
Female				
Frequent	62.6	64.5	70.3	63.7
Infrequent	37.4	35.5	29.7	36.3
Unweighted N				
Men	*1,493*	*178*	*102*	*1,773*[a]
Women	*1,742*	*237*	*184*	*2,163*[b]
Total	*3,235*	*415*	*286*	*3,936*

[a] 1,810 men have friends and 1,773 responded to question on frequency of meeting friends.

[b] 2,215 women have friends and 2,163 responded to question on frequency of meeting friends.

Table 6A.16. Speaking with friends by age and sex (2008–09)

Core wave 4 respondents aged 65 and over with friends

Speaking with friends	**65–79**	**80–84**	**85+**	**Total**
Male	%	%	%	%
Frequent	51.9	49.1	56.3	51.9
Infrequent	48.1	50.9	43.7	48.1
Female				
Frequent	68.5	65.5	64.3	67.6
Infrequent	31.5	35.5	35.7	32.4
Unweighted N				
Men	*1,490*	*178*	*102*	*1,770*[a]
Women	*1,744*	*237*	*188*	*2,169*[b]
Total	*3,234*	*415*	*290*	*3,939*

[a] 1,810 men have friends and 1,770 responded to question on frequency of speaking with friends.

[b] 2,215 women have friends and 2,169 responded to question on frequency of speaking with friends.

7. Trends in disability

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The analysis in this chapter shows that:

- For men aged 60 to 84, the prevalence of walking speed of at least 0.8 metres per second (m/s) increased significantly from 60% to 63% between 2002–03 and 2008–09. There was no change over time in the prevalence of limiting long-standing illness, severe activity limitation or low self-rated health.
- For women aged 60 to 84, there was a small increase in the prevalence of low self-rated health and an increase in the prevalence of mild activity limitation between 2002–03 and 2008–09. The prevalence of severe activity limitation decreased from 35% to 30% between 2002–03 and 2008–09.
- People with high education reported higher prevalence of no activity limitation in 2008–09 than in 2002–03 (61% and 56% respectively) and lower prevalence of a very slow walking speed (less than 0.4m/s). In contrast, those with medium education reported higher prevalence of mild activity limitation in 2008–09 than in 2002–03 (24% and 21% respectively). People with low education had higher prevalence of low self-rated health and of mild activity limitation in 2008–09 than in 2002–03, while they had a reduction in the prevalence of severe activity limitation.
- There were marked reductions in activity limitation across this period for people married or living with a partner, which were not present for men who were not cohabiting. Women not cohabiting had a reduction in the prevalence of severe activity limitation.
- There was a suggestion of decreasing prevalence of severe activity limitation for those aged 60–64 in 2008–09 compared with those aged 60–64 in 2002–03, an improvement in the level of no activity limitation and walking speed of at least 0.8m/s for those aged 70–74, an increase in the prevalence of limiting long-standing illness and low health, and a decline in walking speed for those aged 80–84 in 2008–09 compared with those of the same age in 2002–03.
- On the whole, there was no evidence of cohort shifts in the level of disability. While some statistically significant changes in some measures of disability have been identified for older cohorts, on the whole these were relatively small, and some indicated increases in levels of disability whereas others indicated decreases.
- Trends in subjectively and objectively reported levels of disability were differently patterned. While the level of those identified as disabled using

only subjective measures, or a combination of subjective and objective measures, remained stable for men (or showed very small changes), levels of disability using only the objective measures dropped significantly for both men and women.

- The final stage of the analysis explicitly modelled changes over six years (between 2002–03 and 2008–09) in mean walking speed. This showed a marked improvement in walking speed between 2002–03 and 2004–05, but a significant decrease between 2002–03 and 2008–09. Whilst education, cohabiting status, cardiovascular illness (including raised blood pressure and diabetes), pulmonary disease, arthritis, activity limitation and reported limiting long-standing illness were associated with walking speed, they did not fully explain changes in walking speed over time.

7.1 Introduction

Mortality rates at older ages have fallen markedly in recent years. In 1980–82, there were 1,521 deaths per 100,000 for 60-year-old men in England. By 2006–08, mortality for this group had more than halved – to 768 deaths per 100,000 – and one would have to look at 68-year-old men to find the youngest group with the same mortality probability as that of the 60-year-olds in 1980. Similar trends are observed at all older ages for both males and females. As another example, over the same period, mortality rates for 70-year-old women fell from 1,887 to 1,250 deaths per 100,000 and 75-year-old women in 2006 have almost the same mortality probabilities as 70-year-olds in 1980 (Office for National Statistics). With such strong cohort trends in mortality rates, a recurring research question has been the extent to which these reductions in mortality have been accompanied by increases in function or reductions in disability across cohorts for a given age.

There is great interest in the possibility of ‘compression of morbidity’. This is the idea that, as mortality rates decline and life expectancies consequently increase, the age at which individuals become disabled may also increase such that the overall burden of lifetime illness – i.e. the proportion of their lives that people spend with poor health or disability – may actually decline (Fries, 1980). Declining disability rates would have considerable implications for health and social care providers. Despite suggestions that disability rates among older Americans may have been declining (Manton and Gu, 2001), a systematic review indicated that this evidence is mixed (Freedman, Martin and Schoeni, 2002) and the most recent evidence indicates that this trend in disability reduction may have stopped, at least in those aged under 70 (Seeman et al., 2010). ELSA can contribute to this debate by examining disability trends for a large sample of older people in England in the early years of the 21st century, with the longitudinal data allowing an examination of cohort differences in age-related declines in functioning, alongside comparisons of cross-sections in different periods. Analysis of ELSA data can further strengthen the literature because it adds objective measures of physical functioning to more commonly available subjective measures of disability and physical functioning. This can help inform the debate as to whether changing levels of reported disability, if confirmed in England using ELSA data, are

being driven by changing norms and expectations or are matched by objective functioning measures.

The aims of this chapter are to describe trends in disability for men and women aged 60 to 84 across up to four waves of ELSA and to compare these trends for subjective and objective disability measures.

It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected.

7.2 Methods and definitions

Sample

This chapter focuses on people aged between 60 and 84 because the walking speed test was performed on those aged 60 and over and because mortality is higher among people aged 85 and over. In some analyses, we use cross-sectional data from the relevant waves to examine period differences in the prevalence of disability; in other analyses, we use the longitudinal panel (defined as the sample of respondents who took part in all waves of ELSA) in order to investigate whether there are birth-cohort differences in disability trends.

Age standardisation has been used in tables where age is not included as a break variable. Age standardisation removes the effect of differences in age distributions from comparisons between groups. Direct age standardisation was applied for both sexes combined, expressing male and female data to the overall population, with the standards being the age distribution of the whole ELSA sample in 2008–09.

Where possible, analyses have been weighted using wave-specific cross-sectional weights.

Subjective disability measures

In order to describe trends in subjective disability, we use three measures that capture general health, long-term conditions and physical limitations. Self-rated general health was measured in 2002–03, 2004–05 and 2008–09, using the following question: 'Would you say your health is ...' with reply alternatives: excellent, very good, good, fair or poor. The general health measure was simply dichotomised into those reporting that they had excellent, very good or good health ('high/medium'), contrasted with those who reported that they had fair or poor health ('low'). Different response categories were used in 2006–07, so data from this period are not used in this chapter.

During the interview, participants were asked whether they have any long-standing illness that has troubled them or that is likely to affect them over a period of time. If the answer was yes, they were then asked whether the illness limited their activities in any way. From answers to these questions, a dummy variable was derived to indicate presence or absence of a long-standing illness that is limiting.

The third subjective measure of disability we use is an activity limitation index, which is derived from information on difficulties walking for a quarter of a mile, difficulties with activities of daily living (ADLs) and some instrumental activities of daily living (IADLs), and mobility difficulties. The activity limitation index has three mutually exclusive categories, defined as follows:

- *No limitations.*
- *Mild but not severe limitations.* Some or any of the following: some or much difficulty walking a quarter of a mile; difficulty climbing several flights of stairs without resting; difficulty taking medications; difficulty preparing a hot meal.
- *Severe limitations* (either with or without accompanying mild limitations). Some or any of the following: difficulty with all ADLs; difficulty climbing one flight of stairs without resting; difficulty shopping for groceries; difficulty doing work around house and garden.

Objective disability measure

Respondents aged 60 and over were eligible for the walking (or gait) speed test, which was performed as part of the main ELSA interview. The test involved timing how long it took the respondent to walk a distance of eight feet. Respondents were asked to walk (not race) to the other end of the course at their usual speed, just as if they were walking down the street to the shops, and to walk all the way past the other end of the tape before stopping. The interviewer timed how long they took to get to the other end and then timed them again walking in the other direction. The average of the two times is used for analysis. As well as analysing walking speed as a continuous measure, we use a categorical measure defined as 'very fast' if the respondent's walking speed is at least 0.8m/s; 'fast' if it is greater than or equal to 0.6m/s but less than 0.8m/s; 'slow' if it is greater than or equal to 0.4m/s but less than 0.6m/s; and 'very slow' if it is less than 0.4m/s.

7.3 Trends in demographic and socioeconomic correlates of disability

In this section, we begin by presenting age-standardised trends in subjective and objective disability for the cross-sectional samples in 2002–03 and 2008–09, by sex, cohabiting status (defined as living or not with a partner whether married or not) and education. Education level is defined using the self-reported age of first leaving full-time education. Individuals are grouped into three categories: those who left at or before the compulsory school-leaving (CSL) age that applied in the UK to their cohort (referred to in this chapter as 'low' education), those leaving school after CSL age but before age 19 (referred to as 'mid' education) and those leaving at or after age 19 (referred to as 'high' education). Those who did not know or refused to report the age at which they left full-time education are classified as low education; those who reported still being in full-time education are dropped from all analysis in this chapter where education is used.

Among men, the prevalences of limiting long-standing illness, low health and severe activity limitation did not differ significantly between 2002–03 and 2008–09. However, the prevalence of men with walking speed of at least 0.8m/s increased significantly from 60% in 2002–03 to 63% in 2008–09 ($p<0.05$). Among women, there was no difference in the prevalences of limiting long-standing illness and walking speed between 2002–03 and 2008–09. However, the prevalence of low health among women increased slightly, but significantly, from 28% in 2002–03 to 30% in 2008–09 ($p<0.05$) and the prevalence among women of mild activity limitation increased from 23% in 2002–03 to 26% in 2008–09 ($p<0.05$). In contrast, the prevalence of women with severe activity limitation decreased from 35% in 2002–03 to 30% in 2008–09 ($p<0.001$). (Tables 7A.1 and 7A2)

Those with high education reported higher prevalence of no activity limitation in 2008–09 than in 2002–03 (61% and 56% respectively, $p<0.05$) and lower prevalence of a very slow walking speed (less than 0.4m/s) (2% and 5% respectively, $p<0.01$). Those with medium education reported higher prevalence of mild activity limitation in 2008–09 than in 2002–03 (24% and 21% respectively, $p<0.05$). In marked contrast, among those with low education, the prevalence of low health increased from 33% to 37% between 2002–03 and 2008–09 ($p<0.001$) and the prevalence of mild activity limitation increased from 19% to 23% ($p<0.001$), while the prevalence of severe activity limitation decreased from 38% to 35% between 2002–03 and 2008–09 ($p<0.05$). (Tables 7A.1 and 7A2)

People cohabiting with a partner were less likely to report severe activity limitation in 2008–09 than in 2002–03 (27% and 31% respectively, $p<0.001$). Men not cohabiting with a partner reported a higher prevalence of mild activity limitation in 2008–09 than in 2002–03 (20% and 15% respectively, $p<0.05$) and a lower prevalence of no activity limitation (47% and 54% respectively, $p<0.01$). Women not cohabiting with a partner had a higher prevalence in 2008–09 than in 2002–03 for all of limiting long-standing illness, low self-rated health and mild activity limitation. However, walking speed improved for this group, with 7% of women not cohabiting with a partner having a walking speed of less than 0.4m/s in 2008–09 compared with 10% in 2002–03 ($p<0.05$); also, the prevalence of non-cohabiting women with severe activity limitation decreased from 39% to 35% between 2002–03 and 2008–09 ($p<0.01$). (Tables 7A.1 and 7A2)

We now turn to providing a more detailed description of the pattern of disability in 2002–03 compared with 2008–09, by examining differences for five-year birth cohorts using cross-sectional data.

There were no significant differences in the prevalence of limiting long-standing illness and low self-rated health between 2002–03 and 2008–09 for people aged up to 74 (Tables 7A.3 and 7A.4). Among people aged 75 to 79, the prevalence of those reporting a limiting long-standing illness increased from 42% in 2002–03 to 47% in 2008–09 ($p<0.001$) and the prevalence of those reporting low self-rated health increased from 31% to 36% ($p<0.01$). Among people aged 80 to 84, the prevalence of low self-rated health increased significantly from 2002–03 to 2008–09 (34% and 42% respectively, $p<0.001$) (Table 7A.4).

In the youngest age group (60–64), the prevalence of those reporting severe activity limitation decreased from 24% in 2002–03 to 20% in 2008–09 ($p<0.001$). Among people aged 70 to 74, the prevalence of those reporting no activity limitation increased from 42% to 46% ($p<0.01$); and among those aged 75 to 79, the prevalence of mild activity limitation increased from 22% to 27% ($p<0.01$) between 2002–03 and 2008–09. (Table 7A.5)

People in the youngest age group (60–64) were more likely to have a walking speed of at least 0.8m/s in 2008–09 than in 2002–03 (72% and 67% respectively, $p<0.001$), and were less likely to have walking speed of less than 0.6m/s. Similarly, among those aged 70 to 74, the prevalence of those with walking speed of at least 0.8m/s was significantly higher in 2008–09 than in 2002–03 (59% and 52% respectively, $p<0.001$), while the prevalence of those recording a walking speed between 0.6m/s and 0.8m/s decreased from 29% to 24% ($p<0.01$) between 2002–03 and 2008–09. People aged 80 to 84 had higher prevalence of walking speed of at least 0.8m/s in 2002–03 than in 2008–09 (35% and 27%, $p<0.001$). (Table 7A.6)

7.4 Cohort differences and trends in disability

In order to examine potential changes in the prevalence of disability across birth cohorts, we present changes over time in the pattern of disability for five-year birth cohorts from 2002–03 to 2008–09, using the panel data (so, restricted to sample members present at all waves of ELSA). We present the data graphically, so similarities and differences in trajectories for different birth cohorts can be readily observed.

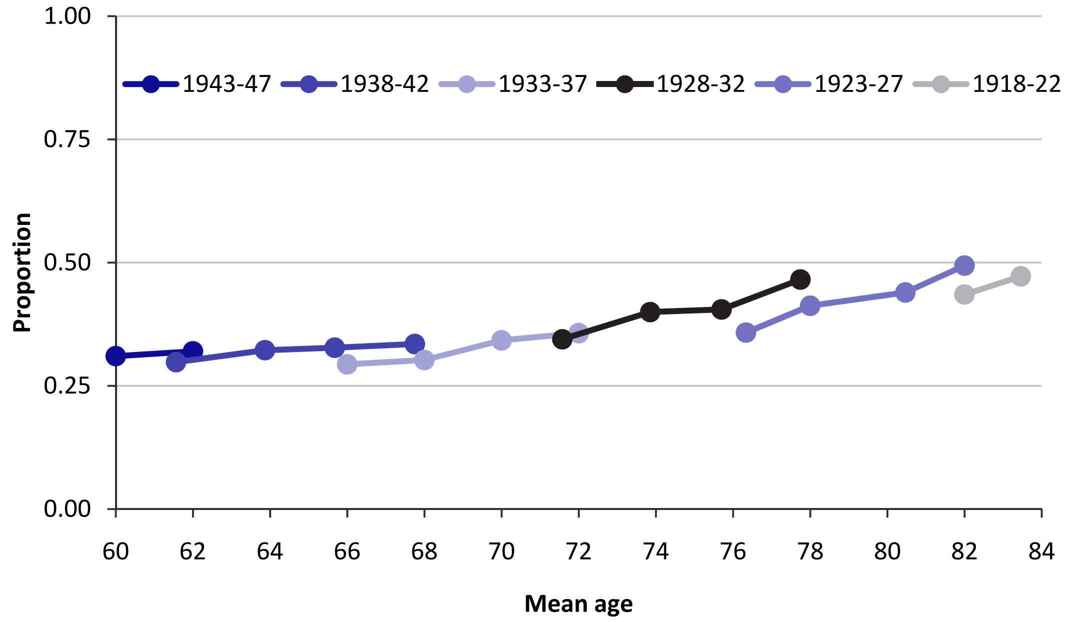
Figures 7.1 to 7.4 show the prevalence of disability for each cohort across the four waves of ELSA. The x-axis represents the average age of the cohort and the y-axis represents the proportion reporting disability or the mean walking speed (with the markers representing the value at each wave of data collection).

Figure 7.1 presents the proportion reporting a limiting long-standing illness from 2002–03 to 2008–09 by birth cohort. In the youngest two birth cohorts (those born between 1943 and 1947 and those born between 1938 and 1942), this proportion was stable over time and overlapped. In the cohort of people born between 1933 and 1937, the prevalence of those reporting a limiting long-standing illness increased from 29% in 2002–03 to 36% in 2008–09 ($p<0.05$). The prevalence of those reporting a limiting long-standing illness increased steeply between 2002–03 and 2008–09 in the oldest cohorts (those born between 1923 and 1927 and those born between 1918 and 1922). However, the trends for the different birth cohorts suggest marked similarities in trajectories.

Figure 7.2 presents the proportions reporting low health in 2002–03, 2004–05 and 2008–09, by birth cohort. The prevalence of low self-rated health was 23% in 2002–03 and 2004–05 in the cohort of those born between 1938 and 1942, and this increased to 27% in 2008–09 ($p<0.01$). In the cohort of people born between 1933 and 1937, the prevalence of low self-rated health increased from 21% in 2002–03 to 26% in 2008–09 ($p<0.05$), and it was 29% in 2002–03 and 37% in 2008–09 ($p<0.01$) for the cohort of those born between 1928

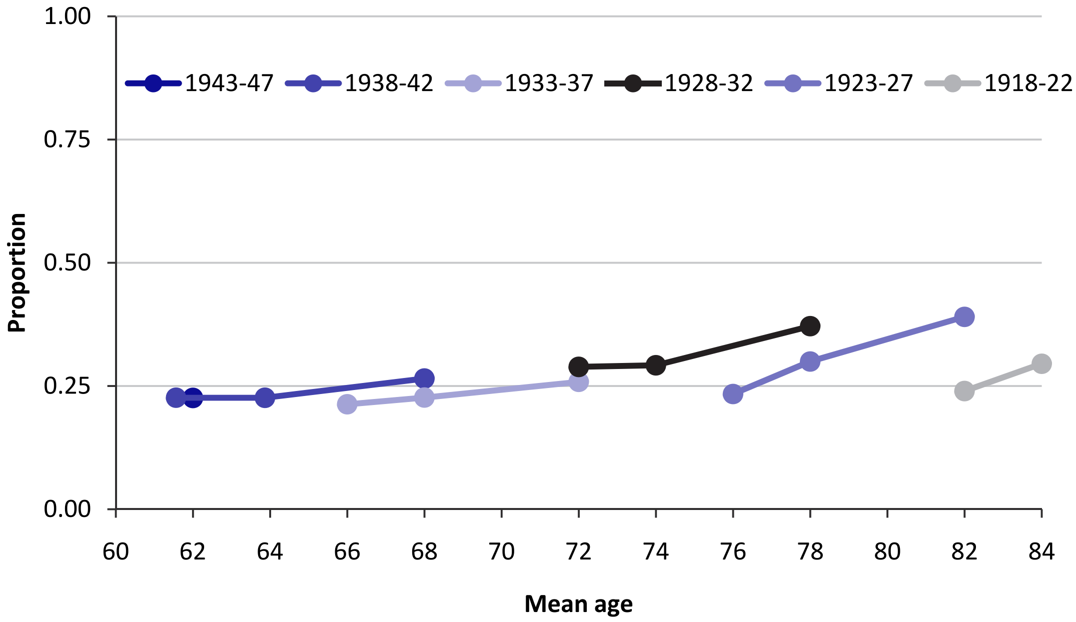
and 1932. The prevalence of low self-rated health increased steeply between 2002–03 and 2008–09 in the oldest cohorts (those born 1923–1927 and those born 1918–1922). However, those born between 1918 and 1922 have lower rates of low health than the immediate younger cohort (those born between

Figure 7.1. Limiting long-standing illness 2002–03 to 2008–09, by birth cohort



Notes: Panel sample of people aged 60 to 84 from each period. For cohort 1943–47, data points are from 2006–07 and 2008–09; for cohort 1918–22, data points are from 2002–03 and 2004–05.

Figure 7.2. Low self-rated health 2002–03 to 2008–09, by birth cohort

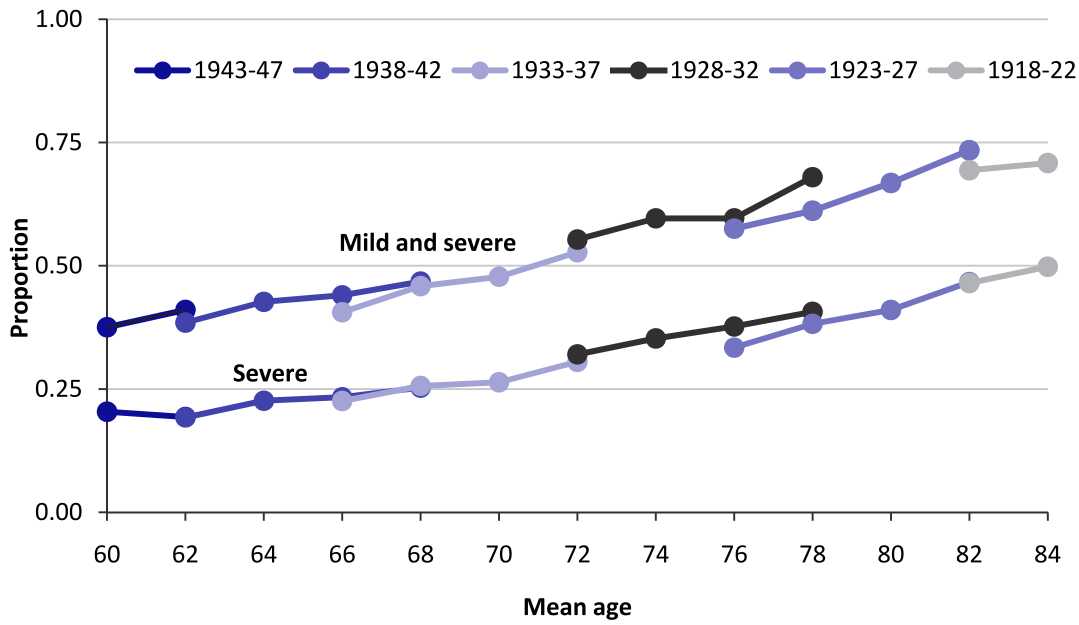


Notes: Panel sample of people aged 60 to 84 from each period. For cohort 1943–47, data point is from 2008–09; for cohort 1918–22, data points are from 2002–03 and 2004–05.

1923 and 1927); this is also true for the latter cohort compared with the immediate younger cohort (those born between 1928 and 1932). The cohort effect is much smaller or null for the younger cohorts.

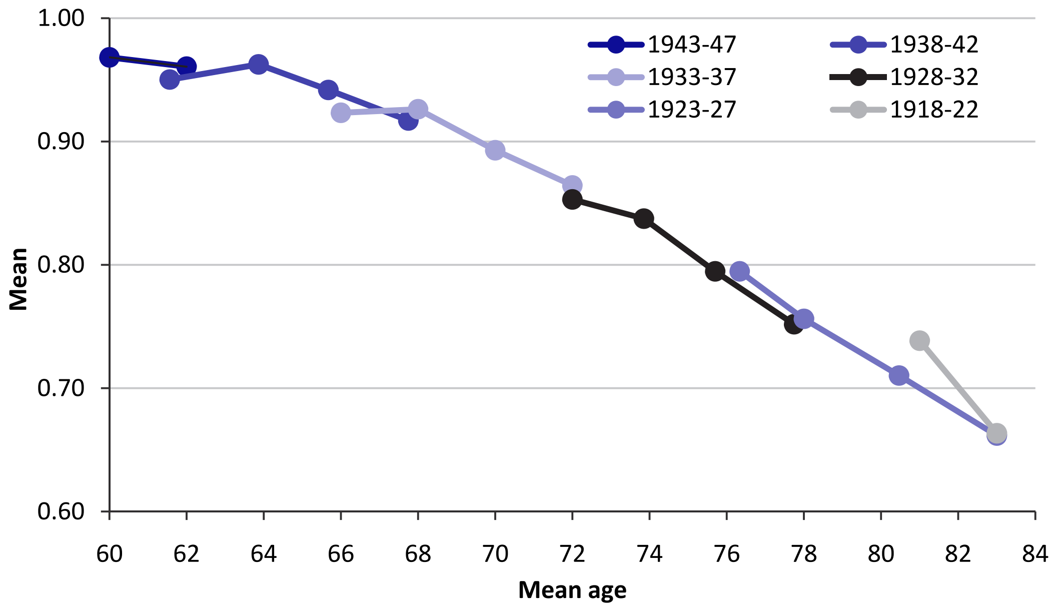
Figure 7.3 presents the proportions reporting mild and severe activity limitation by birth cohort from 2002–03 to 2008–09. The cumulative prevalence of mild and severe activity limitation is higher in older people. In

Figure 7.3. Activity limitation 2002–03 to 2008–09, by birth cohort



Notes: Panel sample of people aged 60 to 84 from each period. For cohort 1943–47, data points are from 2006–07 and 2008–09; for cohort 1918–22, data points are from 2002–03 and 2004–05.

Figure 7.4. Mean walking speed 2002–03 to 2008–09, by birth cohort



Notes: Panel sample of people aged 60 to 84 from each period. For cohort 1943–47, data points are from 2006–07 and 2008–09; for cohort 1918–22, data points are from 2002–03 and 2004–05.

the cohort of those born between 1938 and 1942, the increase between the 2002–03 period and the 2008–09 period in the cumulative prevalence of mild and severe activity limitation was on average 9 percentage points ($p<0.01$), while in the cohort of those born between 1923 and 1927 it was 15 percentage points ($p=0.01$). The graphs suggest that for mild activity limitation there is not much of a cohort effect. The differences (statistically significant although small) are observed in the prevalence of severe activity limitation: people in the oldest cohort (those born between 1918 and 1922) report higher prevalence of severe activity limitation than the immediate younger cohort (those born between 1923 and 1927); similarly, people born between 1928 and 1932 report higher prevalence of severe limitation than those born between 1933 and 1937.

Figure 7.4 presents the mean walking speed for each birth cohort from 2002–03 to 2008–09. Mean walking speed was highest in the youngest people and the decline over time was steeper in older people. However, there was not a cohort effect: for example, those born between 1923 and 1927 had the same mean walking speed (0.79m/s) at age 76 as those born between 1928 and 1932 when observed at the same average age; similarly, those born between 1923 and 1927 had the same mean walking speed (0.66m/s) as those born between 1918 and 1922 when observed at the same average age of 83.

7.5 The link between objective and subjective disability

In this section, we aim to explore the extent to which cohort trends in objective and subjective markers of disability follow similar trends over time, or, perhaps as a consequence of changes in norms and expectations, whether they show different trends. In the first part of the analysis, we explore the age-standardised prevalence of objective by subjective disability cross-sectionally in 2002–03 and 2008–09 by sex. This allows us to see changes in their relationship among cross-sections in different periods. To examine this relationship, we combine the activity limitation index with the walking speed index to define objective-by-subjective disability as follows:

- *No indicator of disability* (both objective and subjective), as defined by walking speed of at least 0.6m/s and the category ‘none’ of the activity limitation index.
- *Subjective disability*, as defined by the categories ‘mild’ or ‘severe’ of the activity limitation index, but no objective marker of disability (walking speed of at least 0.6m/s).
- *Objective disability* (walking speed less than 0.6m/s), but no subjective disability.
- *Both objective and subjective disability*.

Following this, we use panel data from the four periods (2002–03, 2004–05, 2006–07 and 2008–09) to explore, whether within a particular population, trends in objective and subjective disability vary. For this purpose, we calculate the age-standardised walking speed index by the activity limitation index separately for men and women.

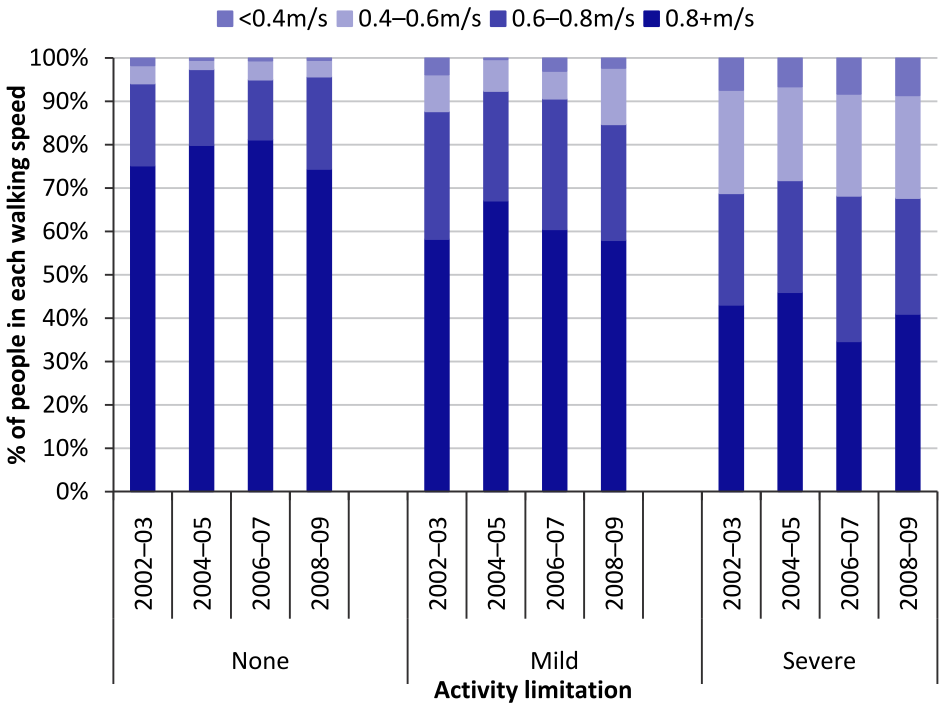
Table 7A.7 presents the change between 2002–03 and 2008–09 in the age-standardised prevalence of disability as defined by the objective and subjective indices, separately for men and women. The prevalence of men and women without either subjective or objective markers of disability was over 8 percentage points higher in 2008–09 than in 2002–03 ($p<0.001$). In contrast, there was no decline in the prevalence of people with subjective, but not objective, markers of disability in either sex. There was a significant decline over time in the prevalence of people with objective, but not subjective, markers of disability (men: 12% in 2002–03 and 6% in 2008–09, $p<0.001$; women: 11% in 2002–03 and 5% in 2008–09, $p<0.001$). The prevalence of men with both subjective and objective markers of disability was similar in 2008–09 compared to 2002–03 (21% in 2002–03 and 19% in 2008–09), while for women it was lower in 2008–09 than in 2002–03 (24% and 27% respectively, $p<0.01$). The implication is that we are seeing real declines in disability, which are masked by changes in subjective perception.

In general, men and women reported the same patterns in changes over time in the prevalence of objective and subjective markers of disability. However, in both 2002–03 and 2008–09, women had higher rates of disability than men – for example, the prevalence of women without either subjective or objective markers of disability was about 10 percentage points lower than the prevalence of men without either, in both waves; women also reported higher rates of having both subjective and objective disability than men, although the gap was narrower in 2008–09 than in 2002–03.

Figures 7.5A and 7.5B present the age-standardised prevalence of objective disability by subjective disability for the four waves of ELSA using the panel sample, for men and women respectively. The prevalence of men reporting walking speed of at least 0.8m/s and no activity limitation was 75% in 2002–03, which increased significantly to 81% in 2006–07 and then decreased again to 74% in 2008–09 ($p<0.001$). The prevalence of men reporting walking speed between 0.6m/s and 0.8m/s and no activity limitation was 19% in 2002–03, which decreased significantly to 14% in 2006–07 ($p<0.01$) and then increased again to 21% in 2008–09 ($p<0.001$). The prevalence of men reporting walking speed between 0.4m/s and 0.6m/s and no activity limitation was 4% in 2002–03, which decreased significantly to 2% in 2004–05 ($p<0.05$) and then increased again to over 4% in 2006–07. The prevalence of men reporting a walking speed of less than 0.4m/s and no activity limitation was 2% in 2002–03, which then decreased significantly over time, to reach zero in 2008–09. In 2002–03, 58% of men reported having mild activity limitation and walking speed of at least 0.8m/s, 29% reported mild activity limitation and walking speed between 0.6m/s and 0.8m/s and 9% reported mild activity limitation and walking speed between 0.4m/s and 0.6m/s.

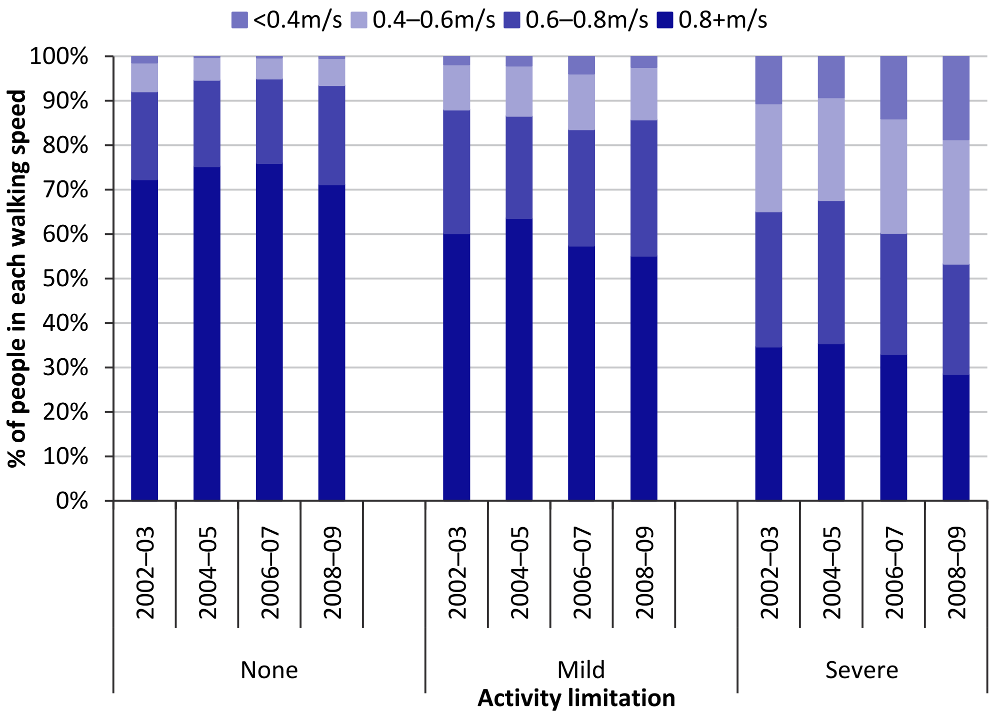
Among women, there were fewer changes over time than for men. The only significant changes were in the prevalence of women reporting no activity limitation and walking speed less than 0.4m/s, which decreased between 2002–03 and 2008–09 ($p<0.001$). The prevalence of women with severe activity limitation and walking speed of at least 0.8m/s decreased from 35% in 2002–03 to 29% in 2008–09 ($p<0.05$); similarly, the prevalence of women with severe activity limitation and walking speed between 0.6m/s and 0.8m/s

Figure 7.5A. Distribution of walking speed at each wave of ELSA, by activity limitation index: men



Note: Age-standardised weighted prevalence based on the panel sample of people aged 60 to 84 at each period.

Figure 7.5B. Distribution of walking speed at each wave of ELSA, by activity limitation index: women



Note: Age-standardised weighted prevalence based on the panel sample of people aged 60 to 84 at each period.

decreased over time (30% in 2002–03 and 25% in 2008–09, $p<0.05$). However, the prevalence of women reporting severe activity limitation and walking speed less than 0.4m/s increased significantly from 11% to 19% between 2002–03 and 2008–09 ($p<0.001$).

7.6 Predicting objective disability

In this section, we examine factors predicting six-year changes in mean walking speed, using generalised estimating equations (GEE) (Zeger and Liang, 1986) that model changes in the population mean given changes in the covariates, while accounting for time dependency of observations. The models are sequentially adjusted for:

- five-year age-groups, sex and year of the study;
- cohabiting status and education;
- cardiovascular disease (CVD), diabetes or high blood pressure, arthritis and pulmonary disease;
- activity limitation index;
- limiting long-standing illness.

The models for average changes in walking speed in the six-year period between 2002–03 and 2008–09 are summarised in Table 7A.8. The results show that, independently of other covariates (models 1 to 5), there was an improvement in walking speed between 2002–03 and 2004–05 (coefficient = 0.014, $p<0.01$ in model 5), while in 2008–09 compared with 2002–03, walking speed was on average 0.024m/s lower (model 5). Increased age, being female, not cohabiting with a partner (either men or women), medium and low education, and the health conditions of CVD, arthritis, high blood pressure, diabetes and pulmonary disease were all, as expected, related to lower mean walking speed (models 1 to 5). Mild and severe activity limitation were also related to decreased mean walking speed (coefficient = –0.064, $p<0.001$ and coefficient = –0.150, $p<0.001$ respectively) independently of other covariates (model 4). People with a limiting long-standing illness had a lower mean walking speed than people without a limiting long-standing illness (coefficient = –0.069, $p<0.001$) independently of other covariates (model 5).

7.7 Conclusions

In the context of large falls in risk of mortality for older people, this chapter sets out to explore whether we are seeing similar declines in levels of disability – which would be indicative of a parallel compression of morbidity – or whether levels of disability at older ages remain stable or are increasing as more people survive into older ages. In the context of an ageing population, understanding the patterning and drivers of such disability trends is of great policy and scientific value.

To address these issues, the chapter has focused on people aged between 60 and 84 and examined: differences in the level of disability in the population aged 60 to 84 at different time points; and trends in the level of disability

within the same people over time and whether these trends differed across different birth cohorts. To assess levels of disability, we used a combination of subjective self-reports (self-rated general health, limiting long-standing illness and reported activity limitations) and an objective measure of walking speed. Although disability may be considered to contain many dimensions – subjective, objective, mobility, cognitive, physical illness etc. – and ELSA contains measures reflecting these various domains, the summary set of measures used here were chosen because they relate well to those used elsewhere and because they provide a good overview.

In relation to the broad questions of trends in levels of disability over time and across birth cohorts, the findings reported in this chapter strongly indicate that levels of disability have been stable. While some statistically significant changes in some measures of disability have been identified, on the whole these were relatively small and some indicated increases in levels of disability while others indicated decreases. For example, over the period 2002–03 to 2008–09, for men aged 60 to 84 there was a small but significant increase in walking speed (the percentage with a speed of at least 0.8m/s increased from 60% to 63%), indicating a reduction in levels of disability, but no change in other markers of disability. For women over the same period, there was an increase in the levels of low self-rated health, but a decrease in the level of severe activity limitation. Examination of disability trajectories for individuals over time also suggested similarity across birth cohorts, rather than difference, with overlaps in levels of disability across birth cohorts when they were at the same age, and similarities in the rate of age-related increases in level of disability across birth cohorts.

This lack of change was consistently found across age groups, but when examined for different demographic groups the picture was a little more complex. There was a suggestion of reductions in levels of disability for those in a ‘high’ education group with an increase in levels of disability for those in a ‘low’ education group. However, this was not found consistently across the various measures of disability used. There were also marked reductions in levels of activity limitation for those who were cohabiting, which were not found for single men.

In contrast to this overall impression of stability in levels of disability, however, the analysis suggested that trends in subjectively reported levels of disability were differently patterned compared with those assessed using the objective measure of walking speed. While the level of those identified as disabled using only subjective measures, or a combination of subjective and objective measures, remained stable for men (or showed very small changes), levels of disability using only the objective measures dropped significantly for both men and women (over 2002–03 to 2008–09 for those aged 60 to 84, from 12% to 6% for men and from 11% to 5% for women).

Nevertheless, the overall stability in levels of disability over time and across birth cohorts is, on the face of it, somewhat surprising given that mortality rates at older ages are continuing to fall quite rapidly. The implication is that there is no compression of morbidity – although the analyses presented here are not a formal test of this. We are seeing a rise in the absolute number of people with a disability as the number of older people increases alongside

stable disability rates. However, the mismatch between trends for subjective and objective measures of disability raises important questions regarding the factors behind the overall lack of change, and points to the need for more detailed research to investigate disability trends and their link with mortality trends.

