Institute for
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The adequacy of wealth among those approaching retirement

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The adequacy of wealth among those approaching retirement

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Preface

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Executive summary

There has been ongoing concern in many quarters in recent decades that individuals in the UK are not saving enough to provide themselves privately with an adequate income in retirement. A number of long-run trends have acted to make it harder for individuals to accumulate sufficient resources, including unexpectedly rapidly increasing life expectancies and the reduced availability of defined benefit (DB) pensions in the private sector. The Pensions Commission was appointed in 2002 with the remit of 'keeping under review the adequacy of private pension saving in the UK, and advising on appropriate policy changes', and its first report (Pensions Commission, 2004) projected that many people, particularly those with defined contribution (DC) pensions, would have 'inadequate' resources in retirement.

The most comprehensive investigation of the adequacy of likely retirement resources among individuals in England was contained in Banks et al. (2005). This report provides an update and extension of that work using the English Longitudinal Study of Ageing (ELSA). Such an update is warranted since recent years have been particularly turbulent: reforms to the state pension system introduced by the Pensions Act 2007 have changed the amount that individuals can expect to receive from the state, while the recent financial crisis affected asset prices and potentially the amount individuals might expect to get from their private pensions.

This report therefore provides a new assessment of the proportion of people aged between 50 and the State Pension Age (SPA) who are at risk of having inadequate resources in retirement and considers the characteristics associated with the risk of such inadequacy. We make use of data from ELSA on 2,534 individuals in families where everyone is below the SPA and does not yet report being retired. For these individuals, we estimate their family income at the SPA from state and private pensions and other potential sources and we compare that income with what might be considered to constitute an 'adequate' income in retirement.

More specifically:

- Our focus is on an individual's family income at the point when an individual reaches the State Pension Age. Since real pension income will decline throughout retirement if not all income streams are price indexed, our figures will likely understate the proportion of individuals who will have inadequate resources *at some point* in retirement.
- We consider six definitions of what constitutes income in retirement, ranging from just pension income (from private and state pensions) to a broad measure of income that includes pensions, the annuitised value of non-housing wealth, expected inheritances, means-tested Pension Credit and an imputed rental income from housing wealth.
- We consider four thresholds for what might constitute an 'adequate' retirement income. One is a poverty line interpretation: is income greater than the minimum level of income required to avoid poverty (which we assume is equal to the Pension Credit Guarantee level of income)? The other thresholds are couched in terms of the proportion of current total family net income that will be replaced (i.e. maintained) in retirement.

Our headline results on the proportion of individuals at risk of having an inadequate family income at the SPA suggest the following:

- Twelve per cent of individuals would have an income at the SPA of less than the Pension Credit Guarantee level if they only drew an income from their state and private pensions. These individuals would be dependent either on their non-pension wealth or on means-tested benefits in order to avoid poverty in retirement.
- Forty-one per cent of individuals are estimated to be in families that, in retirement, would either replace less than 67 per cent of their current net family income or fall below the Pension Credit Guarantee level using pension income alone. Fifty-three per cent are estimated to be in families that would either replace less than 80 per cent of their current net family income or fall below the Pension Credit Guarantee level.
- When a broader measure of income is used, estimated income at the SPA is greater and the proportion of individuals at risk of having inadequate resources is reduced. Using a measure of income that includes income from pensions, the annuitised value of non-housing wealth, expected inheritances, means-tested Pension Credit and an imputed rental income from housing wealth, the proportion of individuals at risk of replacing less than 67 per cent of their current net family income falls to 10 per cent, while the proportion at risk of replacing less than 80 per cent falls to 21 per cent.

Comparisons over time between 2004–05 and 2010–11 suggest that the proportion of individuals at risk of having inadequate resources has fallen. Replacement rates are, on average, greater when calculated using later years of data, due to increases in estimated real pension wealth at the SPA combined with relatively little change in real current total family income. However, comparisons over time should be drawn with care: attrition from the ELSA data is unlikely to be random, meaning that the sample observed in later waves of data may not be entirely comparable to that in earlier waves.

We also consider the characteristics associated with the risk of having inadequate retirement resources. We find the following:

- Single individuals (whether divorced, widowed or never married) are more at risk of inadequacy than married individuals and, among single individuals, women tend to be more at risk than men.
- Having low education and low numeracy are associated with being at greater risk of having an income of less than the Pension Credit Guarantee level in retirement. However, the relationship between education/numeracy and replacement rates is more complicated because, whilst those with higher education tend to have higher incomes in retirement, they also tend to have a higher working-life income to replace.
- Those in lower deciles of current income are more at risk of having a pension income at the SPA below the Pension Credit Guarantee level. Those in higher income deciles are more at risk of having an income in retirement (either from just pensions or on a broader definition) that replaces less than 67 per cent of their current total family net income.

The ELSA survey asks individuals about their own expectation of not having enough financial resources to meet their needs at some point in the future. The majority of individuals report a relatively low (but generally positive) probability of this, with only just over one-quarter of individuals reporting a probability of future inadequacy of greater than 50 per cent. We find the strongest relationship between self-reported expectations of future resource inadequacy and our definition of potential inadequacy that is based on a narrow measure of retirement income and the poverty line benchmark. Conversely, there is little clear relationship between self-reported expectations of

inadequacy and our measures of adequacy based on broader definitions of retirement income and replacement rate benchmarks.

This report looks only at the adequacy of retirement resources, i.e. whether an individual has sufficient income to meet their needs. We have not attempted to assess the *optimality* of an individual's position – in other words, whether they have made the 'correct' saving decisions given their circumstances. Such a distinction is important, since the policy implications of individuals having inadequate resources could be very different depending on whether or not they have behaved suboptimally. The issue of the optimality of wealth accumulation in the UK is the subject of ongoing work that will complement the analysis presented here.

CHAPTER 1
Introduction

The ability of individuals to provide themselves with a suitable income in retirement is an area of particular policy interest. While it is clear that individuals desire to avoid large falls in their ability to consume goods and services as they move from working life to retirement, there has been concern in many quarters in recent decades that individuals are not saving enough to provide themselves privately with an adequate income in retirement. The implication of this is either that these pensioners will suffer from a lower-than-desirable level of income or that the balance of pensioner income will be more state-dominated than projected, or desired, by the government.

A number of long-run trends have acted to make it harder for individuals to accumulate sufficient resources to fund their retirement adequately. Increasing life expectancies, without a similar increase in retirement ages, have meant that the length of retirement that needs to be funded has, on average, increased. According to Blöndal and Scarpetta (1999) and Pensions Commission (2004), life expectancy at age of exit from the workforce increased from 11 years for men and 16 years for women in 1950 to 20 and 25 years respectively by 2005. There have also been changes in the private pension landscape in the UK. Employers are now much less likely to offer defined benefit (DB) pension schemes to their employees, instead replacing these schemes with much less generous and more uncertain defined contribution (DC) schemes.[1] On the other hand, some long-run trends may positively affect wealth accumulation and the preparedness of individuals for retirement. For example, women are increasingly likely to have had more prolonged periods of labour market engagement, potentially increasing the lifetime income of families and increasing engagement with private pension saving.

The effect of such long-run trends is that the situation of current pensioners may not be a particularly good guide to the likely retirement outcomes of those currently approaching retirement or of those in younger generations. In particular, even if current pensioners are thought, on the whole, to be able to fund their consumption needs, the same would not necessarily follow for those who have not yet retired. In the last decade, there has been considerable policy concern that these younger cohorts are not making adequate private provision for their retirement. In 2002, the government appointed the Pensions Commission with the mandates to 'keep under review the regime for UK private pensions and long-term savings' and 'to make recommendations ... on whether there is a case for moving beyond the current voluntarist approach'. Its first report (Pensions Commission, 2004) used a simple modelling exercise to suggest that many people, particularly those with DC pensions, would have 'inadequate' resources in retirement, unless they had large non-pension assets or were planning to retire later than current pensioners did. The Pensions Commission went on to propose reforms to both the state and private pension systems in the UK. The most radical of these – the automatic enrolment of employees into a workplace pension scheme – started to be rolled out in October 2012.

The most comprehensive investigation of the adequacy of likely retirement resources among individuals in England was contained in Banks et al. (2005). Using detailed data from the English Longitudinal Study of Ageing (ELSA) on the population aged between 50 and the State Pension Age (SPA), the authors investigated the actual wealth holdings and likely pension income in retirement of these individuals. By comparing the resulting

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[1] For a discussion of this trend, see Crawford, Emmerson and Tetlow (2010).

predicted income levels with a number of different thresholds for what might constitute an adequate income in retirement, they identified the proportions at risk of having 'inadequate' resources and, importantly, the individual characteristics associated with being at risk.

Recent years, however, have been particularly turbulent. Reforms to the state pension system introduced in Pensions Act 2007 (motivated by the recommendations of the Pensions Commission) changed the amount that individuals could expect from the state pension, while the financial crisis affected asset prices and potentially the amount that individuals could expect from their private pensions. This report therefore acts to update and extend Banks et al. (2005), using more recent ELSA data, collected in 2008–09 and 2010–11,[2] and incorporating the rules in place following the Pensions Act 2007 when estimating likely state pension income.

It should be pointed out from the outset that this report looks only at the *adequacy* of retirement resources – that is, whether an individual has sufficient wealth or income to meet their needs. We do not make any attempt to assess the *optimality* of an individual's position – in other words, whether they have made the 'correct' saving decisions and accumulated the 'correct' amount of wealth given their circumstances and a specification of how they 'should' have behaved. While the distinction between these concepts is often confused or ignored, they are, importantly, separate issues. For example, a family may have inadequate resources in retirement because they simply didn't bother saving or because they had a low level of income during working life and did not have the capacity to save. In both cases retirement resources are inadequate, though only in the former case might their saving behaviour be described as suboptimal. The distinction is important because the policy implications of the two cases could be very different. While the important issue of the optimality of wealth accumulation in the UK is not addressed in this report, it is the subject of ongoing work that will complement the analysis presented here.

This report proceeds as follows. Chapter 2 introduces the data that we use, while Chapter 3 discusses how one can define and measure the adequacy (or otherwise) of income in retirement. Chapter 4 presents our results and Chapter 5 concludes.

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[2] Figures presented in Banks et al. (2005) were based on ELSA data collected in 2002–03.

CHAPTER 2
Data

For evidence on the adequacy of the resources of those currently approaching retirement, we make use of data from the English Longitudinal Study of Ageing. ELSA is a biennial longitudinal data set, broadly representative of the household population of England aged 50 and over. It began in 2002–03 with a sample of around 12,000 individuals, and there are now four subsequent 'waves' of data also available (collected in 2004–05, 2006–07, 2008–09 and 2010–11).

ELSA is uniquely equipped to provide the data required to assess comprehensively the preparedness of individuals approaching retirement. The survey collects a vast array of data on accumulated wealth holdings, combining detailed data on individuals' pension membership and pension schemes with comprehensive information on the components of financial and property wealth held by households, which can be used to predict individuals' future income in retirement. In addition, ELSA collects a large quantity of information on demographics, labour market circumstances, subjective and objective measures of health, and individuals' expectations about the future. The breadth of data collected, which does not come at the cost of detailed wealth data, is a huge asset to those researching the retirement resources of those approaching retirement.

As will be discussed in more detail in Chapter 3, much of this report will be concerned with predicting families' future net income at the State Pension Age, from pensions and other sources, and comparing this with various benchmarks, including the current level of total net income reported in the ELSA survey. Table 2.1 aims to make this more explicit by defining exactly what is included in the different measures of income and wealth that will be discussed throughout the report.

Current total net income, net housing wealth and net non-housing (non-pension) wealth can, broadly speaking, be taken directly from the responses given to the detailed questions in the ELSA survey (with some imputation for missing or imprecise answers; see Oldfield (2012)). However, since we are primarily interested in wealth stocks accumulated by the SPA (which can potentially be used to provide an income stream in retirement), we still need to estimate *future* wealth given the wealth holdings reported at the time of interview. To do this, we simply assume that all non-pension wealth grows by 2.5% a year in real terms.[3]

The pension income that those currently below the SPA will receive has to be estimated, since individuals cannot be in receipt of their state pensions at that age and because individuals in our sample are typically not yet receiving income from their private pensions. Likely pension income at the SPA is estimated for each individual based on their private pension membership, the detailed information they provide on their pension schemes (including scheme rules and their current contribution rates), their reported work history and numerous assumptions about past and future behaviour.[4]

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[3] This assumption differs from the treatment in Banks et al. (2005) and Banks, Emmerson and Tetlow (2007), whose approach was to assume no real growth in non-pension wealth between the most recent data and the respondent's SPA. However, Nationwide Building Society (2008) estimated that the long-run trend growth in real house prices in the UK has been around 2.7% a year. With respect to non-housing wealth, a nominal growth rate of 5% is the lowest of the Financial Services Authority's standard projection rates for the return on investment products, though this may still overestimate the return on net financial wealth held by those aged 50 to the SPA, who tend to hold relatively safe and therefore low-return assets.

[4] The detailed methodology and imputation procedures used to calculate pension income are described in Crawford (2012).

Table 2.1

Income and wealth definitions

Measure	Comprised of:
Total net income	Employment/Self-employment income
	Private pension income
	State benefit income[a]
	Asset income
	Other income (e.g. maintenance, royalties)
	less Income tax and National Insurance contributions and some[b] pension contributions
Net pension income	State pension income:
	Basic state pension
	State earnings-related pension / State Second Pension
	Private pension income:
	Employer pension
	Personal pensions and other defined contribution pensions (e.g. S226 plans and stakeholder pensions)
	less Income tax
Net housing wealth	House value (principal residence)
	less Outstanding mortgage debt
Net non-housing (non-pension) wealth	Net financial wealth:
	Interest-bearing accounts at banks and building societies (including ISAs and TESSAs)
	National Savings accounts and Personal Equity Plans
	Stocks and shares
	Government, corporate and local authority bonds
	Investment trusts and unit trusts
	less Outstanding loans and non-mortgage debts
	Net physical wealth:
	Net non-owner-occupied housing wealth
	Property and land
	Antiques and collectables
	Covenants and trusts
	Net business wealth

a. This measure of state benefit income excludes both Housing Benefit and Council Tax Benefit.
b. Individuals are asked for their pay, net of deductions including pension contributions. Therefore contributions that are deducted from pay before the earner receives that pay (through, for example, salary sacrifice) will not be included in our measure of net income.

For the purpose of all our analysis, wealth and income figures are aggregated up to the family level (where a family is defined as being a couple or single individual) and then attributed equally to all individuals within that family.[5] Therefore, while our results are presented at the individual level and described according to individual characteristics, the income levels and replacement rates discussed refer to the family to which that individual belongs. The analysis is conducted in this way primarily because we are

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[5] This is straightforward except in the case of income at the SPA, where two members of a couple may reach the SPA at different points in time. Our approach here is to take the sum of each individual's projected income at their respective SPA.

interested in the circumstances of the family as a unit. For example, if a couple has made an active decision that all the pension saving will be done by one individual, who has accumulated a sufficient private pension income to provide for them both in retirement, then we would want to class both these individuals as having adequate retirement resources, rather than only the individual who has accumulated the individual pension rights. In addition, conducting the analysis at the family level is convenient for data reasons. Data on wealth holdings in ELSA are often collected at the family level since, unless couples keep their finances separate, it is very difficult to allocate assets credibly to particular individuals in the family.