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Appendix 7A
Tables on trends in disability

Tables start on next page

Table 7A.1. Age-standardised prevalence of subjective disability by demographic and socioeconomic correlates, 2002–03 and 2008–09

	Limiting long-standing illness				Self-rated health				Activity limitation					
	2002–03		2008–09		2002–03		2008–09		2002–03			2008–09		
	No	Yes	No	Yes	High/ medium	Low	High/ medium	Low	None	Mild	Severe	None	Mild	Severe
	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Sex														
Men	61.8	38.2	64.3	35.7	70.5	29.5	70.9	29.1	53.4	16.8	29.8	54.0	17.7	28.4
Women	62.9	37.1	61.0	39.0	72.4	27.6	70.0	30.0	42.6	22.8	34.6	43.8	26.0	30.2
Education														
High	67.8	32.2	69.1	30.9	80.2	19.8	80.8	19.2	56.3	20.3	23.5	60.8	17.8	21.4
Medium	67.4	32.6	66.1	33.9	76.0	24.0	75.2	24.8	52.0	21.1	26.9	51.1	24.4	24.6
Low	58.0	42.0	57.7	42.3	67.5	32.5	63.4	36.6	43.0	19.4	37.6	41.6	23.3	35.0
Cohabiting status														
Cohabiting	62.9	37.1	64.1	35.9	73.3	26.7	73.3	26.7	48.3	21.2	30.5	51.7	21.5	26.7
Men not cohabiting	61.8	38.2	61.4	38.6	66.5	33.5	61.5	38.5	53.7	14.6	31.8	46.5	19.6	33.8
Women not cohabiting	60.9	39.1	57.3	42.7	69.3	30.7	64.4	35.6	41.8	19.4	38.8	38.8	25.9	35.2
***Unweighted* N**														
Sex														
Men	*1,894*	*1,196*	*2,044*	*1,096*	*2,130*	*912*	*2,294*	*849*	*1,590*	*516*	*923*	*1,754*	*531*	*857*
Women	*2,248*	*1,423*	*2,180*	*1,371*	*2,591*	*1,029*	*2,537*	*1,014*	*1,457*	*818*	*1,319*	*1,589*	*925*	*1,037*
Education														
High	*527*	*236*	*1,327*	*571*	*606*	*151*	*1,558*	*341*	*439*	*149*	*163*	*1,211*	*349*	*339*
Medium	*1,353*	*695*	*1,054*	*524*	*1,531*	*491*	*1,204*	*374*	*997*	*435*	*577*	*852*	*380*	*346*
Low	*2,257*	*1,682*	*1,807*	*1,361*	*2,578*	*1,295*	*2,027*	*1,142*	*1,606*	*749*	*1,498*	*1,291*	*777*	*1,101*
Cohabiting status														
Cohabiting	*2,791*	*1,651*	*3,063*	*1,613*	*3,186*	*1,191*	*3,537*	*1,141*	*2,111*	*925*	*1,304*	*2,585*	*1,014*	*1,078*
Men not cohabiting	*479*	*308*	*399*	*244*	*510*	*265*	*412*	*232*	*394*	*117*	*266*	*306*	*128*	*210*
Women not cohabiting	*872*	*660*	*762*	*610*	*1,025*	*485*	*882*	*490*	*542*	*292*	*672*	*496*	*369*	*507*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.2. Age-standardised prevalence of objective disability (walking speed) by demographic and socioeconomic correlates, in 2002–03 and 2008–09

	2002–03				2008–09			
	0.8+m/s	0.6–0.8m/s	0.4–0.6m/s	<0.4m/s	0.8+m/s	0.6–0.8m/s	0.4–0.6m/s	<0.4m/s
	%	%	%	%	%	%	%	%
Sex								
Men	60.3	24.3	11.1	4.4	62.8	22.7	11.0	3.5
Women	54.1	24.3	14.8	6.9	55.0	25.0	13.6	6.4
Education								
High	69.5	18.0	7.6	5.0	72.0	18.4	7.7	1.9
Medium	62.4	22.6	10.9	4.1	63.5	23.2	10.5	2.8
Low	51.5	26.5	15.1	6.8	50.4	27.0	15.3	7.2
Cohabiting status								
Cohabiting	60.7	23.7	11.4	4.2	62.6	23.0	10.2	4.2
Men not cohabiting	51.3	27.4	14.6	6.7	52.4	26.5	15.6	5.5
Women not cohabiting	48.8	24.4	16.9	9.9	48.4	27.4	17.0	7.2
***Unweighted* N**								
Sex								
Men	*1,470*	*582*	*272*	*107*	*1,804*	*595*	*266*	*81*
Women	*1,505*	*707*	*435*	*207*	*1,797*	*766*	*392*	*170*
Education								
High	*429*	*99*	*46*	*26*	*1,283*	*305*	*119*	*29*
Medium	*987*	*376*	*184*	*71*	*967*	*313*	*124*	*30*
Low	*1,557*	*813*	*477*	*217*	*1,339*	*741*	*413*	*191*
Cohabiting status								
Cohabiting	*2,127*	*804*	*380*	*139*	*2,741*	*886*	*354*	*130*
Men not cohabiting	*310*	*167*	*97*	*44*	*299*	*146*	*88*	*29*
Women not cohabiting	*538*	*318*	*230*	*131*	*561*	*329*	*216*	*92*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.3. Prevalence of limiting long-standing illness by age group, 2002–03 and 2008–09

	2002–03		**2008–09**	
	No	Yes	No	Yes
	%	%	%	%
60–64	66.4	33.6	68.0	32.0
65–69	65.7	34.3	65.1	34.9
70–74	61.3	38.7	63.6	36.4
75–79	58.3	41.7	53.4	46.6
80–84	48.3	51.7	49.2	50.8
Total	61.6	38.4	62.0	38.0
Unweighted N				
60–64	*1,114*	*571*	*1,452*	*664*
65–69	*1,115*	*590*	*1,012*	*521*
70–74	*896*	*575*	*937*	*536*
75–79	*633*	*461*	*529*	*435*
80–84	*384*	*422*	*294*	*311*
Total	*4,142*	*2,619*	*4,224*	*2,467*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.4. Prevalence of self-rated health by age group, 2002–03 and 2008–09

	2002–03		**2008–09**	
	High/medium	Low	High/medium	Low
	%	%	%	%
60–64	74.5	25.5	75.8	24.2
65–69	73.7	26.3	71.9	28.1
70–74	69.4	30.6	71.2	28.8
75–79	69.1	30.9	63.9	36.1
80–84	65.6	34.4	58.4	41.6
Total	71.2	28.8	70.2	29.8
Unweighted N				
60–64	*1,238*	*429*	*1,644*	*473*
65–69	*1,235*	*448*	*1,136*	*398*
70–74	*1,000*	*455*	*1,066*	*407*
75–79	*742*	*333*	*631*	*333*
80–84	*506*	*276*	*354*	*252*
Total	*4,721*	*1,941*	*4,831*	*1,863*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.5. Prevalence of activity limitation by age group, 2002–03 and 2008–09

	2002–03			2008–09		
	None %	Mild %	Severe %	None %	Mild %	Severe %
60–64	58.6	17.6	23.9	61.3	18.9	19.8
65–69	54.1	18.9	27.0	53.6	20.9	25.2
70–74	41.7	23.6	34.7	46.1	22.1	31.8
75–79	36.1	21.9	41.9	32.8	27.2	39.9
80–84	26.1	19.2	54.7	25.6	26.1	48.4
Total	46.2	20.1	33.6	48.0	22.1	29.8
Unweighted N						
60–64	*966*	*294*	*400*	*1,327*	*391*	*398*
65–69	*901*	*320*	*457*	*835*	*319*	*380*
70–74	*596*	*340*	*508*	*686*	*329*	*458*
75–79	*391*	*230*	*445*	*339*	*255*	*370*
80–84	*193*	*150*	*432*	*156*	*162*	*288*
Total	*3,047*	*1,334*	*2,242*	*3,343*	*1,456*	*1,894*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.6. Prevalence of walking speed by age group, 2002–03 and 2008–09

	2002–03				2008–09			
	0.8+m/s %	0.6–0.8m/s %	0.4–0.6m/s %	<0.4m/s %	0.8+m/s %	0.6–0.8m/s %	0.4–0.6m/s %	<0.4m/s %
60–64	67.4	19.6	9.3	3.7	72.1	18.9	7.0	2.1
65–69	65.2	20.7	10.2	3.9	65.1	22.0	9.8	3.1
70–74	52.0	29.3	12.6	6.1	58.5	24.0	12.3	5.1
75–79	42.6	29.1	19.4	8.9	40.1	31.9	18.5	9.5
80–84	35.0	29.3	23.6	12.2	27.0	32.8	27.7	12.5
Total	55.8	24.6	13.5	6.1	58.3	24.1	12.6	5.1
Unweighted N								
60–64	*904*	*259*	*122*	*48*	*1,408*	*341*	*117*	*33*
65–69	*904*	*283*	*138*	*54*	*920*	*290*	*118*	*36*
70–74	*607*	*338*	*146*	*67*	*780*	*308*	*146*	*60*
75–79	*355*	*234*	*158*	*71*	*349*	*265*	*143*	*63*
80–84	*205*	*175*	*143*	*74*	*144*	*157*	*134*	*59*
Total	*2,975*	*1,289*	*707*	*314*	*3,601*	*1,361*	*658*	*251*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.7. Age-standardised prevalence of objective-by-subjective disability by sex, 2002–03 and 2008–09

	2002–03	2008–09
	%	%
Men		
No disability (objective–subjective)	40.8	48.4
No disability(objective) Disability(subjective)	26.2	26.9
Disability(objective) No disability(subjective)	12.3	5.5
Disability(objective–subjective)	20.7	19.2
Women		
No disability (objective–subjective)	30.9	39.2
No disability(objective) Disability(subjective)	30.3	31.9
Disability(objective) No disability(subjective)	11.3	4.6
Disability(objective–subjective)	27.4	24.4
Unweighted N		
Men	*3,044*	*3,142*
Women	*3,623*	*3,551*

Note: Prevalence based on cross-sectional sample of people aged 60 to 84 from each period, weighted for non-response.

Table 7A.8. Determinants of changes in walking speed between 2002–03 and 2008–09

	Model 1 Coeff.	Model 2 Coeff.	Model 3 Coeff.	Model 4 Coeff.	Model 5 Coeff.
Aged 60–64	Reference	Reference	Reference	Reference	Reference
Aged 65–69	–0.042‡	–0.037‡	–0.032‡	–0.028‡	–0.029‡
Aged 70–74	–0.096‡	–0.084‡	–0.075‡	–0.064‡	–0.066‡
Aged 75–79	–0.177‡	–0.159‡	–0.145‡	–0.129‡	–0.130‡
Aged 80–84	–0.253‡	–0.227‡	–0.209‡	–0.186‡	–0.186‡
Male	Reference	Reference	Reference	Reference	Reference
Female	–0.061‡	–0.047‡	–0.046‡	–0.037‡	–0.038‡
2002–03	Reference	Reference	Reference	Reference	Reference
2004–05	0.014†	0.012*	0.013*	0.014†	0.014†
2006–07	–0.001	–0.004	–0.004	–0.003	–0.002
2008–09	–0.007	–0.018†	–0.036‡	–0.028‡	–0.024‡
Cohabiting		Reference	Reference	Reference	Reference
Men not cohabiting		–0.067‡	–0.066‡	–0.065‡	–0.067‡
Women not cohabiting		–0.061‡	–0.054‡	–0.043‡	–0.041‡
High education		Reference	Reference	Reference	Reference
Medium education		–0.025‡	–0.027‡	–0.026‡	–0.026‡
Low education		–0.086‡	–0.084‡	–0.078‡	–0.077‡
CVD			–0.050‡	–0.033‡	–0.026‡
High blood pressure or diabetes			–0.038‡	–0.029‡	–0.028‡
Arthritis			–0.025‡	–0.018‡	–0.014‡
Pulmonary disease			–0.024‡	–0.019‡	–0.014†
No limitations			Reference	Reference	Reference
Mild limitations				–0.064‡	–0.050‡
Severe limitations				–0.150‡	–0.124‡
Limiting long-standing illness					–0.069‡
N	*14,361*	*14,360*	*14,357*	*14,317*	*14,311*

Notes: Analysis based on the panel sample of people aged 60 to 84 at each period.
‡ p<0.001; † p<0.01; * p<0.05.

8. Health risk and health protective biological measures in later life

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Wave 4 of ELSA (2008–09) included repeat measures of biological markers for the first time. Some of these biomarkers are risk factors that are associated with adverse health outcomes, while others protect against ill health and may promote well-being. This chapter presents the distribution of these risk and protective factors in wave 4 (2008–09) in relation to age, gender and wealth. For each factor, we also summarise the change in these measures over time for participants who took part in both waves 2 (2004–05) and 4 (2008–09).

The key findings in this chapter include:

- Among ELSA participants, the prevalence of overweight, general and abdominal obesity was high in wave 4 (2008–09), and was inversely related to socioeconomic status as defined by wealth. There was also a marked increase in obesity and waist circumference between 2004–05 and 2008–09 in all participants except the oldest old (age 80+).
- Self-reported doctor-diagnosed hypertension increased with age, and was less prevalent in wealthier groups at wave 4 (2009–09). Self-reported doctor-diagnosed hypertension has increased for both men and women from 2004–05 to 2008–09.
- High total cholesterol was more common among women than men in 2008–09, as was high 'bad' (LDL) cholesterol. Fewer participants who were well off had levels of 'good' cholesterol (HDL) and triglycerides that would indicate increased risk. The proportion of men and women reporting at-risk levels of total cholesterol decreased from 2004–05 to 2008–09.
- Mean fasting blood glucose levels have decreased over time in both men and women. Self-reported diabetes increased with age, and was less prevalent in wealthier groups in 2008–09.
- Mean haemoglobin levels have decreased over time in both men and women. This decrease was larger among the poorest.
- In 2008–09, there was a strong socioeconomic gradient in health-related behaviours, with a greater prevalence of smoking, lower levels of physical activity and less fruit and vegetable consumption among those who were worse off. Overall, only half of the respondents met national recommendations for fruit and vegetable intake. Alcohol consumption was higher among those who were better off. Increases in sedentary behaviour

and decreases in alcohol consumption were seen from 2004–05 to 2008–09.

- Levels of insulin-like growth factor I (IGF-I) and dehydroepiandrosterone sulfate (DHEAS) decreased considerably with age in 2008–09. A socioeconomic gradient was evident for both markers, with higher levels of both markers among those who were better off.
- There were increases in levels of inflammatory markers such as C-reactive protein (CRP) and fibrinogen between 2004–05 and 2008–09. Although these inflammatory markers are inversely related to wealth, the increases across years were greatest in the wealthier groups.
- In 2008–09, greater levels of physical activity were associated with lower levels of triglycerides and CRP and higher levels of health-protective HDL. Among women, greater physical activity was also associated with higher levels of IGF-I, while among men it was associated with higher levels of DHEAS.
- Both DHEAS and IGF-I showed associations with tests of cognitive function. Effects were more marked for men, particularly with respect to DHEAS. DHEAS was lower for those with poorer self-rated memory and among women IGF-I was also lower.

8.1 Introduction

We are entering a new era of psychosocial biomarkers research in population ageing studies, in which assessments of biological indicators are not confined to clinical and subclinical disease identification, but extended to measures of physiological processes that reflect psychological, social and economic experience (Steptoe, 2010). Wave 4 of ELSA (2008–09) included repeat measures of biological markers for the first time. Some of these biomarkers are risk factors that are associated with adverse health outcomes, while others protect against ill health and may promote well-being.

The biological risk measures include indicators of conditions such as diabetes (HbA1c, glucose), cardiovascular disease (lipid profile, blood pressure, fibrinogen, C-reactive protein), chronic obstructive pulmonary disease (lung function) and anaemia (haemoglobin and ferritin). General risk and protective factors such as anthropometric measures (body mass index, waist circumference) and health risk behaviours (smoking, excessive alcohol consumption) will also be analysed. The factors that are potentially health protective include high density lipoprotein (HDL) cholesterol, insulin-like growth factor I (IGF-I) and dehydroepiandrosterone sulfate (DHEAS), together with lifestyle factors such as physical activity and fruit and vegetable consumption.

This chapter presents the distribution of these risk and protective factors in wave 4 (2008–09) in relation to age, gender and wealth. For each factor, we also summarise the change in these measures over time for participants who took part in both waves 2 (2004–05) and 4 (2008–09). The increasing use of biomarkers in social science research, especially in ageing studies, could potentially enhance the indicators of the success of public policy initiatives,

since biomarkers are associated with physical and mental health, social relationships, work and economic experience. In order to highlight these approaches, this chapter explores the relationships between key biomarkers and physical activity, cognitive function and social isolation.

8.2 Methods

Sample

Cross-sectional analyses of data from the 2008–09 sample and longitudinal analyses of individuals who were participants during 2004–05 and 2008–09 are presented in this chapter. The 2008–09 sample included people from three different cohorts: (a) the original ELSA cohort that was drawn in 2002–03 and consisted of people then aged 50 or older; (b) the refreshment sample that was added to ELSA in 2006–07 and consisted of people then aged 50–54 years; and (c) a new cohort that was added to ELSA in 2008–09 and comprised people aged 50–75 years. The longitudinal analysis aimed at highlighting changes in biomarkers at the individual level. The sample employed for this analysis consisted of all core members of the original ELSA cohort (2004–05) who had not dropped out of the study by 2008–09. Since there was some attrition from the study, the numbers in the longitudinal analysis were smaller than those in the cross-sectional wave 2 (2004–05) sample.

All analyses included only core members (eligible members of any of the three ELSA cohorts who participated in at least one wave of the study) for whom a weighting factor to correct for non-response had been estimated. The data for this chapter come from the nurse visit, interview and self-completion questionnaire. Separate weights were computed to account for non-response for the main interview, nurse visit and for blood sample analyses.

Anthropometric measures, biomarkers and lung function data were collected during the nurse visit to the core sample members living in private homes. Of those who had a wave 4 (2008–09) interview 88% had a nurse visit (n=8,643). Cognitive function and health behaviour (smoking and physical activity) data were collected during the main interview. Data on patterns of alcohol consumption, fruit and vegetable consumption and social participation were obtained from the self-completion questionnaire. Relevant features of the methodology related to biomarker and anthropometry measurement are highlighted in this chapter but further details can be found in the technical report. Detailed response rates are in the chapter on methodology (Chapter 10).

Classificatory measures

Three main classificatory variables were employed to analyse the health risk and protective biological measures: age, gender and wealth.

Age

Age was coded into the following seven groups: 50–54 years, 55–59 years, 60–64 years, 65–69 years, 70–74 years, 75–79 years and 80 years or older. In the longitudinal analyses, age at wave 2 (2004–05) was used to classify participants.

Wealth

The socioeconomic variable used in our analysis was wealth. Wealth reflects command over material resources more accurately than other measures of socioeconomic status (Oliver and Shapiro, 1997) and has been found to be the best socioeconomic predictor of health in the ELSA sample (Demakakos et al., 2008). Total non-pension wealth is defined as the sum of financial worth, physical worth (such as business wealth, land or jewellery) and housing wealth after deducting debts; it represents a better measure of the permanent economic status of older people than income. For the purposes of analysis, wealth was categorised into quintiles of net total non-pension wealth measured per benefit unit (a benefit unit is a couple or single person along with their dependent children). The longitudinal analyses employed wealth data from 2004–05, while the cross-sectional analyses used wealth data from 2008–09.[1]

The nurse visit

All core members were eligible for a nurse visit in person (i.e. not by proxy) either in a private household or in an institution. A nurse visit was provided only to those partners who explicitly requested one. The CAPI (Computer Assisted Personal Interview) program was used.

After the main interview, the interviewer made an appointment for the nurse to visit the respondent or set up contact between nurse and respondent. The nurse visit consisted of a series of measurements that were only taken if the appropriate consents were obtained and the respondent was able to respond affirmatively to relevant safety questions. The nurse visit included several standard measures including anthropometric measures, blood pressure, blood sample and lung function.

Full information on all the measurements collected during the nurse visit can be found in the wave 4 (2008–09) technical report.

Anthropometric measures

Height

Height was measured using a portable stadiometer with a sliding headplate, a base plate and three connecting rods marked with a metric scale. Respondents were asked to remove their shoes. One measurement was taken with the respondent stretching to the maximum height and the head in the Frankfort plane.[2] The reading was recorded to the nearest millimetre.

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[1]It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected.

[2]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. This line must be parallel with the floor. This gives the maximum vertical distance from the floor to the highest point of the skull.

Weight

Weight was measured using a portable electronic scale. Respondents were asked to remove their shoes and any bulky clothing. A single measurement was recorded to the nearest 0.1 kg. Respondents 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.

Body mass index (BMI)

Body mass index (BMI) is a widely accepted measure of weight for height and is defined as weight in kilograms divided by the square of the height in metres (kg/m^2). BMI was calculated for all those respondents for whom both a valid height and weight measurement were recorded.

We categorised the BMI scores into three main groups:

- underweight group ($<18.5\ kg/m^2$)
- normal (≥ 18.5 and $<25\ kg/m^2$)
- overweight (≥ 25 and $<30\ kg/m^2$)
- obese ($\geq 30\ kg/m^2$)

Waist circumference

BMI does not distinguish between mass due to body fat and mass due to muscular physique and does not take account of the distribution of fat. It has therefore been postulated that waist circumference may be a better measure than BMI to identify those with a health risk from their body shape. Among older people the fat distribution changes considerably and abdominal fat tends to be greater. Therefore waist circumference can be considered an appropriate indicator of body fatness and central fat distribution among the elderly.

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

Waist circumference was categorised into three main groups using sex-specific cut-offs (Flegal, 2007):

- low risk (<94 cm for men and <80 cm for women)
- medium risk (≥94 cm and <102 cm for men; ≥80 cm and <88 cm for women)
- high risk (≥102 cm for men and ≥88 cm for women).

Blood pressure

All respondents were eligible for the blood pressure module, except those who were pregnant. Three readings were collected at one-minute intervals (systolic, diastolic and pulse rate) using the Omron HEM-907 equipment. It was ensured

that the room temperature was between 15 and 25°C. The respondent was asked not to eat, smoke, drink alcohol or take vigorous exercise in the 30 minutes preceding the blood pressure measurement as blood pressure can be raised immediately after any of these activities.

Systolic (SBP) and diastolic (DBP) blood pressure was measured using a standardised method. In adults, hypertension is defined as an SBP of at least 140 mmHg or a DBP of at least 90 mmHg or being on medication to control hypertension. The systolic arterial pressure is defined as the peak pressure in the arteries, which occurs near the beginning of the cardiac cycle. The diastolic arterial pressure is the lowest pressure at the resting phase of the cardiac cycle.

Blood sample

Blood samples were taken from willing ELSA core members, except those who had a clotting or bleeding disorder (e.g. haemophilia or low platelets), had ever had a fit, were not willing to give their consent in writing or were currently on anticoagulant drugs (e.g. warfarin therapy).

Fasting blood samples were taken whenever possible, but respondents over 80 years, those known to be diabetic and on treatment, those who had a clotting or bleeding disorder or were on anti-coagulant drugs (e.g. warfarin), those who had ever had fits and those who seemed frail or whose health the nurse was concerned about were not asked to fast. Subjects were considered to have fasted if they had not had food or drink except water for a minimum of 5 hours prior to the blood test.

Valid blood samples were taken from 6,188 (75.6%) people of whom 4,149 fasted.

The amount of blood taken from each participant in order to analyse each biomarker is presented below:

- 1 citrate blue tube (1.8 ml) – fibrinogen;
- 1 plain red tube (6 ml) – total and HDL cholesterol, triglycerides, ferritin, C-reactive protein (CRP), IGF-I and DHEAS;
- 1 fluoride grey tube (2 ml): fasting glucose;
- 1 EDTA light purple tube (2 ml) – haemoglobin and glycated haemoglobin;
- 2 EDTA dark purple tubes (4 ml) – genetics.

All the blood samples were analysed at the Royal Victoria Infirmary laboratory in Newcastle.

Blood analytes

These are the blood analytes measured:

- **Total cholesterol**

  Cholesterol is a type of fat present in the blood, related to diet. Too much cholesterol in the blood increases the risk of heart disease.

- **High density lipoprotein (HDL) cholesterol**

  This is 'good' cholesterol which is protective for heart disease.

- **Low density lipoprotein (LDL) cholesterol**

  This is the 'bad' cholesterol and a risk factor for cardiovascular disease.

- **Triglycerides**

  Together with total and HDL cholesterol, they provide a lipid profile which can give information on the risk of cardiovascular disease. High levels of total cholesterol, LDL and triglycerides and low levels of HDL are indicative of risk.

- **Fibrinogen**

  It is a protein necessary for blood clotting. High levels are also associated with a higher risk of heart disease.

- **C-reactive protein**

  The level of this protein in the blood gives information on inflammatory activity in the body, and it is also associated with risk of heart disease. Values over 3 mg/l are associated with increased risk of cardiovascular disease.

- **Fasting glucose**

  It indicates the presence or risk of type 2 diabetes, which is associated with an increased risk of heart disease.

- **Ferritin and haemoglobin**

  These are measures of iron levels in the body and are related to diet and other factors.

- **Insulin-like growth factor I (IGF-I) and dehydroepiandrosterone sulfate (DHEAS)**

  These are hormones that help control reactions to stress and regulate various body processes including digestion, the immune system, mood and energy usage.

Lung function measures

Lung function tests are commonly used in clinical practice to assess impairment that is due to chronic lung disease and asthma. Lung function is known to decline with age and smoking. Respondents were excluded if: they had abdominal or chest surgery in the preceding three weeks; were admitted to hospital with a heart complaint in the preceding six weeks; had an eye surgery in the preceding four weeks; or had a tracheotomy. The tests were not done if the ambient temperature was less than 15°C or more than 35°C, as this affects the accuracy of the readings. The equipment used consisted of a Spirometer (Vitalograph Micro), disposable cardboard mouthpieces and a 1 litre calibration syringe. The measures of lung function obtained at the nurse visit were:

- **Forced Expiratory Volume (FEV1):** the volume in litres expelled in the first second of a forced expiration, starting from a maximum inspiration.
- **Forced Vital Capacity (FVC):** the full volume in litres expelled following a maximum inspiration.
- **Peak Expiratory Flow Rate (PEF):** the fastest rate of exhalation (in litres per minute) recorded during the measurement.

The protocol requires three measurements and the highest satisfactory score is taken as the valid one. High values indicate better lung function.

Health behaviours

Smoking

At both waves participants were asked if they had ever smoked and whether they were currently smoking. Participants who replied in the affirmative were asked if they smoked currently. Based on this, we classified participants as smokers or non-smokers.

Alcohol consumption

Alcohol consumption was included in the self-completion questionnaire. The main questions were about frequency of alcohol consumption over the past year. Based on this information alcohol consumption was divided into four categories: 'Daily', 'Frequently' (once or twice a week or more, but not every day), 'Rarely' (once or twice a month/once every couple of months) and 'Never'. There were further detailed questions regarding the frequency, type and amount of alcohol consumed in the previous week. The total units of alcohol consumed in the previous week were then calculated. Respondents were classed as drinking within or above recommended weekly units of alcohol (i.e. 21 units/week for men and 14 units/week for women).

Physical activity

Self-reported physical activity was classified into four categories as follows:

- **Sedentary:** reporting no physical activity and if working in a sedentary job.
- **Low:** reporting mild physical activity at least once a week or if working in a job that was mostly standing.
- **Moderate:** reporting moderate physical activity at least once a week or if working in a job that involved physical work.
- **High:** reporting vigorous physical activity at least once a week or if working in a job that involved heavy manual labour.

Fruit and vegetable consumption

Participants provided information on the self-completion questionnaire about the number of portions of fruit and vegetables (whole and in composites), fruit juices, salads and pulses consumed on the previous day. Based on this the total portions of fruit and vegetables consumed in the previous day were computed.

Social isolation

A social isolation index was derived for this sample. Respondents were given a point if they lived alone, had less than monthly contact (including face-to-face, telephone or written/e-mail contact) with children, other immediate family or friends and if they did not participate in organisations, religious groups or committees. Scores ranged from 0 to 5, with higher scores indicating greater social isolation.

Cognitive function

The cognitive measures selected for ELSA cover a diversity of cognitive domains and were chosen on the basis of four primary considerations:

- assessing cognitive processes that are relevant to the everyday functioning of older people;
- using mainly tasks that are known to be sensitive to age-related decline;
- avoiding floor effects (too many people failing) and ceiling effects (too many people obtaining maximum scores);
- employing measures used in other studies to facilitate comparisons.

The cognitive measures used in this chapter were:

- **Self-reported memory:** this measure provides an indication of whether the respondent is worried about their memory. They were asked to rate their memory at the present time as excellent, very good, good, fair or poor.
- **Orientation in time:** time orientation was assessed by standard questions about the date (day, month and year) and day of the week. This item forms part of the Mini-Mental State Examination (MMSE), which is used in numerous studies of ageing.
- **Verbal fluency:** this measure tests how quickly participants can think of words from a particular category. We used the naming of as many different animals as possible in one minute.
- **Numeracy:** the participants' level of numeracy was established by asking them to solve six problems requiring simple mental calculations based on real-life situations.

8.3 Health risk measures

Body mass index and waist circumference

There has been a marked increase in the prevalence of obesity across the age spectrum including the oldest age groups living in Western countries. In many populations, the average body mass index (BMI) has been rising by a few per cent per decade, fuelling concern about the effects of increased adiposity on health (Prospective Studies Collaboration, 2009). In England, more than half of all adults are currently classified as overweight or obese (The Information Centre, 2009). If current trends continue, obesity rates could well increase further (Zaninotto et al., 2006). The increase in the prevalence of obesity that

has occurred over the last decade is a key public health concern and is complex to tackle (Foresight Report, 2007). It is estimated that the cost to the NHS in England of obesity in 2007 was £4.2 billion and will rise to £6.3 billion in 2015 (http://www.healthcarerepublic.com, 2008). Obesity and underweight are important problems in the elderly. Obese people have an increased mortality rate compared with those who are overweight or at a desirable weight, but the relative risk of death associated with increasing BMI decreases with age (Calle et al., 1999). Body mass index is a reasonably good measure of general adiposity, and raised BMI is an established risk factor for several causes of death, including ischaemic heart disease, stroke and cancers of the large intestine, kidney and endometrium, and postmenopausal breast cancer.

Results

The overall mean BMI in 2008–09 was similar for men (28.3 kg/m^2) and women (28.4 kg/m^2). Among men, mean BMI starts decreasing after the ages 55–59 years from 28.6 kg/m^2 to 27.0 kg/m^2 for those aged 80 years or over. In women, mean BMI decreases after 75–79 years from 29.0 kg/m^2 to 26.8 kg/m^2 for those aged 80 years or over (Table 8A.1). Less than 1% of men and slightly over 1% of women are underweight. Under a third of women and just over a fifth of men have BMI in the desirable category ($p<0.001$). More men (48.3%) than women (35.0%) are overweight ($p<0.001$), and this applies to all age groups, but more women (33.9%) than men (30.1%) are obese ($p<0.001$), particularly among people in their 70s (Table 8A.2). The very oldest groups are the least likely to be obese.

The mean waist circumference in men is 102.7 cm and 92.8 cm in women. In women, a clear upward linear trend with age is found in waist circumference until the age of 75–79, following which waist circumference decreases (Table 8A.3). Raised waist circumference was defined in men as 102 cm or greater and 88 cm or greater in women. Overall, 49.4% of men have raised waist circumference compared with 60.7% of women ($p<0.001$).

In 2008–09, the prevalence of obesity and raised waist circumference fell with increasing wealth (Figures 8.1 and 8.2 and Tables 8A.4 to 8A.6). Waist circumference is lowest among the wealthiest participants. Thus the proportion of participants with raised waist circumference rose from 42.3% for the wealthiest participants to 54.9% for the poorest in men ($p<0.001$). In women, this proportion rose from 50.6% for the wealthiest participants to 67.2% for the poorest ($p<0.001$).

Participants who provided data at both 2004–05 and 2008–09 waves showed increases in waist circumference over time (Figures 8.3 and 8.4). This increase was apparent for women of all ages and also for men except among the oldest old men (80 years and over).

Figure 8.1. Percentage of participants who are overweight/obese (BMI ≥25 kg/m^2) by sex and wealth quintiles (2008–09)

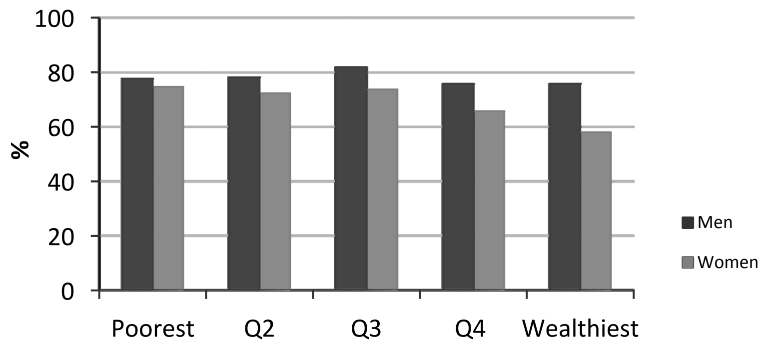


Figure 8.2. Percentage of participants with raised waist circumference (≥102 cm for men and ≥88 cm for women) by sex and wealth quintiles (2008–09)

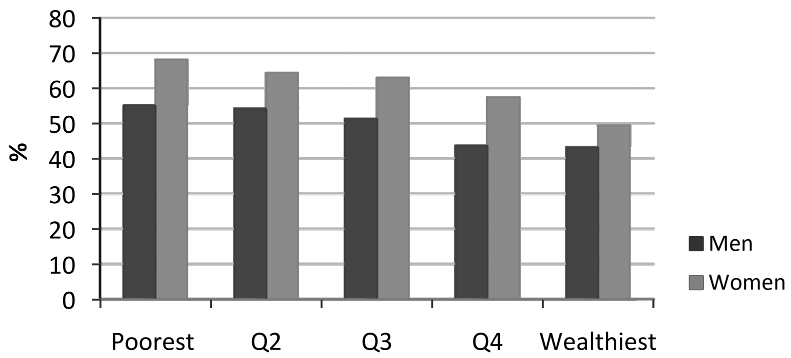


Figure 8.3. Mean waist circumference change from wave 2 (2004–05) to wave 4 (2008–09) in men

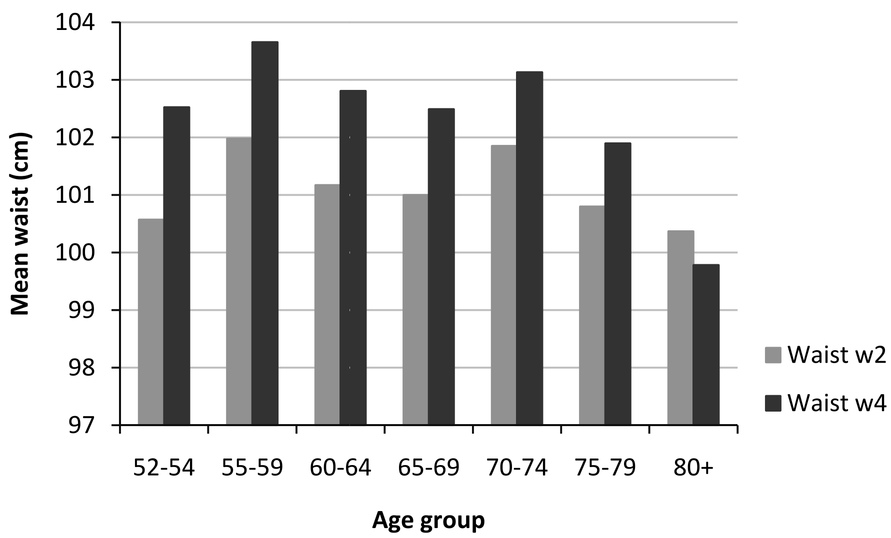
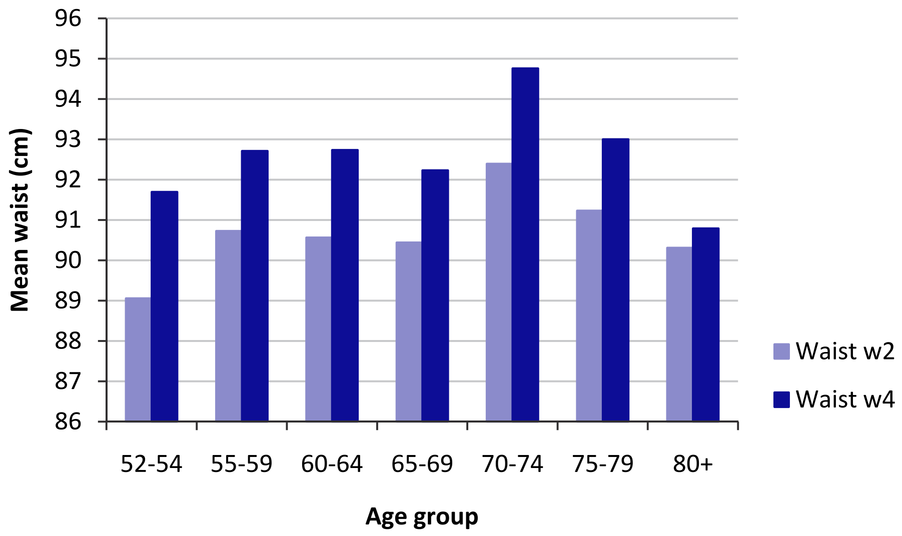


Figure 8.4. Mean waist circumference change from wave 2 (2004–05) to wave 4 (2008–09) in women



Blood pressure

Raised systolic (SBP) and diastolic (DBP) blood pressures are important risk factors for cardiovascular diseases (CVD) such as angina, myocardial infarctions and stroke.

Collated epidemiological data have strengthened the well-recognised relationship between blood pressure (BP) and risk of CVD and have confirmed the overwhelming importance of SBP as a determinant of risk (Lewington et al., 2002). The importance of BP as a risk factor was further highlighted by the World Health Organization (WHO) report which identified high BP as one of the most important preventable causes of premature morbidity and mortality in developed and developing countries (Ezzati et al., 2002).

Hypertension is estimated to cause 11% of loss of healthy life, and is the second most important preventable cause of premature death in economically developed countries (WHO, 2002). The National Institute for Health and Clinical Excellence (NICE) has estimated that 40% of adults in England and Wales have hypertension, using the threshold of 140/90 mmHg, and this proportion increases with age (NICE, 2006).

Epidemiological data have also demonstrated that in a majority of people high-normal BP will evolve to hypertension with ageing. Trial evidence supports treatment in the elderly up to the age of 80 years, because they have good results from treatment. However, the results from the 'Hypertension in the Very Elderly Trial' (HYVET) provided evidence that antihypertensive treatment in persons 80 years of age or older is beneficial (Beckett et al., 2008).

In the developed world, there is a well-established inverse association between socioeconomic status (SES) and blood pressure. A systematic review identified 50 studies from high-income countries which evaluated socioeconomic inequalities in blood pressure or hypertension, allowing for age. Forty-two of these showed that higher socioeconomic status was

associated with lower blood pressure or a lower prevalence of hypertension, while the remainder showed no association (Colhoun, Hemingway and Poulter, 1998).

In accordance with the Fourth British Hypertension Society Guidelines (2004) (Williams et al., 2004), we used cut-off points as follows: SBP equal to or greater than 140mmHg and/or DBP greater than or equal to 90 mmHg to define hypertension. High blood pressure may be asymptomatic and not detected until many years after onset.

Results

Mean SBP and DBP are higher among men (134.7 mmHg and 75.5 mmHg, respectively) than women (132.6 mmHg and 73.8 mmHg, respectively). Among men SBP increases until age 79 and then there is a small decrease, while among women there appears to be a steady increase in SBP with age (Figure 8.5). Among both men and women, increased age is associated with decreases in DBP (Table 8A.7). Prevalence of diagnosed hypertension is just over 40% for both men and women. Hypertension shows a positive association with age ($p<0.001$) (Table 8A.8).

Figure 8.5. Mean systolic blood pressure by sex and age (2008–09)

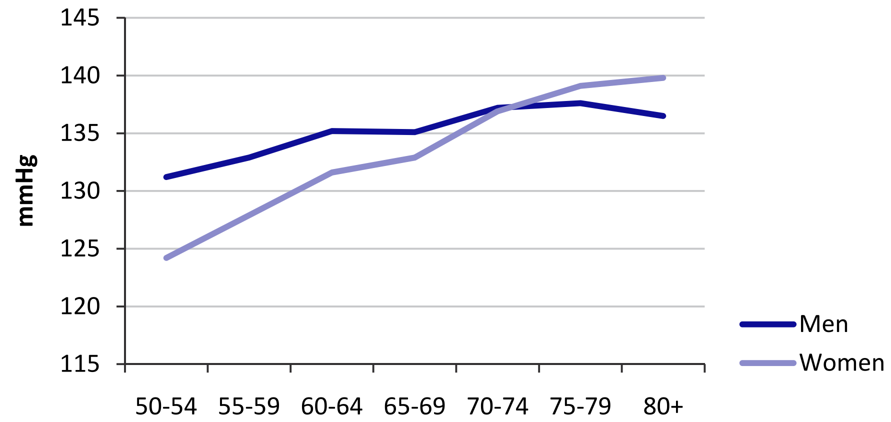


Figure 8.6. Percentage of self-reported doctor-diagnosed hypertension from wave 2 (2004–05) to wave 4 (2008–09) in men

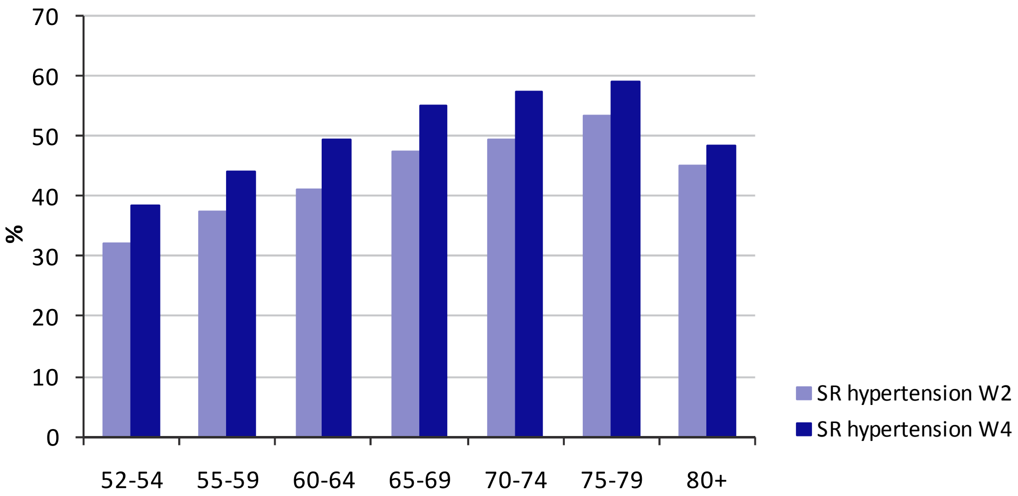
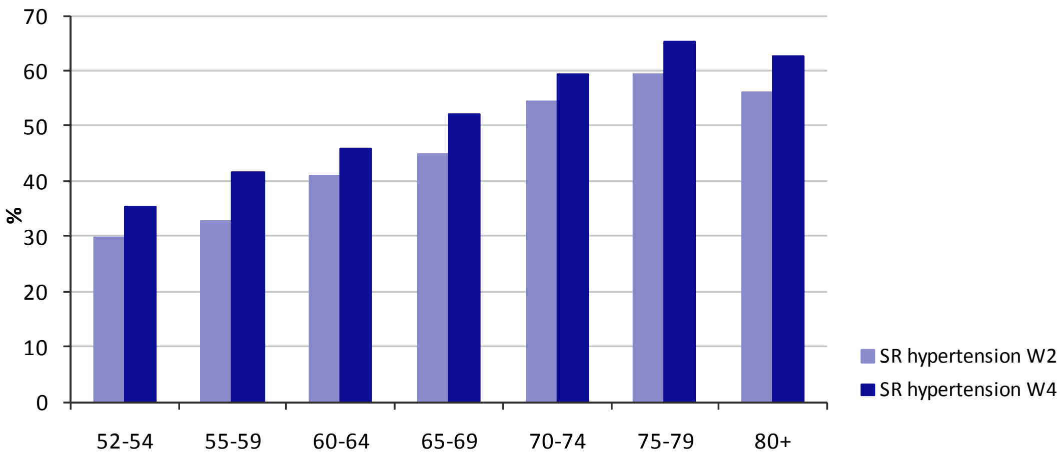


Figure 8.7. Percentage of self-reported doctor-diagnosed hypertension from wave 2 (2004–05) to wave 4 (2008–09) in women



In cross-sectional analyses, mean levels of SBP and DBP did not show a clear pattern of association with wealth (Table 8A.9). Fewer participants who were wealthier, however, reported being hypertensive ($p<0.001$) (Table 8A.10).

Over time, more participants develop hypertension and this trend is evident for both men and women (Figures 8.6 and 8.7).

Lipids

Prospective studies have identified an increased risk of coronary heart disease associated with raised cholesterol concentration. High levels of cholesterol are associated with the development of atherosclerosis (or hardening of the arteries). The World Health Report 2002 estimated that raised cholesterol was responsible for about 8% of the disease burden in developed countries. The prevalence of high cholesterol has been declining in many countries thanks to primary prevention efforts, and it has been estimated that reductions in high cholesterol between 1980 and 2000 accounted for 25% of the life years gained by adults in the USA (Capewell et al., 2009).

Total cholesterol includes two fractions: low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol. LDL is commonly termed as 'bad' cholesterol as increases in LDL levels are associated with adverse outcomes. It comprises 60–70% of total cholesterol and is in itself a risk factor for cardiovascular disease. A meta-analysis of randomised trials of cholesterol-lowering treatments found that reducing LDL cholesterol by 1.00 mmol/l would be expected to reduce coronary heart disease events by 11% in the first year, and 24% in the second year (Law, Wald and Rudnicka, 2003). The other group of fats associated with poor outcomes are the triglycerides. Triglyceride levels are an independent risk factor for cardiovascular disease, and based on the recommendations of the National Cholesterol Education Program in the USA and European cardiovascular disease prevention guidelines, we have used ≥1.7 mmol/l as the cut-off for 'high' triglyceride levels.

A diagnosis of hypercholesterolemia (or high blood cholesterol) includes a consideration of levels of total cholesterol, the ratio between LDL and HDL as well as levels of triglycerides. The European Society of Cardiology 2007

guidelines (Fourth Joint Task Force of the European Society of Cardiology, 2007) state that total plasma cholesterol should be below 5 mmol/l and LDL cholesterol should be below 3 mmol/l. In the high-risk subjects, especially those with clinically established atherosclerotic CVD and patients with diabetes, the treatment goals should be lower: total cholesterol <4.5 mmol/l and LDL cholesterol <2.5 mmol/l. We have therefore taken 5 mmol/l as being the cut-off for high total cholesterol, and 3 mmol/l for a high LDL.

In ELSA we measured total cholesterol in the non-fasting samples and LDL cholesterol and triglycerides in the fasting samples. In reporting mean levels of cholesterol, we did not account for participants with an existing diagnosis of hypercholesterolemia and who were on lipid-lowering agents. Note that participants over 80 years were not asked to fast and, hence, in reporting analysis for fasting measures this group is excluded.