For the bulk of the analysis in this report, we make use of the 2008–09 ELSA data since that was the last time the ELSA sample was fully representative of the household population of England aged between 50 and the SPA. (A refreshment sample of individuals aged between 50 and 75 was added in 2008–09 to compensate for ageing and attrition, but no refreshment sample was added in 2010–11.) The headline statistics are also produced using the 2004–05, 2006–07 and 2010–11 data for comparison, but it should be noted that these statistics are for samples that are less representative of the population than the figures based on the 2008–09 data.

The focus of this work is on the adequacy (or otherwise) of the likely retirement resources of individuals currently approaching retirement. We therefore restrict our sample to those aged between 50 and the SPA whose partner is also aged below the SPA. Furthermore, we exclude from our analysis those individuals who either report themselves as retired or have a partner who reports themselves as retired. These individuals are excluded because they are no longer approaching retirement. In particular, comparing their predicted family income at the SPA with their current family income does not give a sensible indication of how their resources in retirement compare with those they enjoyed during their working life. However, since the exclusion of those who class themselves as retired makes our sample less representative of the overall population and, further, since this group of early retirees is interesting in its own right, these people are considered separately in Appendix A.

The resulting sample from the 2008–09 ELSA data comprises 2,534 individuals from 1,975 families.

CHAPTER 3
Issues in assessing the
(in)adequacy of retirement income

Our aim in this report is to assess the adequacy of the income that those approaching the State Pension Age will have when they reach that age. The approach normally taken in the literature is to compare income at retirement with a benchmark of what an adequate income would be. There are two obstacles to the straightforward implementation of this approach, one related to data and the other conceptual. The former is that the income that an individual will receive at the SPA is not known by the researcher and must be estimated. The conceptual challenge is to define an adequacy benchmark (or benchmarks) – a task for which there is not a single, universally-accepted 'correct' approach. This chapter therefore discusses in detail the issues and assumptions involved in predicting income and defining a series of adequacy benchmarks.

It should be noted that our focus is on the adequacy of income at the point individuals reach the SPA. We do not make any attempt to estimate how income may change over time from that point forwards, though this is an important aspect of individuals' preparedness for retirement: where income streams are not fully indexed in line with prices (in the case of many pensions, they are not), the purchasing power of income could decline through retirement, potentially reducing the adequacy of retirement resources at older ages. Our figures for the proportion of individuals at risk of inadequate resources at the SPA may therefore understate the proportion of individuals at risk of having inadequate resources *at some point* during their retirement.[6]

3.1 What will income in retirement be?

In predicting future income at the SPA, we must tackle two issues. The first is concerned with our uncertainty over when those currently approaching retirement will stop working – and presumably stop accumulating resources for retirement. The second is definitional: what exactly do we mean by income? In this section, we discuss these issues and detail the approaches that we take.

3.1.1 Retirement date
A key parameter in estimating what an individual's pension income at the SPA is likely to be is the date at which the person is assumed to leave work. That will affect their entitlement to the state pension and, in many cases, the private pension rights to which the individual has accumulated entitlement.

Since individuals' retirement plans are not known, an assumption needs to be made about when they leave work. There are clearly many options available here, which tend to trade off simplicity with plausibility. The two extreme assumptions – that everyone leaves work immediately after their ELSA interview or that everyone is in work until the SPA – will respectively underestimate and overestimate pension entitlements. An alternative, likely more accurate, scenario is that individuals currently in work remain in work until the SPA, while those not in work remain out of work until the SPA. Even this

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[6] Of course, if real incomes for some groups of individuals rise as they go through retirement (as they might for individuals whose income predominantly comes from the Basic State Pension, which under current policies is set to rise each year by the greater of inflation, earnings growth and 2.5%), then our estimates will overstate the extent of inadequacy over the entirety of retirement among those groups.

may overestimate pension entitlements, however, since some individuals currently in work will retire, while others may reduce their hours and begin a phased transition to retirement, before reaching the SPA.[7]

The assumption we maintain in this work is taken from Banks et al. (2005) and uses the fact that, as part of the survey, ELSA respondents are asked their expectations of staying in work past a certain age. We make use of respondents' answers to this question to estimate when they retire. This assumption underlies all of the results in Chapter 4; Figure B.1 in Appendix B shows the sensitivity of estimated pension income at the SPA to this assumption about retirement age.

3.1.2 Defining retirement 'income'

Calculating what an individual's income at the SPA will be also involves an important decision over what should amount to 'income'. In some circumstances, retirement income is taken to be the sum of private and state pension income. While this is undoubtedly the object of interest in many circumstances, it is arguably the narrowest definition of potential income in retirement, since many individuals have other financial, physical or property wealth that they could draw on if necessary.

Table 3.1 shows the distribution of family wealth among our ELSA sample, decomposed into wealth held in broad categories. Pension wealth is calculated as the present discounted value of the estimated flow of pension income. Individuals are assumed to continue to accrue pension wealth until they stop working (this date, in turn, being estimated as described in the previous subsection). Further details on the calculation of pension wealth can be found in Crawford (2012). On average across the sample, pension wealth accounts for only just over half of total wealth; and, on average, the largest single components of the total are state pension wealth and private pension wealth. However, net primary housing wealth is also very important on average, with mean wealth across families in our sample of £170,100.

Table 3.1

Distribution of family wealth and its components (£)

	Mean	P10	P25	Median	P75	P90
Pension wealth	360,400	118,700	185,400	285,700	454,100	648,400
State pension wealth	180,900	96,000	127,100	187,700	225,300	264,400
Private pension wealth	179,500	0	12,000	90,700	237,800	438,000
Net primary housing wealth	170,100	0	30,000	150,000	240,000	350,000
Net non-housing wealth	135,900	−3,100	100	14,400	81,400	266,900
Net financial wealth	53,400	−4,800	0	8,500	45,000	123,900
Net physical wealth	82,500	0	0	0	3,000	140,000
Total wealth	666,500	142,500	292,800	506,400	793,700	1,179,800

Notes: Figures are at the family level (one observation per family) and are unequivalised (not adjusted for family composition). Figures are in 2008–09 prices and are rounded to the nearest £100.

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[7] See, for example, Emmerson and Tetlow (2006) and Crawford and Tetlow (2010).

While the mean levels of wealth held in state pensions, private pensions and primary housing are similar, there are important differences in how evenly these types of wealth are distributed. State pension wealth is fairly evenly distributed, with practically all families entitled to some state pension wealth and a ratio between the 75th percentile and the 25th percentile of only 1.8. By contrast, the holdings of wealth in private pensions and net primary housing vary much more across families and there are some with no wealth in these forms at all. The ratio between the 75th percentile and the 25th percentile is 19.9 in the case of private pension wealth and 8.0 in the case of net primary housing wealth.

Some families also hold large amounts of net financial wealth – for example, 10% of families hold over £123,900 in financial assets. However, positive liquid wealth holdings of this form are less common and, in fact, over one-quarter of families have no positive holdings of net financial wealth.

What can be drawn from this is that some, though by no means all, families do have significant non-pension wealth holdings that could be used to provide an income in retirement if necessary. Families could easily draw down their financial wealth in retirement, either by dissaving over time or by making use of more formal financial products such as annuities. Families could also use their housing wealth to provide themselves with additional resources in retirement – by making use of equity-release products, by downsizing, or by selling and moving into rented accommodation. (Under the next subheading, we discuss the perceived appropriateness of expecting individuals to use housing wealth to fund their retirement.) Focusing only on explicit pension resources would be particularly misleading if, for some families, pension wealth and non-pension wealth were substitutes for one another (in other words, if some families hold high levels of pension wealth but low non-pension wealth while others hold low levels of pension wealth but high levels of non-pension wealth).