Results

Associations of three lipids, namely, total cholesterol, LDL cholesterol and triglycerides with age and sex are presented in Table 8A.11. Results for HDL cholesterol are presented among the health protective factors in Section 8.4.

Men have lower levels of total cholesterol than women, 5.3 mmol/l compared to 5.8 mmol/l. In men, mean total cholesterol levels decreased with age from 5.7 mmol/l in those aged 50–54 to 4.7 mmol/l in those aged 80 years and older. In women, there is a small decrease in mean cholesterol levels with age from the age of 70 years. Overall, 60.4% of men and 75.5% of women have high total cholesterol levels (at least 5.0 mmol/l) ($p<0.001$). At every age, the percentage of women with high cholesterol is greater than that of men. This is more pronounced in the older groups because the percentage with higher cholesterol declines sharply with age for men but more gradually for women. In the 75–79 age group, 62.8% of women have raised cholesterol while this proportion is 65.3% in those aged 80 years and above. The corresponding figures are 48.8% and 37.9%, respectively, among men. In both sexes, the prevalence of high cholesterol decreases with age; this was more marked in men than in women ($p<0.001$).

The mean LDL cholesterol levels are slightly lower in men (3.3 mmol/l) than in women (3.6 mmol/l). In men, LDL concentrations decrease with age: the LDL concentration for those aged 50–54 years is 3.6 mmol/l compared with 2.9 mmol/l at age 75–79. In women, there is little variation with age. In total 61.8% of men and 71.6% of women have high levels of LDL cholesterol (at least 3.0 mmol/l) ($p<0.001$). The prevalence of high LDL levels in men decreases with age: 74% of men aged 50–54 years compared with 44.4% of men aged 75–79 years. In women, the prevalence of high LDL decreases from age 65–69 years.

Mean triglyceride concentrations were 1.3 mmol/l in women and 1.5 mmol/l in men. In men, there was a decrease in mean levels by age. ‘High’ levels of triglycerides are reported for 38.6% of men and 31.1% of women (at least 1.7 mmol/l) ($p<0.001$). The prevalence of high levels of triglycerides decreased with greater age in men, while the opposite trend was evident among women.

Mean lipid levels also showed a marked socioeconomic gradient which was the reverse of what might be expected for total cholesterol and LDL.

Increasing wealth was associated with higher rather than lower levels of both total cholesterol and LDL cholesterol. However, fewer participants who were well off had levels of ‘good’ cholesterol (HDL) and triglycerides that would indicate increased risk (p<0.001) (Table 8A.12).

The proportion of individuals with high total cholesterol has decreased from wave 2 (2004–05) to wave 4 (2008–09) in both men and women (Figures 8.8 and 8.9).

Figure 8.8. Percentage of high total cholesterol from wave 2 (2004–05) to wave 4 (2008–09) in men

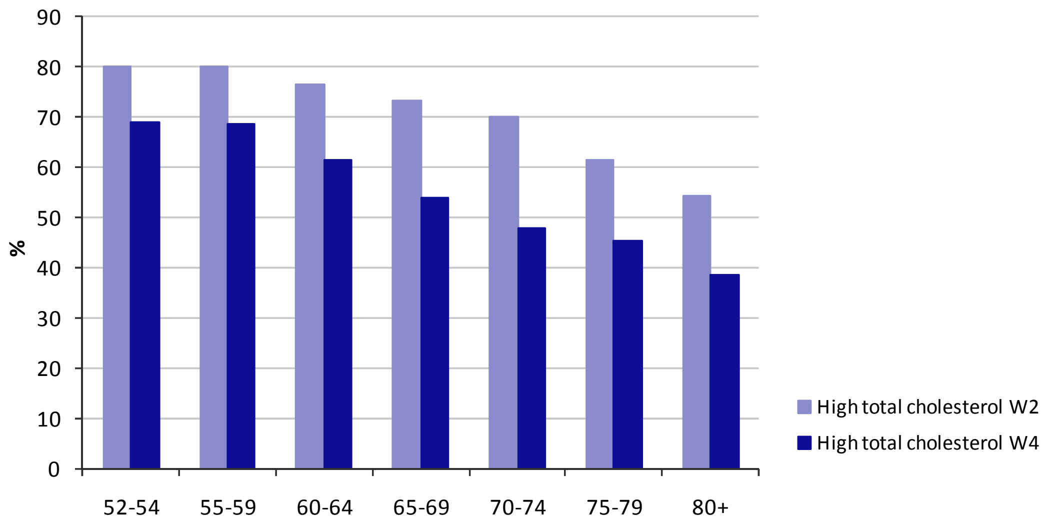
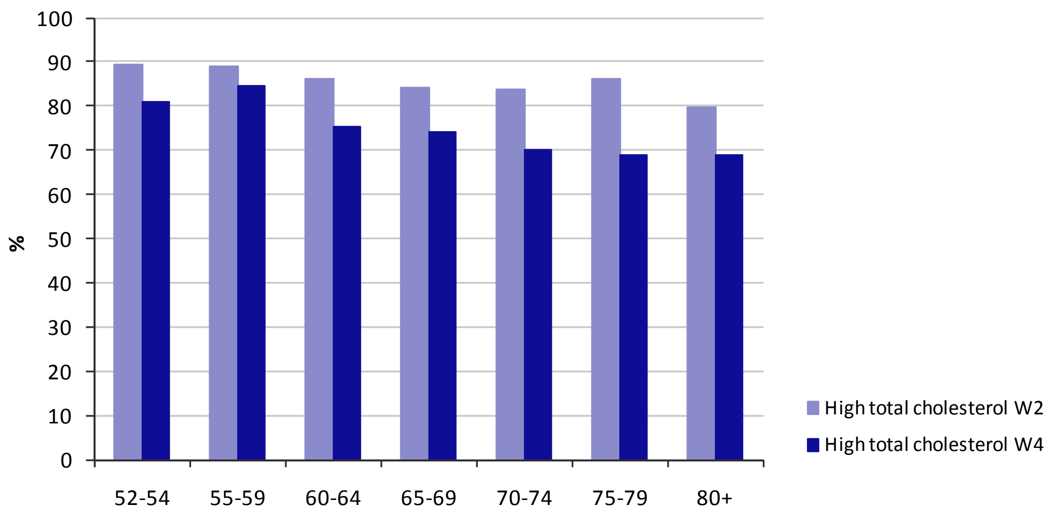


Figure 8.9. Percentage of high total cholesterol from wave 2 (2004–05) to wave 4 (2008–09) in women



Inflammatory biomarkers: fibrinogen and C-reactive protein

Fibrinogen is a major blood glycoprotein that plays an essential role in the haemostasis (coagulation) and the maintenance of blood viscosity as well as being a marker of vascular inflammation. Studies have shown that high fibrinogen is related to an increased risk of cardiovascular disease in middle-

aged and older populations (Smith et al., 2005). Several factors, particularly smoking, are associated with high fibrinogen levels. In a large individual participant meta-analysis (Fibrinogen Studies Collaboration, 2005), moderate to strong associations were found between usual plasma fibrinogen level and the risks of cardiovascular disease, stroke, other vascular mortality and non-vascular mortality in a wide range of circumstances in healthy middle-aged adults.

C-reactive protein (CRP) is an inflammatory marker that is shown to be associated with atherosclerosis and is predictive of myocardial infarction in older men and women (Cushman et al., 2005; Strandberg and Tilvis, 2000). CRP may help to refine the global risk assessment for coronary heart disease (CHD), particularly among those who are at intermediate risk based on traditional risk factors alone. A recent systematic review and meta-analysis (Buckley et al., 2009) showed that there is strong evidence that CRP is associated with CHD events. Consistent evidence suggests that adding CRP to risk prediction models improves risk stratification among intermediate-risk people.

Both fibrinogen (Fibrinogen Studies Collaboration, 2007) and CRP (Nazmi and Victora, 2007) have been shown to be associated with low socioeconomic status.

Results

Table 8A.13 reports the means of fibrinogen (g/l) and CRP concentrations (mg/l) by age for men and women. The mean levels are similar for the two sexes. The mean levels of fibrinogen increase with age in both men and women, but the differences are small, the gradient is shallow and the means are not consistently higher in successively older age groups. CRP levels also increase with age.

With increasing wealth, both fibrinogen and CRP levels decrease (Figures 8.10 to 8.13 and Table 8A.14). There has been a decline in CRP levels between waves 2 (2004–05) and 4 (2008–09) in both men and women, while fibrinogen levels have risen.

Figure 8.10. CRP levels at wave 2 (2004–05) and wave 4 (2008–09) in men by wealth

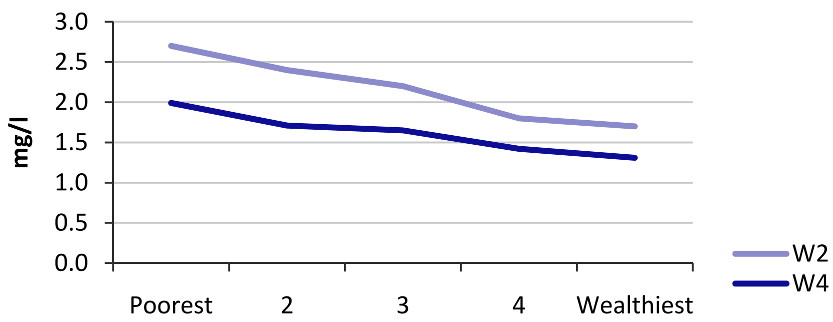


Figure 8.11. CRP levels at wave 2 (2004–05) and wave 4 (2008–09) in women by wealth

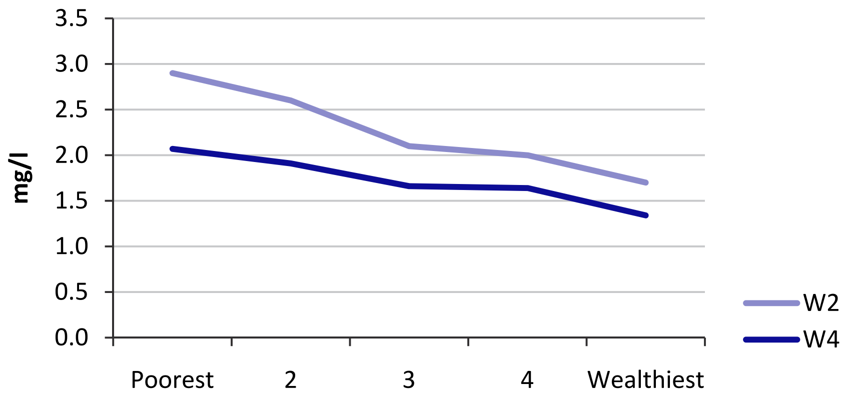


Figure 8.12. Fibrinogen levels at wave 2 (2004–05) and wave 4 (2008–09) in men by wealth

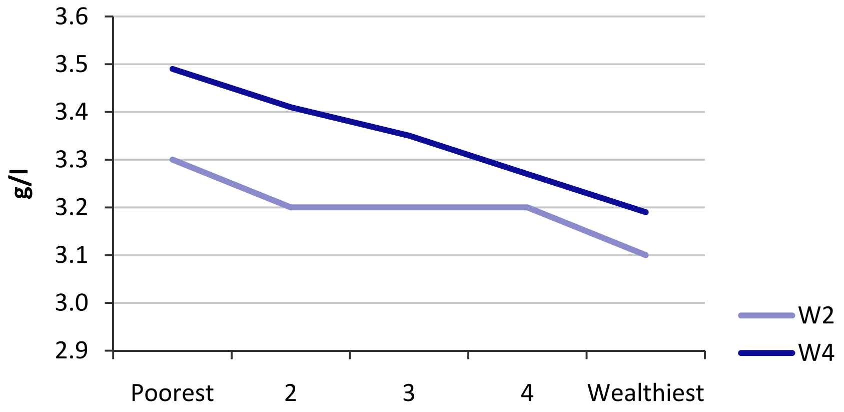
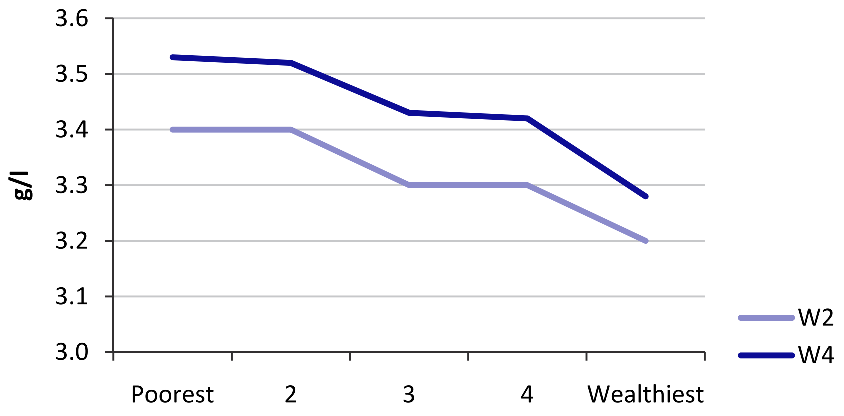


Figure 8.13. Fibrinogen levels at wave 2 (2004–05) and wave 4 (2008–09) in women by wealth



Fasting blood glucose levels and diagnosed diabetes

Fasting blood glucose tests are used to screen for or diagnose diabetes. Diabetes is associated with profound medical complications particularly affecting the eyes, kidneys, peripheral nerves and the cardiovascular system.

Diabetes substantially increases the risk of CVD. Men with type 2 diabetes have up to a fourfold greater risk of coronary heart disease, and there is an even greater risk (up to five times higher) in women. Diabetes is known to worsen the effect of other risk factors for CVD such as dyslipidaemia (abnormal levels of blood fats), hypertension, smoking and obesity. Being overweight or having a raised waist measurement are risk factors for diabetes (HSE, 2006).

Increasing age is one of the most important risk factors for diabetes. Regarding the relationship between diabetes and socioeconomic status, an inverse relationship has been demonstrated between social position and incidence of diabetes in a prospective occupational cohort study of 10,308 British civil servants (Kumari, Head and Marmot, 2004). Similarly, a clear gradient using household income has been found with diabetes more prevalent in people from households in the lowest quintile of household income than in the highest (Shelton, 2004).

In the present analyses, we used the following three indicators: mean fasting blood glucose levels; levels of fasting blood glucose greater than or equal to 7 mmol/l, which is indicative of diabetes; and the presence of diagnosed diabetes.

Results

Table 8A.15 shows the mean fasting glucose levels by age and sex. Mean fasting glucose is slightly higher at all ages in men than in women. There is a small increase with age in both sexes. The mean rises from 4.7 mmol/l in the youngest men to 5.0 mmol/l in the oldest men (here, aged 75–79 years), and from 4.7 mmol/l to 5.0 mmol/l in the same age groups in women. Fasting blood glucose level ≥ 7 mmol/l is more common in men than women and increases with age (Figure 8.14). It is striking that elevated blood glucose is relatively rare, being found in fewer than 3% of participants in any age group. By contrast, self-reported doctor-diagnosed diabetes rates are higher, averaging 11.8% in men and 9.1% in women (Table 8A.16) ($p<0.001$). Rates rise with age, and are inversely related to wealth (Table 8A.18). For example, a diagnosis of diabetes was reported by 8.8% of the wealthiest men and 3.6% of the wealthiest women, rising to 16.5% of men and 16.2% of women in the poorest category ($p<0.001$).

The mean fasting blood glucose level has decreased from wave 2 (2004–05) to wave 4 (2008–9) in both men and women. Men in the age group 75–79 have a considerably higher mean fasting level of glucose than women in the same age group (Figures 8.15 and 8.16).

Figure 8.14. Percentage of participants with a fasting blood glucose level ≥7 mmol/l by sex and age in 2008–09

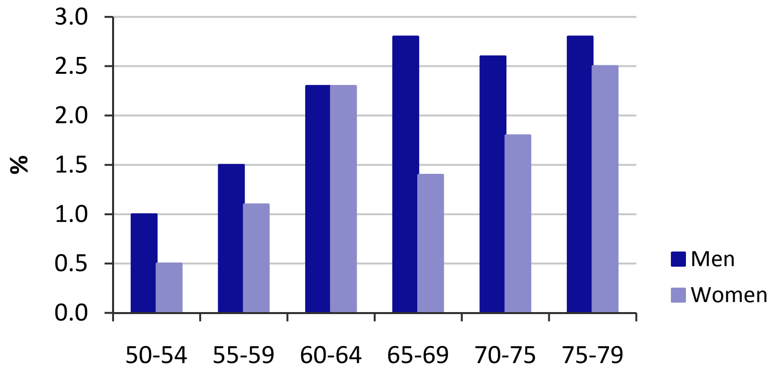


Figure 8.15. Mean fasting blood glucose levels change in men (from 2004–05 to 2008–09)

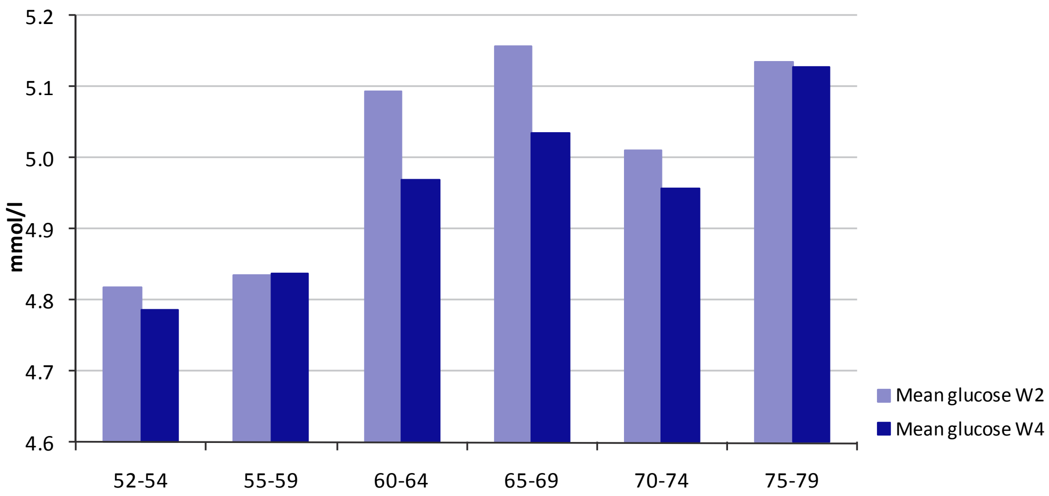
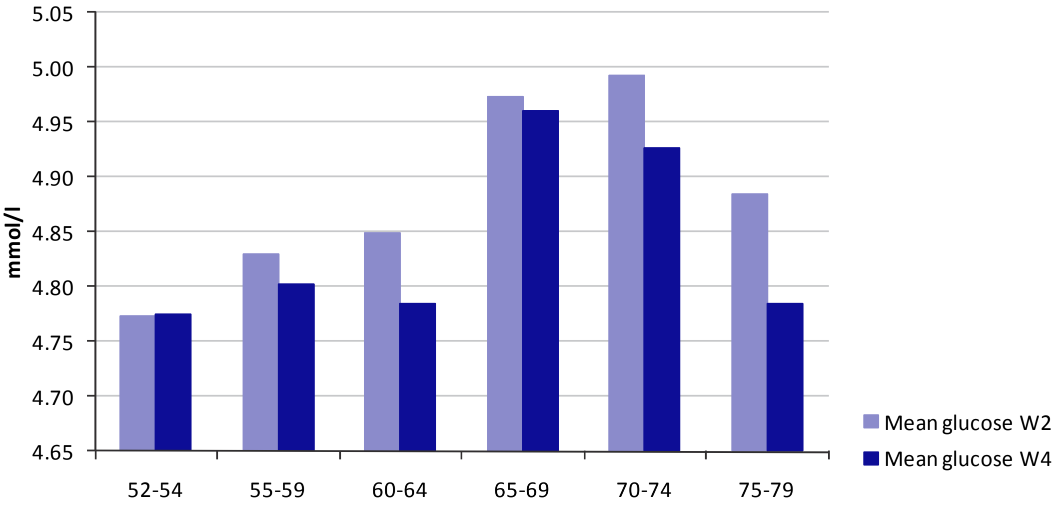


Figure 8.16. Mean fasting blood glucose levels change in women (from 2004–05 to 2008–09)



Haemoglobin and ferritin

Haemoglobin is the oxygen-carrying, iron-containing molecule in red blood cells. The level of haemoglobin is partially determined by the iron status in the body. Low haemoglobin or anaemia may be caused by iron deficiency, which arises when iron requirements exceed supply, either through excessive blood loss or inadequate dietary supply. Blood haemoglobin, in a number of studies, has been reported to decline in the elderly, more so among men than among women. This decline has been confirmed in healthy subgroups of the population (Nilsson-Ehle et al., 2000).

Anaemia is commonly found in the elderly, and its prevalence is expected to rise sharply in this population in the future. Not only is its presence a strong predictor of an increased risk of mortality (Culleton et al., 2006), it has also been associated with various conditions such as decreased physical performance, disability in daily living, mobility disabilities, cognitive impairment, depression, falls and fractures, frailty, admission to hospital and diminished quality of life (Eisenstaedt, Penninx and Woodman, 2006). Moreover, findings from studies involving patients with chronic heart failure have suggested that the development of incident or new-onset anaemia has an even stronger effect on mortality than prevalent anaemia (Tang et al., 2008).

A recent systematic review assessing the prevalence of anaemia in older persons found that the weighted mean prevalence of anaemia was 17% overall, and 12% in studies based in the community, 47% in nursing homes and 40% in hospital admissions. The prevalence of anaemia increased with age, was slightly higher in men than women and was higher in black people than white. Most individuals classified as anaemic using WHO criteria were only mildly anaemic. The authors concluded that anaemia, as defined by WHO criteria, is common in older people living in the community and particularly common in nursing home residents and hospital admissions. Predicted demographic changes underline the need to understand more about anaemia in older people (Gaskell et al., 2008).

Ferritin is a circulating protein that is an indicator of the amount of iron stored in the body. It provides a more definite indicator of low iron status than haemoglobin, as ferritin is often depleted before the haemoglobin concentration. Moreover, low haemoglobin can be due to conditions other than iron deficiency. On the other hand, infection and several chronic diseases can raise the levels of ferritin.

There is some controversy about the thresholds for haemoglobin that should define anaemia (Beutler and Waalen, 2006). This report uses the World Health Organization definition of anaemia, which is a haemoglobin concentration of less than 13 g/dl in men and less than 12 g/dl in women (World Health Organization, 1972). Ferritin was measured by immunoassay, a method that shows a wide variability between laboratories. There is therefore no universally accepted level of ferritin that indicates low iron status. For the purposes of this report, sex-specific quintiles were used to categorise ferritin levels. Those in the lowest quintile (less than 56.8 µg/l for men and less than 37 µg/l for women) were classified as having low ferritin. As ferritin is not normally distributed, the geometric mean is used in describing ferritin levels.

Results

Mean haemoglobin is 14.7 g/dl in men and 13.5 g/dl in women. It decreases in concentration with increasing age (Table 8A.19).

Overall, 6.8% of men and 7.3% of women have low haemoglobin (anaemia). In both men and women there is a clear upward shift in the prevalence of anaemia in the oldest age groups. In men the prevalence of anaemia increases from less than 2% in the youngest age group to 23.2% in the oldest age group, with substantial differences between those aged 75 years and over and those who were younger ($p<0.001$). In women, those in the oldest age group had the highest prevalence of anaemia (22.5%) but the prevalence across the younger age groups does not differ greatly (Table 8A.19).

Geometric mean ferritin is 110.6 µg/l in men and 68 µg/l in women. In men, the mean ferritin concentration varies somewhat over age categories between 50 and 69 years, but decreases for those aged 70 years and older. In women, mean ferritin concentrations increase from age 50 to 64 years and then decrease (Table 8A.20).

Among men, the proportion of individuals in the lowest quintile of ferritin fluctuates in age groups younger than 79 years but is highest in the oldest age group at 26.5% ($p<0.001$). Among women, there is a U-shaped relationship with age, with the oldest and youngest groups reporting high proportions of participants with levels of ferritin in the bottom quintile (Table 8A.20).

While mean haemoglobin levels do not differ appreciably by wealth status, prevalence of anaemia is lower among wealthier participants ($p<0.001$). Ferritin levels vary markedly by socioeconomic status with increases in wealth being associated with higher levels of ferritin ($p<0.001$) (Table 8A.21).

Mean haemoglobin levels decreased from 2004–05 to 2008–09 in both men and women (Figures 8.17 and 8.18). This decrease is larger among the poorest (Figure 8.19).

Figure 8.17. Mean haemoglobin levels change (from 2004–05 to 2008–09) in men

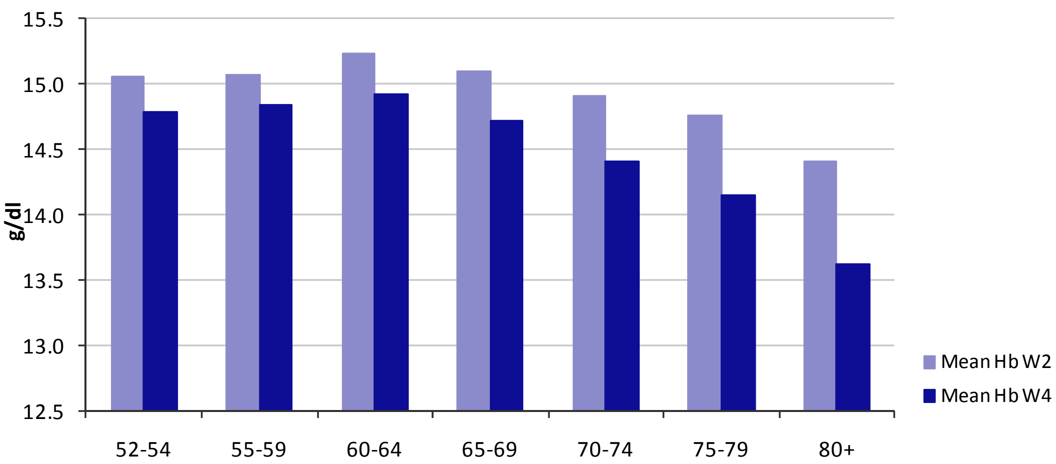


Figure 8.18. Mean haemoglobin levels change (from 2004–05 to 2008–09) in women

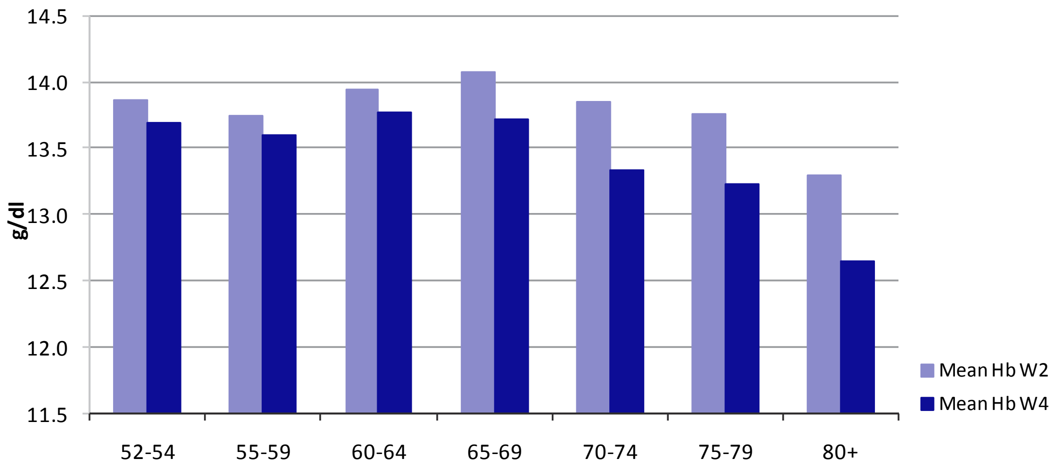
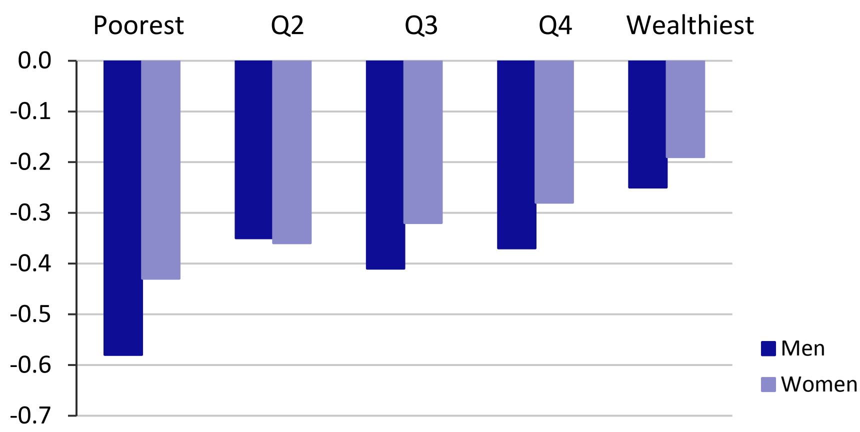


Figure 8.19. Mean haemoglobin levels change (from 2004–05 to 2008–09) by wealth



Lung function

Lung function tests measure the size of the lungs, how much air one can breathe in and out, how fast one can breathe air out and how well the lungs deliver oxygen to the blood. These pulmonary function tests are used to look for the cause of breathing problems (like shortness of breath). Lung function tests are used to identify conditions such as asthma, lung tissue scarring, sarcoidosis and chronic obstructive pulmonary disease (COPD). These tests are also useful to assess how well treatments for breathing problems, such as asthma medicines, are working.

Throughout adult life, lung function deteriorates gradually and is a strong predictor of survival, lung cancer development and functional limitations (Mannino and Davis, 2006). COPD is an important cause of morbidity and mortality in the United States and around the world. Socioeconomic position is an important determinant of lung function and an under-recognised contributor to pulmonary disease (Herrick, 2005; Hegewald and Crapo, 2007).

Lung function is also dependent on lung size. Sex and height correlate strongly with lung volume and hence the results are presented separately for two

different height categories in each gender, as done in the Scottish Health Survey 2003 (Herrick, 2005). Results are only presented for participants for whom reliable height measurements were obtained.

Results

Table 8.A.22 shows that mean forced expiratory volume (FEV1), forced vital capacity (FVC) and peak expiratory flow rate (PEF) are all greater in men than in women and greater in taller people of either sex ($p<0.001$). Within each gender-specific height band the FEV1, FVC and PEF decreases with advancing age ($p<0.001$).

Tables 8A.23, 8A.24 and 8A.25 show FEV1, FVC and PEF by wealth quintile. For each of the measurements a similar pattern is observed. Generally as wealth quintile increases, so does the lung function ($p<0.001$) (Figures 8.20 and 8.21).

Figure 8.20. Peak expiratory flow rate in men by wealth (2008–09)

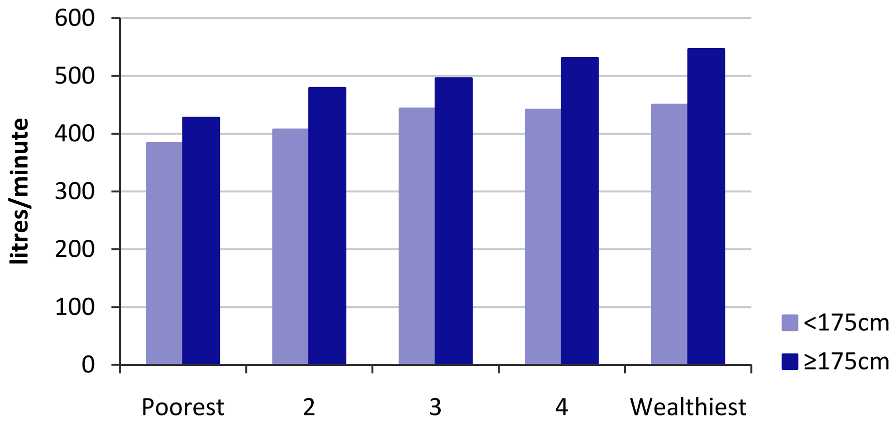
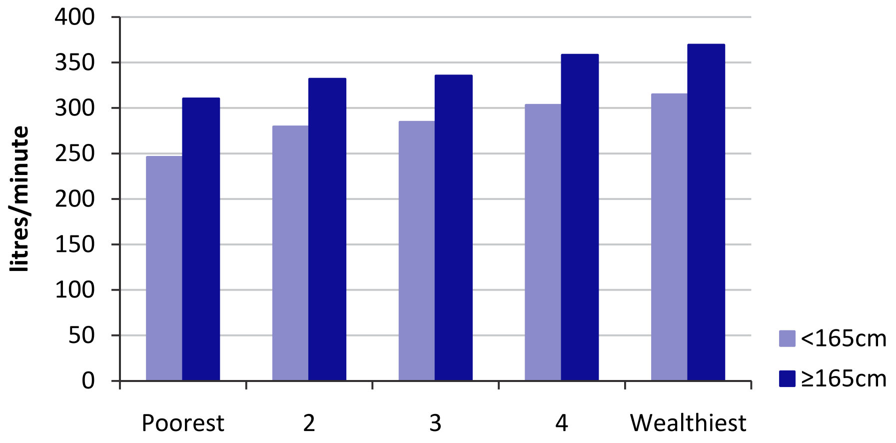


Figure 8.21. Peak expiratory flow rate in women by wealth (2008–09)



Health risk behaviours: smoking and excessive alcohol consumption

Health behaviours are important among older adults. A recent longitudinal study of more than 20,000 men and women followed for 11 years showed that all-cause mortality and deaths from cardiovascular disease and cancer were

inversely associated with four behaviours: not smoking, being physically active, drinking moderately and eating five or more servings of fruit and vegetables per day (Khaw et al., 2008). Physical activity, not smoking, and eating a healthy diet have also been associated with improved physical functioning in the elderly, and a healthy lifestyle pattern may promote survival in this age group (Haveman-Nies et al., 2002; Knoops et al., 2004).

Although smoking is less common among older adults because smokers are expected to die younger, the health effects on those older adults who have smoked are pronounced as they have smoked for longer and the effects may therefore be cumulative. Smoking leads to reduction of bone mineral density among postmenopausal women. It is also thought to contribute to higher risk of hip fractures and nuclear lens cataracts in the eye, and is associated with higher rates of COPD (US Department of Health and Human Services, 2004). Older smokers are also at a greater risk of developing cardiovascular disease, cognitive decline and mortality (Burns, 2004; Doll et al., 2004; Lam et al., 2007).

As with smoking, heavy alcohol consumption is less common among older adults. However, it remains a sizeable problem in the UK. Heavy alcohol consumption is associated with mortality in older adults (Ashton, Bajekal and Raine, 2010; Thun et al., 1997). Among the elderly, physical changes such as decreases in body water percentage, lowered blood flow to the liver, inefficiency of liver enzymes and changes in responsivity of the brain may lead to a greater effect of alcohol (Institute of Alcohol Studies, 2009). The value of moderate alcohol consumption in preventing cognitive decline and reducing the risk of all-cause mortality among older adults has been well established (Lang et al., 2007; Stampfer et al., 2005; Thun et al., 1997).

Results

The prevalence of current smokers decreases with age for both men and women ($p<0.001$) (Table 8A.26), though it is striking that overall, 15.5% of men and 15.3% of women were current smokers. As has been repeatedly observed in younger samples, smoking shows a striking socioeconomic gradient, with a greater prevalence of smoking among those who are worse off (Figure 8.22 and Table 8A.27). More than one in four of women and a third of men in the poorest wealth quintile were current smokers, compared with fewer than 7.4% of women and 7% of men in the wealthiest ($p<0.001$). For ELSA participants, overall, 15% of men and 5.7% of women reported drinking above recommended limits. The proportion of participants drinking above recommended limits decreases with age ($p<0.001$) (Table 8A.30), and is higher among those who are better off (Table 8A.31).

The percentage of smokers has decreased from 2004–05 to 2008–09 to a similar extent in both men and women (Figures 8.23 and 8.24). Daily alcohol consumption has also decreased from 2004–05 to 2008–09 with women drinking less than men (Figures 8.25 and 8.26).

Figure 8.22. Percentage of current smokers by sex and wealth (2008–09)

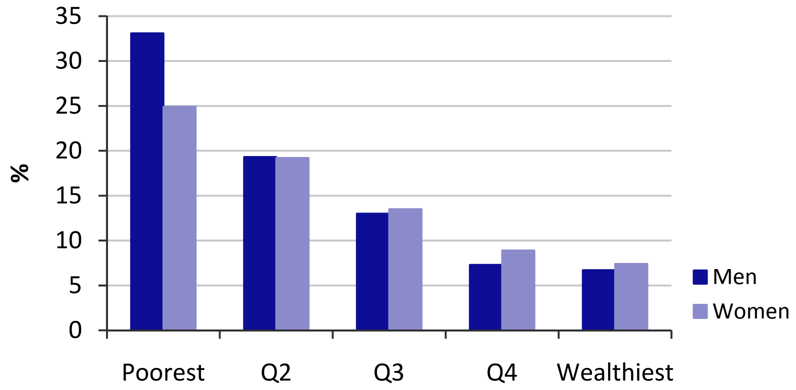


Figure 8.23. Percentage of current smokers change (from 2004–05 to 2008–09) in men

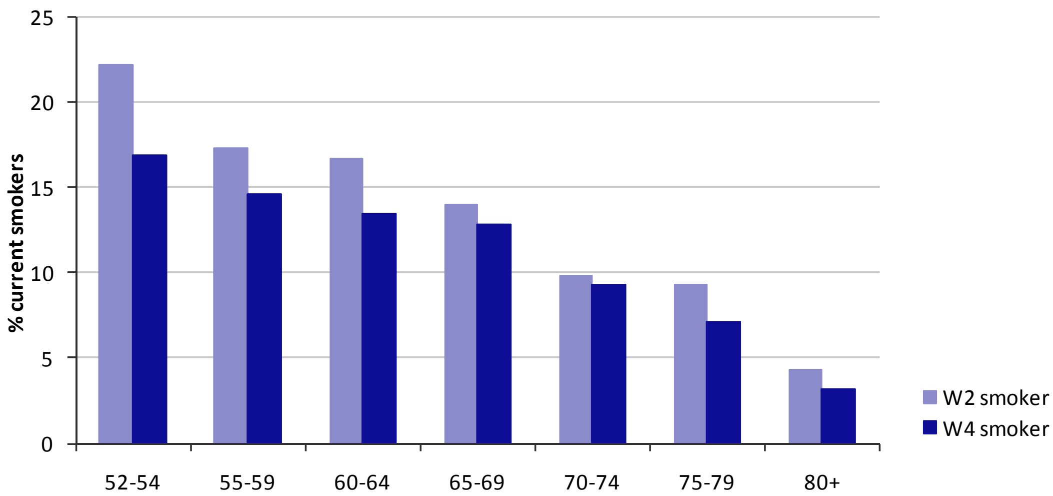


Figure 8.24. Percentage of current smokers change (from 2004–05 to 2008–09) in women

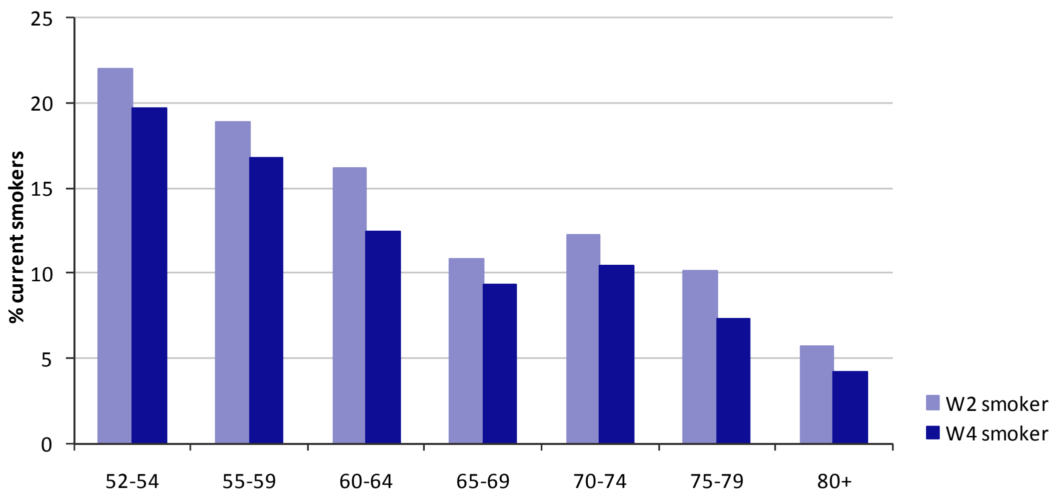


Figure 8.25. Percentage reporting daily drinking change (from 2004–05 to 2008–09) in men

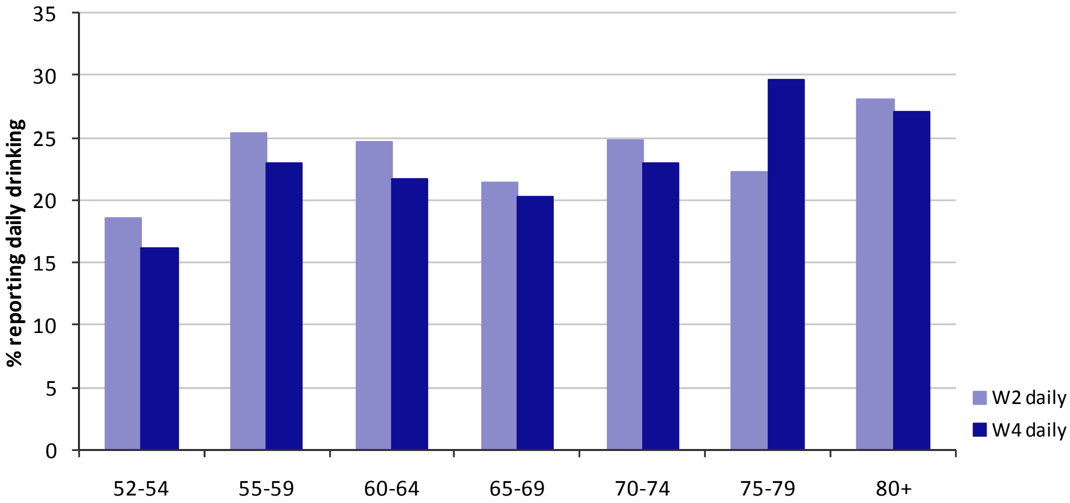
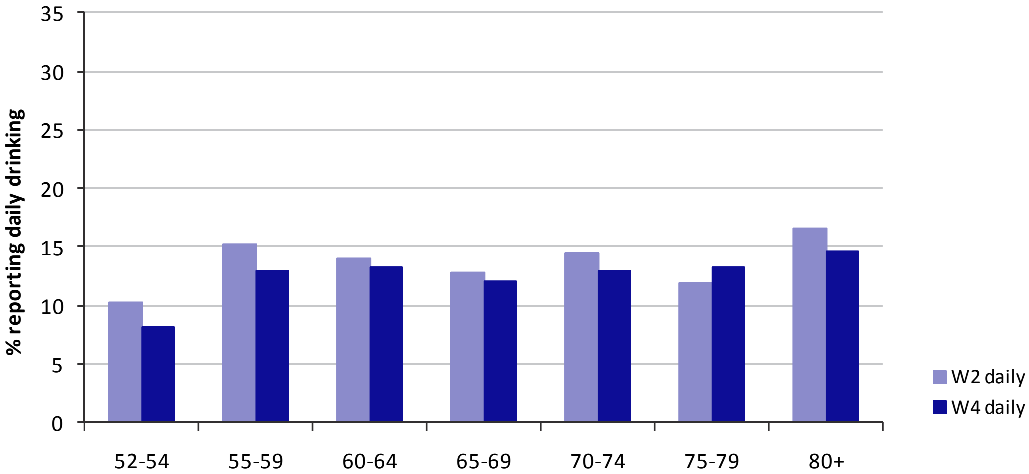


Figure 8.26. Percentage reporting daily drinking change (from 2004–05 to 2008–09) in women



8.4 Health protective measures

High-density lipoprotein (HDL) cholesterol

HDL cholesterol is a smaller fraction of total cholesterol and is cardio-protective, involved in carrying cholesterol away from the arteries to the liver where it is metabolised. Low HDL cholesterol is a strong independent risk factor for cardiovascular disease (Barter et al., 2007; Turner et al., 1998).

The cut-offs for HDL cholesterol (at least 1.0 mmol/l in men and 1.2 mmol/l in women) recommended by the European Society of Cardiology 2007 guidelines were used in this chapter.

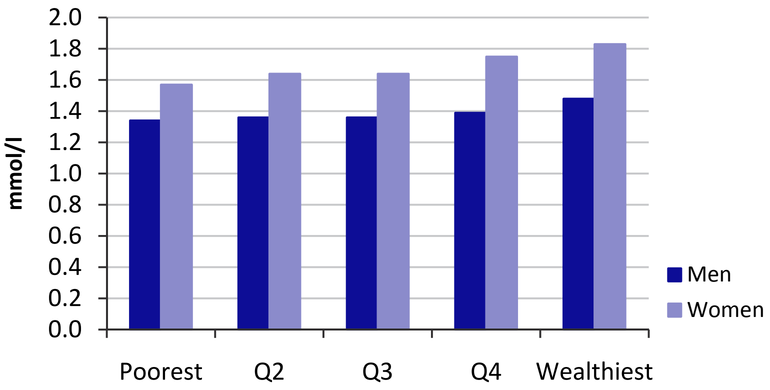
Results

Mean HDL cholesterol is higher in women than men in every age category, averaging 1.7 and 1.4 mmol/l, respectively (Table 8A.11). Overall, mean HDL levels do not vary appreciably with age in either sex. 'High-risk' levels of

HDL (less than 1.0 mmol/l for men and less than 1.2 mmol/l for women) were reported for 7.1% of men and 7.2% of women and no consistent pattern of difference with age is seen in either sex.

Mean HDL levels show a marked socioeconomic gradient, with increasing wealth associated with higher levels of HDL cholesterol ($p<0.001$), especially among women (Figure 8.27).

Figure 8.27. Mean HDL level by sex and wealth (2008–09)



Insulin-like growth factor I (IGF-I)

Insulin-like growth factor I (IGF-I) is a pleiotropic and ubiquitous growth and metabolic factor critically involved with a host of physiological processes. On the cellular level, IGF-I possesses anabolic, mitogenic, cell-differentiating and metabolic effects, whereas on the whole body level, IGF-I has been implicated as an important modulating biomarker for fitness and exercise training, muscle hypertrophy, bone mineral density, body composition changes, cognitive function, mortality and cancer. Accumulating scientific data from basic, applied, clinical and epidemiological experimental approaches has revealed the physiological implications of the presence and absence of IGF-I. From a practical standpoint, the utility of IGF-I may reside in the potential for measured concentrations to provide both insight and prognostic value about fitness, health, metabolic and disease status (Nindl and Pierce, 2009).

Results

Overall, the mean levels of IGF-I decrease with age in both men and women ($p<0.001$). The prevalence of those in the lowest quintile of levels of IGF-I increases considerably with age in both men (from just under 14% in the 50–54 age group to 48.1% at 80 years and older) and women (from 12.6% in the 50–54 age group to 33.3% at 80 years and older) ($p<0.001$) (Table 8A.32). A socioeconomic gradient is evident, with increases in levels with increased wealth ($p<0.001$) (Table 8A.33); this replicates the pattern recently described in a large middle-aged cohort (Kumari et al., 2008). IGF-I was measured for the first time in wave 4 of ELSA (2008–09), so longitudinal changes cannot be presented.

Dehydroepiandrosterone sulfate (DHEAS)

Dehydroepiandrosterone (DHEA) is secreted by the adrenal glands and its secretory rate changes throughout the human lifespan. When human development is completed and adulthood is reached, DHEA and DHEA sulfate (DHEAS) levels start to decline so that at 70–80 years of age, peak DHEAS concentrations are only 10–20% of those in young adults. This age-associated decrease has been termed ‘adrenopause’ (Tannenbaum et al., 2004).

In humans, as in other primates, the adrenal glands secrete large amounts of the inactive precursor steroids DHEA and its sulfate ester DHEAS, which are converted into potent androgens and oestrogens in peripheral tissue. DHEAS, the secretion of which declines in humans with age, is important in health maintenance; studies in animals have suggested that DHEAS is a multifunctional hormone with immune-enhancing, anti-diabetic, anti-obesity, anticancer, neurotrophic, memory-enhancing and anti-ageing effects. Although there are some epidemiological reports suggesting that DHEAS may serve as a potential longevity marker, most of these were cross-sectional, and those that were prospective were limited to subjects with cardiovascular diseases. There have been only a few prospective studies of longevity in a community-based cohort and the follow-up periods have not been long. Moreover, they have produced conflicting results.

DHEA and its sulfate form DHEAS are the most abundant endogenous sex hormones in ageing men and women. DHEAS is produced in the adrenal cortex and is converted to androgens and oestrogens in peripheral tissues. It provides close to 100% of active oestrogens in postmenopausal women, and up to 50% of androgens in older men and women.

Cross-sectional studies have shown significant age-related declines in circulating levels of DHEAS among older men and women; however, longitudinal studies suggest that DHEAS levels may actually increase in 10–40% of older adults. This discrepancy remains largely unexplained. DHEAS was measured for the first time in wave 4 of ELSA (2008–09).

Results

Overall, the mean levels of DHEAS decrease with age in both men and women ($p<0.001$). The mean levels are higher in men. The proportion of those in the lowest quintile of levels of DHEAS increases considerably with age in both men (from 5.7% in the 50–54 age group to 53.6% at 80 years and older) and women (from 6.2% in the 50–54 age group to 39.3% at 80 years and older) ($p<0.001$) (Table 8A.34). A socioeconomic gradient is evident, with increases in levels with increased wealth ($p<0.001$) (Table 8A.35). DHEAS was measured for the first time in wave 4 of ELSA (2008–09), so longitudinal changes cannot be presented.

Health protective lifestyle factors: physical activity and fruit and vegetable consumption

Physical activity levels are known to decrease with age. In the recent Health Survey for England, fewer than 10% of men and 5% of women aged over 75 met current physical activity recommendations, when compared with nearly 50% of men and just over a third of women between the ages of 25 and 34

(Roth, 2009). When objectively measured, almost none of the over 65-year-olds met physical activity recommendations (Chaudhury and Esliger, 2009). Such lowered physical activity contributes, in part, to decreased strength and stamina in older ages (US Department of Health and Human Services, 1996). While structured exercise may be difficult for some older adults, it has been found that any activity that contributes to energy expenditure may help in reducing mortality in this population (Manini et al., 2006). Physical activity may also help prevent cognitive impairment, dementia and Alzheimer's disease in older adults (Laurin et al., 2001; Etgen et al., 2010). It is thought to have numerous other health benefits for older people, including improved glucose metabolism, lower blood pressure, improved lipid profiles, enhanced weight control, reduced decline in bone density and enhanced emotional well-being (Chodzko-Zajko et al., 2009).

Adequate fruit and vegetable consumption is an important part of a healthy diet and current recommendations in the UK stress the importance of eating at least five portions a day. There is considerable evidence regarding the role of fruit and vegetable consumption in protecting against ischaemic heart disease (Law and Morris, 1998) and incident CVD (He et al., 2006; Liu et al., 2000). A diet rich in vegetables and pulses has been associated with reduced mortality among people with diabetes (Nothlings et al., 2008).

Results

The prevalence of sedentary behaviour/low physical activity increases with age and is higher among women (Table 8A.36). At age 50–54 years, 3.4% of men and 4.8% of women were classified as sedentary, compared with 18.6% and 22.7% in those aged 80+ years ($p<0.001$). The mean consumption of fruit and vegetables among ELSA participants is constant across age groups in both men and women (Table 8A.38). However, only around half of participants are meeting national recommendations for fruit and vegetable intake. Physical activity and fruit and vegetable consumption both show a socioeconomic gradient, with a greater prevalence of sedentary behaviour or low physical activity and less fruit and vegetable consumption among those who are worse off ($p<0.001$) (Figures 8.28 and 8.29 and Tables 8A.37 and 8A.39).

Figure 8.28. Percentage of sedentary/low physical activity by sex and wealth (2008–09)

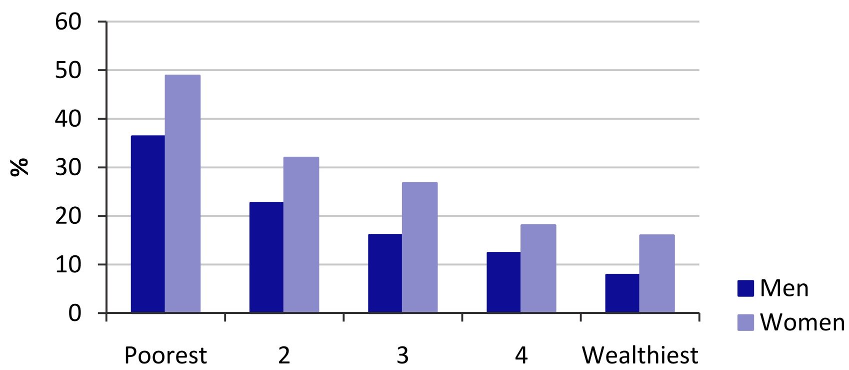


Figure 8.29. Percentage of participants consuming less than five portions a day by sex and wealth (2008–09)

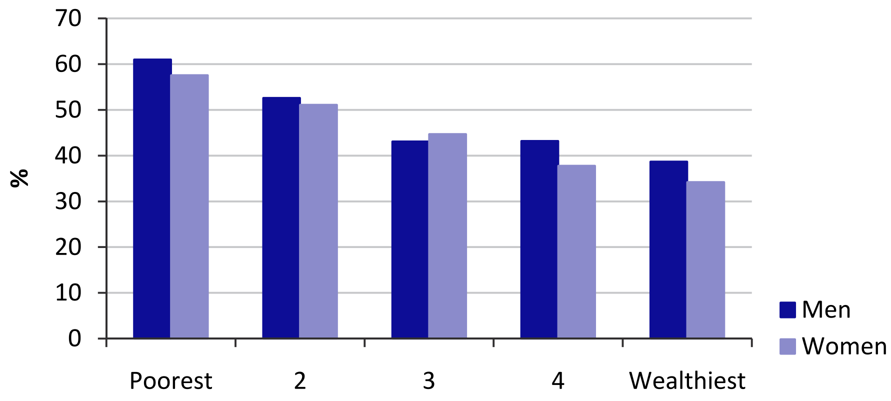


Figure 8.30. Percentage of sedentary/low physical activity change (from 2004–05 to 2008–09) in men

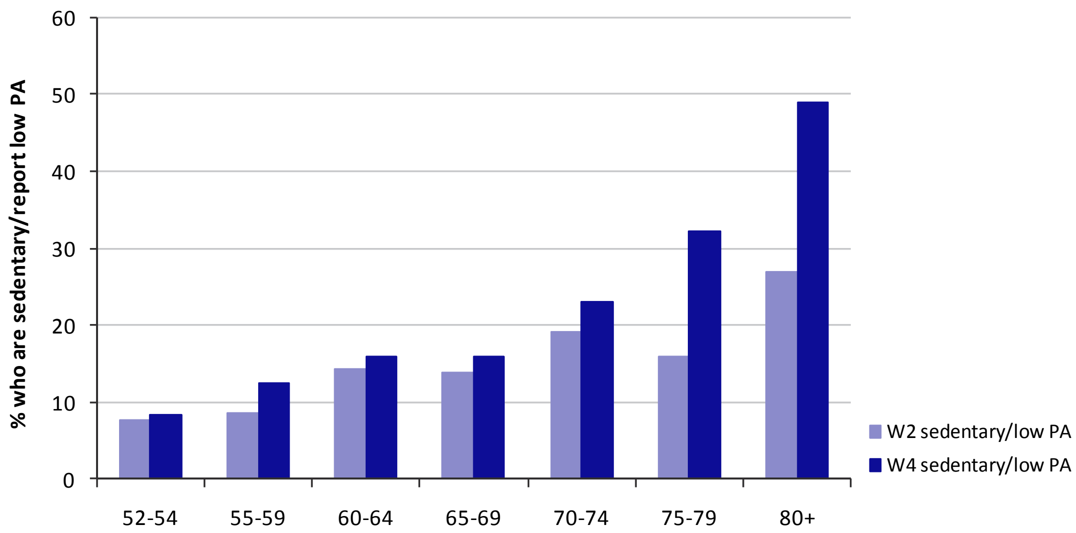
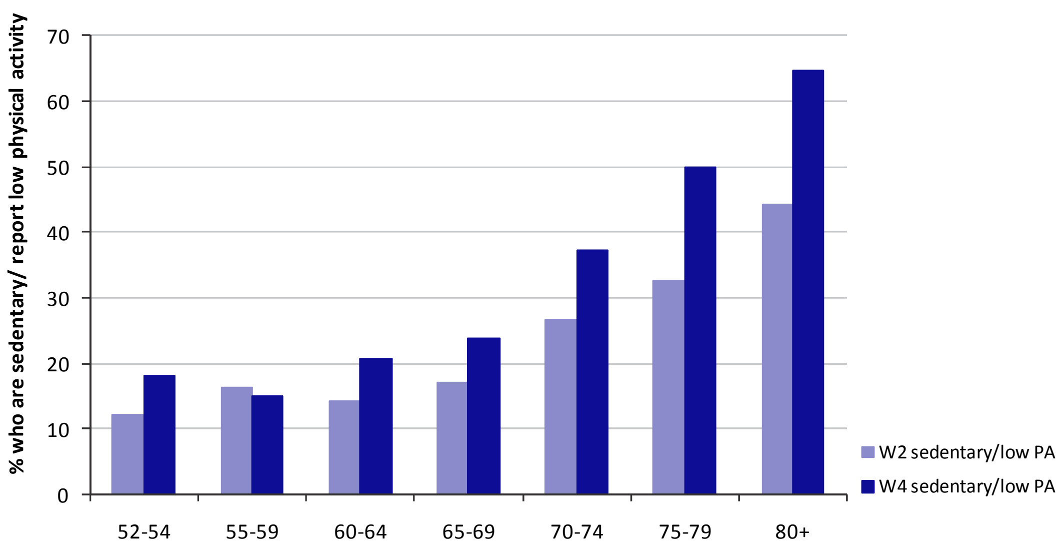


Figure 8.31. Percentage of sedentary/low physical activity change (from 2004–05 to 2008–09) in women



The percentage of respondents who reported low physical activity and are sedentary has increased from 2004–05 to 2008–09 for both men and women (Figures 8.30 and 8.31).

8.5 Biomarkers and physical activity

In this section, results from the analyses assessing the relationship between some biological markers and levels of physical activity will be presented. While relationships between physical activity levels and certain biological markers such as HDL and CRP are well established, relatively little is known about the relationship between activity levels and markers such as DHEAS, which is associated with improved health and well-being.

Overall, increasing levels of physical activity are associated with a healthier profile of biomarkers, including lower levels of triglycerides and CRP and higher levels of HDL. Among women, increased physical activity is associated with higher levels of IGF-I, while among men it is associated with higher levels of DHEAS (Figures 8.32 to 8.35). All analyses were adjusted for age.

Figure 8.32. Mean HDL cholesterol levels by sex and levels of physical activity (2008–09)

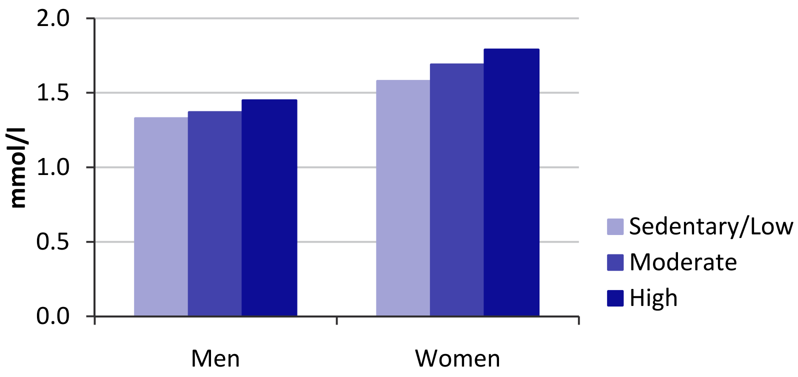


Figure 8.33. Mean triglyceride levels by sex and levels of physical activity (2008–09)

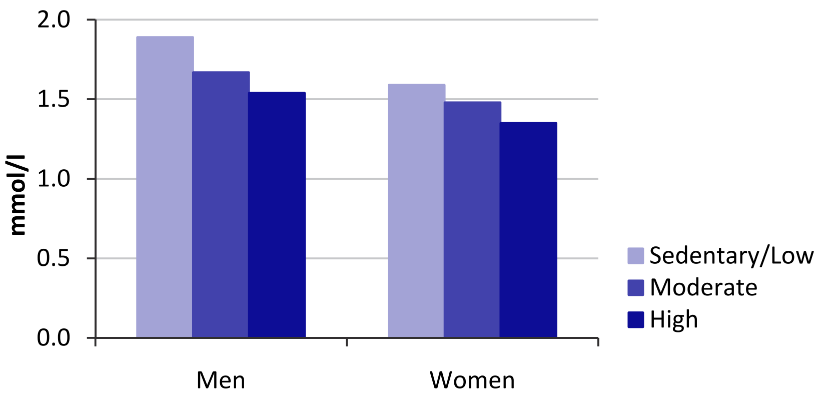


Figure 8.34. C-reactive protein levels by sex and levels of physical activity (2008–09)

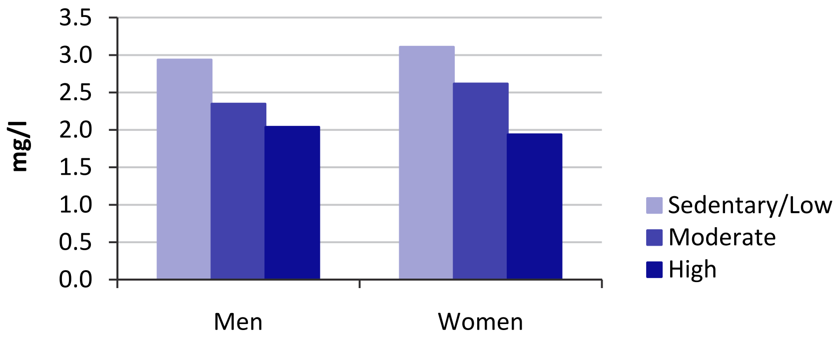
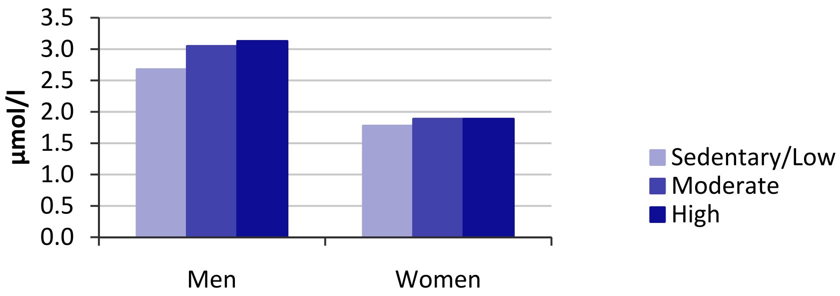


Figure 8.35. DHEAS levels by sex and levels of physical activity (2008–09)



8.6 Biomarkers and cognitive function

Progressive age-associated decline in memory, name finding, complex decision making and speed of information processing is common, though not inevitable, throughout late middle age and later life. Impairments in memory, decision-making abilities and other aspects of executive processing may reduce the capacity to make important decisions about retirement, health, housing and finances in later life. Increasing difficulties in doing complex planning and organisational processing as well as reduced mental flexibility could lead to depression and social withdrawal. Basic abilities such as literacy and numeracy are also very important in dealing with complexities of daily life (Huppert, Gardener and McWilliams, 2006).

A comprehensive assessment of the key aspects of cognitive functioning facilitates our understanding of decision making in retirement and later life. Information relating to the factors that influence the maintenance or decline of cognitive functioning and factors that affect perceptions of cognitive ability further enhance our understanding of economic, social and lifestyle decisions (Huppert, Gardener and McWilliams, 2006).

There is some evidence showing the relationship between decline in cognitive function and blood levels of biomarkers such as DHEAS and IGF-I. This is the first time ELSA has investigated the relationship between these two biomarkers and measures of cognitive function.

Results

Overall, both DHEAS and IGF-I showed associations with tests of cognitive function. Effects were more marked for men, particularly with respect to DHEAS. DHEAS was lower for those with poorer self-rated memory and among women IGF-I was also lower.

Figure 8.36. Mean DHEAS levels (µmol/l) by sex and self-rated memory (2008–09)

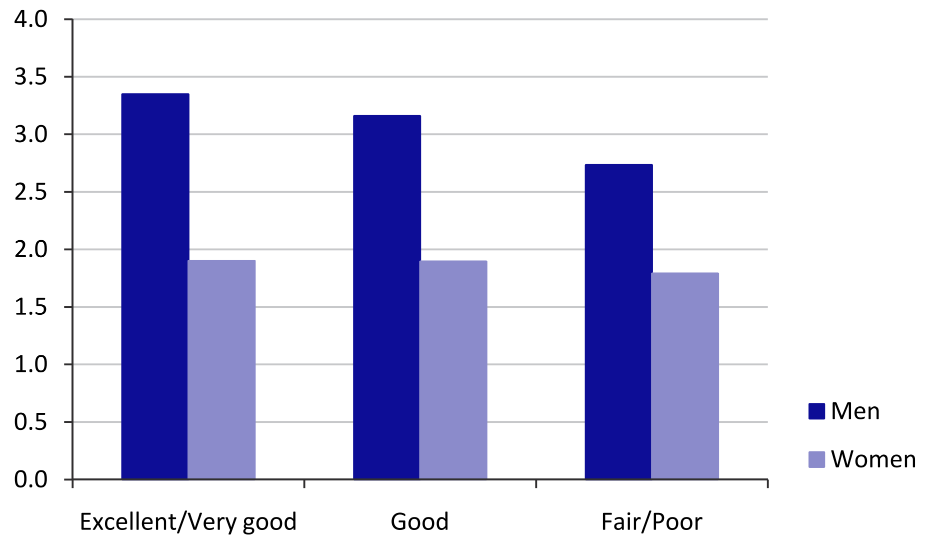


Figure 8.37. Mean DHEAS levels (µmol/l) by sex and time orientation (2008–09)

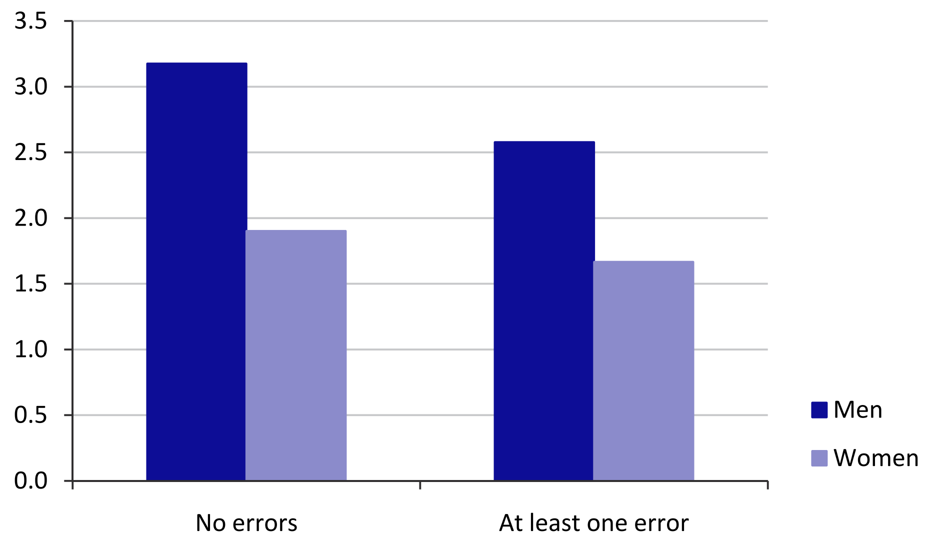


Figure 8.38. Mean DHEAS levels (µmol/l) by sex and levels of verbal fluency (2008–09)

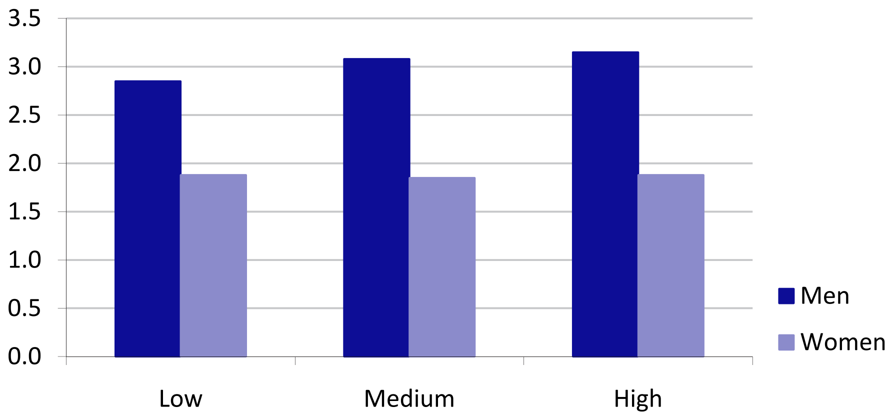
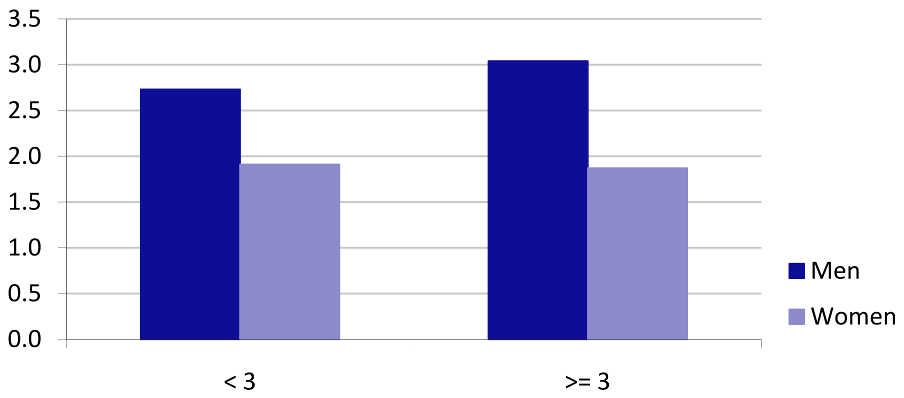


Figure 8.39. Mean DHEAS levels (µmol/l) by sex and numeracy score category (2008–09)



Among men, DHEAS was lower for those with poorer time orientation and lower numeracy and verbal fluency. IGF-I was lower for those who had poorer time orientation and lower numeracy and verbal fluency.

The results from the relationship between levels of DHEAS and cognitive function are presented in Figures 8.36 to 8.39.

8.7 Biomarkers and social participation

Individuals who live alone, have few friends or family and have limited contact with people are viewed as being socially isolated. Social isolation is generally objectively measured by network size, diversity and frequency of contact (De Jong Gierveld and Havens, 2004; Age Concern, 2009). Individuals who are isolated are known to have poorer health outcomes including being at greater risk of developing cardiovascular disease (Thurston and Kubzansky, 2009), and greater rates of premature mortality (Berkman et al., 2004). This issue is particularly important for older adults as they are at a greater risk of being socially isolated (Iliffe et al., 2007) due to retirement, bereavement, moving house and children moving away.

Results

Among ELSA participants, those who are less socially isolated have lower levels of CRP and higher levels of DHEAS (Figures 8.40 and 8.41), suggesting that social isolation is associated with a riskier profile of biomarkers.

Figure 8.40. CRP levels by sex and levels of social isolation (2008–09)

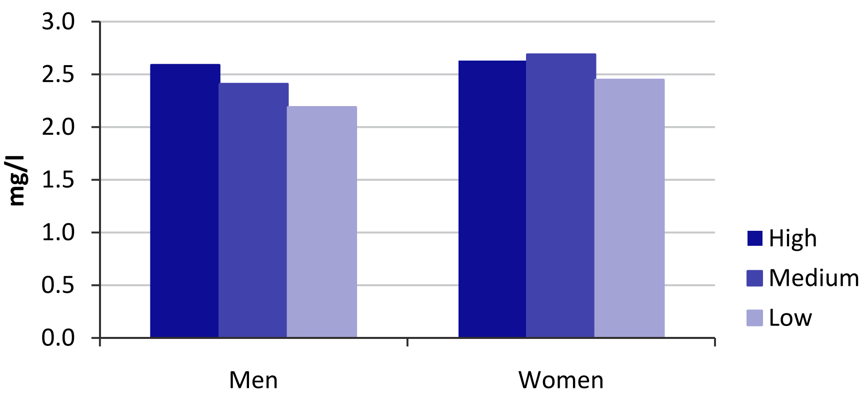
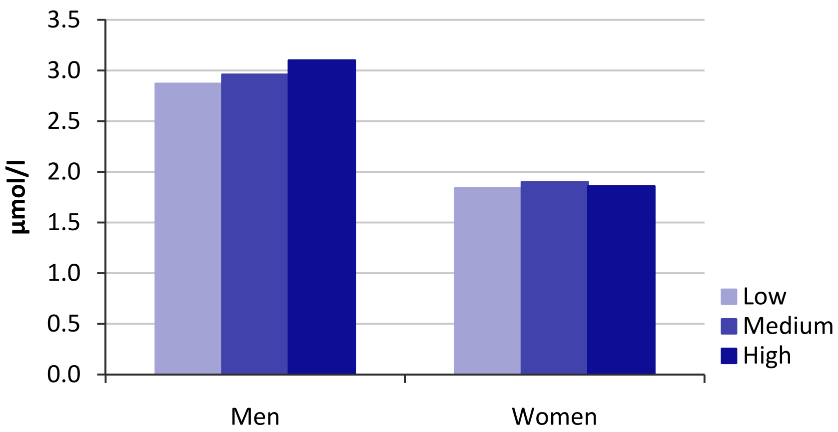


Figure 8.41. DHEAS levels by sex and levels of social contact (2008–09)



8.8 Concluding remarks

For the first time in the English Longitudinal Study of Ageing we have collected repeated measures of biological measures. This chapter has described the cross-sectional and longitudinal variations in health risk and health protective biological measures and health behaviours between age groups and between men and women, and the effects of wealth for people aged 50 and over in England.

Cross-sectional analyses of wave 4 (2008–09) data showed that most of the biological measures and several of the health behaviours examined deteriorate with age. This is clear for systolic blood pressure, self-reported high blood pressure, self-reported diabetes, fasting blood glucose, lung function,

haemoglobin levels and levels of both IGF-I and DHEAS. A high proportion of the elderly are anaemic and have low ferritin levels. Among ELSA participants, the percentage of those reporting being sedentary or having low levels of physical activity also increased with age. Obesity as measured by BMI ($\geq$25 kg/m^2) and raised waist circumference generally rises with age, raising concerns about risks of cardiovascular disease, diabetes and certain cancers. On the other hand, alcohol consumption showed a decline with age.

Despite public information campaigns and efforts to increase awareness about the role of lifestyle factors in health, smoking and excessive alcohol consumption are common in the ELSA cohort, as are low physical activity and inadequate fruit and vegetable intake. Of particular concern is the high prevalence of several of these health-risk behaviours among those who are worse off.

The data from the fourth wave of ELSA (2008–09) presented in this chapter have also provided valuable insights into the relationships between biomarkers and cognitive function, health behaviours and social isolation. The key findings from these analyses highlight the nurse visit and collection of biomarkers as a very important source of information, helping us to understand the possible connections between physical health, mental health and social patterns among the elderly population in England (Steptoe, 2010).

The longitudinal analyses provide an invaluable resource for examining changes not only in biological measures but also in health behaviours. While some health factors have improved (e.g. smoking rates), others such as body weight and physical activity have deteriorated. This chapter has provided some very preliminary analyses of the patterns of health risk and health protective biological measures observed over the two nurse visits of ELSA, including changes in individual measures over time and changes across wave 2 (2004–05) and wave 4 (2008–09).

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Appendix 8A

Tables on health risk and health protective biological measures in later life

Table 8A.1. Body mass index (BMI, kg/m^2) means, by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid BMI

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men	28.3	28.8	28.6	28.4	27.8	27.7	27.0	28.3
Women	28.5	28.7	28.7	28.4	28.6	29.0	26.8	28.4
N (weighted)								
Men	*527*	*879*	*693*	*506*	*423*	*319*	*318*	*3,665*
Women	*544*	*930*	*724*	*538*	*481*	*407*	*493*	*4,117*
N (unweighted)								
Men	*379*	*636*	*782*	*580*	*535*	*322*	*299*	*3,533*
Women	*431*	*813*	*930*	*657*	*651*	*396*	*412*	*4,290*

Notes: Differences in BMI by age group and sex are statistically significant (p<0.001).

Table 8A.2. Body mass index categories, by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid BMI

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
	%	%	%	%	%	%	%	%
Men								
Underweight	1.3	0.3	0.3	0.4	1.2	0.6	1.6	0.7
Desirable	23.0	20.1	20.1	17.4	21.0	22.3	25.2	20.9
Overweight	43.6	43.9	49.7	50.4	52.2	52.4	52.5	48.3
Obese	32.1	35.6	29.9	31.8	25.5	24.8	20.8	30.1
Women								
Underweight	2.6	1.3	0.7	0.6	0.8	1.5	1.8	1.3
Desirable	32.2	31.6	27.0	29.3	26.8	20.4	38.7	29.8
Overweight	33.1	30.6	36.8	36.7	36.9	39.6	35.3	35.0
Obese	32.2	36.5	35.4	33.4	35.5	38.6	24.1	33.9
N (weighted)								
Men	*527*	*879*	*692*	*506*	*423*	*319*	*318*	*3,664*
Women	*544*	*930*	*725*	*539*	*485*	*407*	*493*	*4,123*
N (unweighted)								
Men	*379*	*636*	*782*	*580*	*535*	*322*	*299*	*3,533*
Women	*431*	*813*	*930*	*657*	*651*	*396*	*412*	*4,290*

Notes: Underweight indicates BMI < 18.5; Desirable indicates BMI from 18.5 to 24.9; Overweight indicates BMI from 25 to 29.9; and Obese indicates BMI 30 or more.
Differences in BMI by age group and sex are statistically significant (p<0.001).

Table 8A.3. Waist circumference means, by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid waist circumference

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men								
Mean waist circumference	100.9	103.3	103.2	103.4	102.4	103.2	101.3	102.7
Raised waist circumference (%)	44.2	50.3	49.4	53.5	50.5	53.2	43.4	49.4
Women								
Mean waist circumference	91.5	92.5	93.1	93.1	93.1	95.7	91.5	92.8
Raised waist circumference (%)	53.6	56.8	63.1	61.0	62.9	71.5	60.9	60.7
N (weighted)								
Men	*527*	*901*	*692*	*512*	*428*	*325*	*343*	*3,728*
Women	*545*	*948*	*729*	*549*	*498*	*417*	*535*	*4,221*
N (unweighted)								
Men	*379*	*650*	*779*	*587*	*540*	*327*	*320*	*3,582*
Women	*429*	*828*	*938*	*668*	*665*	*406*	*446*	*4,380*

Notes: Any measurement that was considered invalid by the nurse was omitted. If the first two measurements differed by more than 3 cm then a third was taken. The measurements included in the table are the means of two valid measurements. Raised waist circumference was defined as >= 102 cm for men and >= 88 cm for women.
Differences in waist circumference by age group and sex are statistically significant (p<0.001).

Table 8A.4. Body mass index (BMI, kg/m^2) means, by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid BMI

	Wealth quintiles					
	Poorest	**2nd**	**3rd**	**4th**	**Richest**	**Total**
Men	28.6	28.8	28.6	27.8	27.7	28.3
Women	29.5	29.1	28.8	27.8	26.8	28.4
N (weighted)						
Men	*618*	*686*	*721*	*777*	*784*	*3,586*
Women	*818*	*823*	*812*	*800*	*793*	*4,046*
N (unweighted)						
Men	*498*	*621*	*694*	*793*	*850*	*3,456*
Women	*724*	*837*	*862*	*866*	*920*	*4,209*

Note: Differences in BMI means by wealth and sex are statistically significant (p<0.001).

Table 8A.5. Body mass index categories, by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid BMI

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
	%	%	%	%	5
Men					
Underweight	2.4	0.1	0.7	0.4	0.3
Desirable	21.2	19.8	17.3	23.6	22.9
Overweight	42.5	44.2	48.8	50.6	53.6
Obese	33.9	35.9	33.1	25.4	23.2
Women					
Underweight	1.5	1.7	0.7	1.4	1.3
Desirable	24.3	25.5	26.2	33.1	40.2
Overweight	31.4	33.9	36.5	35.8	36.8
Obese	42.8	38.9	36.6	29.7	21.7
N (weighted)					
Men	*619*	*616*	*721*	*776*	*783*
Women	*818*	*823*	*812*	*801*	*793*
N (unweighted)					
Men	*498*	*621*	*694*	*793*	*850*
Women	*724*	*837*	*862*	*866*	*920*

Notes: Underweight indicates BMI <18.5; Desirable indicates BMI from 18.5 to 24.9; Overweight indicates BMI from 25 to 29.9; Obese indicates BMI 30 or more.
Differences in BMI categories by wealth and sex are statistically significant (p<0.001).

Table 8A.6. Waist circumference means (cm), by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid waist circumference

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean waist circumference	104.5	104.2	103.4	101.2	100.7
Raised waist circumference (%)	54.9	55.3	53.4	42.9	42.3
Women					
Mean waist circumference	95.5	94.1	93.6	91.3	89.2
Raised waist circumference (%)	67.2	64.8	63.7	56.4	50.6
N (weighted)					
Men	*649*	*693*	*731*	*780*	*794*
Women	*859*	*847*	*827*	*809*	*803*
N (unweighted)					
Men	*519*	*628*	*702*	*797*	*857*
Women	*752*	*859*	*881*	*877*	*929*

Notes: Any measurement considered invalid by the nurse was omitted. If the first two measurements differed by more than 3 cm then a third was taken. The values included in the table are the means of two valid measurements. Raised waist circumference was defined as >= 102 cm for men and >= 88 cm for women.

Differences in waist circumference by wealth and sex are statistically significant (p<0.001).

Table 8A.7. Means of systolic and diastolic blood pressure (mmHg), by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a measured systolic and diastolic blood pressure

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men								
Systolic BP	131.2	132.9	135.3	135.2	137.2	137.7	136.6	134.7
Diastolic BP	79.3	78.4	77.6	74.8	73.5	70.2	67.3	75.5
Women								
Systolic BP	124.2	127.9	131.6	132.9	136.9	139.1	139.8	132.6
Diastolic BP	75.3	76.7	75.9	73.9	73.3	71.5	67.6	73.8
N (weighted)								
Men	*528*	*906*	*703*	*517*	*437*	*335*	*356*	*3,782*
Women	*552*	*949*	*737*	*555*	*501*	*427*	*563*	*4,284*
N (unweighted)								
Men	*381*	*654*	*791*	*591*	*550*	*337*	*335*	*3,639*
Women	*436*	*827*	*946*	*675*	*670*	*414*	*471*	*4,439*

Note: Differences in both systolic and diastolic blood pressure by age group and sex are statistically significant ($p<0.001$).

Table 8A.8. Self-reported doctor-diagnosed hypertension by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a measured systolic and diastolic blood pressure

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men								
Hypertension (%)	31.3	33.9	40.9	45.3	49.3	55.7	54.4	42.0
Women								
Hypertension (%)	21.8	29.9	36.3	41.1	51.4	59.0	64.6	41.4
N (weighted)								
Men	*619*	*1,066*	*819*	*607*	*517*	*393*	*419*	*4,440*
Women	*646*	*1,114*	*868*	*657*	*590*	*500*	*672*	*5,047*
N (unweighted)								
Men	*460*	*799*	*882*	*679*	*652*	*385*	*398*	*4,255*
Women	*551*	*1,020*	*1,078*	*772*	*772*	*484*	*597*	*5,274*

Note: Differences in self-reported doctor-diagnosed hypertension by age group and sex are statistically significant (p<0.001).

Table 8A.9. Means of systolic and diastolic blood pressure (mmHg) by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a measured systolic and diastolic blood pressure

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean systolic BP	134.9	135.9	134.0	134.8	133.9
Mean diastolic BP	75.0	75.7	75.1	75.5	76.1
Women					
Mean systolic BP	132.9	134.1	133.3	133.3	129.0
Mean diastolic BP	72.4	74.4	74.1	74.5	74.2
N (weighted)					
Men	*668*	*703*	*741*	*791*	*798*
Women	*882*	*856*	*837*	*818*	*816*
N (unweighted)					
Men	*538*	*634*	*715*	*810*	*864*
Women	*773*	*870*	*892*	*882*	*941*

Table 8A.10. Self-reported doctor-diagnosed hypertension by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a measured systolic and diastolic blood pressure

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Hypertension (%)	49.1	47.0	41.4	40.5	34.8
Women					
Hypertension (%)	50.0	46.3	43.4	36.9	30.8
N (weighted)					
Men	*801*	*836*	*863*	*917*	*928*
Women	*1,045*	*1,022*	*996*	*951*	*935*
N (unweighted)					
Men	*675*	*766*	*816*	*924*	*977*
Women	*980*	*1,058*	*1,051*	*1,022*	*1,056*

Note: Differences in self-reported doctor-diagnosed hypertension by wealth and sex are statistically significant (p<0.001).

Table 8A.11. Lipids (mmol/l) by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid blood sample

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men								
Mean total cholesterol	5.69	5.61	5.37	5.15	5.02	4.93	4.72	5.30
% ≥5.0 mmol/l Chol	71.9	72.5	63.6	56.5	47.6	48.8	37.9	60.4
Mean LDL cholesterol	3.55	3.45	3.25	3.11	3.02	2.91	–	3.27
% ≥3.0 mmol/l LDL	74.0	72.3	59.2	53.8	52.8	44.4	–	61.8
Mean HDL cholesterol	1.39	1.40	1.40	1.37	1.39	1.39	1.34	1.38
% <1.0 mmol/l HDL	8.1	6.7	6.3	6.2	6.5	7.6	9.5	7.1
Mean‡ triglycerides	1.60	1.52	1.49	1.41	1.36	1.29	–	1.47
% >1.7 mmol/l Trig	48.1	41.9	38.4	36.4	32.4	26.4	–	38.6
Women								
Mean total cholesterol	5.87	5.97	5.92	5.87	5.69	5.41	5.47	5.78
% ≥5.0 mmol/l Chol	83.3	80.8	79.9	77.5	70.8	62.8	65.3	75.5
Mean LDL cholesterol	3.57	3.68	3.59	3.61	3.39	3.27	–	3.55
% ≥3.0 mmol/l LDL	73.7	77.7	71.5	72.6	64.7	59.1	–	71.6
Mean HDL cholesterol	1.71	1.67	1.67	1.68	1.68	1.62	1.67	1.67
% <1.2 mmol/l HDL	5.4	6.9	6.5	6.1	7.2	10.4	9.1	7.2
Mean‡ triglycerides	1.23	1.29	1.37	1.38	1.42	1.33	–	1.33
% >1.7 mmol/l Trig	26.0	27.7	33.2	33.2	37.0	32.0	–	31.1

Continues

Table 8A.11 continued

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
N (weighted)								
Men								
Total cholesterol	*392*	*673*	*527*	*386*	*338*	*250*	*253*	*2,819*
HDL cholesterol	*392*	*671*	*525*	*386*	*337*	*250*	*253*	*2,814*
LDL cholesterol	*251*	*415*	*346*	*264*	*212*	*144*	–	*1,632*
Triglycerides	*258*	*430*	*352*	*264*	*216*	*144*	–	*1,664*
Women								
Total cholesterol	*412*	*725*	*567*	*413*	*387*	*325*	*430*	*3,259*
HDL cholesterol	*411*	*724*	*566*	*413*	*388*	*326*	*430*	*3,258*
LDL cholesterol	*259*	*498*	*390*	*286*	*240*	*172*	–	*1,845*
Triglycerides	*261*	*504*	*393*	*286*	*242*	*172*	–	*1,858*
N (unweighted)								
Men								
Total cholesterol	*290*	*512*	*634*	*457*	*411*	*235*	*208*	*2,747*
HDL cholesterol	*290*	*511*	*633*	*457*	*411*	*235*	*208*	*2,745*
LDL cholesterol	*185*	*327*	*425*	*323*	*271*	*141*	–	*1,672*
Triglycerides	*191*	*339*	*432*	*323*	*274*	*141*	–	*1,700*
Women								
Total cholesterol	*334*	*643*	*767*	*504*	*505*	*285*	*323*	*3,361*
HDL cholesterol	*334*	*641*	*766*	*504*	*505*	*285*	*323*	*3,358*
LDL cholesterol	*206*	*449*	*526*	*358*	*328*	*160*	--	*2,027*
Triglycerides	*208*	*454*	*529*	*359*	*330*	*160*	--	*2,040*

Notes: Triglycerides and LDL cholesterol measurements were done on those who are eligible to fast according to the protocol.
Chol indicates total cholesterol; LDL indicates LDL cholesterol; Trig indicates triglycerides; LDL indicates LDL cholesterol.
‡Geometric means are reported.