Broader definitions of 'income' in retirement can therefore be thought of that include not just income from state and private pensions, but also income from some of these other sources of wealth. Clearly the broader the definition of 'income' in retirement, the higher that income will be and the more likely a family is to be deemed to have adequate resources. We discuss six definitions of income in this work. The first five of these are summarised in Box 3.1. The sixth, which involves a conceptually different consideration of the appropriate treatment of housing wealth, is introduced under the next subheading.

Box 3.1

Measures of income in retirement

1. Pension (state and private) income only
2. … Plus annuitised value of non-housing wealth
3. … Plus annuitised value of half of housing wealth
4. … Plus annuitised expected value of inheritances
5. … Plus (means-tested) Pension Credit

Non-housing wealth, housing wealth and expected inheritances are all assumed to be annuitised at a nominal rate of 5% – in other words, £100,000 of wealth would be converted into an annual income stream of £5,000. This represents the approximate rate for non-index-linked annuities. (We also test the sensitivity of our results to assumed annuity rates of 3% and 7%.) Our approach in taking account of the value of expected inheritances is taken from Banks et al. (2005, page 73).

Figure B.2 in Appendix B shows the distribution of estimated income at the SPA under the five definitions of income described in Box 3.1. Median income at the SPA is £11,500 per year under (1), increases to £13,500 under (2) and is higher again, at £16,000, under (3). The inclusion of expected inheritances makes very little difference, and the inclusion of means-tested Pension Credit substantially affects incomes at the bottom of the income distribution but does not impact that median.

Whether and how to take housing wealth into account

The question of whether or not individuals should use primary housing wealth to provide additional resources in retirement is a controversial and often emotive issue. For example, TNS-BMRB (2012) was commissioned by the Commission on Funding of Care and Support to research attitudes towards using housing assets to cover the costs of social care.[8] It found that many individuals were emotionally attached to their home and expressed a strong sense of injustice at the idea of selling the family home to pay for care. On the other hand, there were some individuals (although these were in the minority) who argued that housing was just another form of asset and should be liquidated if necessary.

In three of the measures of income described in Box 3.1 (3 to 5), we assume that individuals annuitise half of their housing wealth to provide additional income in retirement. This is not meant to represent a judgement that individuals *should* downsize to a house of half the value of their existing primary residence (indeed, for individuals with relatively low net housing wealth, such downsizing may not be possible); the measures are merely designed to indicate what pension incomes and inadequacy rates would look like *if* individuals were to do so.

This raises the question of whether families who *could* use some of their housing wealth for consumption (in retirement or otherwise) actually do so either by downsizing or by using a financial product designed to release equity in homes. Banks et al. (2010) compared the incidence of downsizing in the US and in England among a population over the age of 50. They found that, while it is less common in England than in the US, downsizing does happen. Focusing on a period of 10 years from when an individual was first observed in a longitudinal survey, the authors found that almost a quarter of homeowners move, with the average change in the number of rooms being –0.3. Terry and Gibson (2006) noted that while there are now a number of commercial providers of equity-release products tailored to the elderly, few of the people who could benefit from these products actually do so. The authors identified some, at least partially remediable, obstacles to the use of these products but also recognised that a fundamental obstacle may centre around attitudes to housing and the perception among many that, as described above, consumption of wealth that is in the form of housing equity should be considered only as a last resort.

Abstracting from the debate about whether or not housing wealth should be liquidated to fund retirement, it should be clear that a family with housing wealth is better off than a family with the same non-housing wealth but no housing wealth. Similarly, if two families are both replacing, say, 80% of their working-life income with their pension income but one has housing wealth and the other does not, the one with housing wealth is unambiguously better off: the family with housing wealth is essentially replacing 100% of their housing in retirement and 80% of their income, while the other is

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[8] The Commission on Funding of Care and Support was an independent body launched in July 2010 to review the funding system for care and support in England. For more information, see
http://www.dilnotcommission.dh.gov.uk/.

only replacing 80% of their income, which includes that portion necessary to cover their rental costs.

Housing wealth therefore has to be taken into account. One consistent way of doing so is to recognise that housing is an asset that yields a flow of income. This is not cash income but an imputed income – loosely speaking, the income that families could get if they rented out their homes, or equivalently the income that they do not have to use paying rent for the home that they live in that can then be spent on other activities. The importance of taking account of imputed income in a variety of situations has long been recognised – the imputed income from homeownership is included in national income (gross domestic product) calculations and it was liable for income tax in the UK until 1963.

We therefore consider, in addition to the definitions of income in Box 3.1, a sixth definition of income. This covers income from pensions, the annuitised value of non-housing wealth, an imputed rental income from housing, expected inheritances and means-tested Pension Credit. The imputed 'rental yield' of housing is estimated at 5%,[9] implying that an individual in a £200,000 house, for example, could rent an equivalent house for £10,000 per year. We would like to subtract mortgage interest payments from the imputed rental income from housing; however, while the ELSA survey does collect data on mortgage payments, it does not ask respondents to distinguish between mortgage interest payments and capital repayments. Since for homeowners approaching the end of their mortgage (as most of those in our sample are) the mortgage repayment will be predominantly capital rather than interest, we do not adjust the imputed rental income from housing for mortgage repayments. When comparing this sixth definition of income with the reported current (pre-retirement) level of family income, the imputed rental income from housing for homeowners also needs to be added to the pre-retirement level of income, since homeowners derive this benefit from owner-occupation before as well as after retirement.

We therefore have three different approaches to housing wealth when defining income in retirement. The first is to ignore it (the approach taken in income definitions 1 and 2 in Box 3.1). This approach is consistent with a notion that accumulated housing wealth should not be considered 'fair game' for the purposes of generating income in retirement. The second approach is to consider a scenario where families use half of their accumulated housing equity to purchase an annuity to generate income in retirement (as in definitions 3, 4 and 5). The third approach is to consider the notional flow of rental income that families get from their ownership and occupancy of the property they own (as described in the previous paragraph).[10]

Summary – defining 'income'

In this subsection, we have outlined a number of different definitions of retirement income that can be used to assess adequacy of resources in retirement. Box 3.1 listed five successively broader measures of income that can be used and the discussion that

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[9] Our particular choice of which rental yield to use is admittedly somewhat arbitrary. Rental yields vary over time (see, for example, chart 1 in Weeken (2004)) and they vary over property type and geography at one point in time (see, for example, http://www.londonpropertywatch.co.uk/average_rental_yield.html). However, estimating family-specific rental yields is difficult, and would be complicated by the need to predict them in the future. We therefore assume a constant (across time and across households) rental yield of 5%, which is close to the long-run average shown in Weeken (2004). We also test the sensitivity of our results to assuming rental yields of 3% and 7%.

[10] When comparing the second and third approaches, there are two important differences. First, a different proportion of housing wealth is added to retirement income (the annuity rate multiplied by the proportion of equity annuitised in the former case; the rental yield multiplied by gross housing equity in the latter case). Second, the pre-retirement income that is compared with income at the SPA differs (current income in the former case; current income plus an imputed rental income from housing wealth in the latter case).

followed it considered an alternative manner of taking into account the benefit that homeownership yields.

None of these definitions can be considered the 'correct' one – each will provide the 'correct' answer to a different question. In some of our analysis, we will present results using all six measures of income; in others, we focus on three of them – one consistent with each of the three approaches to housing that we outline. These three definitions of income are:

- Narrow: definition 1 in Box 3.1 – the income coming only from state and private pensions.
- Broad (1): definition 5 in Box 3.1 – the income coming from pensions, the annuitised value of non-housing wealth, the annuitised value of half of housing wealth, expected inheritances and Pension Credit.
- Broad (2): a measure that includes income from pensions, the annuitised value of non-housing wealth, an imputed rental income from housing wealth, expected inheritances and Pension Credit.[11]

3.2 What constitutes an 'adequate' income in retirement?

Even if a family's income in retirement is known with certainty, this would not on its own be sufficient to say objectively whether or not their resources would be adequate – such an assessment also requires knowledge of the family's spending needs in retirement. In practice, such data are not available (nor can spending 'needs' be defined objectively), and therefore the more practical approach that is generally taken is to compare income in retirement with some assumed benchmark of what constitutes an 'adequate' income.