Table 8A.12. Lipids (mmol/l) by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid blood sample

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean total cholesterol	5.16	5.27	5.19	5.27	5.55
% ≥5.0 mmol/l Chol	52.9	61.6	57.3	59.4	68.5
Mean LDL cholesterol	3.17	3.27	3.19	3.23	3.43
% ≥3.0 mmol/l LDL	54.3	62.7	58.8	60.7	68.7
Mean HDL cholesterol	1.34	1.35	1.34	1.37	1.48
% <1.0 mmol/l HDL	11.7	7.6	7.4	6.9	2.6
Mean‡ triglycerides	1.58	1.57	1.46	1.42	1.35
% ≥1.7 mmol/l Trig	45.3	44.0	38.2	34.9	33.2
Women					
Mean total cholesterol	5.46	5.73	5.79	5.86	6.08
% ≥5.0 mmol/l Chol	66.0	71.9	77.2	78.5	84.0
Mean LDL cholesterol	3.40	3.52	3.57	3.56	3.70
% ≥3.0 mmol/l LDL	64.3	69.1	72.5	72.8	78.2
Mean HDL cholesterol	1.56	1.63	1.63	1.74	1.80
% <1.2 mmol/l HDL	13.8	7.1	6.7	3.9	4.4
Mean‡ triglycerides	1.43	1.41	1.40	1.25	1.22
% ≥1.7 mmol/l Trig	36.5	36.5	35.1	26.2	23.6

Continues

Table 8A.12 continued

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
N (weighted)					
Men					
Total cholesterol	*495*	*515*	*555*	*594*	*607*
HDL cholesterol	*495*	*514*	*555*	*593*	*607*
LDL cholesterol	*247*	*292*	*320*	*357*	*386*
Triglycerides	*253*	*298*	*327*	*361*	*394*
Women					
Total cholesterol	*680*	*636*	*628*	*623*	*630*
HDL cholesterol	*679*	*636*	*627*	*623*	*630*
LDL cholesterol	*311*	*346*	*356*	*367*	*416*
Triglycerides	*315*	*348*	*360*	*367*	*420*
N (unweighted)					
Men					
Total cholesterol	*385*	*462*	*546*	*621*	*678*
HDL cholesterol	*385*	*461*	*546*	*620*	*678*
LDL cholesterol	*199*	*279*	*328*	*386*	*446*
Triglycerides	*204*	*284*	*334*	*390*	*454*
Women					
Total cholesterol	*562*	*635*	*669*	*687*	*743*
HDL cholesterol	*561*	*635*	*668*	*686*	*743*
LDL cholesterol	*278*	*369*	*403*	*413*	*514*
Triglycerides	*282*	*371*	*407*	*413*	*517*

Notes: Triglycerides and LDL cholesterol measurements were done on those who are eligible to fast according to the protocol.
Chol indicates total cholesterol; LDL indicates LDL cholesterol; Trig indicates triglycerides; LDL indicates LDL cholesterol.
‡Geometric means are reported.
Differences in lipid levels by wealth and sex are statistically significant (p<0.001).

Table 8A.13. Fibrinogen (g/l) and C-reactive protein (mg/l) means by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid blood sample

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men								
Mean fibrinogen	3.19	3.25	3.32	3.40	3.44	3.45	3.45	3.33
Mean‡ C-reactive protein	1.33	1.47	1.55	1.57	1.61	1.94	1.99	1.57
Women								
Mean fibrinogen	3.33	3.36	3.44	3.44	3.43	3.58	3.55	3.44
Mean‡ C-reactive protein	1.49	1.53	1.69	1.67	1.73	2.13	1.95	1.69
Fibrinogen								
N (weighted)								
Men	*388*	*654*	*499*	*378*	*331*	*242*	*250*	*2742*
Women	*397*	*697*	*549*	*408*	*383*	*315*	*421*	*3170*
N (unweighted)								
Men	*285*	*498*	*604*	*449*	*403*	*228*	*205*	*2672*
Women	*324*	*624*	*742*	*493*	*498*	*274*	*319*	*3274*
C-reactive protein								
N (weighted)								
Men	*354*	*595*	*447*	*333*	*293*	*202*	*213*	*2437*
Women	*347*	*618*	*467*	*346*	*334*	*263*	*357*	*2732*
N (unweighted)								
Men	*265*	*454*	*546*	*403*	*360*	*194*	*178*	*2400*
Women	*289*	*553*	*642*	*429*	*438*	*235*	*270*	*2856*

Note: Participants with levels greater than 10 mmol/l or those with a respiratory infection in the past three weeks were excluded.
‡Geometric means are reported.

Table 8A.14. Fibrinogen (g/l) and C-reactive protein (mg/l) means by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid blood sample

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean fibrinogen	3.49	3.41	3.36	3.26	3.19
Mean‡ C-reactive protein	2.00	1.75	1.63	1.43	1.29
Women					
Mean fibrinogen	3.53	3.52	3.43	3.42	3.28
Mean‡ C-reactive protein	2.06	1.94	1.67	1.65	1.31
Fibrinogen					
N (weighted)					
Men	*479*	*496*	*547*	*576*	*592*
Women	*665*	*615*	*606*	*607*	*618*
N (unweighted)					
Men	*373*	*443*	*535*	*603*	*665*
Women	*550*	*619*	*649*	*667*	*727*
C-reactive protein					
N (weighted)					
Men	*394*	*435*	*479*	*523*	*561*
Women	*541*	*506*	*530*	*538*	*565*
N (unweighted)					
Men	*311*	*394*	*468*	*459*	*632*
Women	*451*	*514*	*566*	*599*	*672*

Note: Participants with levels greater than 10 mmol/l or those with a respiratory infection in the past three weeks were excluded.
‡Geometric means are reported.

Table 8A.15. Mean fasting glucose (mmol/l) levels by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid fasting blood glucose

	Age in 2008–09						
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**Total**
Men	4.74	4.90	4.90	5.06	5.14	5.04	4.94
Women	4.68	4.75	4.96	4.90	4.98	5.03	4.86
N (weighted)							
Men	*262*	*431*	*349*	*262*	*213*	*144*	*1,621*
Women	*260*	*499*	*388*	*285*	*241*	*171*	*1,844*
N (unweighted)							
Men	*193*	*339*	*428*	*321*	*271*	*142*	*1,694*
Women	*208*	*449*	*523*	*355*	*328*	*160*	*2,023*

Note: Includes only eligible people who had fasted in accordance with the protocol.

Table 8A.16. Diagnosed diabetes* by sex and age (2008–09)

Core wave 4 respondents (excluding proxies)

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**Total**
Men	8.6	7.7	11.6	13.0	15.8	16.8	16.5	11.8
Women	5.6	5.5	8.8	8.2	11.7	15.8	12.1	9.1
N (weighted)								
Men	*619*	*1,066*	*818*	*607*	*518*	*392*	*419*	*4,439*
Women	*646*	*1,114*	*868*	*657*	*590*	*501*	*672*	*5,048*
N(unweighted)								
Men	*460*	*799*	*882*	*679*	*652*	*385*	*398*	*4,255*
Women	*551*	*1,020*	*1,078*	*772*	*772*	*484*	*597*	*5,274*

Notes: Differences in diagnosed diabetes by age group and sex are statistically significant (p<0.001).
*Reported having a doctor diagnosis of diabetes.

Table 8A.17. Mean fasting glucose by wealth quintile and sex (2008–09)

Core wave 4 respondents (excluding proxies)

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men	4.99	4.96	4.86	4.92	4.99
Women	4.91	4.87	4.81	4.91	4.80
N (weighted)					
Men	*250*	*200*	*326*	*362*	*392*
Women	*309*	*348*	*362*	*362*	*415*
N (unweighted)					
Men	*202*	*285*	*332*	*390*	*451*
Women	*276*	*371*	*408*	*408*	*510*

Table 8A.18. Diagnosed diabetes* by wealth quintile and sex (weighted %) (2008–09)

Core wave 4 respondents (excluding proxies)

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men	16.5	13.6	12.3	9.2	8.8
Women	16.2	9.7	8.1	7.3	3.6
N (weighted)					
Men	*801*	*836*	*863*	*918*	*928*
Women	*1,046*	*1,022*	*997*	*951*	*934*
N (unweighted)					
Men	*675*	*766*	*816*	*924*	*977*
Women	*980*	*1,058*	*1,051*	*1,022*	*1,056*

Notes: Differences in diagnosed diabetes by wealth and sex are statistically significant ($p<0.001$).
*Reported having a doctor diagnosis of diabetes.

Table 8A.19. Mean haemoglobin (g/dl) and anaemia (%) by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid haemoglobin concentrations

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Mean haemoglobin (g/dl)	14.9	14.9	14.9	14.9	14.6	14.3	13.9	14.7
Anaemia (%)	1.6	2.8	4.3	4.5	8.7	15.1	23.2	6.8
Women								
Mean haemoglobin (g/dl)	13.6	13.6	13.7	13.7	13.5	13.4	12.8	13.5
Anaemia (%)	4.4	3.2	2.3	3.9	7.1	13.0	22.5	7.3
N (weighted)								
Men	*382*	*673*	*509*	*382*	*332*	*245*	*249*	*2,772*
Women	*407*	*716*	*554*	*406*	*381*	*315*	*427*	*3,206*
N (unweighted)								
Men	*281*	*512*	*615*	*453*	*404*	*232*	*205*	*2,702*
Women	*329*	*636*	*749*	*492*	*497*	*277*	*321*	*3,301*

Notes: Anaemia defined as below 13g/dl for men and below 12 g/dl for women.
Differences in anaemia prevalence by age group and sex are statistically significant ($p<0.001$).

Table 8A.20. Geometric mean ferritin (μg/l) and low ferritin (%), by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with valid ferritin concentrations

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Mean# ferritin (μg/l)	118.5	114.0	111.7	115.8	102.9	106.6	95.3	110.6
Low ferritin (%)	18.1	19.3	20.0	18.7	24.9	18.8	26.5	20.4
Women								
Mean# ferritin (μg/l)	56.8	69.1	75.8	74.4	72.3	65.2	61.3	68.0
Low ferritin (%)	27.5	16.6	16.1	18.5	18.6	22.2	27.1	20.3
N (weighted)								
Men	*393*	*673*	*526*	*386*	*338*	*250*	*253*	*2,819*
Women	*411*	*725*	*566*	*413*	*388*	*325*	*431*	*3,259*
N (unweighted)								
Men	*290*	*512*	*634*	*457*	*411*	*235*	*208*	*2,747*
Women	*334*	*643*	*766*	*504*	*505*	*285*	*324*	*3,361*

Notes: Low ferritin is defined by sex-specific quintiles. This represents values below 56.8 μg/l for men and below 37 μg/l for women.
Geometric mean reported.

Table 8A.21. Mean haemoglobin (g/dl), anaemia prevalence and geometric mean ferritin (µg/l), by wealth quintile and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid iron status measurement

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Haemoglobin (g/dl)					
Men	14.6	14.8	14.6	14.7	14.9
Women	13.3	13.5	13.5	13.6	13.6
Anaemia (%)					
Men	10.6	8.2	7.7	4.9	4.2
Women	14.4	7.0	6.3	5.2	3.2
Ferritin# (µg/l)					
Men	101.8	103.9	107.3	113.6	124.8
Women	58.8	63.2	70.5	69.1	80.7
Haemoglobin/Anaemia					
N (weighted)					
Men	*479*	*504*	*550*	*589*	*599*
Women	*659*	*626*	*625*	*615*	*622*
N (unweighted)					
Men	*372*	*452*	*540*	*613*	*672*
Women	*544*	*624*	*665*	*676*	*728*
Ferritin					
N (weighted)					
Men	*495*	*515*	*555*	*594*	*606*
Women	*682*	*636*	*628*	*623*	*631*
N (unweighted)					
Men	*385*	*462*	*546*	*621*	*678*
Women	*563*	*635*	*669*	*686*	*743*

Note: Differences in anaemia prevalence and mean ferritin by wealth and sex are statistically significant ($p<0.001$).
#Geometric mean reported for ferritin. Anaemia defined as below 13g/dl for men and below 12 g/dl for women.

Table 8A.22. Lung function measures: mean values of FEV1, FVC and PEF by age and sex-specific height group (2008–09)

Core wave 4 respondents (excluding proxies) with a valid lung function measurement

		Age in 2008–09							
		50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
FEV1 (litres)	Men <175cm	3.14	2.87	2.79	2.61	2.39	2.16	2.00	2.62
	Men ≥175cm	3.54	3.44	3.19	2.99	2.80	2.68	[2.45]	3.22
	Women <165cm	2.33	2.19	2.04	1.89	1.73	1.57	1.32	1.90
	Women ≥165cm	2.69	2.53	2.38	2.15	2.10	[1.91]	[1.47]	2.39
FVC (litres)	Men <175cm	4.12	3.79	3.85	3.58	3.36	3.05	2.91	2.58
	Men ≥175cm	4.78	4.61	4.33	4.15	3.83	3.79	[3.24]	4.36
	Women <165cm	3.01	2.94	2.74	2.58	2.42	2.18	1.84	2.58
	Women ≥165cm	3.52	3.43	3.18	3.04	2.97	[2.73]	[2.23]	3.25
PEF (litres/minute)	Men <175cm	500.7	469.8	454.1	430.3	406.1	368.2	326.1	430.0
	Men ≥175cm	547.3	544.8	495.7	485.0	459.7	426.9	[386.4]	508.0
	Women <165cm	349.6	333.1	313.4	288.4	266.9	243.7	190.8	289.6
	Women ≥165cm	376.9	365.7	350.2	324.6	301.3	[274.7]	[219.8]	346.7
N (weighted)									
	Men <175cm	*252*	*410*	*372*	*281*	*266*	*201*	*228*	*2,010*
	Men ≥175cm	*240*	*412*	*275*	*185*	*116*	*79*	*40*	*1,347*
	Women <165cm	*335*	*608*	*522*	*380*	*360*	*320*	*372*	*2,897*
	Women ≥165cm	*169*	*262*	*152*	*118*	*73*	*30*	*20*	*824*
N (unweighted)									
	Men <175cm	*181*	*300*	*418*	*326*	*348*	*213*	*241*	*2,027*
	Men ≥175cm	*177*	*312*	*316*	*224*	*152*	*86*	*39*	*1,306*
	Women <165cm	*267*	*541*	*679*	*474*	*501*	*328*	*351*	*3,141*
	Women ≥165cm	*136*	*232*	*204*	*151*	*102*	*31*	*19*	*875*

Note: Differences in FEV1, FVC and PEF by sex-specific height and age groups are statistically significant ($p<0.001$).

Table 8A.23. Mean FEV1 (litres) by sex-specific height and wealth (2008–09)

Core wave 4 respondents (excluding proxies) with a valid FEV1

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
<175cm	2.43	2.53	2.66	2.72	2.75
≥175cm	2.74	3.08	3.24	3.32	3.39
Women					
<165cm	1.67	1.88	1.92	1.98	2.08
≥165cm	2.19	2.24	2.37	2.44	2.55
N (weighted)					
Men	*544*	*624*	*664*	*711*	*739*
Women	*719*	*720*	*731*	*747*	*733*
N (unweighted)					
Men	*466*	*578*	*655*	*744*	*815*
Women	*670*	*764*	*812*	*821*	*871*

Note: Differences in FEV1 by sex-specific height and wealth are statistically significant ($p<0.001$).

Table 8A.24. Mean FVC (litres) by sex-specific height and wealth (2008–09)

Core wave 4 respondents (excluding proxies) with a valid FVC

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
<175cm	3.33	3.51	3.63	3.71	3.73
≥175cm	3.87	4.29	4.37	4.45	4.54
Women					
<165cm	2.30	2.56	2.57	2.65	2.83
≥165cm	2.97	3.07	3.24	3.36	3.39
N (weighted)					
Men	*544*	*624*	*664*	*711*	*739*
Women	*719*	*720*	*731*	*747*	*733*
N (unweighted)					
Men	*466*	*578*	*655*	*744*	*815*
Women	*670*	*764*	*812*	*821*	*871*

Note: Differences in FVC by sex-specific height and wealth are statistically significant ($p<0.001$).

Table 8A.25. Mean PEF (litres per minute) by sex-specific height and wealth (2008–09)

Core wave 4 respondents (excluding proxies) with a valid PEF

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
<175cm	389.5	413.7	443.6	447.9	454.7
≥175cm	425.4	480.2	493.3	532.1	548.5
Women					
<165cm	251.6	283.9	288.8	305.9	321.3
≥165cm	311.4	332.9	336.9	360.4	368.6
N (weighted)					
Men	*544*	*624*	*664*	*711*	*739*
Women	*719*	*720*	*731*	*747*	*733*
N (unweighted)					
Men	*466*	*578*	*655*	*744*	*815*
Women	*670*	*764*	*812*	*821*	*871*

Note: Differences in PEF by sex-specific height and wealth are statistically significant (p<0.001).

Table 8A.26. Smoking status by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid smoking status

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Current smoker (%)	20.2	19.7	16.9	15.3	13.3	9.1	4.1	15.5
Women								
Current smoker (%)	22.8	20.9	16.9	13.6	10.5	11.5	5.4	15.3
N (weighted)								
Men	*614*	*1,063*	*816*	*606*	*512*	*386*	*411*	*4,408*
Women	*641*	*1,110*	*864*	*653*	*583*	*495*	*661*	*5,007*
N (unweighted)								
Men	*456*	*797*	*879*	*679*	*645*	*379*	*391*	*4,226*
Women	*547*	*1,017*	*1,072*	*766*	*764*	*478*	*588*	*5,232*

Note: Differences in smoking status by sex and age group are statistically significant (p<0.001).

Table 8A.27. Smoking status by wealth quintile and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid smoking status

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Current smoker (%)	33.6	18.6	13.4	7.4	6.9
Women					
Current smoker (%)	26.0	19.4	13.4	9.3	7.4
N (weighted)					
Men	*795*	*829*	*861*	*909*	*921*
Women	*1,032*	*1,019*	*992*	*944*	*924*
N (unweighted)					
Men	*670*	*760*	*814*	*915*	*970*
Women	*966*	*1,054*	*1,046*	*1,012*	*1,047*

Note: Differences in smoking status by sex and wealth are statistically significant (p<0.001).

Table 8A.28. Frequency of alcohol consumption in the previous 12 months by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid frequency of alcohol consumption

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Daily	13.1	16.9	21.9	19.7	19.9	22.5	25.4	19.3
Frequently	56.3	55.1	55.3	53.1	50.2	41.9	32.8	51.2
Rarely	24.8	21.5	16.2	20.2	20.1	19.8	26.8	21.0
Never	5.9	6.6	6.6	7.1	9.8	15.8	15.1	8.5
Women								
Daily	11.7	10.6	11.6	12.7	10.6	12.5	13.3	11.7
Frequently	42.8	44.4	42.1	35.8	34.8	26.6	24.6	37.3
Rarely	32.0	33.2	34.1	35.5	32.6	38.8	38.2	34.6
Never	13.5	11.9	12.1	15.9	22.0	22.1	24.0	16.4
N (weighted)								
Men	*528*	*913*	*698*	*524*	*438*	*329*	*351*	*3,781*
Women	*556*	*962*	*750*	*558*	*491*	*417*	*558*	*4,292*
N (unweighted)								
Men	*385*	*678*	*778*	*608*	*567*	*333*	*302*	*3,651*
Women	*466*	*887*	*968*	*692*	*671*	*403*	*457*	*4,544*

Table 8A.29. Frequency of alcohol consumption in the previous 12 months by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid frequency of alcohol consumption

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Daily	16.3	14.2	16.0	19.4	27.7
Frequently	38.9	53.6	55.0	52.8	54.9
Rarely	26.0	22.9	22.4	22.2	12.9
Never	18.8	9.3	6.6	5.5	4.5
Women					
Daily	6.5	8.0	8.6	14.0	21.1
Frequently	19.5	35.0	38.3	44.4	49.9
Rarely	43.2	37.7	38.8	31.8	21.3
Never	30.8	19.4	14.3	9.8	7.8
N (weighted)					
Men	*661*	*699*	*724*	*814*	*820*
Women	*843*	*863*	*856*	*836*	*812*
N (unweighted)					
Men	*504*	*639*	*707*	*838*	*896*
Women	*744*	*883*	*926*	*928*	*972*

Table 8A.30. Alcohol consumption in relation to weekly limits by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid frequency of alcohol consumption

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
>21 units/week	16.5	18.1	16.9	13.4	11.3	12.4	9.9	15.0
Women								
>14 units/week	8.5	7.3	7.6	5.9	3.1	2.7	1.5	5.7
N (weighted)								
Men	*526*	*912*	*693*	*523*	*435*	*323*	*345*	*3,757*
Women	*553*	*954*	*739*	*545*	*481*	*408*	*548*	*4,228*
N (unweighted)								
Men	*382*	*677*	*772*	*606*	*562*	*325*	*295*	*3,619*
Women	*462*	*879*	*955*	*677*	*656*	*393*	*448*	*4,470*

Note: Differences in alcohol consumption by sex and age group are statistically significant (p<0.001).

Table 8A.31. Alcohol consumption in relation to weekly limits by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid frequency of alcohol consumption

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
>21 units/week	12.9	16.0	12.5	15.4	16.5
Women					
>14 units/week	2.4	3.9	5.1	6.4	10.3
N (weighted)					
Men	*657*	*692*	*718*	*806*	*819*
Women	*831*	*849*	*838*	*831*	*799*
N (unweighted)					
Men	*500*	*630*	*700*	*828*	*894*
Women	*732*	*867*	*905*	*921*	*955*

Note: Differences in alcohol consumption by sex and wealth are statistically significant only for women (p<0.001).

Table 8A.32. IGF-I levels (nmol/l) by sex and age (2008–09)

Core wave 4 respondents (excluding proxies) with a valid IGF-I measurement

	Age in 2008–09							
	50–54	55–59	60–64	65–69	70–74	75–79	80+	All
Men								
Mean IGF-I	17.7	16.5	16.9	16.9	16.3	15.7	13.3	16.4
% in lowest quintile	13.9	25.0	22.0	20.9	25.9	34.1	48.1	25.3
Women								
Mean IGF-I	17.3	15.8	15.4	14.8	14.5	13.7	13.4	15.1
% in lowest quintile	12.6	16.2	15.7	17.2	24.4	28.1	33.3	20.2
N (weighted)								
Men	*388*	*667*	*519*	*383*	*335*	*246*	*250*	*2,788*
Women	*406*	*717*	*559*	*307*	*385*	*320*	*427*	*3,221*
N (unweighted)								
Men	*286*	*507*	*625*	*453*	*408*	*230*	*206*	*2,715*
Women	*330*	*635*	*755*	*499*	*502*	*279*	*320*	*3,320*

Note: Sex-specific quintiles used.
Differences in IGF-I levels by age group are statistically significant (p<0.001).

Table 8A.33. IGF-I levels (nmol/l) by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid IGF-I measurement

	Wealth quintiles				
	Poorest	2nd	3rd	4th	Richest
Men					
Mean IGF-I	16.2	15.9	16.3	17.0	16.9
% in lowest quintile	30.8	28.9	24.1	22.5	21.2
Women					
Mean IGF-I	14.2	14.9	15.3	15.3	15.9
% in lowest quintile	27.3	22.7	16.7	18.8	14.9
N (weighted)					
Men	*490*	*508*	*552*	*586*	*600*
Women	*675*	*629*	*617*	*617*	*622*
N (unweighted)					
Men	*381*	*456*	*541*	*612*	*670*
Women	*556*	*630*	*656*	*679*	*734*

Note: Differences in % in lowest IGF-I quintile by wealth are statistically significant (p<0.001).

Table 8A.34. DHEAS (μmol/l) by sex and age (2008–09)

Core wave 4 respondents (excluding proxies) with a valid DHEAS measurement

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Mean DHEAS	4.13	3.87	3.21	2.76	2.32	1.86	1.55	3.06
% in lowest quintile	5.7	7.3	12.7	19.6	28.6	47.8	53.6	20.1
Women								
Mean DHEAS	2.86	2.28	1.95	1.66	1.41	1.33	1.19	1.87
% in lowest quintile	6.2	8.5	13.2	23.8	30.6	30.1	39.3	19.8
N (weighted)								
Men	*388*	*667*	*519*	*383*	*335*	*247*	*250*	*2,789*
Women	*406*	*717*	*559*	*407*	*385*	*320*	*427*	*3,221*
N (unweighted)								
Men	*286*	*507*	*625*	*453*	*408*	*231*	*206*	*2,716*
Women	*330*	*635*	*755*	*499*	*502*	*279*	*320*	*3,320*

Notes: Sex-specific quintiles used.
Differences in DHEAS levels by age group and sex are statistically significant (p<0.001).

Table 8A.35. DHEAS (μmol/l) by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid DHEAS measurement

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean DHEAS	2.78	2.95	2.99	3.12	3.35
% in lowest quintile	26.7	23.4	20.3	17.1	15.3
Women					
Mean DHEAS	1.66	1.90	1.86	1.93	1.96
% in lowest quintile	27.3	19.9	17.8	18.2	16.4
N (weighted)					
Men	*490*	*509*	*552*	*586*	*600*
Women	*675*	*629*	*617*	*617*	*622*
N (unweighted)					
Men	*381*	*457*	*541*	*612*	*670*
Women	*556*	*630*	*656*	*679*	*734*

Notes: Sex-specific quintiles used.
Differences in DHEAS levels by wealth are statistically significant (p<0.001).

Table 8A.36. Physical activity levels (%) by age and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid physical activity level

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Sedentary	3.4	4.2	5.1	7.6	9.1	8.4	18.6	7.0
Low	7.8	6.6	9.5	12.4	10.8	17.9	24.8	11.3
Moderate	42.9	49.2	47.6	46.8	53.6	48.0	44.2	47.6
High	45.9	40.0	37.8	33.3	26.6	25.8	12.2	34.0
Women								
Sedentary	4.8	3.4	2.9	7.2	8.0	12.0	22.7	7.9
Low	11.6	14.7	14.3	17.0	22.7	32.2	35.6	20.0
Moderate	51.9	51.6	52.5	48.2	45.4	43.4	36.6	47.8
High	31.7	30.2	30.4	27.5	23.9	12.4	5.0	24.2
N (weighted)								
Men	*616*	*1,066*	*818*	*607*	*519*	*392*	*419*	*4,437*
Women	*646*	*1,112*	*869*	*657*	*590*	*500*	*674*	*5,048*
N (unweighted)								
Men	*458*	*799*	*882*	*678*	*652*	*385*	*398*	*4,252*
Women	*551*	*1,018*	*1,078*	*772*	*772*	*484*	*597*	*5,272*

Note: Differences in levels of physical activity by sex and age group are statistically significant ($p<0.001$).

Table 8A.37. Physical activity levels (%) by wealth quintiles and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid physical activity level

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Sedentary	15.4	7.9	6.0	3.9	3.0
Low	20.5	15.2	9.8	8.1	4.7
Moderate	43.8	48.1	47.4	52.0	47.0
High	20.3	28.7	36.7	36.0	45.3
Women					
Sedentary	17.5	8.2	6.1	4.1	3.3
Low	30.4	23.6	19.8	13.2	12.3
Moderate	41.5	50.2	51.8	51.6	44.3
High	11.0	18.0	22.3	31.0	40.1
N (weighted)					
Men	*799*	*835*	*863*	*917*	*928*
Women	*1,043*	*1,022*	*995*	*951*	*935*
N (unweighted)					
Men	*674*	*766*	*816*	*923*	*976*
Women	*979*	*1,058*	*1,050*	*1,022*	*1,056*

Note: Differences in levels of physical activity by wealth are statistically significant (p<0.001).

Table 8A.38. Fruit and vegetable consumption by sex and age (2008–09)

Core wave 4 respondents (excluding proxies) with a valid fruit and vegetable consumption level

	Age in 2008–09							
	50–54	**55–59**	**60–64**	**65–69**	**70–74**	**75–79**	**80+**	**All**
Men								
Mean consumption	5.56	5.94	6.23	6.11	6.00	6.02	6.00	5.98
<5 portions/day (%)	50.2	47.1	46.8	43.5	46.8	47.0	49.1	47.1
Women								
Mean consumption	6.14	6.10	6.08	6.03	6.34	5.89	5.88	6.07
<5 portions/day (%)	48.4	47.1	44.6	45.1	39.4	45.8	45.3	45.3
N (weighted)								
Men	*531*	*920*	*698*	*524*	*436*	*332*	*347*	*3,788*
Women	*554*	*963*	*753*	*565*	*501*	*430*	*566*	*4,332*
N (unweighted)								
Men	*385*	*681*	*777*	*606*	*564*	*332*	*297*	*3,642*
Women	*464*	*887*	*972*	*695*	*679*	*412*	*461*	*4,570*

Table 8A.39. Fruit and vegetable consumption by wealth and sex (2008–09)

Core wave 4 respondents (excluding proxies) with a valid fruit and vegetable consumption level

	Wealth quintiles				
	Poorest	**2nd**	**3rd**	**4th**	**Richest**
Men					
Mean consumption	5.28	5.55	6.39	6.21	6.41
<5 portions/day (%)	60.9	52.9	43.5	42.8	38.6
Women					
Mean consumption	5.12	5.87	6.10	6.34	7.05
<5 portions/day (%)	57.8	50.6	45.6	38.1	33.7
N (weighted)					
Men	*661*	*703*	*726*	*815*	*819*
Women	*867*	*867*	*862*	*842*	*813*
N (unweighted)					
Men	*496*	*644*	*702*	*838*	*895*
Women	*759*	*885*	*929*	*933*	*974*

Note: Differences in fruit and vegetable consumption by wealth are statistically significant (p<0.001).

9. Receipt and giving of help and care

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The chapter has two parts, the first concerning sources of care for those who have limitations with daily activities (whether of mobility and strength or of a function such as washing or shopping), the second concerning the health and well-being of those providing general help and care.

Receiving help and support

Among those with limitations in daily activities, four groups, designated by initials, were compared: people not reporting help (NH – 58%); those reporting informal help only (IH – 34%); those reporting some paid help but not from the state (PH – 4%); and those reporting help from the state care services (SH – 4%).

- The SH group were most likely to be in the poorest wealth quintile whereas the PH group were on average more wealthy than the other groups receiving help.
- The NH group were generally best able to perform the physical and cognitive functioning tests. The SH group had the worst functioning of all groups.
- People in the PH group were not markedly different from those in the IH group in most aspects of functioning. Given the means to do so, they may choose paid help in situations where others would still rely on informal help.
- Women in the SH group were most likely to have personal aids, e.g. mobility aid or an alarm and to have adaptations in the home, e.g. bathroom modifications or stair lift. They were also most likely to have these supports paid for by the social services or the National Health Service but at least half of those receiving state help had paid for housing adaptations themselves.
- The SH group were much more likely than other groups to say that accessing retail or health services was difficult or impossible for them.
- Lower quality of life among the SH group was largely explained by their poorer state of self-reported health.

Giving help and care

- In line with earlier waves, 9.1% of respondents reported that they actively provided care for someone in the last week.

- People in poor health were less likely to be caring for parents or grandchildren but more likely to be caring for their partner. The data raise concerns over the health of those who are providing care for their partner.
- Those in the most deprived areas were also more likely to be providing care for their partner compared with those in less deprived areas, adjusting for gender, age and wealth.
- Adjusted analyses showed that younger people (aged 50–64 years) and female ELSA respondents were more likely to be caring for a parent or parent-in-law compared with older people and males.
- On average, respondents in the 75+ age group spent 41 more hours each week in the active provision of care compared with those aged 50–64. Those in the most deprived areas spent 31 more hours each week actively caring compared with those in the least deprived areas.
- Quality of life was lower for those who provided care for their partner (adjusted for age, sex, wealth, area deprivation and self-rated health). This lower quality of life was explained by sense of obligation and total hours in the caring role. Caring for grandchildren, however, was associated with a higher quality of life score.

As the population ages, discussions on appropriate models to provide and finance the care and support system have come to the fore (HM Government, 2008). The system relies on informal support from family members and others in addition to publicly and privately provided and funded care. Informal support for older people typically comes from the partners and children of those needing help. In the UK, data from the 2001 census indicate that substantial numbers of people (estimates suggest around 4.9 million) are providing informal help and care to family, friends and neighbours (ONS, 2001), although the census is necessarily lacking in detail on elements such as the type and frequency of help and care provided and the relationship of carer to recipient.

There are ongoing debates about the funding of care. In July 2010 the government established an independent commission to consider the evidence and make recommendations on how to achieve an affordable and sustainable funding system for care and support for all adults in England (Department of Health, 2010). As Carers UK point out, one in five carers are forced to give up work and one in three cannot return to work because of their caring responsibilities (Carers UK, 2010a). The demand is not to remove informal family care but to make it more manageable (Carers UK, 2010b). It is also understandable if carers not wanting to do paid work (e.g. well beyond the normal working age) wish to have room in their lives for more than caring. At the time of the ELSA wave 4 fieldwork (2008–09), state help was primarily available to those with 'critical need', defined as requiring significant help with four activities of daily living (ADL), such as washing, eating, going to the toilet and dressing (Lister, 2010). State care was also means tested. This chapter describes the characteristics of people according to source of help, providing a greater range of information than is possible with routine data. This will enable some comparisons over time as policy for caring evolves.

We are also interested in ELSA respondents as caregivers. Analysis based on data at waves 2 and 3 of ELSA indicated that 10% of participants aged 52 and over had provided care in the previous week, including care for spouses, children, grandchildren and other family and friends (Ross et al., 2008). This figure includes normal childcare for dependent children although this is relatively uncommon in this age group of over-50s. Carers may be dealing with physical and cognitive limitations in the people they care for and may experience reduced quality of life and poorer health because of their caring responsibilities (Tooth et al., 2008; Hirst, 2005; Cannuscio et al., 2002; Lee et al., 2003; Broe et al., 1999). Compared with non-carers, carers' quality of life may be especially low for those providing a greater number of hours of care (Ross et al., 2008). Financial hardship, difficulty in accessing community services because of responsibilities and constraints on social and leisure activities appear to contribute to poorer quality of life among some carers (Ross et al., 2008).

On the other hand, providing care and help can engender a sense of purpose and can increase social interaction and connection to the community, and theory suggests that negative effects should not ensue where the rewards balance the efforts invested in caring (Siegrist et al., 2004, cited in McMunn et al., 2009). Additionally, some older carers look after recipients who do not have functional limitations. This leads us to explore the relationship between caring and quality of life for different levels of care and care recipients. Quality of life, as measured by CASP-19 (Hyde et al., 2003), has been used in the past by the UK government as an indicator of well-being of older people (DWP, 2009). People who have limitations with function and those who provide care both have to cope with a feature of their lives that could be burdensome but could also have positive aspects. Thus we have taken CASP-19 as our main outcome measure in relation to both receipt of help and provision of care.

The fieldwork reported in this chapter took place during a time of economic turbulence in the UK and worldwide. This also brought financial and practical challenges for older people. The value of people's pension funds and assets had fallen dramatically during 2008 (Age Concern and Help the Aged, 2009, p. 2); on top of this, although the Retail Price Index had fallen during the year to end March 2009, the index for a couple of state pension age rose by 6.8% and that for a single person by 5.2% (cited in Age Concern and Help the Aged, 2009, p. 4). Loss of local shops is likely to add to difficulties in getting out and about. It is estimated that already about one in five of the vital institutions like grocers, high street banks and post offices disappeared between 1995 and 2000 (cited in Age Concern and Help the Aged, 2009, p. 5). The bankruptcy of Woolworth stores in late 2008 and loss of other local landmarks exacerbates this. A study of four councils in England in mid-2009 did not paint a totally bleak picture, partly because of the social implications of a recession lag after the drop in economic output (as described by the Audit Commission, 2009). The four councils did not report a change in social care priorities but were concerned about future cuts and some Third Sector organisations felt that pressure was being transferred to them (Hulbert, 2010). A survey of local authorities found that during the financial year 2008–09 nearly one in six local authorities had experienced closure of independent local homes (cited in

Hulbert, 2010, p. 44), which presumably puts more pressure on the forms of care reported in this chapter.

9.1 Aims and objectives

The aim of the first part of this chapter is to compare the characteristics of respondents according to the sources of help they report for their limitations in daily activities. At the time the survey was undertaken, statutory health and social services gave priority to people who have multiple functional limitations and the help was means tested. This survey can show in more depth the extent to which, on the one hand, the SH group have a concentration of functioning limitations, and on the other, they are provided with additional support such as aids and adaptations. One of the performance indicators for health and social care provision has been improved quality of life of the care recipient and another was support for that recipient to have a social life, including access to services (Care Quality Commission, 2009). As far as we know, quality of life and access to services have not previously been compared for people receiving help and care from various sources. To the extent that the different sources vary on the training and expertise of the provider, flexibility over when and how the care is provided and intimacy between provider and recipient, we might expect to see some differences in overall quality of life and in particular in sense of control and autonomy.

The specific objectives with respect to similarities and differences by sources of help for difficulties in daily activities were:

(1) to describe socio-demographic characteristics; in particular to see whether source of help for limitations in daily living is associated with wealth and the deprivation of the area of residence;

(2) to compare indicators of physical and cognitive functioning across the groups to see whether receiving formal help is more likely for those with more limitations;

(3) to examine evidence of other types of support received in the form of personal aids, such as wheelchairs, and adaptations to the home and to investigate the source of these aids;

(4) to evaluate the ease of access to services and quality of life against the source of help provided.

The second part of the chapter describes the types and levels of help and care provided by ELSA respondents, and how this is patterned by gender, age and socioeconomic characteristics. It also explores associations between providing care and quality of life. Socially productive activities, including volunteering and providing help for others, are positively associated with survival in older people (Glass et al., 1999). The active provision of care potentially brings rewards for the care provider, despite the demands it can make on carers. Previous work based on ELSA data which has investigated socially productive activities and well-being highlighted the balance of effort expended and the rewards received as being important for well-being (McMunn et al., 2009). Whilst that study did not find any clear link between caring and quality of life, it did not distinguish between different types of care recipient. A separate

study which did distinguish between types of care recipient found that those providing more than 20 hours of care each week for their spouse/partner, child or parent each had significantly poorer quality of life (Ross et al., 2008). Important determinants of carer's quality of life which might be linked to their caring role included their own health status, financial hardship and difficulties in getting to community services such as health services or shops. Motivations for caring might also be important in determining the quality of life of carers. These include positive motivations such as contributing to the family or wider society, enjoyment derived from helping others and sense of personal achievement. However, others take on a caring role because they feel obliged to do so. We anticipate that quality of life would be lower for carers who feel obligated compared with those who report other reasons for caring.

The objectives of the second part of the chapter are:

(1) to describe the types and level of help and care provided by ELSA respondents and to describe how these vary by socio-demographic factors;

(2) to compare quality of life according to whether the respondent is actively providing care for their partner or spouse, their parent or parent-in-law or their grandchildren;

(3) to assess the contribution of health, socioeconomic factors and motivation for caring to explain differences in quality of life.

9.2 Methods and sample

Sample

For all the analyses in this chapter the sample is taken from core members who took part in wave 4 in 2008–09. It is important to note that the data collection period for wave 4 in 2008–09 coincided with a period of economic downturn which will have affected the distributions of many of the measures collected. People who had moved into long-term care institutions by wave 4 are omitted from the analyses in this chapter since their situation is so different from those living at home.

For the section on receipt of help, there are some initial descriptive analyses that include all the core members who answered the section on daily activities (n = 9,777). Thereafter most of the analyses focus on people (n = 5,653) who had at least one difficulty with a function of daily living (as given in Box 9.1 below). The analyses for any given measure were restricted to those who provided answers to the relevant questions and this is indicated by the sample sizes provided in the tables within this chapter.

For the section on giving help, the initial analyses include all core members. The final section on active provision of care focuses on the 900 respondents who reported that they had cared for someone in the previous week. For those who indicated that they had provided some form of care in the previous week, a more detailed set of questions concerning that care was administered. These questions included the relationship of carer to care recipient(s), the number of hours spent caring, their motivations for caring and rewards derived from caring.

Measures

Quality of life

The quality of life measure used here is CASP-19, which has four dimensions: control, autonomy, self-realisation and pleasure. It comprises 19 questions. It is described more fully in Chapter 4. An advantage of the CASP-19 measure is that it covers aspects of life other than health and functioning. We can then use the CASP-19 to investigate the association between health and functioning as predictors of quality of life. A sub-scale combining control and autonomy is also used in this chapter because one of the goals of government policy has been that people should feel that they are in control of their condition. Similarly, one of the indicators monitoring progress on the Independent Living Strategy is based on the concept of choice and control in one's life (ODI, 2010).

Subjective activities of daily living

ELSA includes questions about respondents' ability to carry out everyday tasks. These self-reports of physical functioning are divided into three types: activities of daily living (ADL), instrumental activities of daily living (IADL) and motor skills or strength. The wordings of the questions are given in Box 9.1.

Problems with motor skills and strength may be potential precursors to restrictions on participation. Respondents in ELSA are asked about ten items referring to movements involving the upper and/or lower limbs, most of which require a degree of muscle strength but a few of which are more to do with dexterity and flexibility (see the first ten items in Box 9.1).

The original scale of ADL was developed by Katz and colleagues (Katz et al., 1963) who described them as 'activities which people perform habitually and universally' (p. 94). The activities covered in ELSA are the first six in the second set of questions in Box 9.1 (from dressing [01] to using the toilet [06]).

IADL are everyday tasks that differ from ADL in being more complex and involving a mix of cognitive and physical competences. The following activities derive from a set validated by Lawton and Brody (1969) to reflect what they termed 'instrumental self-care': preparing a hot meal; shopping for groceries; making telephone calls; taking medications; doing work around the house or garden; and managing money. An additional activity, adopted from the US Health and Retirement Survey, referred to using a map to figure out how to get around in a strange place (Fonda and Herzog, 2004). Two functions were added in wave 4 (2008–09) to harmonise with questions asked in other surveys: recognising danger and communication problems (ODI, 2009). The Katz and Lawton-Brody lists are widely used for professional assessments of the needs of older people.

The questions in ELSA represent simplified versions and do not differentiate the amount of assistance needed to achieve them; they are assumed to be activities that most people would wish to undertake in their lives.

Box 9.1. Questions on limitations in daily activities

Because of a physical or health problem, do you have difficulty doing any of the activities on this card? Exclude any difficulties that you expect to last less than three months.

INTERVIEWER: PROBE – 'What others?' … Code all that apply.

01 Walking 100 yards

02 Sitting for about two hours

03 Getting up from a chair after sitting for long periods

04 Climbing several flights of stairs without resting

05 Climbing one flight of stairs without resting

06 Stooping, kneeling or crouching

07 Reaching or extending arms above shoulder level (either arm)

08 Pulling or pushing large objects like a living-room chair

09 Lifting or carrying weights over 10 pounds, like a heavy bag of groceries

10 Picking up a 5p coin from a table

96 None of these

Here are a few more everyday activities. Please tell me if you have any difficulty with these because of a physical, mental, emotional or memory problem. Again exclude any difficulties you expect to last less than three months.