There are two broad interpretations of what form such an adequacy benchmark should take. The first is a *poverty line* interpretation, which identifies individuals as having adequate resources if they have more than the fixed level of income that is judged necessary to buy essential goods and services. The second is a *replacement rate* interpretation, which identifies individuals as having adequate resources if they will not experience an unacceptable reduction in their living standards in retirement. However, even within each of these interpretations, there is no consensus on where the line identifying who has adequate resources and who does not should be drawn.

Since the benchmarks chosen to measure adequacy can appear fairly ad hoc, despite the crucial impact that their choice can have on the resulting proportions of individuals deemed to have inadequate resources, this section discusses the justification for common benchmarks used when assessing adequacy. We also describe the benchmarks that are used in this work, though it should be said from the outset that we do not believe any one of these to be the definitive answer as to what constitutes an adequate income in retirement.

3.2.1 Adequacy benchmarks: poverty line interpretation

Having sufficient income to buy essential goods and services is the bare minimum that could be associated with the term 'adequate' resources. Differing estimates of where such a poverty line lies arise from different interpretations of what counts as *essential.* We do

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[11] In addition to the obvious difference between the two broad measures (the first includes the annuitised value of half of housing wealth; the second includes an imputed rental income from housing), there is a further, more subtle, difference. Entitlements to Pension Credit will be greater under the broad (2) measure of income since the imputed rental income from housing wealth that we include is not counted as income for the purposes of the means test that determines Pension Credit entitlement, whereas the income stream resulting from annuitising half of housing wealth under the broad (1) definition is.

not here derive our own poverty line but use the minimum income that, under current policy, pensioners should be able to obtain.

In the UK, means-tested Pension Credit ensures that all pensioners have access to an income over a certain guaranteed level.[12] In 2012–13, the Guarantee Credit of Pension Credit is £142.70 for a single person and £217.90 for a couple. In addition, pensioners who claim the Guarantee Credit component of Pension Credit are automatically entitled to claim the maximum level of Housing Benefit and the maximum level of Council Tax Benefit.

In this work, we calculate the proportion of individuals who are at risk of having an income less than the Pension Credit Guarantee level when they reach the SPA. Such a figure indicates the proportion of people reliant on the state providing this safety-net minimum level of income.[13]

3.2.2 Adequacy benchmarks: replacement rate interpretation

For some individuals, the level of income guaranteed by Pension Credit will be similar to what they had during their working lives. Indeed, for those on Income Support during working life, their income would actually rise when they move onto Pension Credit. However, for most individuals in the UK, an income in retirement at the Pension Credit Guarantee level would represent a significant fall in their income and living standards compared with working life.[14] This suggests that a 'replacement rate' interpretation of adequacy is more suitable when looking at the preparedness of individuals in the UK for their retirement.

The replacement rate approach holds that for income in retirement to be viewed as adequate, it must be at least equal to some proportion of working-life income; the replacement rate is defined as the proportion of working-life income that is replaced by income in retirement. This is grounded in an extensive economics literature that assumes that individuals want to avoid large swings in consumption over time.[15] In keeping with this assumption, individuals will not want to allow their consumption to fall substantially when they move from work to retirement.

The approach that we take compares the replacement rate, calculated as predicted income at the SPA divided by reported current income in the survey year, with a particular set of benchmarks. This subsection discusses the theoretical and empirical research that informs the particular replacement rate benchmarks used in this (and other) work.

The advantage of comparing predicted income at the SPA with the current income reported in the ELSA survey is that it is relatively simple. There are, however, two particular disadvantages. First, individuals may *phase* into retirement and gradually

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[12] Pension Credit has to be actively claimed by pensioners and there is not full take-up in the UK. In 2009–10, take-up of Pension Credit was estimated at between 62% and 68% by caseload and at between 73% and 80% by expenditure (Department for Work and Pensions, 2012b).

[13] Recent research by the Centre for Research in Social Policy (CRSP) at Loughborough University has attempted to define a minimum income standard for the UK. Detailed focus group discussions aimed to identify what goods and services different household types required, focusing on *needs* rather than *wants*, and then the cost of this consumption was calculated. The researchers estimated that the minimum income (excluding that needed to cover housing costs and council tax) required by a pensioner couple in an urban area in 2012 is £212.36 per week and that required by a single pensioner is £144.39, with more required by pensioners in rural areas. The level required by pensioners in urban areas is very close to the Pension Credit Guarantee level. For more information, see http://www.minimumincomestandard.org. For the minimum income calculator, see http://www.minimumincome.org.uk.

[14] In 2010–11, the Pension Credit Guarantee was £132.60 for a single individual (£202.40 for a couple), which equated to only 47% (48%) of median income before housing costs at the time (authors' calculations using table 2.4ts of Department for Work and Pensions (2012c)).

[15] For a summary of this literature, see Browning and Crossley (2001).

reduce their hours of work and their income towards the end of working life. This means that, for older individuals in our sample, their current income may be lower than the income they enjoyed over most of their working life, and comparing predicted income at the SPA with this level of income would then overstate how well off they will be in retirement compared with in their working life. The second problem is that a one-year snapshot of income may not give a particularly good indication of working-life income if income is highly variable or measured with error, which could lead to the preparedness of individuals for retirement being under- or overstated. Both these problems can be overcome by using data on earnings throughout working life rather than in a single year. This information is not available in the data that we use in this report, but such analysis is the topic of ongoing work by the authors.

Theoretical considerations

There are a number of reasons why expenditure need not necessarily be perfectly maintained in retirement even if material living standards are not to fall. For example, some categories of expenditure (costs associated with work, such as commuting expenses or work clothing costs) may fall or disappear in retirement. In addition, when individuals have more leisure time, they may be able to achieve their consumption in a more cost-efficient manner (for example, making meals themselves rather than purchasing pre-prepared food). These factors would imply that standards of living could be maintained with less than 100% continuation of expenditure levels in retirement. On the other hand, some spending needs may be greater in retirement than in working life. The additional cost of activities undertaken in the new leisure time may be greater than the reduction in work-associated costs. Also, the costs of health and social care are likely to increase in retirement.

Moreover, a given level of expenditure can be achieved with a lower level of gross income in retirement than in working life, for two main reasons. First, pensioners pay less tax than younger individuals: younger individuals pay National Insurance contributions on earned income, while pensioners get a relatively small proportion of their income from earnings and they do not pay National Insurance contributions in any case; in addition, the personal allowance – the amount of income on which tax does not have to be paid – is greater for individuals aged 65 and over (and greater again for those aged 75 and over). Second, pensioners have a lower need to save than working-age individuals, since much of the saving done during working life is in order to accumulate housing wealth and pension resources for retirement. This saving does not need to be continued once the individual has retired, though there are still other precautionary motives for pensioners to save.

This all suggests that, in general, even if living standards are not to fall in retirement, net income in retirement need not be as high as net income during working life (in other words, the required replacement rate could be less than 100%) and that a given replacement rate of net income requires a lower replacement rate of gross income. The main exception to this is for those on low incomes. If an individual's net income during working life is at (or below) the minimum level of income required to avoid poverty, then they would need 100% replacement (or more) in retirement in order to have an adequate income.

This leads to a final point that is often made: there are reasons to believe that the replacement rate that defines an adequate income is lower for higher-income individuals than it is for lower-income individuals. In addition to the point made above that lower-income individuals may need greater income replacement in order to have an income that is above the poverty line, higher-income individuals also tend to have higher savings

rates during working life than lower-income individuals (Crossley and O'Dea, 2010). If this saving is being undertaken in order to accumulate a certain amount of wealth that is achieved at or before retirement, then – for a given level of expenditure – higher-income families will need a lower replacement rate than families with slightly lower levels of working-life income and pre-retirement saving.