INTERVIEWER: PROBE – 'What others?' … Code all that apply.

01 Dressing, including putting on shoes and socks

02 Walking across a room

03 Bathing or showering

04 Eating, such as cutting up food

05 Getting in or out of bed

06 Using the toilet, including getting up or down

07 Using a map to figure out how to get around in a strange place

08 Recognising when you are in physical danger

09 Preparing a hot meal

10 Shopping for groceries

11 Making telephone calls

12 Communicating (speech, hearing or eyesight)

13 Taking medications

14 Doing work around the house or garden

15 Managing money, such as paying bills and keeping track of expenses

96 None of these

The disability index is described in Chapter 7.

Objective measures of physical functioning

In the interview, respondents aged 60 and over are eligible for the gait speed test, which involves being timed walking a distance of 8 feet. The mean speed of two attempts is taken. This test is described more fully in Chapter 7.

Of the measures taken during the nurse visit, two have been selected here as indicators of physical functioning. The first is grip strength, which is a useful measure for adults of all ages. It has been shown to predict functional limitations and disability 25 years after measurement on a group of people aged 45–64 years at baseline (Rantanen et al., 1999) and also to predict decline over a 3-year period among people aged 65–84 (Ishikazi et al., 2000).

The protocol for grip strength can be summarised as follows:

> The grip strength test is a test for upper body strength. It was given to all respondents who were willing to take it, with no upper or lower age limits, but with certain exclusions on safety grounds (respondents were excluded if they had swelling or inflammation, severe pain, a recent injury, or if they had had surgery to the hand in the preceding six months). If there was a problem with only one hand, measurements were taken using the other hand.
>
> After adjusting the gripometer* (grip gauge) to suit the respondent's hand and positioning the respondent correctly, the respondent was asked to squeeze the gripometer as hard as they could for a couple of seconds. Three values were recorded for each hand, starting with the non-dominant hand and alternating between hands. Any measurements carried out incorrectly were not included (Melzer et al., 2006, p. 168).

In the current analysis, the largest grip strength measurement was used, whether in the dominant or non-dominant hand.

The second is the ability to rise from an armless chair without assistance (sit to stand test). This is the first part of a more demanding test involving getting up and sitting down again several times. Being able to do one chair rise was chosen because, if failed, it suggests severe limitations on one's ability to function without aids. The ability to rise from a chair unassisted also depends on various cerebral processes (Lord et al., 2002). The protocol for this, summarised in a previous ELSA report, is briefly as follows:

> Respondents were asked to stand up from a firm chair without using their arms … While doing the test, respondents had to keep their arms folded across their chest and their feet on the floor … each rise was counted as complete when the respondent was fully standing with his or her back straight (Melzer et al., 2006, p. 171).

* The gripometer used was the 'Smedley's for Hand' Dynamo Meter, scale 0–100kg.

Cognitive function

Cognitive function is included as another indicator of need for assistance. Two summary measures of cognitive function are used here and as they are direct tests, they do not apply to people for whom a proxy interview is undertaken. The first is a memory scale from 0 to 27 combining results from four tests: orientation in time; knowing the day and date; word list learning (immediate and delayed recall of ten words given to the respondent); and prospective memory, involving remembering what to do when prompted. For the last of these tests, the respondent is told the task early in the cognitive performance part of the interview and also the cue that they will be given to undertake this task. When the appropriate point in the session was reached for the respondent to carry out the action, the interviewer waited for 5 seconds to see if the respondent performed the correct action without a prompt. If they failed to carry out the action spontaneously, the interviewer reminded them that they were going to do something, and recorded what the respondent then did. A correct response requires the person to carry out the correct action without being reminded. The second cognitive measure is an executive function scale from 0 to 23 combining results from two tests. The first concerns verbal fluency in which the respondent was asked to mention in one minute as many words as possible that belong to a specified category. The second test concerns visualisation and processing speed, in which respondents were given a page of random letters and asked to cross through as many target letters (P and W) as they found in 1 minute. More information about these tests is given in Chapter 8 of the ELSA wave 2 report (Huppert, Gardener and McWilliams, 2006).

Sources of help

In the main interview, after the questions on motor functions and activities of daily living, respondents are asked: ‘thinking about the activities that you have problems with, does anyone ever help with these activities (including your partner or other people in the household)?’

If they answer yes they are then asked who helps them for each of seven sets of motor skills or activities of daily living. They are given 12 categories to choose from: spouse or partner; son; daughter; sister; brother; other relative; privately paid help; local authority or social services helper, e.g. home care worker; nurse, e.g. health visitor or district nurse; member of staff at care or nursing home; friend or neighbour; other. For most of the analyses in this chapter people with at least one limitation in daily activities (or motor skills) have been classified into four groups as given below. The percentage in brackets is the weighted (but not age-standardised) percentage of all those with at least one limitation in a daily activity.

- No help reported, designated as NH (58.5%).
- Informal help only, designated as IH (33.8%) – reported help from family, friends or neighbours but not from a paid or state source.
- Paid help, designated as PH (3.8%) – reported privately paid help but not from a state source: 54% of these also reported informal help.

- State help, designated as SH (3.9%) – reported help from social services, nurse, care assistant: 69% also reported informal care, 15% paid help; 12% of those with state help had both informal and paid help.

Although it would have been useful to look at characteristics by combination of sources, numbers were too small to allow for this.

Giving help outside the family

Respondents were asked about help they have provided as an individual (that is, not through an organisation, club or group) to friends, neighbours or other people (not relatives) in the last 12 months. Using a checklist of ten different types of help, respondents were asked whether they had or had not provided that help.

Active provision of care

Respondents were asked what activities they had undertaken in the last month, including paid work, voluntary work, education and caring for someone. Multiple responses were permitted. For those who indicated that they had provided some form of care in the previous month, an additional set of questions concerning that care was administered. The first additional question was whether they had provided care in the last week. Only those who affirmed this were asked in more detail about active provision of care. They were asked about the relationship of carer to care recipient(s), with possible responses being spouse or partner, child, grandchild, parent, parent-in-law, other relative, friend or neighbour, other. The total number of hours spent caring was also asked, with 168 hours indicating full-time caring. Respondents were also asked about their reasons for caring. The focus in this chapter is on those who selected 'Because I feel obliged to do it' as one of the reasons. Two questions asked whether, considering all the efforts that they have put into caring for someone, (1) respondents were fully satisfied with what they have gained so far, and (2) whether respondents have always received adequate appreciation from others.

Socioeconomic measures

Two indicators of socioeconomic position were used in this chapter, namely non-pension wealth and level of deprivation in the area of residence based on the Index of Multiple Deprivation (IMD 2007) (Communities and Local Government, 2007). Material resources may affect the scope for buying in help and so affect both the sources of help for recipients of care and the provision of help by those who have a relative or friend in need of help. The level of deprivation of the area may affect the caring opportunities that are available.

Classificatory measures

Three age groups have been created to reflect different stages of life: 50–64 years (age at which paid work is still fairly common and problems with daily living are expected to be unusual); 65–74 years (age at which people may be fairly active but have more problems with functioning and there are more care demands on them); and 75 years and over (age at which the need for help is anticipated to be more common).

Analyses

Each section starts with descriptions of the sample covered. All results are cross-sectional and refer to wave 4 which took place in 2008–09. Unless otherwise stated the percentages are age-standardised to the age distribution of the wave 4 core sample and weighted to adjust for non-response and the different periods of recruitment (see Chapter 10).

There are several factors that must be taken into account when using ELSA data to describe who gives and receives help and care. For example, the age of the respondent influences the opportunity to have grandchildren or indeed children (although the analyses presented here are limited to core respondents aged 50 and over). Socioeconomic background may be associated with the timing of childbearing and so again can be associated with whether or not a respondent has children or grandchildren. One other important factor to consider is that there may be selection into caregiving by health status. In other words, people who have existing health conditions may be less likely to provide care. Some of the analyses presented here therefore use statistical methods (regression) which take account of respondent's age, socioeconomic status and perceived general health. For all analyses, a p-value of 0.05 is considered statistically significant.

9.3 Receipt of help with limitations in daily activities

In Table 9.1 the prevalence of having limitations and receipt of help is given by sex and age. There was a clear gradient of greater presence of limitation at older ages, especially at 75 and over. In each age group women were more likely to have limitations than men. The oldest age group not only had the highest percentage of people with limitations but were most likely to receive help if they had one. Informal help, especially help from spouse, was received by substantially more people than formal help. While one in three of those with physical limitations received informal help, approximately one in 40 men and just under one in 20 women received paid help. One in 30 men and women received state help. Women aged 75 and over who had difficulties were much more likely to receive formal help (that is, paid or state help) than all other groups.

In Table 9.1 the percentages are based on all those with a difficulty regardless of their family circumstances. Clearly, receipt from spouse/child is not possible if there is no spouse/child. Further analyses taking into account whether the respondent had a partner or had children (not shown) revealed that among women with a partner the likelihood of receiving help from that partner was no less at older than at younger ages. In addition, logistic regression showed that having a child and having a partner independently decreased the likelihood of having privately paid help (odds ratio for paid help if had a child versus not 0.54, 95% confidence interval [CI] 0.39, 0.74; odds ratio if had a partner versus not 0.44, 95% CI 0.33, 0.60). Receipt of state help was more strongly associated with presence or absence of a partner than the existence of a child (odds ratio if had child versus not 0.57, 95% CI 0.39, 0.82; odds ratio if had partner versus not 0.35, 95% CI 0.25, 0.49). The information in the study

did not allow us to explore more details of the availability of children. Ideally, further exploration would take into account geographical distance, work and family commitments of the children, and attitudes towards giving and receiving care within the family.

Table 9.2 shows the demographic and socioeconomic characteristics of the groups. The PH and SH groups are less likely to have a partner or to have children in the household than the other groups with limitations in daily activities,[1] and also less likely to have children outside the household although the majority have at least one child. This would be consistent with the absence of family support being one reason for people either seeking formal help (especially if paying for it) or being found eligible for it.

Table 9.1. Percentage with at least one physical limitation and, of those, percentage receiving help from various sources, by age and sex (2008–09)

Core respondents, 2008–09

	Men				Women			
	50–64	**65–74**	**75 and over**	**All**	**50–64**	**65–74**	**75 and over**	**All**
% with at least one limitation with daily activities	39.0	53.8	74.3‡	52.5	53.2	68.1	85.8‡	64.9
Source of help for those with limitation (%)								
Any source	31.4	31.4	48.0	33.6	37.3	43.0	59.2	44.1
Spouse/partner	24.7	20.9	27.8	23.6	24.8	27.7	14.8	24.3
Child[a]	7.2	7.1	15.9	8.5	12.8	11.7	29.1	16.2
All informal[b]	30.1	28.4	44.1	31.6	35.4	40.4	50.4‡	40.8
Paid help	0.9	2.2	5.7‡	2.4	1.7	4.9	11.3‡	5.2
State[c]	1.8	2.7	5.9‡	3.1	1.1	1.9	10.5	3.3
All formal	2.7	4.8	10.2‡	5.1	2.7	6.2	20.3‡	7.9
Unweighted N								
All	*2,201*	*1,364*	*826*	*4,391*	*2,683*	*1,571*	*1,132*	*5,386*
With physical limitation	*861*	*724*	*611*	*2,196*	*1,420*	*1,075*	*962*	*3,457*

[a]Child refers to any son or daughter of any age. No definition was given to respondents regarding inclusion of step or in-law; this would depend on how they perceived their relationship.
[b]Includes family, neighbours and friends. A small group of 'other' sources (1.2%, 63 people) are excluded from the informal and subtotals but included in 'any source'.
[c]Social Services, nurse or care assistant.
Notes: Percentages in the columns for all men and for all women are weighted and age-standardised; *p<0.05; †p<0.01; ‡p<0.001. P-values refer to log-linear trends across age groups for males and females separately; there was departure from linearity with a greater difference between the upper two age groups than the lower ones with respect to help from spouse or child and, for men, with respect to total informal help.

[1] However, the difference was not statistically significant for women.

Table 9.2. Demographic and socioeconomic characteristics by source of help[a] and sex (2008–09)

People with limitations in daily activities

	Men				Women			
	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)
	%	%	%	%	%	%	%	%
Age				‡				‡
50–64	47.5	41.6	18.7	24.9	49.0	40.0	13.5	11.0
65–74	29.5	23.5	25.5	23.3	27.1	26.3	22.5	11.5
75+	23.0	34.9	55.8	51.8	23.9	33.7	64.0	77.5
Has partner	69.1	81.5	40.1	45.7‡	55.8	67.2	38.6	28.2‡
Has child:								
in household	27.6	29.6	2.8	12.0‡	26.8	27.9	13.1	12.1
outside h.h.	72.9	78.4	61.6	58.7†	76.2	82.1	72.9	75.8†
Wealth quintile[b]				‡				‡
Poorest	21.8	35.4	15.0	51.7	22.6	29.1	16.2	58.5
2nd	21.6	26.6	21.5	25.5	19.6	26.0	24.5	24.6
3rd	20.6	12.5	19.7	11.1	20.2	20.7	18.1	3.4
4th	19.4	14.8	29.5	11.6	21.6	14.5	15.1	6.9
Wealthiest	16.6	10.7	14.2	0.0	16.1	9.7	26.1	6.5
Area deprivation (IMD) quintile				‡				‡
Most deprived	17.5	30.4	8.3	36.7	16.8	20.0	18.9	25.0
4th	18.5	18.6	18.4	19.0	17.0	20.2	9.4	26.3
3rd	19.2	17.4	33.7	20.9	19.7	20.8	20.1	18.5
2nd	24.7	16.8	25.0	16.7	23.6	22.5	17.3	19.1
Least deprived	20.1	16.8	14.6	6.7	22.9	16.5	34.2	11.1
In retirement housing[c]	3.8	4.1	8.9	15.6‡	5.8	6.5	5.4	21.5‡
Unweighted N	*1,431*	*644*	*53*	*68*	*1,940*	*1,206*	*182*	*129*

[a]The PH group had privately paid help for at least one type of difficulty; they may also have had informal help but did not receive state help. The SH group received help from social services, care assistant or nurses; they may also have received help from family or had paid help.

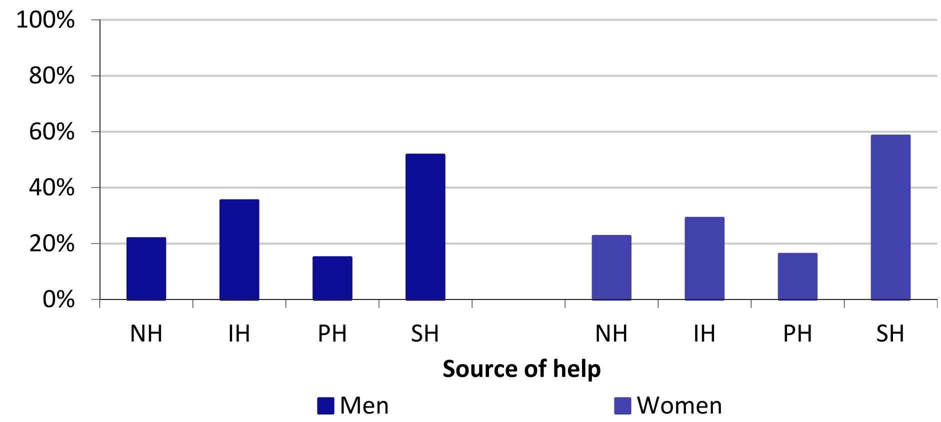
[b]There were 115 missing values of wealth so bases were a little smaller for the wealth distributions but only two people with state help were missing wealth. Wealth includes housing, savings, tangible assets but not pension wealth.

[c]Retirement housing was defined as accommodation only available to those over a certain age (usually 55 or 60 years).

Notes: Weighted; age-standardised to the age distribution of core members taking part in wave 4. * p<0.05; † p<0.01; ‡ p<0.001. P-tests for heterogeneity across help groups for men and women separately.

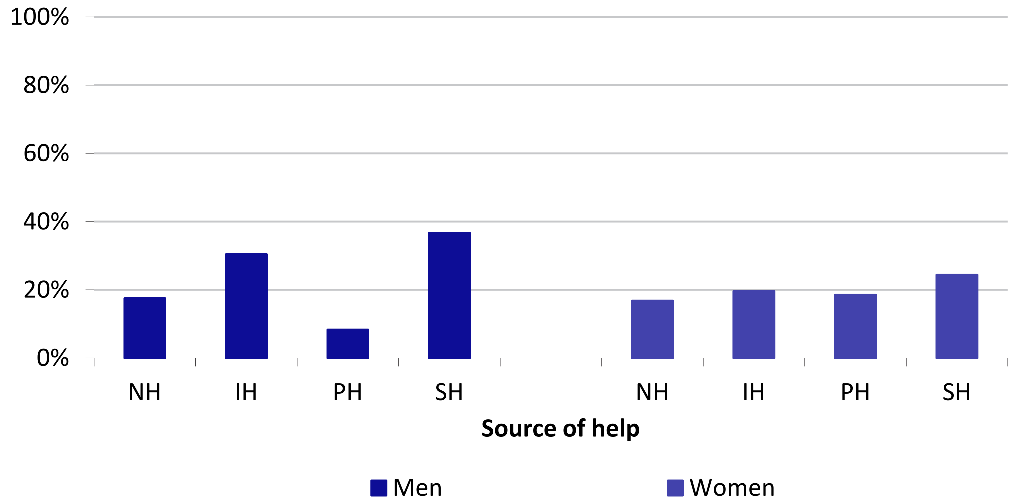
Figure 9.1 shows that, among respondents with limitations in daily activities, the SH group are most likely to be in the poorest wealth quintile while the PH group are least likely to be so. However, differences in percentages in the most deprived quintile of area deprivation are less clear-cut (Figure 9.2). Greater detail in Table 9.2 shows that people in the PH group are significantly wealthier and live in less deprived areas than those in the SH group. People with no help (NH) are also generally wealthier and, for men, in less deprived areas than those only receiving informal help (IH). The SH recipients are substantially more likely than other groups to be in retirement housing (in the questionnaire this is described as accommodation only available to those over a certain age, usually 55 or 60). This housing will often have, at minimum, a warden on site and various other facilities catering for disabilities.

Figure 9.1. Percentage in poorest wealth quintile by source of help with limitations in daily activities, and sex (2008–09)



Notes: Weighted, age-standardised. See Table 9.2 for base numbers.

Figure 9.2. Percentage in most deprived quintile of area deprivation (IMD 2007) by source of help with limitations in daily activities, and sex (2008–09)



Notes: Weighted, age-standardised. See Table 9.2 for base numbers.

Levels of functioning by source of help

The functioning measures used in this section are described in Section 9.2. Not all respondents could take the tests and this omission was sometimes in itself an indicator of lack of strength to do so. It was thus decided that the comparisons across groups would provide a better indication of functioning if some categories of non-response to the item were included. Overall 18% of respondents to the interview were not involved in the nurse visit. This analysis assumes that differential drop-out by source of help will be correlated with functioning.

Table 9.3 provides information on self-reported limitations and Figure 9.3 illustrates the number of limitations. It can be observed that people who receive state help are significantly more burdened with difficulties in motor skills and ADL than other groups and nearly all those in the PH and SH groups have difficulty with at least one IADL.

Figure 9.4 shows that the SH group were clearly least likely to undertake the gait speed test. This test applies to people aged 60 years and over. ‘Unable’ here includes people who were not tested because of health restrictions, those for whom the test was judged unsafe and those who tried the test and could not do it. Proxies, people who refused and those unable to do the test for technical reasons (e.g. no space to do it) were omitted from the graph (264 people in total). It is likely that this figure underestimates the difficulties experienced by the SH group as a higher percentage of them were omitted, mainly because they were proxies.

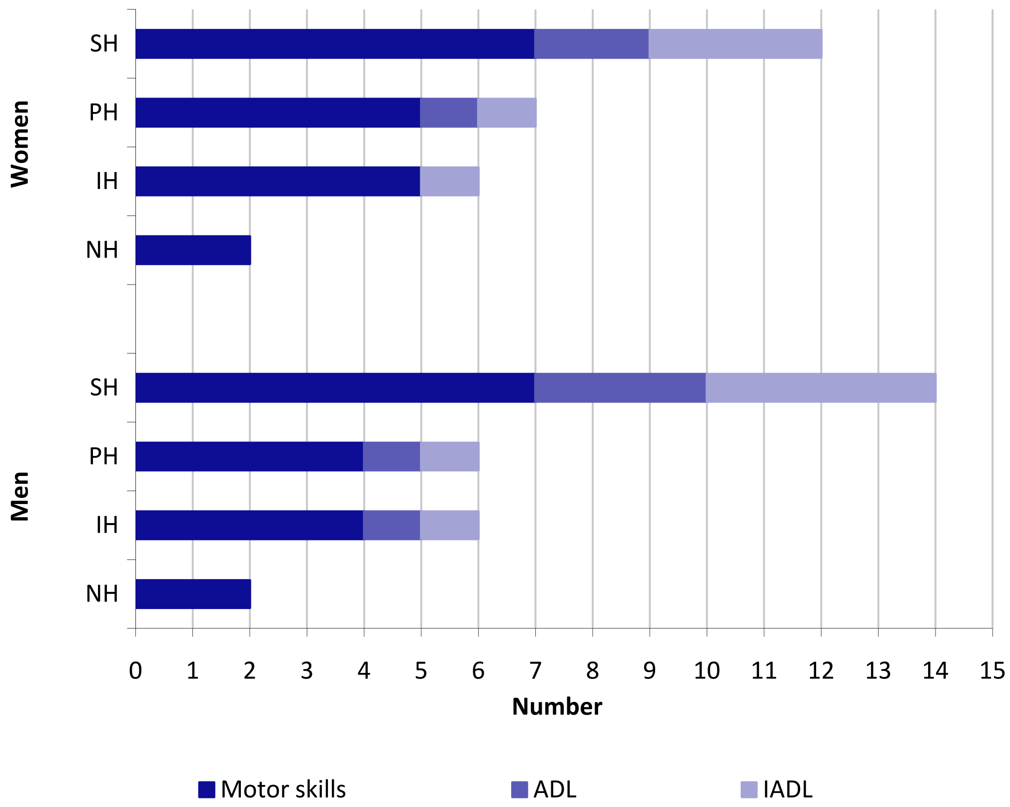
Table 9.3. Subjective measures of functioning by source of help, and sex (2008–09)

People with limitations with daily activities

	Men				Women			
	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)
	%	%	%	%	%	%	%	%
Difficulty with:								
2 or more motor skills	50.7	87.6	97.4	84.3‡	59.7	88.4	96.4	89.7‡
1 or more ADL	22.5	62.9	59.8	82.7‡	18.7	42.1	58.1	91.1‡
1 or more IADL	18.9	70.8	93.6	98.6‡	16.5	61.8	92.4	94.0‡
Disability Index					‡			‡
None	37.3	8.8	0.9	4.7	31.2	11.8	2.8	1.6
Mild only	30.7	12.0	5.5	0.0	40.2	20.5	3.0	1.6
Severe	31.9	79.2	93.6	95.3	28.6	67.7	94.2	96.9
Interview by proxy	1.5	5.5	3.2	24.0‡	0.8	3.0	1.0	14.2‡
Unweighted N	*1,431*	*644*	*53*	*68*	*1,940*	*1,206*	*182*	*129*

Notes: Weighted; age-standardised to the age distribution of core members taking part in wave 4 (2008–09). *p<0.05; † p<0.01; ‡ p<0.001. P-tests for heterogeneity across help groups for men and women separately.

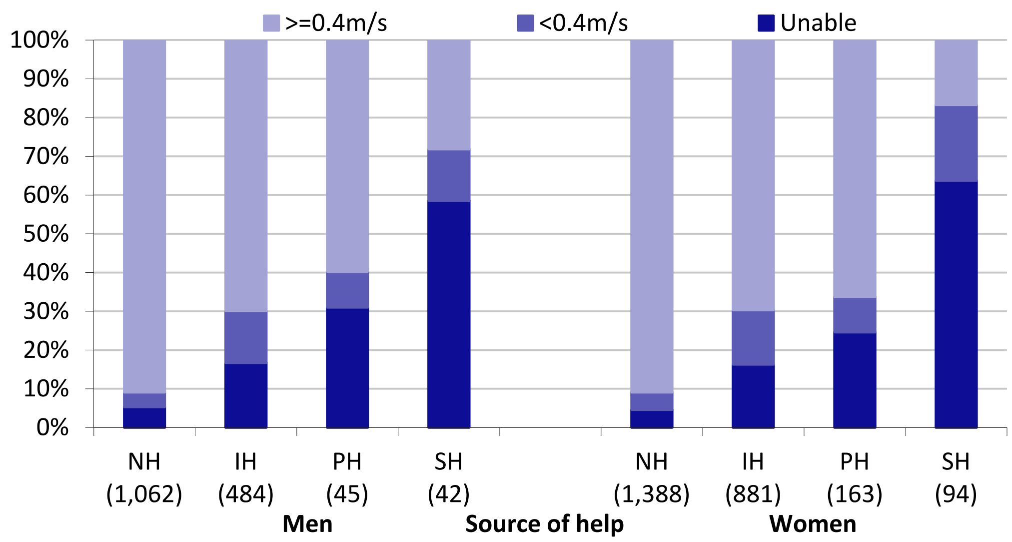
Figure 9.3. Median number of motor skills and daily activities with which people had difficulty, by source of help, and sex (2008–09)



Notes: Weighted but not age-standardised. p<0.001 for each component and total limitations; tested by nonparametric equality-of-medians test on unweighted data. See Table 9.3 for base numbers.

Figure 9.4. Gait speed performance, by source of help received with limitations in daily activity and sex (2008–09)

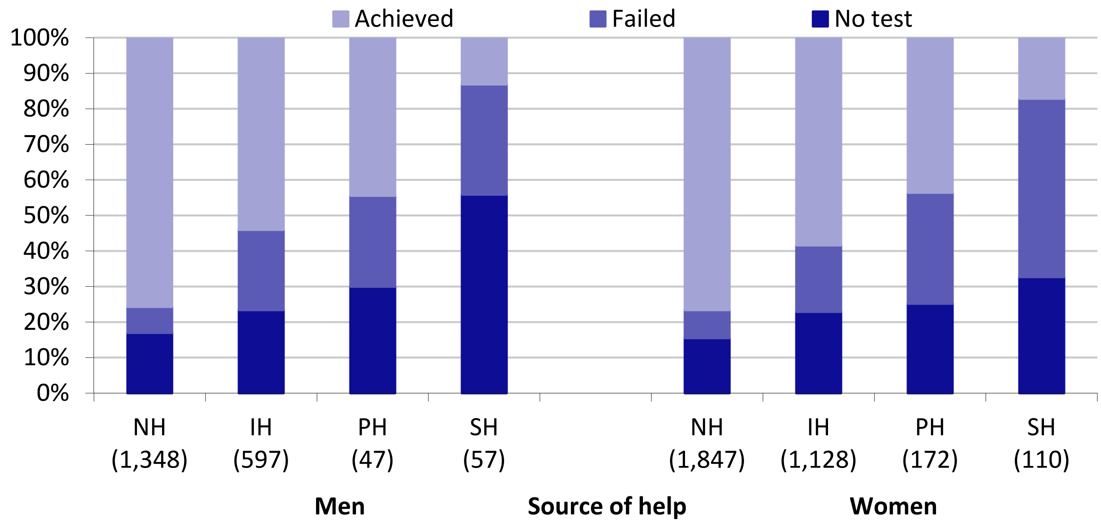
People aged 60 and over with limitation in daily activity



Notes: Weighted, age-standardised. The numbers in brackets are the base numbers (i.e. those included in the analysis). p<0.001 for both men and women.

Figure 9.5. Achieving a single chair rise, by source of help received with limitations in daily activity and sex (2008–09)

People with limitation in daily activity



Notes: Weighted, age-standardised. The base numbers are in brackets. p<0.001 for both men and women. 'No test' includes those who did not do the nurse visit, and those for whom the test was considered unsafe by the respondent or interviewer.

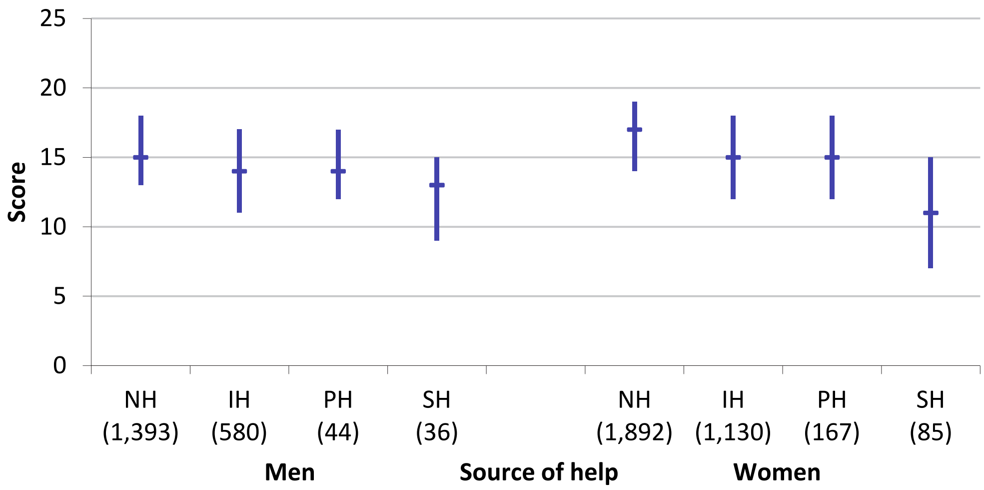
Figure 9.5 reinforces the picture of very limited functioning among people receiving help from the state. Only 13% of men and 17% of women (age-standardised) receiving state help showed that they could rise from a chair. Only just under half of the men with state help did a nurse visit and tried the grip strength test (results not shown) and despite small numbers in this group a regression analysis showed that they had the weakest strength. The numbers were too small to draw firm conclusions about the magnitude of their grip strength. Among women the percentages with a grip strength measure were fairly similar at three out of four or just under for all three groups receiving help (higher for those who did not). However, among women with state help who could try the test the average strength was only 16.6kg (95% confidence interval 16.0–17.3 kg) while the average for those with no help was 24.2 kg (95% confidence interval 23.8–24.6 kg).

As with the limitations of daily activity, and objective physical measures, the SH group performed the worst on objective cognitive tests (Figures 9.6 and 9.7). There was, however, considerable overlap between the groups in the scores achieved. Adjusting for sex and age, the mean scores for the PH group were not statistically different from the NH group whereas the mean scores for both the IH and SH groups were lower (p<0.001). However, only half of men with SH had the two scores respectively compared with over four-fifths of others for the memory tests and over two-thirds of others for the executive function tests. Although higher percentages of women undertook the tests, there was still a substantial gap between the likelihood of those with SH having scores and others (not shown). Thus, again, the differences in performance may be underestimated.

Summarising the functional measures, the SH group were clearly most affected while the PH group were more like the IH group than the SH one with the exception of severe disability on the disability index and reporting difficulty with at least one IADL.

Figure 9.6. Median (interquartile range) memory score, by source of help and sex (2008–09)

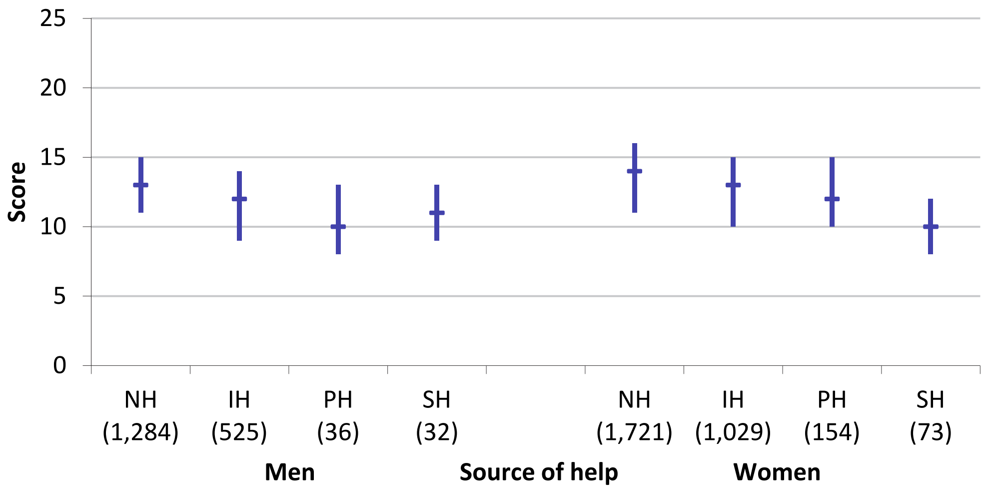
People with limitation in daily activity who completed memory tests



Notes: Weighted, unstandardised. The base numbers are in brackets. The score range is 0–27.

Figure 9.7. Median (interquartile range) executive score, by source of help and sex (2008–09)

People with limitation in daily activity who completed memory tests



Notes: Weighted, unstandardised. The base numbers are in brackets. The score range is 0–23.

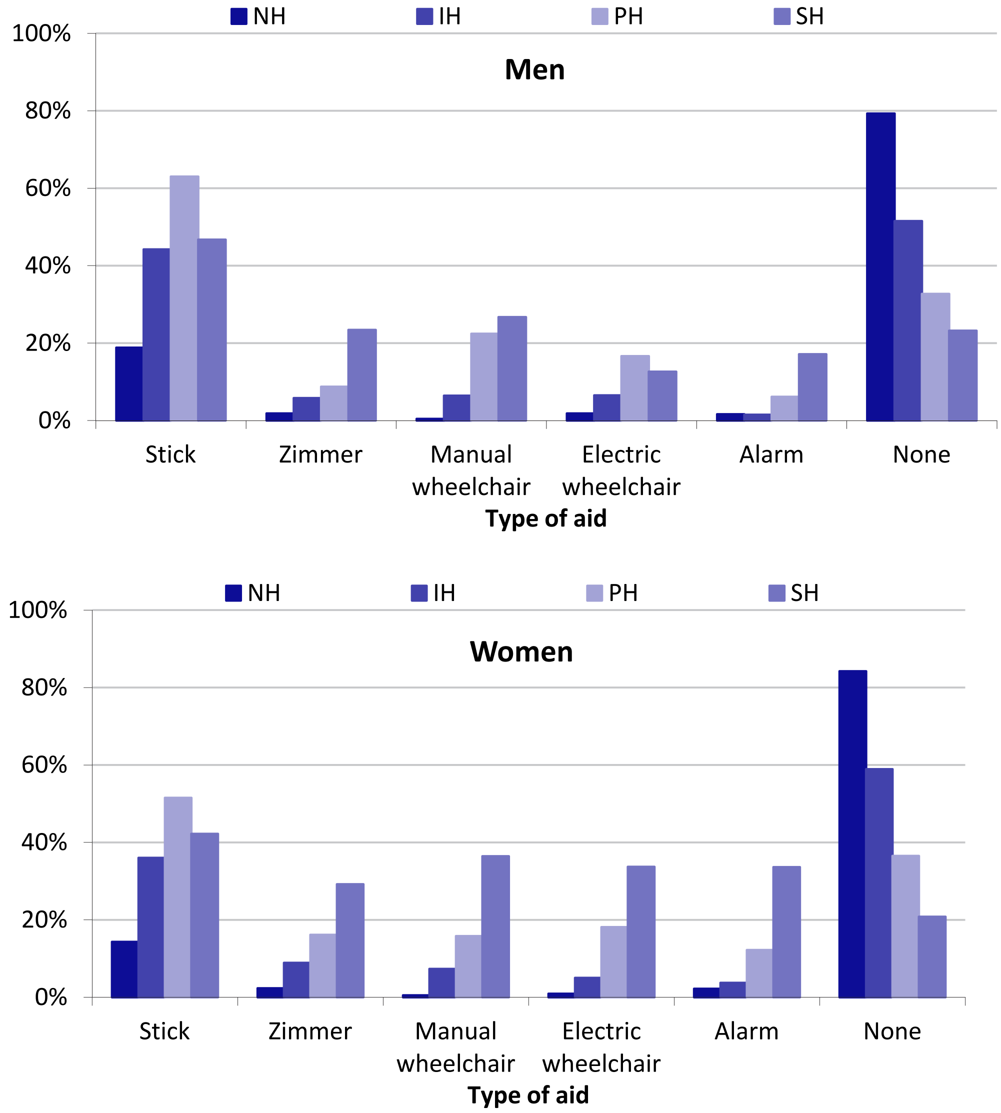
Aids and adaptations available

The ELSA interview includes questions on use of certain personal aids by people who have reported difficulty with at least one limitation in daily living (as given in Box 9.1). The aids that are included in the question are mainly ones that facilitate ambulation or moving around. In the housing part of the interview there are also questions on adaptations in the house, although these need not have been done specifically for the person in question.

Figure 9.8 shows that, in line with the greater number of functioning limitations, the SH group were least likely to be without any aid (one in five compared to four in five of those not receiving help – weighted and age-standardised percentages). They were also most likely to have any one of the aids except a walking stick and, for men, a wheelchair or buggy.

Figure 9.8. Use of aids by source of help (2008–09)

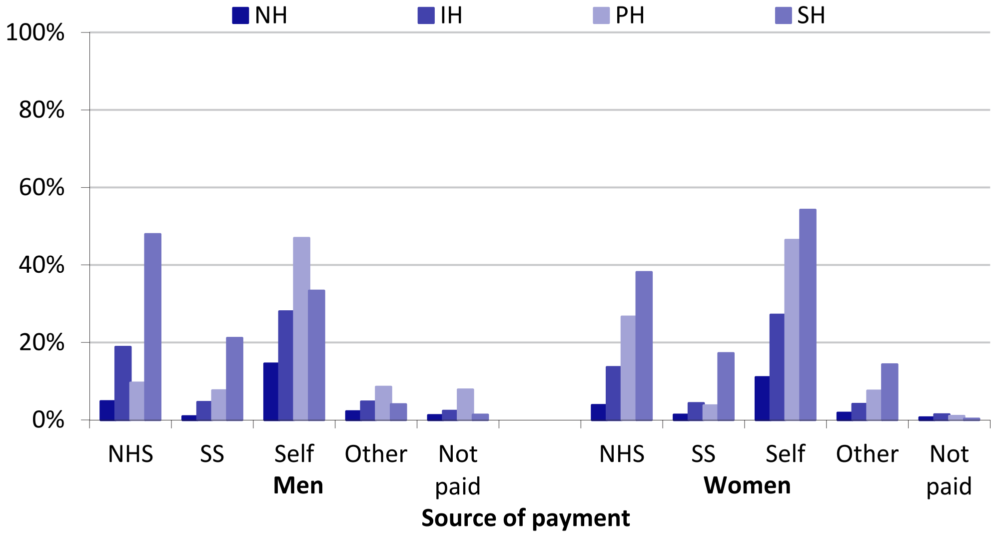
People with limitations in daily activities



Notes: Weighted, age-standardised. See Table 9.2 for base numbers. p<0.001 for tests of heterogeneity across sources of help for all categories of aid. The categories are: walking stick or cane; zimmer frame or elbow crutches; manual wheelchair; electric wheelchair or buggy or scooter; personal alarm; none of the aids above or a special eating utensil.

Figure 9.9. Percentage with aid paid from specified source, by source of help (2008–09)

People with limitation in daily activity



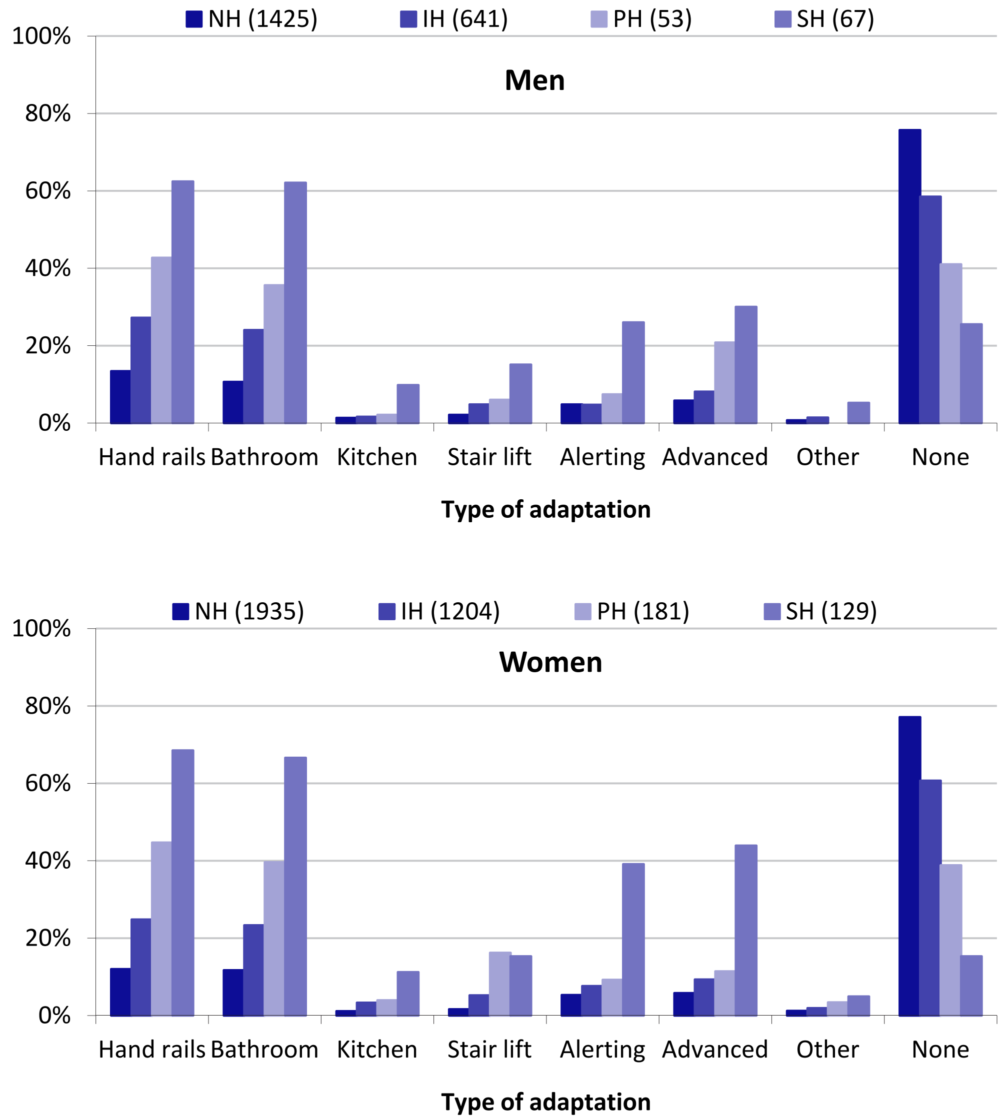
Notes: Weighted, age-standardised. See Table 9.2 for base numbers. p<0.001 for tests of heterogeneity across sources of help for all sources of aid except 'not paid' for which p=0.01 for both men and women.
NHS = National Health Service; SS = Social Services; Self = respondent or spouse/partner; not paid = acquired the aid without any purchase involved.

Respondents were also asked who had paid for the aids that they used; in particular they were asked to indicate if the National Health Service (NHS) had paid, or Social Services (SS) or themselves (Figure 9.9). They could also specify other sources. Elbow crutches were most likely to be paid for by the NHS (over two-thirds) while zimmer frames and manual wheelchairs were equally likely to be paid for by the respondent and the NHS (roughly one-third each). Except for these three items, more people reported paying themselves than reported any other single source; indeed nine out of ten with buggies had paid for them themselves. Figure 9.9 gives the age-standardised percentages of all in that group (whether they had any aids or not) who reported that they had at least one aid from a specific source. About half the women in the SH group had paid for at least one aid themselves. The PH group were noticeably less likely than the SH group to have an aid funded by either the NHS or the social services.

Figure 9.10 displays a steep gradient in percentages without any of the listed housing adaptations according to the help received for their limitation with daily living. Hand rails and bathroom adaptations were generally more commonly available than other aids but still showed clear differences according to source of help. On the whole the SH group were most likely to have any one of the adaptations shown (exceptions for women being stair lift and the miscellaneous 'other' group). This in part reflects their greater likelihood of being in retirement housing.

Figure 9.10. Availability of house adaptations, by source of help (2008–09)

People with limitation in daily activity

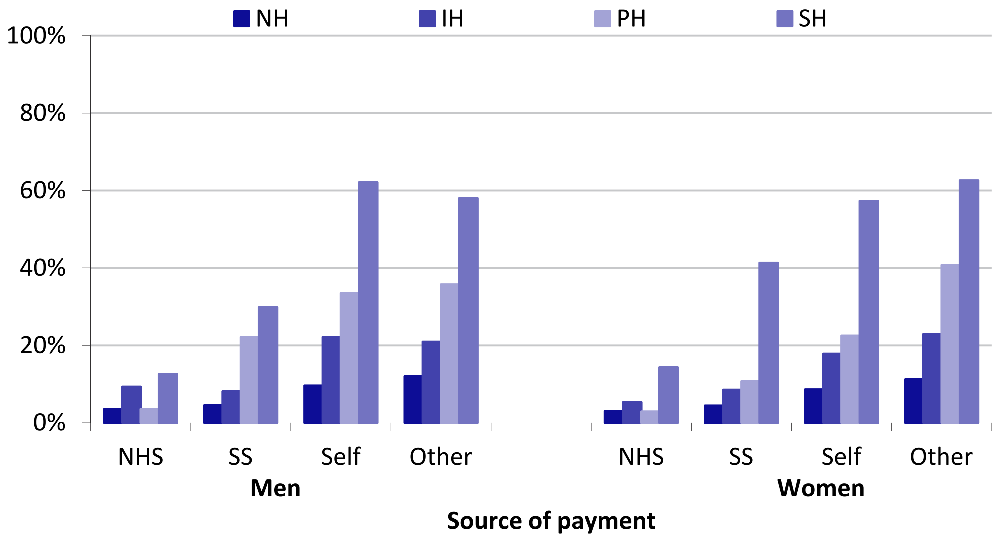


Notes: Weighted, age-standardised. Base numbers in brackets after category heading. $p<0.001$ for tests of heterogeneity across sources of help for all forms of adaptation except $p=0.007$ for men and $p=0.02$ for women with respect to the 'other' category. The categories are: hand rails; bathroom adaptation; kitchen adaptation; stair lift or glide; alerting device; advanced/widened doorways and/or ramps or street-level entrances and/or automatic or easy-open doors and/or lift and/or accessible parking or drop-off site.

Figure 9.11 indicates that, as for personal aids, paying for adaptations oneself was common even among the SH group but women helping this group were more likely to have had an adaptation paid for by the social services than those in other groups.

Figure 9.11. Percentage with housing adaptation paid for from specified source, by source of help (2008–09)

People with limitation in daily activity



Notes: Weighted, age-standardised. See Figure 9.10 for base numbers. $p<0.001$ for tests of heterogeneity across sources of payment for both men and women.
NHS = National Health Service; SS = Social Services; Self = respondent or spouse/partner; other – either someone other paid (e.g. family) or was already in the home.

Access to services

The self-completion questionnaire includes items on ease of access to services that are used by most of us at some time or another. For the purposes of this chapter, access is seen as an outcome because help with difficulties in daily activities can include help to gain access to services.

The question asks: 'How easy or difficult is it for you to get to each of the following places using your usual forms of transport?' and there are six response options: very easy; quite easy; quite difficult; very difficult; unable to go; do not wish to go. In this section we examine how this varies with the source of help for limitations with daily activities. The responses have been grouped into three categories: easy, combining very easy and quite easy; difficult or unable, combining quite difficult, very difficult and unable; and not wishing to go.

Table 9.4 covers shopping and obtaining money and Table 9.5 covers health services. In every case there is a stark contrast in percentages reporting difficulty of access between the SH group and all the others. The percentages reporting barriers to access tend to be in the range 40–60% for people in the former group compared to less than 40% for others.

This is also clear from Figure 9.12, giving the distribution of number of services for which an individual reported difficult access. Chiropody has been excluded because of relatively low response to this question and the analysis is confined to those who answered all the remaining nine access questions. It is noticeable that half the women helping the SH group reported difficulty or inability in accessing six to nine services. Although there were too few men in the SH group to show separately, the indication for them was also that they

had difficulty in accessing more services than others. The differences between groups may be underestimated since people receiving formal help were less likely to answer these questions (for example proxy respondents did not receive them). Although the weight used took account of non-response to the self-completion questionnaire this may not have compensated fully for differentials arising from more limited functioning.

Table 9.4. Self-reported ease of access to retail services by source of help and sex (2008–09)

People with limitations in daily activities

Service	Men				Women			
	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)	No help (NH)	Informal only (IH)	Paid help (PH)	State help (SH)
	%	%	%	%	%	%	%	%
Bank or cash point				‡				‡
Easy	92.4	83.3	[83.3]	–	94.0	80.4	76.1	52.1
Difficult; unable	6.0	14.3	[11.7]	–	5.4	17.8	20.7	43.6#
No wish to go	1.6	2.3	[5.0]	–	0.7	1.8	3.2	4.3
Post Office				‡				‡
Easy	90.9	81.4	[79.0]	[52.9]	93.8	79.3	75.4	43.3
Difficult; unable	8.3	16.8	[12.6]	[46.5]#	5.8	19.1	22.1	51.3#
No wish to go	0.8	1.8	[8.3]	[0.7]	0.4	1.6	2.5	5.5
Corner shop				‡				‡
Easy	90.2	79.1	[75.4]	–	91.8	78.4	73.7	43.6
Difficult; unable	7.1	15.5	[7.8]	–	5.9	17.5	21.7	46.6#
No wish to go	2.7	5.4	[16.8]	–	2.3	4.1	4.6	9.8
Large or medium supermarket				‡				‡
Easy	92.5	79.1	[91.9]	–	93.7	78.9	74.6	46.1
Difficult; unable	7.1	18.4	[8.1]	–	6.0	19.9	20.9	53.9#
No wish to go	0.4	2.5	[0.0]	–	0.3	1.2	4.5	0.0
Shopping centre				‡				‡
Easy	85.0	70.9	[73.6]		87.0	70.6	60.4	38.0
Difficult; unable	13.2	22.6	[26.4]		11.4	26.1	33.8	60.1#
No wish to go	1.8	6.5	[0.0]		1.6	3.3	5.8	1.9
Unweighted N	*1,180*	*477*	*36*	*30*	*1,662*	*937*	*131*	*64*

Notes: Weighted; age-standardised. *$p<0.05$; † $p<0.01$; ‡$p<0.001$. P-tests for heterogeneity across help groups for men and women separately. # indicates that percentage for whom access was difficult was greater for those who received help than for any other group, $p<0.05$. Base numbers varied slightly from service to service and were <30 for men receiving state help with respect to all but post office.

Within the limitations of this information, it appears that difficulty of access was most common for shopping centre and hospital, both of which are confined to a smaller number of locations than the other services. It is interesting that so many reported difficulty with access to a chiropodist given that higher numbers omitted this question. This is the only service for which a substantial percentage of respondents reported no need and for which a substantial percentage gave no answer. It is possible that many of those who did not answer had not yet sought access to a chiropodist and did not know where to find one. The PH group was fairly similar to the IH group with respect to numbers of services for which access was difficult or impossible.

Table 9.5. Self-reported ease of access to health services by source of help and sex (2008–09)

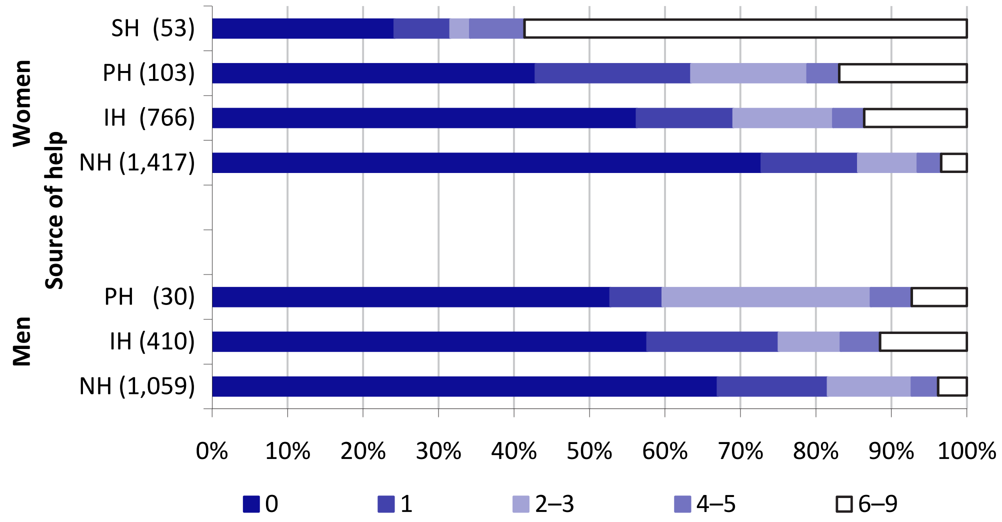
People with limitations in daily activities

Service	Men				Women			
	No help (NH)	**Informal only (IH)**	**Paid help (PH)**	**State help (SH)**	**No help (NH)**	**Informal only (IH)**	**Paid help (PH)**	**State help (SH)**
	%	%	%	%	%	%	%	%
GP				‡				‡
Easy	91.3	84.3	[84.6]	[56.9]	94.0	85.1	77.8	45.0
Difficult; unable	8.7	15.3	[11.5]	[43.1]#	6.0	14.6	21.3	55.0#
No wish to go	0.0	0.4	[3.9]	[0.0]	0.0	0.3	0.9	0.0
Chiropodist				‡				‡
Easy	55.8	53.0	[54.8]		64.4	59.9	50.2	32.6
Difficult; unable	12.1	20.4	[16.9		8.9	16.4	22.2	53.5#
No wish to go	32.1	26.5	[28.3]		26.6	23.7	27.6	13.8
Dentist				‡				‡
Easy	79.3	73.3	[65.8]		85.9	73.4	70.1	45.4
Difficult; unable	15.2	19.0	[23.5]		10.5	18.8	24.5	50.0#
No wish to go	5.5	7.8	[10.7]		3.7	7.8	5.4	4.7
Optician				‡				‡
Easy	90.4	81.2	[71.5]	[60.4]	93.5	81.7	75.9	48.9
Difficult; unable	6.9	16.5	[19.4]	[38.3]#	5.3	16.8	21.4	51.1#
No wish to go	2.7	2.3	[9.1]	[1.3]	1.2	1.5	2.7	0.0
Hospital				‡				‡
Easy	82.3	72.0	[79.3]	[52.4]	83.6	71.8	68.2	48.5
Difficult; unable	16.1	26.6	[18.0]	[47.6]#	15.8	27.0	27.7	50.7#
No wish to go	1.6	1.4	[2.7]	[0.0]	0.6	1.3	4.2	0.8
Unweighted N	*1,141*	*463*	*36*	*30*	*1,613*	*922*	*132*	*63*

Notes: Weighted; age-standardised. See notes to Table 9.4. Base numbers were lowest for chiropody for which 3,802 answered compared to 4,549 average for the rest. Base numbers were <30 for men receiving state help with respect to the chiropodist and dentist.

Figure 9.12. Distribution of number of services which respondents had difficulty accessing or were unable to access, by source of help and sex (2008–09)

People with limitations with daily activities answering nine access questions, excluding chiropody



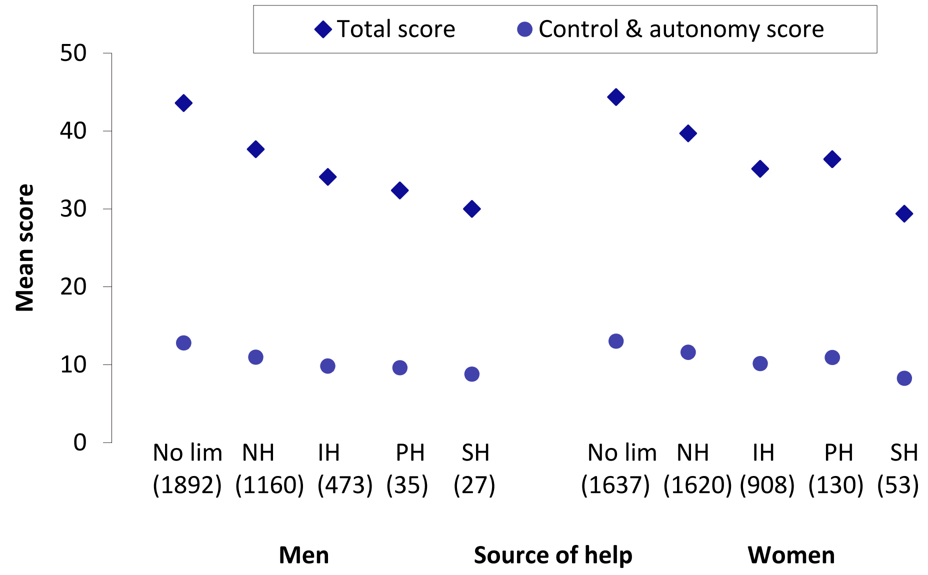
Notes: Weighted, age-standardised. Base numbers in brackets. p<0.001 for heterogeneity across groups for both men and for women. State help not shown for men owing to small numbers.

Quality of life score by source of help

Figure 9.13 shows that, adjusted only for age, the mean CASP-19 score is progressively worse from no limitations through to state help except that, for women, the score for those with paid help is on a par with those who receive informal help only. The pattern is similar for the control and autonomy sub-scale (potential range 0–18).

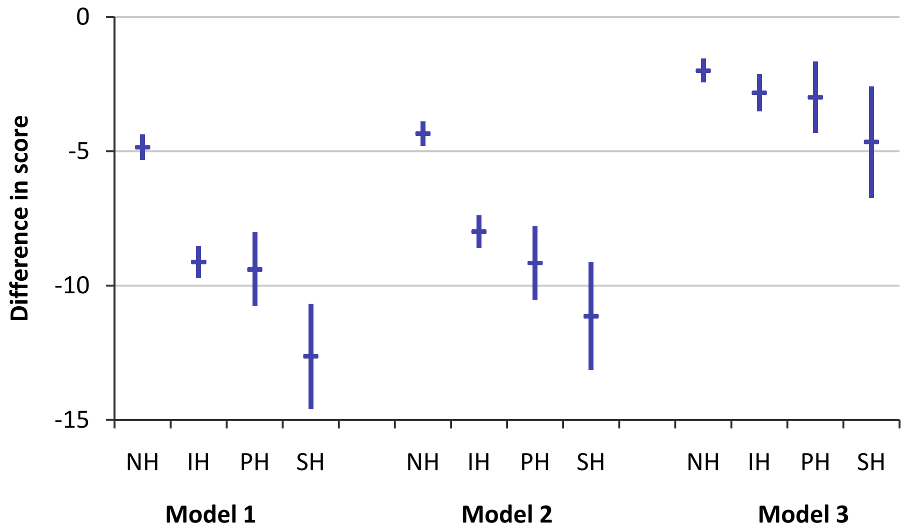
The total and sub-scale scores were then modelled, using linear regression, to see whether these differences are accounted for by some other factors. Figure 9.14 shows the quality of life scores for the NH, IH, PH and SH groups compared to those with no limitations in daily activities. A model adjusted for demographic factors (age, sex, whether has partner) shows the IH group had similar scores to the PH group but worse than those for the NH group and greater than those for respondents with SH. Wealth accounts for little of this (Model 2) but the addition of general health and disability index noticeably reduces the differences between help groups (Model 3). The estimate for difference in total CASP-19 score between those with SH and those without limitations reduces from 11.1 points in Model 2 to 4.7 points in Model 3, which means that general health and disability account for much of the difference in score that superficially appeared to be related to source of help. Adjusting for general health made a greater difference than adjusting for the disability index.

Figure 9.13. Mean quality of life (CASP-19) total score and control and autonomy sub-scale score, by source of help, and sex (2008–09)



Notes: Weighted, age-standardised. Base numbers for total CASP-19 score in brackets; 66 more men and 121 more women had scores for the sub-scale.

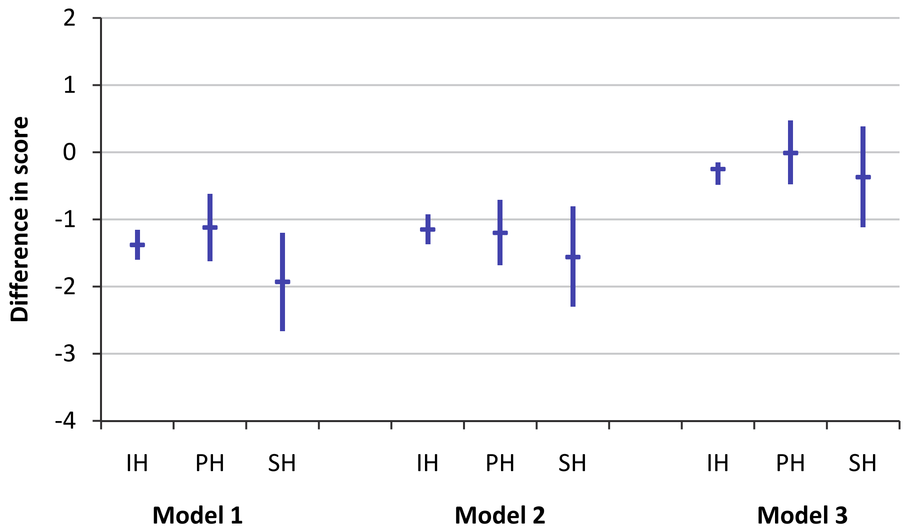
Figure 9.14. Quality of life (CASP-19) score – difference from those without limitations (mean, 95% confidence intervals), by source of help (2008–09)



Notes: Model 1 adjusted for age, sex and whether respondent has a partner; Model 2 also adjusted for wealth; Model 3 also adjusted for disability index and general health. A negative difference means that the quality of life score is worse than the reference group, people without limitations in daily activities. p<0.001 for heterogeneity across sources of help for each model. Base numbers were NH 2,717, IH 1,361, PH 165 and SH 79.

Figure 9.15. Quality of life (CASP-19) control and autonomy sub-scale score – difference from those without help (mean, 95% confidence intervals), by source of help (2008–09)

People with limitations in daily activities who answered CASP-19



Notes: See notes for Figure 9.14.

For the control and autonomy sub-scale it was hypothesised that state help, but not paid help, might lead to a lesser sense of control and autonomy than informal help but that having any kind of help would be associated with lower sense of control and autonomy than no help (especially given the lesser degree of limitation in functioning of the latter). This was found to be the case (Figure 9.15). However, after adjusting for general health and the disability index, the differences attributable to source of help disappear.

Thus it appears that sense of general health, and to a lesser extent the disability itself, are more important for quality of life than the source of help.

9.4 Giving help and care

This section describes the types of help and care provided by ELSA respondents and investigates associations between care provision and quality of life.

Types of help and care provided

The types of help provided by the respondent in the last 12 months to friends, neighbours or other people (not relatives) are summarised in Table 9.6. Each respondent was permitted to tick each type of help and Table 9.6 shows row percentages indicating, for example, that 21% of those aged 50–64 kept in touch with someone who could not get about. One-third of respondents aged 75 and over reported providing any help compared with around half of younger respondents. A higher percentage of women compared with men were providing help, especially keeping in touch, running errands and providing

Table 9.6. Percentage of the demographic group providing help to friends and neighbours in last 12 months, respectively by age, sex, wealth and area deprivation (2008–09)

Core wave 4 respondents

	Type of help provided							
	Keeping in touch[a]	**Errands**[b]	**Personal care**[c]	**Letters, forms**[d]	**Transport**[e]	**Other**[f]	**Any of these**	***Unweighted N***
Age								
50–64, %	21	12	3	12	16	32	47	*4,789*
65–74, %	28	17	4	9	21	32	53	*2,877*
75+, %	20	11	2	5	12	16	35	*1,877*
Men, %	18	10	2	9	17	29	44	*4,549*
Women, %	27	16	4	10	17	29	49	*4,869*
Wealth quintile								
1, %	22	14	3	8	15	26	42	*1,835*
2, %	21	13	3	7	14	26	44	*1,841*
3, %	24	14	3	9	17	29	43	*1,847*
4, %	24	13	3	10	20	31	49	*1,852*
5 (highest wealth), %	27	13	4	14	20	32	53	*1,840*
Area deprivation (IMD) quintile								
5, %	18	14	2	7	11	20	35	*1,232*
4, %	21	13	3	7	13	26	42	*1,622*
3, %	24	15	3	11	19	31	48	*1,938*
2, %	25	13	3	11	18	31	49	*2,359*
1 (least deprived), %	25	13	4	10	20	31	50	*2,373*

Notes: See next page.

Notes to Table 9.6
[a]Keeping in touch with someone who can't get about.
[b]Shopping, collecting pension or paying bills.
[c]Providing personal care for someone who is sick.
[d]Writing letters or filling in forms.
[e]Transporting or escorting someone.
[f]Cooking/cleaning/laundry/gardening, decorating/home repairs/car repairs, babysitting/caring for children, looking after property or pet for someone who is away, representing someone.
Notes: Weighted; age-standardised to the age distribution of core members taking part in wave 4. Percentages do not sum to 100 because multiple responses were permitted.

personal care. There was also evidence of a socioeconomic gradient in providing help: the percentage of people providing any help increased with increasing wealth and with decreasing area deprivation.

Several respondents provided more than one type of help (Table 9.7). Women, those in the higher wealth quintiles and those in the least deprived areas tended to provide more types of help. One important consideration is the possibility that the ability to provide help depends to some extent on one's own health.

Table 9.7. Percentage of the demographic group providing multiple types of help to friends and neighbours in last 12 months, respectively by age, sex, wealth and area deprivation (2008–09)

Core wave 4 respondents

	Number of different types of help					
	0	**1**	**2**	**3–4**	**5+**	***Unweighted N***
Age						
50–64, %	53	18	13	12	5	*4,789*
65–74, %	47	20	14	14	5	*2,877*
75+, %	65	15	10	8	2	*1,877*
Men, %	56	18	12	11	3	*4,549*
Women, %	51	18	13	13	5	*4,869*
Wealth quintile						
1, %	58	17	11	10	4	*1,835*
2, %	56	19	12	10	3	*1,841*
3, %	54	18	13	12	4	*1,847*
4, %	51	19	13	13	5	*1,852*
5 (highest wealth), %	47	19	16	14	4	*1,840*
Area deprivation (IMD) quintile						
5, %	62	17	10	8	4	*1,232*
4, %	58	17	12	10	4	*1,622*
3, %	52	19	12	12	5	*1,938*
2, %	51	18	14	14	4	*2,359*
1 (least deprived), %	50	19	14	13	3	*2,373*

Notes: Weighted; age-standardised to the age distribution of core members taking part in wave 4 (2008–09).

Health, therefore, might be one reason why a greater proportion of women and those with more favourable socioeconomic circumstances provide help to others. More detailed analyses were conducted to explore this using regression modelling to 'control' for a person's health and wealth. This confirmed that those in better health were more likely to provide help and that, for a given level of health, women were more likely than men to provide help. These analyses also confirmed that having lower wealth or living in a more deprived area both contributed to being less likely to provide help.

Active provision of care

A total of 900 (9.1%) respondents had cared for someone in the last week. Of these, 34% reported caring for their spouse/partner, 33% for a parent/parent-in-law, 9% for their children, 13% for their grandchildren and 22% for others. The above figures are very similar to those at wave 2 (reported in Ross et al., 2008). Among male carers, 93% cared for one type of recipient and 7% for two or three types. Among women carers, 88% cared for one type of recipient, 9% for two types and 3% for three or four types (weighted, age-standardised).

Table 9.8 shows provision of care for different care recipients respectively by gender, age and socioeconomic circumstances. Among men, caring for partner or spouse increased with age. Among women, those aged 75 and over were less likely than younger women to care for their partner or spouse. This presumably reflects the fact that women in this age group are more likely than men to be widowed. Table 9.8 also shows that 6.8% of women aged 50–64 were providing care for their parent or parent-in-law. Caring for the partner or spouse was more common among those in the most deprived areas whereas caring for a parent/parent-in-law was the least common among those with the lowest wealth. A clearer association between area deprivation and likelihood of caring was seen when other factors (sex, age, wealth and health) were controlled for, as shown in Figure 9.16 below.

On average, respondents who cared for their partner or spouse spent more hours caring (107.0 hours per week) than those who cared for their children (93.5 hours per week) or for their parents/parents-in-law (33.0 hours per week). Male and female carers spent a similar number of hours caring. This reflects the fact that, although women more frequently care for parents/parents-in-law, grandchildren and others, men are more likely than women to be providing care for their spouse/partner at ages 65 and over. This could be due to a combination of factors, including the fact that older women are more likely to be widowed and that women have greater levels of limitations in physical functioning than men at a given age (see Chapter 7 for examples).

Statistical modelling was used to estimate how hours spent caring varied by gender, age, socioeconomic circumstances and health status, controlling for all other factors. Complete data on all relevant factors were available for 852 respondents. Figure 9.16 shows that older people spent more time caring than those in the youngest age group. On average, respondents in the 75+ age group spent 41 more hours each week in the active provision of care compared with those aged 50–64. Respondents in the most deprived areas spent substantially

Table 9.8. Percentage of respondents actively providing care in last week, respectively by age, sex, wealth and area deprivation (2008–09)

Core wave 4 respondents

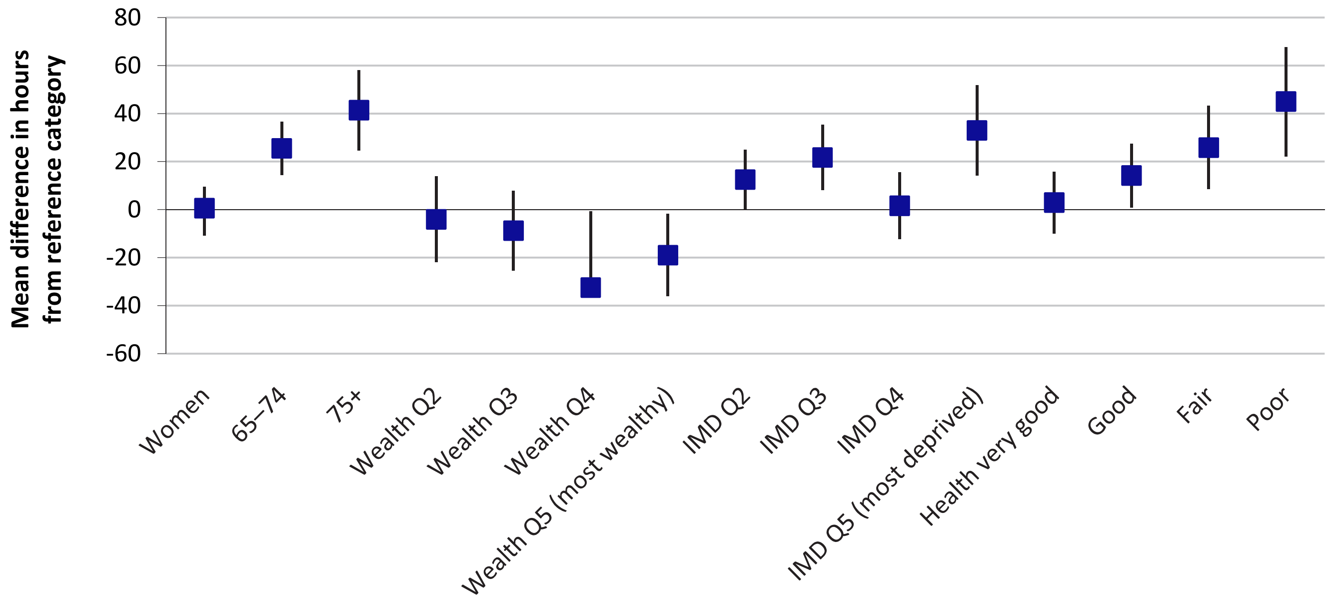
	Care recipient				
	Partner	Parent or parent-in-law	Grandchild	Other	*Unweighted N*
Men, %	3.2	1.9	0.5	1.3	*4,430*
Women, %	3.1	3.8	1.7	2.5	*5,466*
Men: by age					
50–64, %	2.0	3.2	0.5	1.3	*2,216*
65–74, %	4.1	1.1	0.7	1.6	*1,373*
75+, %	4.9	0.0	0.4	0.8	*841*
Women: by age					
50–64, %	3.2	6.8	2.2	2.6	*2,702*
65–74, %	3.8	1.5	1.6	3.0	*1,579*
75+, %	1.9	0.3	0.3	1.4	*1,185*
Wealth quintile					
1, %	2.1	2.7	0.9	1.6	*1,902*
2, %	5.1	2.5	1.8	1.9	*1,901*
3, %	4.1	2.6	0.8	1.7	*1,900*
4, %	3.0	2.7	1.7	2.4	*1,902*
5 (highest wealth), %	2.6	3.1	1.1	1.8	*1,900*
Area deprivation quintile					
5, %	4.1	2.2	1.1	1.8	*1,280*
4, %	2.9	2.6	1.0	1.5	*1,693*
3, %	3.4	2.6	1.1	2.1	*2,023*
2, %	3.5	3.3	1.6	1.8	*2,438*
1 (least deprived), %	2.1	3.3	0.8	2.3	*2,442*

Note: Weighted; age-standardised to the age distribution of core members taking part in wave 4.

more time caring (an average of 31 hours more per week than those in the least deprived areas). Those who were themselves in fair or poor health also spent more time caring for others (30 and 46 more hours per week, respectively) compared with those in excellent health.

Since this analysis is based solely on data from wave 4 (2008–09), it is not possible to tell whether caring is a determinant of poor health. However, it is clear that a substantial burden of care falls disproportionately on those in poor health and living in more deprived areas. Although information on services and support for carers, such as respite care, sitting services and day-care centres, was asked of those providing substantial hours of care, the numbers of respondents who used such services was too small for further analysis.

Figure 9.16. Hours spent caring compared with reference category, by gender, age, socioeconomic circumstances and health (2008–09)



Quality of life of carers

The final section of the chapter examines the quality of life among carers, measured by the CASP-19 instrument, according to the relationship of the care recipient. Unadjusted mean CASP-19 scores were lower for those caring for their partner or spouse (38.6 95% CI 37.5, 39.7) compared with those not caring for the partner or spouse (42.4 95% CI 42.2, 42.6, p<0.001). Those caring for a parent or parent-in-law had higher CASP-19 scores, on average, than those not caring for a parent or parent-in-law and those caring for grandchildren had higher CASP-19 scores than those not caring for grandchildren.

Since several other studies have shown that gender, age, socioeconomic circumstances and health status, among other factors, are associated with the CASP-19, regression modelling was used to control statistically for these characteristics of carers. Any differences in quality of life between carers are then assumed not to be due to these characteristics. The factors of primary interest as possible explanations for differences between carers looking after different groups of recipient are the burden of care and the rewards derived. The burden of care is captured by the number of hours they are caring and taking on the caring role because they feel obliged to do so. The rewards derived are captured by a sense of satisfaction with their role and feeling appreciated for providing care. The analyses examined whether those caring for spouse/partner, parent/parent-in-law or grandchild have a different quality of life compared with those who were not caring for these groups of people. In the first set of regression models, only carers are included. In the second set of models, carers and non-carers are compared.

Figure 9.17 shows that carers who provide care for their partner or spouse have a poorer quality of life compared with carers not caring for their partner or spouse. Lack of satisfaction and appreciation do not make much contribution to this discrepancy in quality of life. However, the discrepancy is fully explained by the number of hours' care they provide and a sense of obligation in this role. Caring for grandchildren, on the other hand, was associated with a higher quality of life, such that those who looked after grandchildren in the past week had higher quality of life than those who did

Figure 9.17. Quality of life scores of carers by care recipient (2008–09)

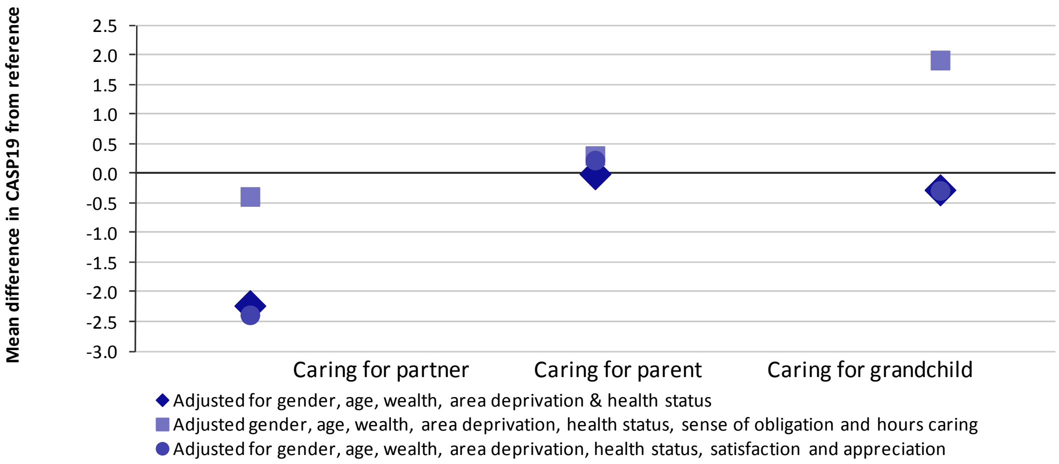
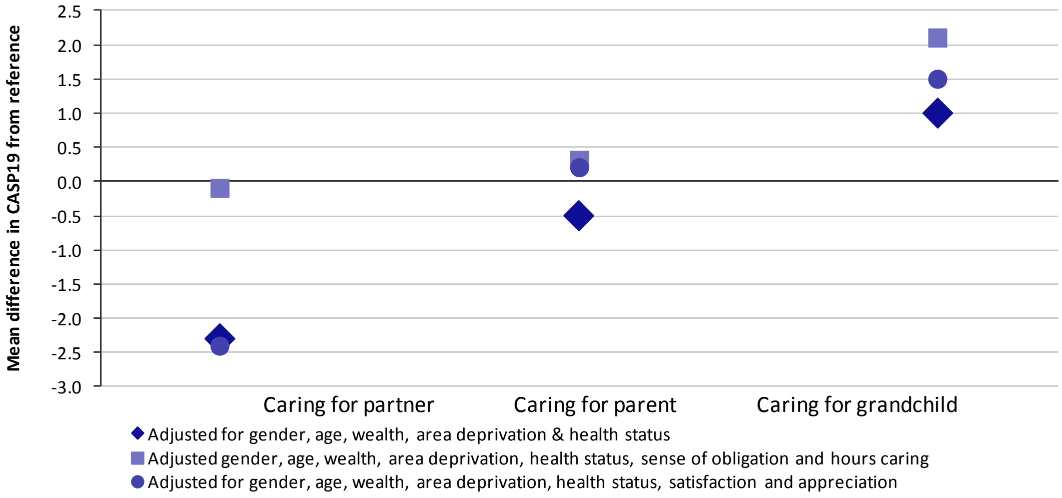


Figure 9.18. Quality of life scores of carers versus non-carers (2008–09)



not look after grandchildren, once hours caring and sense of obligation were accounted for. The relationship between quality of life and caring depends on the recipient and the burden of care (indicated by hours caring and sense of obligation).

Carers for multiple recipients had a slightly poorer quality of life (CASP-19 score of 0.9 points lower) than those caring for only one type of recipient. This was explained by number of hours' care they provide and by sense of obligation. It appears that caring for one's partner or spouse is more strongly related to quality of life than is multiple caring.

Figure 9.18 replicates the above analysis but here the reference group is those who did not actively provide care in the previous week. Due to the routing of the questions on caring, this reference group includes a small group (305 respondents) who provided care in the last month but not in the last week. In this figure, we see that caring for grandchildren is associated with an increase in quality of life of 1.0 points, adjusting for demographic characteristics and health. This differential is even higher (over 2.0 points) once hours spent caring and sense of obligation are accounted for. This finding confirms in-depth work describing the contribution of grandchildren and looking after grandchildren to older people's quality of life (Clarke and Roberts, 2003).

In summary, caring for one's partner or spouse is associated with a poorer quality of life and this is explained by factors representing the burden of care. Caring for grandchildren, on the other hand, is associated with higher quality of life, and especially so for those who are not spending very large amounts of time or feeling obligated in this role.

9.5 Conclusions

The policy environment is constantly changing and some policies that were implemented by previous governments and in place at the time of the fieldwork in 2008–09 are under review by the new coalition government. Planning for personal and social care of older people is of major importance and is likely to remain so well into the future because of the ageing population.

Community care has been seen as an ideal for many years although even 'intensive' care can leave people alone for most of the day (Bamji, 2010) and so institutional care should not automatically be assumed to be a less desirable option. Nevertheless, informal care has been, and is likely to remain, the main source of help for people with difficulties. Informal care is not uncommon even in countries like Sweden where the state assumes responsibility and care of the elderly is firmly assigned to the public sector (Hellström and Hallberg, 2001). The use of formal care is likely to be greater for those with more disability even in a regime where the state takes more responsibility. For example, a 4-year follow-up of older people in Sweden found that as the number of limitations in activities of daily living increased people began to receive formal care (Bravell, Berg and Malmberg, 2008).

A clear majority of those receiving formal care in our sample also received informal care. Bonsang (2009), in a study of the European countries taking part in the Survey of Health, Ageing and Retirement in Europe (SHARE), found that informal care substitutes for paid domestic help but that as the level of disability increased, this substitution effect decreased. Our results suggest that domestic paid help is more likely to be used when the main informal sources are not available but we also found (not shown in tables) that informal help is more common the more limitations a person has even if they are receiving paid help or state help. The findings reported in this chapter suggest that those who pay privately for help also have wealth advantages – the economic circumstances may have reduced the number of people who could afford this option.

Source of care was associated with quality of life but, once health and disability were taken into account, the discrepancy in quality of life by source of care was small. There are few studies looking at quality of life in relation to help. A Swedish study found that people receiving formal help only and those receiving a combination of formal and informal help had equally raised (worse) scores on their quality of life scale (Hellström and Hallberg, 2001). Their comparisons are not the same as the ones here, adjusting for number of medical conditions and symptoms rather than perception of general health, but it does suggest that the source of help received is not an important factor. Baldock (1997) noted little evidence that type of help affected satisfaction or health outcomes or, indeed, chances of moving into long-term care. He attributed this to the complexity of personal care and the importance of attitudes and preferences.

This chapter also highlights older people providing care for others, including infirm partners and parents as well as grandchildren. A key concern raised by these analyses is the considerable care responsibility, indicated by total hours spent caring, from those in the oldest age group, living in deprived areas and having poor health. In the light of the findings of this report we recommend seeking ways of preventing the need for individuals to provide long hours of caring and for extra attention to be paid to carers who are already in poor health. This has to be tackled in the context of difficult economic circumstances described earlier.

However, caring can additionally bring rewards and this is especially evident in the quality of life of those who provide care for their grandchildren. The

reasons for this improved quality of life will be examined in more detail in future work, but we might expect that interaction with grandchildren might be a pleasurable experience, might enhance grandparents' social networks and connections to the community and might encourage health-promoting behaviours.

The strengths of this study include the wide age range, the national sample of people of all abilities and the variety of information available. There is scope to look at more factors linked to help and outcomes, such as financial benefits received, expectations of the future and quality of family relationships. This analysis is just a beginning. Limitations of the study are that we have taken a cross-sectional approach and so have not looked at whether quality of life changed as both functioning and help changed. However, the cross-sectional approach was taken to maximise the sample sizes, and to take advantage of new questions on certain types of disability and on payment for aids and adaptations.

As Baldock (1997) argued, personal care is complex. While quantitative studies are not designed to capture this complexity of personal interaction, they can indicate where there is cause for concern. This study illustrates how highly concentrated state help has become. However, the findings are partially reassuring in that quality of life is not strongly associated with type of help received for physical limitations and shows some types of relationship in which quality of life is positively associated with active provision of care.

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10. Methodology

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This chapter presents a summary of the survey methodology for the fourth wave (2008–09) of the English Longitudinal Study of Ageing (ELSA). It includes a brief account of the sample design, the content of the interview and the approach to fieldwork. It provides basic information about response to the survey and the weighting strategies used in this report. Further details will be provided in the ELSA technical reports,[1] which can be accessed via the ELSA website (http://www.ifs.org.uk/elsa).

A summary of the chapter shows the following:

- The ELSA interview covers a wide range of topics so analysts can examine the relationship between different aspects of respondents' lives. The wave 4 (2008–09) questionnaire was similar to that used in the previous waves.
- The wave 4 (2008–09) interview was also expanded to answer a variety of additional research questions. The new items included questions on sleep patterns, women's health, working beyond the state pension age and state pension deferral, adaptations to accommodation to assist mobility, monetary gifts and transfers including Child Trust Funds, frequency of carrying out formal and informal volunteering and questions on use of respite services for those who provide care. Some items were reintroduced into the interview from previous waves of the study, such as the questions which test the respondent's numeracy in the Cognitive Function section (reintroduced from wave 1) and questions relating to spending on leisure activities (reintroduced from wave 2).
- Core members who completed the wave 4 (2008–09) interview were also offered a nurse interview. The nurse visit allowed collection of further objective biomedical and physical performance measures which included: blood pressure, grip strength, blood samples, standing and sitting height, weight, waist and hip measurement, lung function, balance, leg raises, chair rises and saliva samples to measure levels of cortisol.
- A cohort of people born between 1 March 1933 and 28 February 1958 (aged 50–74) was added to the wave 1 cohort in 2008–09. The wave 4 cohort was selected from Health Survey for England (HSE) (2006).
- In total 11,050 main interviews were completed at wave 4 (2008–09). Of these, 6,623 (59.9%) were core members from the original cohort selected

[1] Please note the wave 4 Technical Report is forthcoming (2010).

at wave 1, 972 were eligible sample members from the additional cohort selected at wave 3 (8.8%) and a further 2,291 (20.7%) were new sample members added at wave 4. The remaining 1,164 were with partners, defined as core, young, old or new partners (10.5%). This report is based on core members from the wave 1, wave 3 and wave 4 cohorts.

- In total 8,641 nurse interviews were completed at wave 4 (2008–09). Of these 5,625 (65.1%) were core members from the original cohort selected at wave 1, 745 were eligible sample members from the additional cohort selected at wave 3 (8.6%) and a further 1,850 (21.4%) were new sample members added at wave 4. The remaining 423 (4.9%) nurse interviews were with partners,[2] defined as core, young, old or new partners.

10.1 Sample design

The ELSA sample is selected to be representative of people aged 50 years and over, living in private households in England. It was drawn from households that had previously responded to the HSE so that the study could benefit from data that had already been collected. Some background information about the HSE is provided below.

- The HSE is an annual cross-sectional household survey that gathers a wide range of health data and biometric measures. The original cohort at wave 1 (persons born on or before 29 February 1952) was selected from three survey years of the HSE (1998, 1999 core sample[3] and 2001).
- Each of the main HSE samples had originally been drawn in two stages. First, postcode sectors were selected from the Postcode Address File, stratified by health authority and proportion of households in the non-manual socioeconomic groups. Addresses were then selected systematically from each sector and a specified number of adults and children in each household were deemed eligible for interview.
- Eligible individuals were asked to participate in a personal interview, followed by a nurse visit. Further details about the HSE years 1998, 1999 and 2001 are available from the Technical Reports (Erens and Primatesta, 1999; Erens, Primatesta and Prior, 2001; Prior et al., 2003).
- A cohort of people born between 1 March 1953 and 29 February 1956 was added to the wave 1 cohort in 2006–07 (henceforth referred to as Cohort 3). Cohort 3 was selected from four survey years of the HSE (2001 to the core sample in 2004).[4] Further details about the HSE years 2002–04 are

[2]Only core members are eligible to receive the nurse interview unless they are insistent that their partners are involved. In this instance, the nurse would interview the core member and their partner.

[3]The core sample is a general population sample. In recent years, the core sample has also been augmented by an additional boosted sample from a specific population subgroup, such as children, older people or, as in 1999 and 2004, those from the largest minority ethnic groups in England.