Related empirical literature

While the theoretical considerations described above are useful for identifying qualitatively what replacement rates may look like (i.e. probably less than 100% for most individuals), they do not pin down quantitatively what a suitable replacement rate is for most of the income distribution. The literature that has defined adequacy benchmarks quantitatively has therefore tended to take one (or both) of two approaches.

The first approach has been to make use of economic studies that investigate actual income in retirement and how this compares with income before retirement (e.g. Blundell and Tanner, 1999; Bardasi, Jenkins and Rigg, 2002; Crawford and Tetlow, 2012). These studies find net replacement rates in the UK that average around 80%, being higher (lower) among those with lower (higher) pre-retirement incomes. However, the significant drawback of using such literature to inform adequacy benchmarks is that doing so makes the implicit assumption that those who have been observed retiring provided themselves with an income that was just adequate. One could easily argue, though, that these pensioners provided themselves with a generous retirement income (in other words, in excess of what might be considered merely adequate) or that their income in retirement is actually lower than they desired (and is therefore in some sense inadequate).

The second approach has been to attempt to elicit from people themselves what income in retirement they would deem to be adequate. Mayhew (2002) analysed the responses to a number of questions regarding retirement incomes in the National Statistics Omnibus Survey in March 2002. She found that, when people's perceptions of an adequate income were compared with their current incomes, 39% of individuals suggested an adequate retirement income of less than their current income, 32% one the same as their current income and 19% proposed an income that was actually higher than their current income; 10% did not know. Analysing the perceived adequate replacement rates according to individuals' income levels suggests a similar pattern to that observed for actual replacement rates – that those on lower (higher) incomes desire a higher (lower) replacement rate (Pensions Commission, 2004). Binswanger and Schunk (2012) conducted a similar exercise in the US and the Netherlands. As part of an internet survey, they asked respondents, 'What is a minimum level of monthly spending that you never want to fall below during retirement, at all costs?'. They found that in the US these responses equate to an average minimum replacement rate of 108% among the lowest income quintile, gradually declining to 54% among the highest income quintile. The equivalent figures in the Netherlands are 69% and 63%.

Summary – replacement rate thresholds

Putting the theoretical arguments and the empirical evidence together, there is still no clear definition of what constitutes an adequate replacement rate. The Pensions Commission (2004), drawing on many of the sources discussed above, published a benchmark for adequacy that had a replacement rate threshold that declined with income, as described in Table 3.2. This benchmark has since been used in a number of studies assessing the adequacy of retirement saving in the UK (e.g. Banks et al., 2005; Silcock, Redwood and Curry, 2012; Department for Work and Pensions, 2012a).

Table 3.2
Pensions Commission (2004) benchmark of adequacy

Pre-retirement gross earnings	Replacement rate threshold
Less than £9,500	80%
£9,500–£17,499	70%
£17,500–£24,999	67%
£25,000–£39,999	60%
£40,000 and more	50%

Source: Pensions Commission, 2004, table G.1.

There are, however, a number of drawbacks to the Pensions Commission benchmark that mean that this definition should be used with care and not just accepted as *the* benchmark against which adequacy should be assessed:

- While informed by the theoretical and empirical literature discussed above, the replacement rate thresholds chosen at each income level are still somewhat ad hoc. Among higher earners, the benchmark is heavily influenced by the assumption that the high replacement rates seen among existing high-income retirees are unnecessarily high, in large part driven by 'unintentionally and unnecessarily generous' final salary pension plans (Pensions Commission, 2004, page 142). It should also be noted that a replacement rate of 80% for some individuals on very low earnings would not be sufficient to give them an income in retirement greater than the minimum income required to avoid poverty.
- The benchmark is defined in terms of replacement of pre-retirement *gross earnings* rather than a measure of *total net income*. While this has the advantage that earnings tend to be more salient to individuals than total income, for many people gross earnings are not a particularly good indication of standards of living. We are much more concerned with the replacement of total net income, since that is more closely related to the capacity to consume. Indeed, for families who, before the SPA, have no earnings but are living on benefits, this replacement rate is not defined and they would have to be (and have been in previous work) dropped from the sample. This is not ideal, as any change in the living standards of such families as they move past the SPA is of interest.
- The benchmark is defined for individual earnings, but we are primarily concerned with the resources of the family as a whole. Applying the thresholds to each individual in a family would imply that a couple in which each individual earns £30,000 would require 60% replacement to have adequate retirement resources, while a couple in which only one individual earns £60,000 would only require 50% replacement. Alternatively, applying the thresholds to family income perhaps makes the replacement rate thresholds seem somewhat low compared with the replacement rates of current retirees.

We do not intend to make a judgement in this work on what the 'correct' threshold is against which adequacy should be assessed. Instead, we take the approach of highlighting the proportion of families at risk of having inadequate resources under three different thresholds for the replacement of pre-retirement income. These are:

- 67% replacement of total family net income;
- 80% replacement of total family net income;

- *X*% replacement of total family net income, where *X* depends on pre-retirement equivalised net family income using the Pensions Commission thresholds (as set out in Table 3.2) uprated by growth in the average weekly earnings index.[16]

While the third of these is similar to the Pensions Commission benchmark of adequacy, in that we use the same thresholds (albeit uprated to take into account average earnings growth since 2004), we should stress that we apply these thresholds based on *equivalised total family net income* rather than individual gross earnings and that we assess the replacement rate of *total family net income* rather than individual gross earnings. Therefore any results should not be considered as directly comparable to analysis based on the Pensions Commission benchmark.

For each of these adequacy benchmarks, we also impose that, to be classed as having adequate income in retirement, the family must also have a net income in retirement above the poverty line level (defined as the level of the Pension Credit Guarantee). In other words, when looking at replacement rate benchmarks of adequacy, we assess first that individuals have an income in retirement above the poverty line and then that their income is greater than a certain threshold percentage of their pre-retirement income.

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[16] The thresholds are uprated by the growth in the seasonally adjusted average weekly earnings (AWE) index between December 2004 and December in the year of the ELSA fieldwork (i.e. December 2006 for the 2006–07 ELSA data, December 2008 for the 2008–09 ELSA data and December 2010 for the 2010–11 ELSA data).

CHAPTER 4
Results

4.1 Are those approaching retirement adequately prepared?

For each individual in our ELSA subsample, we estimate their net family income at the SPA and calculate what proportion of their current net family income this amounts to. We then compare that level of income and the implied replacement rate with our four benchmarks of adequacy to get an indication of what proportion of individuals are at risk of having an inadequate income at the SPA.

As Section 3.2.2 warned, we do not view any of the benchmarks that we use to assess adequacy as the 'correct' one. We therefore start by showing, in Figure 4.1, the full distribution of estimated replacement rates of net family income using three of our definitions of income. The advantage of this approach is twofold. First, it can be used to assess the proportion of individuals at risk of falling below *any* constant replacement rate (though without the imposition of the poverty line floor). Second, it illustrates the range of replacement rates that are predicted for different individuals and gives an indication of how far above or below the threshold individuals classified as having adequate or inadequate incomes are.

The estimated replacement of current total net family income at the SPA varies significantly across different individuals. Under the narrowest definition of income (i.e. just pension income), Figure 4.1 shows that the median replacement rate is 81% (in other words, half of individuals are estimated to have a higher replacement rate than that and half a lower replacement rate) and one-third of individuals are in families predicted to have an income at the SPA greater than their current income. On the other hand, over 16% of individuals are estimated to have a replacement rate of less than 50%.

Figure 4.1
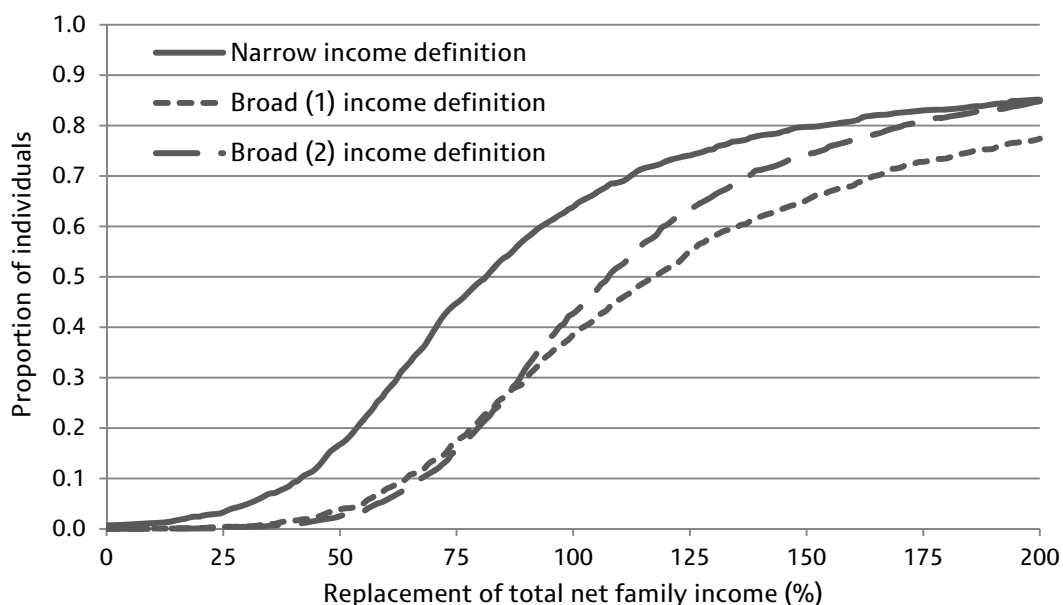Distribution of replacement rates at SPA

Table 4.1

Percentage of individuals with inadequate resources

Income definition	Adequacy threshold:			
	PCG	67%	80%	Adapted Pensions Commission
Pension income only ('narrow')	12%	41%	53%	41%
… plus non-housing wealth	10%	30%	42%	31%
… plus half housing wealth	7%	20%	30%	20%
… plus expected inheritances	7%	18%	28%	18%
… plus Pension Credit ('broad (1)')	0%	12%	22%	11%
'Broad (2)' – includes imputed rental income from housing wealth	0%	10%	21%	9%

Notes: Sample size = 2,534. Income measures are defined in Section 3.1.2 and adequacy thresholds in Section 3.2.2. The three measures of income in bold typeface are those on which we focus below.

If individuals were to use all their available non-housing resources to provide an income in retirement and if the imputed rental income from housing is considered part of income both before and after retirement (broad (2) income), then the proportions attaining a given replacement rate threshold would be higher. We estimate that 57% of individuals would replace more than 100% of their current net family income at the SPA and one-quarter of individuals would see an increase in income of over 50%.

The result of comparing individuals' estimated level of income at the SPA and implied replacement rate with our four benchmarks of adequacy is shown in Table 4.1 for our six definitions of income (described in Section 3.1.2). Focusing first on the poverty line interpretation of adequacy, where an adequate income is defined as an income greater than the Pension Credit Guarantee (PCG) level, 12% of individuals are predicted to have an income from state and private pensions at the SPA of less than that amount (row 1, column 1). These 12% of individuals would therefore be reliant either on their accumulated non-pension wealth stocks or on state means-tested benefits in order to avoid poverty.

Turning to the more demanding replacement rate interpretations of adequacy, 41% (53%) of individuals are at risk of having net family pension income at the SPA either below the poverty line or of less than 67% (80%) of their current total net family income. However, these proportions at risk decline if individuals are assumed also to draw income in retirement from their non-pension wealth: if non-housing wealth is drawn upon, they fall to 30% under the 67% replacement rate threshold and to 42% under the 80% replacement rate threshold. A further 10% (12%) could avoid having an inadequate income in retirement if they were to annuitise half of their housing wealth to provide additional income. Even if expected inheritances and means-tested Pension Credit are included as sources of income, 12% (22%) of individuals are still at risk of having inadequate resources in future given the 67% (80%) benchmark.

The broad (2) definition of income, which covers income from pensions, the annuitised value of non-housing wealth, expected inheritances, means-tested Pension Credit and an imputed income from housing wealth, produces a similar conclusion to that obtained when looking at the broad (1) measure of income. If individuals were to use all of the (non-housing) resources available to them to provide an income in retirement, 10% (21%) would still be able to replace less than 67% (80%) of their current total family net income and could be classed as having inadequate resources.

The final column of Table 4.1 reports the percentage of individuals at risk of having inadequate resources according to a benchmark of adequacy adapted from the Pensions Commission (2004) benchmark. As discussed in Section 3.2.2, this is not our preferred benchmark for adequacy, but we report these results in order to enable some comparison with other work, including Banks et al. (2005), Department for Work and Pensions (2012) and Silcock, Redwood and Curry (2012). According to this definition of adequacy, 41% of individuals are predicted to have inadequate income at the SPA if only income from pensions is included, falling to 31% if non-housing wealth is annuitised to provide additional income. If half of housing wealth is also annuitised, 20% would have inadequate incomes, falling to 11% when income from expected inheritances and means-tested Pension Credit is also included. Using the broad (2) definition of income, only 9% of individuals would have inadequate incomes at the SPA according to the adapted Pensions Commission definition of adequacy.

The sensitivity of these results to the assumed annuity rate for non-pension wealth and the assumed yield for imputed rental income used to calculate the broader measures of income is demonstrated in Tables B.1 and B.2 in Appendix B. When a 3% annuity rate and rental yield are assumed (Table B.1), a slightly larger proportion of individuals have inadequate resources under the broader income definitions (since a given amount of wealth is calculated to provide a smaller income in retirement). Conversely, when a 7% annuity rate and rental yield are assumed (Table B.2), a slightly smaller proportion of individuals have inadequate resources under the broader income definitions. However, while the results are clearly sensitive to the annuity rate and rental yield assumed, the differences are not all that large. For example, under an assumption of 3%/5%/7% for the annuity rate and the rental yield of housing, 14%/10%/8% of individuals would replace less than 67% of net family income at the SPA under the broad (2) definition of income, while 27%/21%/17% of individuals would replace less than 80%.

Under any benchmark for adequacy chosen and given any definition of income, Table 4.1 and Figure 4.1 show that there will almost always be some individuals who are estimated to be at risk of having inadequate resources. This proportion is clearly higher the more demanding the income benchmark against which adequacy is assessed, and lower when individuals are assumed to draw on more sources for a retirement income. However, as important for policymakers as the proportion of individuals at risk of having inadequate resources is who those individuals are. If policy to address the inadequacy of retirement saving is to be effective, it needs to target the particular individuals in question and ideally address the underlying cause for the inadequate saving. The next section therefore looks at the association between individuals' characteristics and their level of preparedness for retirement.

4.2 Who is at risk of being inadequately prepared?

In this section, we look at the association between individual characteristics and the family's preparedness for retirement (in terms of their estimated income replacement rate at the SPA and the likelihood that their income will fall below different benchmarks of adequacy).

Table B.3 in Appendix B describes the median replacement rate for individuals with different characteristics. Tables B.4 and B.5 describe the percentages of individuals with different characteristics who are estimated to have an income in retirement of less than the PCG level and the 67% replacement rate threshold respectively. However, what we focus on in this section is not these *unconditional* associations, but instead *conditional*

associations. This means that we are looking at the association between one particular individual characteristic (sex, for example) and the risk of inadequacy, controlling for some other characteristics (for example, education and age). That this is important is best illustrated with an example: among our sample, a greater proportion of women are likely to have low retirement resources than men (Tables B.4 and B.5); however, it is also the case that, among our sample, women on average are less educated than men and those with less education are more likely to have low retirement resources. This begs the question, 'Is the association between sex and risk of low resources in retirement simply arising because of the different levels of education between the sexes or is there an association between sex and the risk of low resources that is independent of education levels? i.e. For men and women with the same education levels, are the women more likely to have low resources?'. To answer questions such as this, it is important to control for other characteristics when making comparisons between individuals to investigate one particular characteristic.