[4]Cohorts 1 and 3 overlap as a number of young partners in the original cohort selected at wave 1 (sampled from the HSE 2001) moved into their 50s in wave 3 and so were potential core members (i.e. born *after* 29 February 1952). Unfortunately, the algorithm used to select

available from the Technical Reports (Sproston and Primatesta, 2003; 2004; Sproston and Mindell, 2006).

- A cohort of people born between 1 March 1933 and 28 February 1958 (aged 50–74) was added to the wave 1 cohort in 2008–09 (henceforth referred to as Cohort 4). The wave 4 cohort was selected from HSE 2006. Further details about HSE 2006 are available from the Technical Report (Craig and Mindell, 2008).

Box 10.1 summarises the eligibility criteria in wave 4 for the original cohort selected at wave 1. The wave 1 interview took place in 2002–03, providing the baseline for the study. Eligible sample members who responded at wave 1 were renamed 'core members' to distinguish them as the core element of the continuing ELSA sample. As in previous waves, core members were eligible for the main interview in wave 4 unless they had since died, had explicitly asked at the end of the previous ELSA interview not to be re-contacted or had moved out of Britain. Core members form the main focus of this report. Partners of core members (core partners, new partners or young partners) were also eligible for an interview.

Box 10.2 and Box 10.3 summarise the eligibility criteria in wave 4 for Cohort 3 and Cohort 4 who were added to the original cohort (Cohort 1) sample selected at wave 1.

We continued in wave 4 to attempt to interview all partners who had been living with a core member at the time of an ELSA interview and had been separated or divorced from them, or had been widowed, so that we could

Box 10.1. Summary of the eligibility criteria for Cohort 1 members for the wave 4 ELSA interview (2008–09)

Core members were individuals who had been living within the household at the time of the HSE interview in 1998, 1999 or 2001, were born on or before 29 February 1952 and were subsequently interviewed as part of wave 1 at a private residential address in England. They were not eligible if they had since died, asked not to be revisited or moved out of Britain.

Core partners were individuals who, like core members, had been living within the household at the time of the HSE interview in 1998, 1999 or 2001 and were born on or before 29 February 1952. However, they were *not* interviewed as part of wave 1, so missing the baseline survey. As a consequence they were only approached by virtue of their being the partner of a core member.

Young partners were the cohabiting spouses or partners of core members, who were living within the household at the time of the HSE, and were still cohabiting with the core member at the wave 1 interview. They were born *after* 29 February 1952. Young partners who stopped living with their core member partner are only interviewed once following the split with their core member partner.

New partners were the cohabiting spouses or partners of core members at the time of the first, second or third ELSA interview who had joined the household *since* the original HSE interview. As with young partners, new partners who stopped living with their core member partner are only interviewed once after they split with their core member partner.

Cohort 3 excluded potential eligible sample members born between 1 March 1952 and 28 February 1953. This has resulted in a gap of one year's births between the wave 1 and wave 3 cohorts.

understand their circumstances after this event had occurred. The only circumstances in which a partner who had separated from the core member was not approached were if they had died, had explicitly asked at the end of their first ELSA interview not to be re-contacted, had left Britain or moved into an institution. Ex-partners are only followed up once after leaving the core member's household.

The eligibility criteria for Cohort 3[4] resembled those for Cohort 1 in wave 1, as described in Box 10.2. Overall, 103 of the potential eligible sample members born between 1 March 1952 and 28 February 1953 (the missing year of births) were in fact successfully interviewed in wave 3.[5] Potential eligible

Box 10.2. Summary of the eligibility criteria for Cohort 3 members for the wave 4 ELSA interview (2008–09)

Core members were individuals who were living within the household at the time of the HSE interview (2001 to 2004), were born between 1 March 1952 and 29 February 1956[6] and were subsequently interviewed as part of the wave 3 interview at a private residential address in England. They were not eligible if they had since died, asked not to be revisited or moved out of Britain.

Core partners were individuals who, like core members, had been living within the household at the time of the HSE interview (2001 to 2004) and were born between 1 March 1952 and 29 February 1956. However they were *not* interviewed as part of the wave 3 interview, so missing the baseline survey. As a consequence they were only approached by virtue of their being the partner of a core member.

Young and old partners were the cohabiting spouses or partners of eligible sample members, who had been living within the household at the time of the HSE, and were still cohabiting with the core member at the wave 3 interview. Young partners were born *after* 29 February 1956 and old partners were born *before* 1 March 1952. Partners who stopped living with their core member partner are only interviewed once following the split with their core member partner.

New partners were the cohabiting spouses or partners of eligible sample members identified at the time of the ELSA wave 3 or wave 4 interview, who had joined the household *since* the original HSE interview. As with young and older partners, new partners who stopped living with their core member partner are only interviewed once after they split with their core member partner.

For all four sample types within Cohort 3, interviews were only conducted at households in England, and only within residential addresses. So, if an individual had moved out of England or into an institution since their HSE interview, and before their first ELSA interview, they were treated as ineligible.[7] Individuals who take part in their first ELSA interview and then move into an institution or into Scotland and Wales will remain eligible for future ELSA interviews.

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[5]Originally such individuals were classified as younger partners (if in Cohort 1) or older partners (if in Cohort 3). These have now been reclassified as core members from the additional cohort selected in wave 3.

[6]The majority of Cohort 3 core members were born between 1 March 1953 and 29 February 1956 due to the unintentional omission of those born between 1 March 1952 and 28 February 1953.

[7]During the wave 4 interview a Cohort 4 sample member was mistakenly interviewed in an institution (by proxy). Although this interview was not eligible (see Box 10.3 for eligibility rules) they are represented in this report.

Box 10.3. Summary of the eligibility criteria for Cohort 4 members for the wave 4 ELSA interview (2008–09)

Eligible sample members were individuals who were living within the household at the time of the HSE interview (2006) and were born between 1 March 1933 and 28 February 1958. In order for the individual to be eligible, the interviewer had to ascertain that the individual was living in a private residential address in England at the time of the ELSA wave 4 interview.

Young and old partners were the cohabiting spouses or partners of eligible sample members, who were living within the household at the time of the HSE, and were still cohabiting with the core member at the wave 4 interview. Young partners were born *after* 28 February 1958 and old partners were born *before* 1 March 1933.

New partners were the cohabiting spouses or partners of eligible sample members identified at the time of the ELSA wave 4 interview, who had joined the household *since* the original HSE interview.

For all four sample types within Cohort 4, interviews were only conducted at households in England, and only within residential addresses. So, if an individual had moved out of England or into an institution since their HSE interview, they were treated as ineligible. As with Cohort 1 and Cohort 3, individuals who take part in their first ELSA interview at wave 4 and then move into an institution or into Scotland and Wales will remain eligible for future ELSA interviews.

sample members mistakenly not issued at wave 3 were followed up for interview at wave 4. Those interviewed at wave 4 have been reclassified as core members in wave 4 and treated as Cohort 4 core members.

10.2 Development of the wave 4 interview (2008–09)

Extensive discussion took place with ELSA collaborators about what changes were needed for the wave 4 interview and what new topics to include. As there were few interview changes a pilot was not carried out, but a dress rehearsal took place in December 2007. The purpose of the dress rehearsal was to test the fieldwork approach for the main interview.

Structure and content of the wave 4 interview (2008–09)

As at previous waves, the wave 4 main survey comprised a personal face-to-face interview and a self-completion questionnaire. Overall, the intention at wave 4 was to collect data about the same topics as at the previous waves. There were, however, some additions to the content of the interview to respond to new areas of enquiry. Furthermore, a few elements of the questionnaire were amended to take account of responses given at the previous wave.

The structure of the main interview was the same as it had been at waves 1, 2 and 3. In brief:

- In households with one respondent, or where two respondents were interviewed separately, each interview followed the course set out in Box 10.4, though some flexibility was given in the order of the walking-speed, income and assets and housing modules.

- In households where more than one eligible respondent agreed to take part, two individuals could be interviewed in a single session (unless they kept their finances separately and were not prepared to share this information). In these ‘concurrent’ sessions, the two respondents were interviewed alongside each other, but were separated during the course of the interview so that the later modules assessing cognitive function and collecting information about expectations for the future, psychosocial health, demographic information and consents for linkages to administrative data could be administered in private.

Box 10.4. Content of the ELSA interview at wave 4 (2008–09)

Household demographics: collected or updated demographic information about everyone living in the household, including sex, age and relationships to each other, and collected or updated information about children living outside the household.

Individual demographics: collected or updated details about respondents’ legal marital status, parents’ age and cause of death and number of living children.

Health: collected or updated self-reported general health, long-standing illness or disability, eyesight, hearing, specific diagnoses and symptoms, pain, difficulties with daily activities, smoking, mental health, urinary incontinence, falls and fractures, quality of care and sleep patterns.

Social participation: covered the use of public transport.

Work and pensions: collected or updated current work activities, current and past pensions, reasons for job change, health-related job limitations and working beyond the state pension age and state pension deferral.

Income and assets: assessed the income that respondents received from a variety of sources over the last 12 months: wages, state pensions, private pensions, other annuity income and state benefits; also collected financial and non-financial assets.

Housing: collected or updated current housing situation (including size and quality), housing-related expenses, adaptations to accommodation for those with physical impairments, ownership of durable goods and cars, consumption including food in and out of home, fuel, durables and clothing.

Cognitive function: measured different aspects of the respondent’s cognitive function, including memory, speed, mental flexibility and numerical ability.

Expectations: measured expectations for the future in a number of dimensions, financial decision making and relative deprivation.

Effort and reward: assessed motivations behind voluntary work and caring for others, and the relationship between effort and reward.

Psychosocial health: measured how the respondent viewed his or her life across a variety of dimensions.

Walking speed: for respondents aged 60 and over, a ‘timed walk’ with the respondent walking a distance of 8 feet (244 cm) at their usual walking pace.

Final questions: collected any missing demographic information and updated contact details and consents as described below.

Self-completion questionnaire: covered quality of life, social participation, altruism, control at work, life satisfaction, consumption of fruit and vegetables, social networks and alcohol consumption.

- The self-completion questionnaire was normally completed after the face-to-face interview was over and the interviewer had left the household (if the eligible individual was interviewed alone) or while the other person in the concurrent interview session completed the 'private' modules described above.
- Where two or more eligible individuals lived in a household, one was nominated as the respondent for the housing module. Similarly, one individual was asked to be the respondent to report on income and assets on behalf of each benefit unit. However, if two individuals in the same benefit unit kept their finances separately the data for each financial unit were collected separately.

The interview ended with a request to all those who responded in person for confirmation – or amendment – of consent to obtain health and economic data from administrative sources. Consent to obtain information from the NHS Central Register was requested from those who had completed an ELSA interview in person but who had not provided this consent at the HSE pre-baseline interview. None of these consents were collected from individuals for whom a proxy respondent was needed. Contact details were requested for a stable address and for a nominated individual who might respond if a proxy, institutional or end-of-life interview were needed in the future.

Box 10.5. Content of the ELSA nurse interview at wave 4 (2008–09)

The nurse visit included several standard measures including:

Blood pressure

Lung function: a measure of how much air respondents can blow out from lungs, and is measured using a spirometer.

Blood sample: most respondents under the age of 80 were asked to fast before giving the sample. A list of the uses to which the sample was put is listed in Box 10.6.

Anthropometric measures: weight, sitting height, standing height and waist and hip measurement (to assess the distribution of body fat across the body).

In addition nurses took four **physical performance** measures. Taken together with the gait speed (or timed walk) measure carried out during the personal interview, these provide an excellent way of tracking change in physical well-being over time:

Grip strength: a measure of upper body strength, during which the respondent was asked to squeeze a grip gauge up to three times with each hand.

Chair rises: a measure of lower body strength, during which respondents were asked to stand up from a firm chair without using their arms. If they succeeded, they were asked to stand up and down as quickly as they can for either five rises if they are aged 70 years and over, or up to ten rises if aged 69 years and under.

Balance: respondents were asked to stand in three different positions for up to 30 seconds.

Leg raise: respondents under 70 years old were asked to lift one foot off the ground for up to 30 seconds.

Saliva sample: a sub-sample of respondents were asked to supply saliva samples over a 24-hour period to measure cortisol, which is an indicator of stress.

Structure and content of the wave 4 nurse interview (2008–09)

After carrying out the interview, the interviewer made an appointment for the nurse to visit the respondent or set up contact between the nurse and respondent. The nurse then visited the respondent to carry out a series of measurements listed in Box 10.5. These were only obtained if the appropriate consents were given and the respondent was able to respond affirmatively to relevant safety questions.

As described above, a blood sample was collected from respondents who gave consent for this in order to examine the following (Box 10.6):

Box 10.6. Purpose of the blood measurements at wave 4 (2008–09)

- **Factors increasing heart disease risk:** fibrinogen, total cholesterol, high triglycerides, high C-reactive protein (also a marker for inflammation).
- **Risk of diabetes:** fasting glucose, glycated haemoglobin.
- **Protective factors against heart disease:** high density lipoprotein, apolipoprotein E.
- **Checks on iron levels and anaemia:** ferritin and haemoglobin.
- **Genetics:** genetic factors are associated with some common diseases, such as diabetes and heart disease, and relate to general biological aspects of the ageing process.

10.3 Fieldwork

Each eligible individual within a household was sent an advance letter inviting them to take part. Interviewers then visited the households and were able to explain the study and to interview willing individuals straight away, or to make appointments to call at a convenient time. A number of approaches were used to encourage participation among the sample, many of which were similar to those described in the first ELSA report (Marmot et al., 2003). Fieldwork for the fourth wave of ELSA began in May 2008 and spanned 14 months, finishing in July 2009.

10.4 Survey response

In this section, we present summary information about survey response in wave 4 (2008–09) for the main interview. We focus mainly on the core members from the original cohort selected at wave 1 – who form the main basis of this report.

Response to main interview

Survey response and quality of fieldwork were carefully monitored throughout the study period. Ultimately, the ELSA wave 4 fieldwork produced 11,050 productive interviews (including both proxy and partial interviews). Sixty-seven of these interviews were conducted with individuals who had originally been interviewed in a private household and had since moved into an institution and so were eligible for the study. Table 10.1 shows the number of interviews conducted for Cohort 1, broken down by sample type.

Table 10.2 shows the 6,623 core members belonging to Cohort 1 by their pattern of response, whether they gave a full or partial interview, were individual or proxy respondents and whether they were interviewed in an institution. Table 10.3 shows the number of interviews conducted for Cohort 3 and Cohort 4.

Table 10.4 shows the 972 core members belonging to Cohort 3 by their pattern of response, whether they gave a full or partial interview, were individual or proxy respondents and whether they were interviewed in an institution.

Table 10.5 shows the 2,291 core members belonging to Cohort 4 by their pattern of response, whether they gave a full or partial interview, were individual or proxy respondents and whether they were interviewed in an institution.

Table 10.1. Respondents, by sample type (Cohort 1)

Respondents in 2008–09, including proxies

	Number of respondents
Core member[a]	6,623
Core partner[b]	101
Younger partner	276
New partner	119
Unweighted N	*7,119*

[a]Born on or before 29 February 1952.
[b]Core partners are individuals sampled as core members in wave 1 but who did not respond in wave 1 and so were only interviewed in wave 4 by virtue of their being the partner of a core member.

Table 10.2. Core member respondents, by situation in wave 4 (2008–09) (Cohort 1)

Core member respondents in 2008–09

	Number of respondents	**%**
Pattern of response		
All four waves	6,014	91
Missed one wave	609	9
Type of interview		
Full interview in person	6,353	96
Full interview by proxy	167	3
Partial interview in person	39	1
Partial interview by proxy	1	0
Institutional interview in person	14	0
Institutional interview by proxy	49	1
Unweighted N	*6,623*	*100*

Note: Columns may not add up to 100% because of rounding.

Table 10.3. Respondents, by sample type (Cohort 3 and Cohort 4)

Respondents in 2008–09, including proxies

	Number of respondents
Cohort 3	
Core member[a]	972
Core partner	12
Younger partner	226
Older partner	106
New partner	25
Cohort 4	
Core member[b]	2,291
Younger partner	119
Older partner	165
New partner	15
Unweighted N	*3,931*

[a]Born between 1 March 1952 and 29 February 2006.
[b]Born between 1 March 1933 and 28 February 1958.

Table 10.4. Core member respondents, by situation in wave 4 (2008–09) (Cohort 3)

Core member respondents in 2008–09

	Number of respondents	%
Type of interview		
Full interview in person	943	97
Full interview by proxy	24	2
Partial interview in person	4	0
Partial interview by proxy	0	0
Institutional interview in person	0	0
Institutional interview by proxy	1	0
Unweighted N	*972*	*100*

Note: Columns may not add up to 100% because of rounding.

Table 10.5. Core member respondents, by situation in wave 4 (Cohort 4)

Core member respondents in 2008–09

	Number of respondents	%
Type of interview		
Full interview in person	2,230	97
Full interview by proxy	51	2
Partial interview in person	9	0
Partial interview by proxy	0	0
Institutional interview by proxy[7]	1	0
Unweighted N	*2,291*	*100*

Note: Columns may not add up to 100% because of rounding.

Response rates

There is no universally accepted definition of response rate. An important distinction exists between *field* and *study* response rates. Fieldwork response rates are based on the subset of individuals actually issued for interview at any particular wave. Study response rates for longitudinal surveys are broader in that they relate back to the originally selected sample, irrespective of whether eligible cases were issued to field at any particular wave. Both rates exclude cases not belonging to the target population through ‘terminating events’ such as deaths, institutional moves and moves out of Great Britain. Field response rates are discussed in this section.

Contact, co-operation and response rates[8] are measures often used to evaluate the quality of fieldwork. A summary of the rates is presented here. External information from the National Health Service Central Register was matched to non-respondents to identify any deaths that had not been revealed in the course of fieldwork. Individuals whose outcome showed that their eligibility had *not* been confirmed during fieldwork were all assumed to be eligible for the response rate calculation. Over the full fieldwork period, for core members in Cohort 1, a household contact rate of 96.7% was achieved and an individual co-operation rate of 76.9%. The response rate in wave 4 was 74.3%.[9]

The equivalent contact, co-operation and response rates for core members in Cohort 3 were 96.8%, 81.1% and 78.3%, respectively. For Cohort 4 the contact rate was 91.9%, the contact rate 68.6% and the response rate 62.9%.

The reasons for non-response for core members in Cohort 1 *issued* to field in wave 4 are given in Table 10.6. As in waves 2 and 3, the largest component (over three-quarters) of non-response was a result of refusals. Of non-responders, 10% were individuals who could not be found (this is higher than wave 3 where those who had moved and could not be traced constituted 7% of non-respondents, but a similar proportion to wave 2 when 11% of issued wave 2 non-respondents could not be traced). The final category of non-response is ‘other’, grouping together such reasons as being ill or away during the survey period. A judgement of the impact of any differential non-response is reserved for Section 10.5 where bias is examined.

The reasons for non-response for core members in Cohort 3 are given in Table 10.7. Three-quarters of non-response were a result of refusals. The reasons for non-response for age-eligible sample members in Cohort 4 are shown in Table 10.8. Similar to Cohort 3 the majority of non-response is due to refusals (70.3%) whilst 16.2% of non-responders could not be traced.

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[8]Contact rate is defined as ‘total households where contact was made with at least one member of the sample divided by total eligible households’. The co-operation rate is defined as ‘total individual respondents divided by total eligible individuals contacted’. Respondents have been defined as those who gave a full or partial interview either in person or by proxy.

[9]The response rate is defined as ‘total individual respondents to wave 4 divided by total individuals eligible for wave 4’. By eligible we mean that core members were *not* known to have died, moved into an institution or moved outside Great Britain. Note that inclusion in either the numerator or denominator was *not* conditional upon response at wave 3. Hence the total respondents in wave 4 included those core members who returned to the study after missing wave 3. (Conditional response rates will be presented in the Wave 4 Technical Report).

Table 10.6. Reasons for non-response (core members in Cohort 1)

Eligible core members but non-respondents in 2008–09

	Frequency	%
Non-contact	87	3.8
Refusal	1,776	78.0
Moved – unable to trace	209	9.2
Other	206	9.0
Unweighted N	*2,278*	*100*

Note: Columns may not add up to 100% because of rounding.

Table 10.7. Reasons for non-response (core members in Cohort 3)

Non-respondents in 2008–09

	Frequency	%
Non-contact	17	6.3
Refusal	206	76.6
Moved – unable to trace	26	9.7
Other	20	7.4
Unweighted N	*269*	*100*

Note: Columns may not add up to 100% because of rounding.

Table 10.8. Reasons for non-response (age-eligible sample members in Cohort 4)

Non-respondents in 2008–09

	Frequency	%
Non-contact	80	5.9
Refusal	948	70.3
Moved – unable to trace	219	16.2
Other	101	7.5
Unweighted N	*1,348*	*100*

Note: Columns may not add up to 100% because of rounding.

Profile of main interview respondents

Cohort 1

The profile of core member respondents belonging to Cohort 1 (born on or before 29 February 1952) is presented in Table 10.9; this includes respondents who took part in all four waves plus some who returned to wave 4 after missing waves 2 or 3. The distribution shows that the sample contains more women than men, as expected, especially in the older age groups.

An alternative way of looking at response differences by characteristics is to show how response rates vary by subgroups. Tables 10.10 and 10.11 (based on

respondents who took part in waves 1–3) split the sample into key subgroups based on age and non-housing wealth. Table 10.10 shows that among women who took part in waves 1–3, 90% of those who were aged 60–74 in wave 1 and 85% of those aged 75+ responded to wave 4. The corresponding figures for men were closer (87% and 88%, respectively). This is consistent with the pattern in response rates shown in previous waves.

Table 10.11 shows response in wave 4 (amongst those who took part in waves 1–3) increasing from the lowest non-housing wealth quintile to the highest (as measured in wave 1).

Table 10.9. Achieved sample of core members (Cohort 1), by age in 2008–09 and sex

Respondents in 2008–09, including proxies but excluding those in institutions

	Men	Women	Total	Men	Women	Total
Age in wave 4				%	%	%
56–59	507	637	1,144	17	17	17
60–64	651	781	1,432	22	21	22
65–69	501	597	1,098	17	16	17
70–74	482	593	1,075	17	16	16
75–79	372	458	830	13	13	13
80–84	241	317	558	8	9	9
85 and over	144	279	423	5	8	6
Unweighted N	*2,898*	*3,662*	*6,560*	*100*	*100*	*100*

Note: Columns may not add up to 100% because of rounding.

Table 10.10. Wave 4 (2008–09) main interview response for core members (Cohort 1) who took part in waves 1–3, by age in 2002–03 and sex

Eligible core members in 2008–09 who took part in waves 1–3

	50–59	60–74	75+	All
	%	%	%	%
Men				
Respondents	88	87	88	88
Non-respondents	12	13	13	12
Women				
Respondents	88	90	85	88
Non-respondents	12	10	15	12
Unweighted N	*2,668*	*2,215*	*1,923*	*6,806*
Men	*1,201*	*1,016*	*792*	*3,009*
Women	*1,467*	*1,199*	*1,131*	*3,797*

Note: Columns may not add up to 100% because of rounding.

Table 10.11. Wave 4 (2008–09) main interview response for core members (Cohort 1) who took part in waves 1–3, by non-housing wealth quintile in 2002–03 and sex

Eligible core members in 2008–09 who took part in waves 1–3

	Poorest	2nd	3rd	4th	Richest
	%	%	%	%	%
Men					
Respondents	85	84	86	89	93
Non-respondents	15	16	14	11	7
Women					
Respondents	85	86	87	90	90
Non-respondents	15	14	13	10	10
All					
Respondents	85	86	86	90	92
Non-respondents	15	14	14	10	8
Unweighted N	*1,065*	*1,307*	*1,389*	*1,441*	*1,474*
Men	*428*	*508*	*616*	*690*	*714*
Women	*637*	*799*	*773*	*751*	*760*

Cohort 3

The profile of the core member respondents belonging to Cohort 3 is presented in Table 10.12. For both men and women, the age distribution was more or less evenly split across the 52, 53 and 54 age bands. A slightly higher proportion of women (28%) were in the 55-year-old age band compared to men (24%).

Table 10.12. Achieved sample of core members (Cohort 3), by age in 2008–09 and sex

Respondents in 2008–09, including proxies

	Men	Women	Total	Men	Women	Total
Age in wave 4				%	%	%
52	139	177	316	26	26	26
53	131	154	285	24	23	23
54	142	159	301	26	23	25
55	130	187	317	24	28	26
Unweighted N	*542*	*677*	*1,219*	*100*	*100*	*100*

Cohort 4

The profile of the core member respondents belonging to Cohort 4 is presented in Table 10.13. For both men and women, the age distribution was more or less evenly split within each age group from 50 to 65 and 70 to 74. A slightly lower proportion of women than men represented the 65–69 age group (17% and 20%, respectively).

Table 10.13. Achieved sample of core members (Cohort 4), by age in 2008–09 and sex

Respondents in 2008–09, including proxies

	Men	Women	Total	Men	Women	Total
Age in wave 4				%	%	%
50–54	195	222	417	20	21	20
55–59	196	237	433	20	22	21
60–64	223	256	479	23	24	23
65–69	190	187	377	20	17	18
70–74	164	172	336	17	16	16
Unweighted N	*968*	*1,074*	*2,042*	*100*	*100*	*100*

Note: Columns may not add up to 100% because of rounding.

Profile of proxy respondents

As mentioned in the methodology section of the wave 1 report (Taylor et al., 2003) the number of interviews conducted by proxy was expected to grow in future waves as the ELSA sample ages. A comparison in wave 1 of proxies with those of individual respondents showed that there were considerable differences between the two groups, as would be expected due to the rules employed to qualify for a proxy interview. Relative to those completing a full interview in person, proxy respondents are more likely to be older, more likely to have a long-standing illness and less likely to be in paid work or to be self-employed (Taylor et al., 2003). Table 10.14 shows the proxy respondent sample in 2008–09 (core members in Cohort 1), by age and sex; 48% of women were aged 80 and over compared with 25% of men.

Table 10.14. Proxy respondent sample (Cohort 1), by age in 2008–09 and sex

Proxy respondents in 2008–09, excluding those in institutions

	Men	Women	Total	Men	Women	Total
Age in wave 4				%	%	%
56–59	7	7	14	9	8	8
60–64	16	10	26	20	11	15
65–69	11	10	21	14	11	13
70–74	13	9	22	16	10	13
75–79	14	9	23	17	10	14
80–84	10	13	23	12	15	14
85 and over	10	29	39	12	33	23
Unweighted N	*81*	*87*	*168*	*100*	*100*	*100*

Profile of nurse interview respondents

In total, 8,641 nurse visits were completed. ELSA core members were eligible for the nurse visit if they had completed an ELSA wave 4 main interview in person (and not by proxy). Of these, 8,218 nurse visits were carried out with

core members and 423 were carried out with partners. The response rate for the nurse visit for core members who completed a main interview was 86%. The age-sex profile of nurse visit respondents is shown in Table 10.15 and achieved nurse visits by age are shown in Table 10.16.

A number of reasons were given for not taking part in the nurse visit. The main reason was refusal (see Table 10.17). A minority did agree to take part but could not be contacted by the nurse. This may reflect some people's circumstances, but in other cases this could be interpreted as an implicit refusal despite the fact that consent had been given to be visited by the nurse at the end of the main interview. Other reasons for non-response include being too ill or away at the time.

Table 10.15. Achieved nurse visits with core members, in 2008–09, by age and sex

Core members in all cohorts who completed a productive main interview in person

	Men	Women	Total	Men	Women	Total
Age in wave 4				%	%	%
50–54	481	547	1,028	13	12	13
55–59	683	886	1,569	18	20	19
60–64	769	899	1,668	21	20	20
65–69	585	685	1,270	16	15	15
70–74	555	666	1,221	15	15	15
75–79	312	391	703	8	9	9
80–84	191	239	430	5	5	5
85+	118	211	329	3	5	4
Unweighted N	*3,694*	*4,524*	*8,218*	*100*	*100*	*100*

Table 10.16. Achieved nurse visits as a proportion of wave 4 interviews (2008–09) by age

Core members in all cohorts

Age band (years) at wave 4	Productive wave 4 interview (excluding proxies)	Productive wave 4 nurse visit	% of wave 4 interviews resulting in a nurse visit
50–54	1,288	1,028	80
55–59	1,862	1,569	84
60–64	1,873	1,668	89
65–69	1,447	1,270	88
70–74	1,384	1,221	88
75–79	810	703	87
80–84	536	430	80
85+	392	329	84
Unweighted N	*9,592*	*8,218*	*86*

Table 10.17. Reasons for non-response to nurse visit for core members

Core members who responded to wave 4 interview, but had no nurse visit

Reason for non-response	Frequency	%
Non-contact	60	4
Refusal	1,041	76
Other	273	20
Unweighted N	*1,374*	*100*

10.5 Implications for analyses: weighting

This section describes the weighting strategies used to adjust for non-response and the process of combining Cohorts 1, 3 and 4.

Longitudinal data sets such as ELSA can be analysed either as a cross-section or longitudinally. Cross-sectional analysis uses data collected at a particular wave; longitudinal analysis involves data collected from more than one wave for the purposes of analysing change. Cross-sectional and longitudinal weights support these two different objectives. We describe the cross-sectional and longitudinal weights constructed at wave 4 in turn, beginning with the longitudinal weight.[10]

Longitudinal analysis

An analysis of non-response using information collected at previous waves can help to identify the potential for bias in the respondent sample. For those core members from Cohort 1 eligible for the main interview in wave 4, *and* who responded at waves 2 and 3, response was modelled using logistic regression analysis on a range of household and individual-level information collected at wave 3 (supplemented by information taken from waves 1 and 2). The analysis was conducted using the main interview weight (longitudinal) derived in wave 3 to ensure that the wave 4 weight did not replicate the wave 3 weight.

The results showed significant differences between respondents and non-respondents on a number of characteristics:

- age (at wave 1) by sex;
- government office region (at wave 3);
- white/non-white ethnicity;
- highest educational qualifications (at wave 1);
- housing tenure (at wave 3);
- self-assessed health (at wave 3);

[10]A more technical description of the weighting strategies can be found in the User Guide accompanying the wave 3 data.

- number in household (at wave 3);
- National Statistics Socio-Economic Classification NS-SEC (at wave 3).

A longitudinal weight was calculated for the set of 5,971 core members who responded to all four waves of ELSA and remain living in private households. The weighting strategy in wave 4 aimed to minimise any bias arising from sample loss after wave 3.

Taking the inverse of the estimated probability of response (from the logistic regression model) created a non-response weight for wave 4. For example, a response probability of 0.8 corresponds to a weight of 1.25, while a lower response probability of 0.5 corresponds to a greater weight of 2. The non-response weighting factor in wave 4 was then multiplied by the wave 3 weight. The sequential nature of the weighting[11] means that we have adjusted for non-response to HSE and each of the four waves of ELSA.

The longitudinal methods literature distinguishes between two types of non-response. First, *attrition* patterns of non-response describe the situation in which the respondent appears in an early wave and then fails to respond at later waves. Second, *wave non-response* represents the case in which respondents at a particular wave had failed to respond to one or more of the previous waves.

Typically, longitudinal surveys only provide longitudinal weights to compensate for attrition patterns of non-response. Compensating for wave non-response necessitates constructing an independent weight for each pattern of response. As Lynn et al. (1994) explain, the potential for error in such a situation is considerable. Furthermore, although the purpose of weighting a data set is to make it 'representative' of the population, small differences between survey estimates will inevitably occur when using the different sets of weights (Lynn et al., 1994, p. 11).

Hence, as with other longitudinal studies (e.g. The British Household Panel Study or The Families and Children's Study), the longitudinal weighting strategy focuses on only those core members who have responded at all waves up to and including wave 4 (2008–09). At each wave, as described above, the fully responding core members are re-weighted to take account of the previous wave's respondents lost through refusal at the *current* wave or through some other form of sample attrition. The longitudinal weight derived in wave 4, therefore, was defined only for the set of 5,971 core members who have responded at each and every wave up to and including the fourth wave.[12]

Core members from Cohort 1 who returned to the study at wave 4 after missing either wave 2 or wave 3 or both do not, therefore, have a positive longitudinal weight. Possible longitudinal weighting strategies to

[11]That is to say, longitudinal weights are based on a sequence of attrition models for each wave, which is multiplied by the weight created at the previous wave. In this case, the weight derived in wave 4 builds on the wave 3 weight, which, in turn, built on the weight created in wave 2, etc.

[12]Both proxy and telephone respondents have positive weights. Core members known to be living in institutions are classified as respondents to the survey but are treated as ineligible for the purposes of weighting as they no longer belong to the population of interest.

accommodate wave non-response are outlined in Lepkowski (1989) and Lynn et al. (1994). The 582 core members who returned to the study at wave 4 (2008–09) (and were still living in England) do, however, have a positive cross-sectional weight, discussed in the next section.

Cross-sectional analysis

Longitudinal surveys are often not as good as cross-sectional surveys at providing cross-sectional estimates. For example, compared with estimates from a cross-sectional survey, cross-sectional estimates from a longitudinal survey (from wave 2 onwards) may be more likely to suffer from coverage error (because the sample was selected longer ago and may not include recent additions to the population of interest such as immigrants). Also, a longitudinal survey may experience lower response rates than a cross-sectional survey.

Nevertheless, in order to support cross-sectional analysis, a cross-sectional weight was derived that can be used to analyse all core members responding at wave 4. This allows for the inclusion of Cohort 3 core members (new entrants at wave 3), Cohort 4 core members (new entrants at wave 4) and 'wave non-responders' (those core members from Cohort 1 who returned to the study at wave 4 after missing either wave 2 or wave 3 or both).

Core members responding at wave 4 can be described as the *combined sample*. The cross-sectional weight defined for the combined sample at wave 4 was calculated using the following steps:

1. For Cohort 3 core members (the refreshment sample chosen from HSE 2001–04), response to wave 4 was modelled on a range of household and individual-level information collected from wave 3. A non-response weight was then derived to adjust for non-response between wave 3 and wave 4.
2. For Cohort 4 core members (the refreshment and 'top-up' sample chosen from HSE 2006), plus those Cohort 3 core members omitted at wave 3, response to wave 4 was modelled on a range of household and individual-level information collected from the HSE. A non-response weight was then derived to adjust for non-response between HSE and ELSA wave 4.
3. Population estimates for those core members aged 56+ at wave 4 were derived from those responding to all four waves of ELSA plus those Cohort 4 core members aged 56–74 at wave 4. The non-response weights for all core members aged 56+ at wave 4 (i.e. the first two groups plus wave non-responders) were then calibrated to these population estimates plus estimates of age/sex and region from 2008 household population estimates.[13]
4. The non-response weights for all core members aged 50-55 at wave 4 i.e. all Cohort 3 core members plus the Cohort 4 core members aged 50-55, were calibrated to 2008 population estimates of sex and region.[13]

[13]Age is defined here as age at 1 March 2008, immediately prior to the beginning of wave 4 fieldwork.

5. Finally the calibration weights from steps 3 and 4 above were combined and scaled so that the average weight was equal to 1.

These steps are discussed in turn. A more detailed description will be provided in the Technical Report.

Non-response weights for Cohort 3

A cohort of people born between 1 March 1953 and 29 February 1956 was added to the wave 1 cohort in 2006–07. The wave 3 cohort (Cohort 3) was selected from four survey years of the Health Survey for England (2001–04). Only those core members responding at wave 3 were eligible for interview at wave 4 (2008–09).

For Cohort 3 core members eligible for the main interview in wave 4 response was modelled on a range of household and individual-level information collected from wave 3. The analysis was conducted using the non-response weight derived in wave 3 to ensure that the wave 4 weight did not replicate any adjustment made by the wave 3 weight.

The results showed significant differences between respondents and non-respondents on one characteristic only: educational status. Taking the inverse of the estimated probability of responding created a non-response weight to adjust for possible non-response bias between wave 3 and wave 4.

The cross-sectional weighting for Cohort 3 is complicated by the omission at wave 3 of persons born between 1 March 1952 and 28 February 1953. These individuals were introduced to ELSA for the first time at wave 4 (instead of wave 3 as originally intended). Their response to wave 4 was therefore modelled with Cohort 4 core members.

Furthermore, 103 individuals originally classified as younger or older partners were reclassified as Cohort 3 core members at wave 3. As these individuals were given a zero cross-sectional weight at wave 3, their response to wave 4 was also modelled with Cohort 4 core members.

Non-response weights for Cohort 4

A cohort of people born between 1 March 1934 and 28 February 1958 was added to the ELSA sample at wave 4 (2008–09). They were selected from the Health Survey for England 2006 and are collectively referred to as Cohort 4. This group can be seen as comprising three distinct cohorts:

- those born between 1 March 1956 and 28 February 1958 (aged 50–51 at wave 4), otherwise known as the refreshment sample;
- those born between 1 March 1952 and 29 February 1956 (aged 52–55 at wave 4), thereby providing a ‘top-up’ of Cohort 3 core members;
- those born between 1 March 1934 and 29 February 1952 (aged 56–74 at wave 4), thereby providing a ‘top-up’ of Cohort 1 core members.

Their response to wave 4 was modelled on a range of household and individual-level information collected from HSE. Also included in this model, as discussed above, were:

- those Cohort 3 core members born between 1 March 1952 and 28 February 1953 who were erroneously omitted from ELSA wave 3;

- the 103 individuals originally classified as younger or older partners who were reclassified as Cohort 3 core members at wave 3.

The results showed significant differences between respondents and non-respondents on a number of characteristics:

- age by sex;
- highest educational qualifications;
- household type;
- National Statistics Socio-Economic Classification (NS-SEC);
- whether had a long-term limiting illness;
- marital status.

Taking the inverse of the estimated probability of responding created a non-response weight to adjust for possible non-response bias between HSE and ELSA.

Cross-sectional weights for Cohort 1

Core members belonging to Cohort 1 and successfully interviewed at wave 4 belonged to one of two groups:

- 5,971 core members who had taken part in waves 1, 2 and 3 (eight of these respondents had moved to either Wales or Scotland and were therefore given zero cross-sectional weights);
- 589 wave non-responders, that is, individuals who had returned to the study at wave 4 after missing wave 2 or wave 3 or both (seven of these respondents had moved to either Wales or Scotland and were therefore given zero cross-sectional weights).

It is often speculated that wave non-responders are likely to have characteristics that differ from those who have taken part at all waves (Lynn et al., 1994). At wave 3, it was found that the following socio-demographic features were predictive of wave non-response when compared with response to all waves:

- housing tenure;
- white/non-white ethnicity;
- highest educational qualifications;
- marital status.

At wave 4 (2008–09), this issue was complicated by the introduction of the Cohort 4 ‘top-up’ which includes 1,548 core members aged 56–74 at wave 4, who have been included to supplement Cohort 1 core members who at wave 4 are aged 56+.

In order to combine these three groups to create a representative sample of persons aged 56+, it was necessary to make sure, as far as possible, that the characteristics of the combined sample match those of the population. In order to do this, estimates of population characteristics are required.

Table 10.18. Household population estimates

Mid-2008 England household population (aged 50 and over)

Age	Men	Women	Total	Men	Women	Total
				%	%	%
50–55	1,846,645	1,888,680	3,735,325	23.0	20.9	21.9
56–59	1,183,385	1,225,145	2,408,530	14.8	13.5	14.1
60–64	1,474,930	1,546,341	3,021,271	18.4	17.1	17.7
65–69	1,089,441	1,174,974	2,264,415	13.6	13.0	13.3
70–74	924,760	1,040,579	1,965,339	11.5	11.5	11.5
75–79	715,095	893,286	1,608,381	8.9	9.9	9.4
80+	787,112	1,276,400	2,063,512	9.8	14.1	12.1
Total	8,021,368	9,045,405	17,066,773	100.0	100.0	100.0

The Cohort 1 core members who responded to all four waves of ELSA and the Cohort 4 core members aged 56–74 already had weights derived to adjust for non-response at wave 4, previous waves of ELSA and HSE. Either of these cohorts could therefore provide such population estimates (although the latter only for those aged 56–74).

Combining these groups (whilst accounting for the larger numbers of 56–74s by scaling down their non-response weights) provided a basis from which to estimate the population characteristics of those aged 56+. Estimates of housing tenure, white/non-white ethnicity, highest educational qualifications and marital status were derived using this method (the same characteristics were used as in wave 3 for consistency).

The non-response weights for all core members aged 56+ at wave 4 (2008–09) (i.e. the two groups already combined plus the wave non-responders) were then adjusted using calibration weighting so that the resulting weights, when applied to the three groups combined, provide survey estimates that match the population estimates on the four socio-demographic characteristics plus estimates of age/sex and region of those aged 56+ (from mid-2008 household population estimates, see Table 10.18).

Cross-sectional weights for Cohorts 3 and 4

Responding core members aged 50–55 at wave 4 included:

- 1,219 Cohort 3 core members (aged 52–55 at wave 4) (one of these respondents had moved to Wales and was therefore given a zero cross-sectional weight);
- 494 Cohort 4 core members aged 50–55, comprising 149 in the refreshment sample of 50–51-year-olds and 345 in the 'top-up' of 52–55-year-olds.

These groups were combined and their non-response weights were adjusted using calibration weighting so that the resulting weights provide survey

estimates that match population estimates of sex and region (from mid-2008 household population estimates) for those aged 50–55.[14]

Putting the cross-sectional weights together

The final step in the calculation of the cross-sectional weights was to take the calibrated weights from the two cohorts (Cohort 1 and Cohort 3 and 4 combined) and to scale them so that they are in the correct proportion in the final weighted sample. The final weights were then scaled so that the average weight was equal to 1.

The profile of the combined core member respondents, weighted by the cross-sectional weight, is presented in Table 10.19.

Table 10.19. Achieved (combined) sample of core members, by age in 2008–09 and sex

Respondents in 2008–09, including proxies but excluding those in institutions

	Men	Women	Total	Men	Women	Total
Age at wave 4 interview				%	%	%
50–55	861	870	1,730	18.7	16.7	17.6
56–59	880	919	1,799	19.1	17.7	18.4
60–64	847	888	1,736	18.4	17.1	17.7
65–69	626	675	1,301	13.6	13.0	13.3
70–74	531	598	1,129	11.5	11.5	11.5
75–79	411	513	924	8.9	9.9	9.4
80 and over	452	733	1,186	9.8	14.1	12.1
Weighted N	*4,608*	*5,197*	*9,805*	*100.0*	*100.0*	*100.0*
Unweighted N	*4,398*	*5,407*	*9,805*	*100.0*	*100.0*	*100.0*

Notes: The apparent under-representation of the 50–55 cohort is due to the fact that some of these respondents turned 56 by the time of their wave 4 interview. The cohort of people aged 50–55 on 1 March 2008 appears in its correct proportion in the weighted sample. Columns may not add up to 100% because of rounding.

10.6 Conclusions

ELSA is now reaching the stage where genuine longitudinal exploration has become possible. The study remains strong and has been successful in achieving many of its scientific aims. Wave 4 (2008–09) has seen the introduction of a variety of questions covering sleep patterns, women's health, state pension deferrals, monetary gifts and monetary transfers. A number of questions have also been reintroduced from earlier waves such as spending on leisure activities and the numerical cognitive function test. We continue to aim for high response rates. A number of core members not interviewed at previous waves returned to the study at wave 4 and a new cohort of respondents, aged between 50 and 74, was added to the wave 1 cohort. No

[14]Age was not included because the small numbers of 50–51-year-olds would have caused this group to have excessively large weights in comparison with those aged 52–55.

single rate can represent the overall level of response to studies such as ELSA but two or three figures are indicative. In 2008–09, 74% of eligible core members (from Cohort 1) were successfully interviewed and this represents a reasonable measure of the success of this particular wave. If we consider those who we successfully interviewed at the ELSA survey in 2002–03 who formed our baseline, we have interviewed 70% successfully at subsequent waves (waves 2 and 3). We will continue to work hard to achieve the maximum possible response at wave 5 and to ensure that the study remains high quality and innovative.

Finally, we acknowledge and appreciate the enormous contribution of all the individuals who take part in the study, and the interviewers and nurses who carry it out in such a committed way.

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