A final point to emphasise is our use of the word *association* rather than the word *causation* or similar. The process that leads to an individual having inadequate resources in retirement is an extremely complicated one – it does not simply arise 'because of' sex, education, numeracy or any other individual characteristic, but is due to the interaction of these and many other characteristics, societal institutions and macroeconomic circumstances, some of which will be quantifiable and measurable and some of which will not be. Therefore, when we identify and remark on an association of interest (for example, that divorced women are more at risk of having inadequate resources than some other family types), we do not suggest that divorce *causes* this risk, but rather that divorce *identifies* those at risk. Solutions to the problem of inadequate resources in retirement should then be designed and implemented with this particular group in mind, but not necessarily treating divorce as the cause of the problem.

The characteristics that we investigate for an association with the likelihood of inadequate resources in retirement are the following:

- **Education:** This is defined as 'low' for individuals who left full-time education at or below the compulsory school-leaving age (CSL),[17] 'mid' for individuals who left full-time education between the CSL and age 18, and 'high' for those who left full-time education above age 18. Education may be associated with both the ability to save for retirement (as more educated people tend to earn more) and the willingness to save for retirement (as some research has suggested that more educated people are more patient (Lawrance, 1991)). Level of education is therefore a strong contender to be associated with the preparedness of individuals for retirement.

- **Numerical ability:** ELSA contains questions designed to gauge the numerical ability of respondents. We use the answers to these to divide respondents into four groups, following the methodology in Banks, O'Dea and Oldfield (2010). Numeracy is likely to be associated with an ability to understand pension products, and has also been shown to have clear associations with household saving behaviour even once education has been controlled for (Banks, O'Dea and Oldfield, 2010).

- **Marital status:** There are a number of channels through which marital status might affect the level of preparedness for retirement. Being married and having had children have substantial implications for saving patterns over the life cycle (see Scholz and

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[17] For those born between 1933 and 1956, who represent the majority of our sample, the school-leaving age was 15. For those born subsequent to 1956, it was 16.

Seshadri (2007) and references therein), while going through a divorce or suffering the death of a spouse could undermine retirement-savings plans that had been made.

- *Age:* Age is used as an indicator of an individual's birth cohort. This may be associated with their saving decisions, as each cohort faces different economic opportunities, institutional features and prevailing attitudes to saving. However, the sample of individuals considered here are reasonably close in age, so even if underlying long-run trends in saving for retirement do exist, we may not observe any association between age and preparedness for retirement here.

A reasonable question is why we have investigated the conditional association of only these characteristics, since there are a number of other socio-economic and demographic characteristics that we could have investigated. Indeed, in Tables B.3 to B.5 in Appendix B, we describe the unconditional association between preparedness and region of residence, income, whether the individual has a limiting health condition and several other characteristics, in addition to those listed above. In deciding which characteristics to investigate, we wish to avoid two types: those that *directly* affect preparedness for retirement and those that can change frequently throughout the life cycle.

With regard to the first of these exclusions – characteristics that *directly* affect preparedness for retirement – we could have investigated, for example, the association between an individual's wealth and their preparedness for retirement. However, wealth generates income in retirement (see Section 3.1.2), so wealth holdings represent something that we wish to explain, rather than something that we wish to use to explain the adequacy of income in retirement. A similar point could be made about having a private pension: of course, we may be interested in the different replacement rates for those with and without private pensions, but in assessing the association between (say) education and replacement rates, we do not wish to control for having a private pension – on the contrary, the extent to which those with more or less education have a private pension is an interesting part of the story that determines replacement rates.

The second set of explanatory variables for which we do not investigate the association with inadequate resources in retirement are those that can change frequently throughout an individual's life. We do not control for these because the level of preparedness for retirement is something that is determined by decisions taken over the entirety of an individual's life and it is potentially misleading to try to explain such an outcome by a snapshot of how that individual appears at a particular point in time.[18] Current income is a notable example of a characteristic that we exclude from these regressions on the basis that it changes regularly throughout life. While the relationship between current income and the adequacy or otherwise of an individual's retirement resources is of interest (and we look at it separately in Section 4.2.4), current income is an imperfect indicator of income across the entirety of working life. It may be temporarily higher or lower than normal for a particular individual – and it is income over the entire working life (or 'permanent income') that will have contributed to the determination of an individual's retirement resources. Education is often considered to be a good proxy for permanent income, as those with more education tend to earn more throughout their working life than those with less education. In the discussion that follows, we interpret the association between education and the adequacy of retirement resources as indicative of the relationship between permanent income and the adequacy of retirement resources.

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[18] As described above, we do control for age, which obviously changes throughout the life cycle. However, recall that this variable is to be interpreted as a cohort effect, and an individual's birth cohort does not change over the life cycle.

4.2.1 Median replacement rates

Table 4.2 shows the results from a median regression investigating the association between replacement rates (the dependent variable in the regression) and the individual characteristics described above (the explanatory variables).[19] We consider the replacement rate arising from three definitions of income at the SPA – the narrow and the two broad measures of income defined in Section 3.1.2.

All the associations between replacement rates and individual characteristics are shown relative to a 'reference person', defined here as a married individual, aged 50–54, with low levels of education and numeracy. For example, focusing on the first column, where income in retirement is defined on the narrow measure, conditional on all the

Table 4.2

Median regression of replacement rates

| | Income definition: | | |
	Narrow	**Broad (1)**	**Broad (2)**
Education			
Low (ref.)			
Mid	–0.1	6.3	3.0
High	–8.6**	5.8	2.4
Numeracy			
Group 1 (lowest) (ref.)			
Group 2	3.2	–9.4	–9.8**
Group 3	3.1	–9.4	–11.0**
Group 4 (highest)	–0.3	–10.4	–13.1**
Marital status			
Married (ref.)			
Never married, male	5.6	19.8**	11.7**
Divorced, male	10.9	10.8	14.7
Widowed, male	–5.5	–11.5*	–7.5
Never married, female	–8.4	–6.9	–3.9
Divorced, female	–20.7**	–11.8	–8.7
Widowed, female	–18.0***	–11.1*	–8.4**
Age			
50–54 (ref.)			
55–59	–1.1	0.3	–2.0
60–64	2.5	–0.7	–4.5
Constant	82.3***	122.5***	118.0***
Sample size	2,418	2,418	2,418

Notes: The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. The sample used in the regressions is slightly smaller than the overall sample (2,534 individuals) because education level and numerical ability are missing for some individuals.

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[19] For a discussion of median regressions, see Koenker and Hallock (2001).

other characteristics listed, the median replacement rate is 8.6 percentage points lower for high-educated individuals than for low-educated individuals. This indicates that, while those with the most education are more likely to have higher lifetime earnings and be covered by private pensions (Crossley and O'Dea, 2010), they – at the median at least – tend to replace less of their pre-retirement income with their pension income than those with less education. However, this result changes when we move to a replacement rate that is calculated using a broader measure of retirement income. Those with more education have substantially greater holdings of net financial wealth and are more likely to own a property; once these assets are assumed to provide a flow of income in retirement, the position of those with more education relative to those with less education becomes more favourable. Under either broad measure of income, the median replacement rate among the high-educated or the mid-educated group is not statistically significantly different from that among the low-educated group.

The only other significant associations identified in Table 4.2 are with respect to marital status; there are no robust significant relationships between median replacement rates and either numeracy or age. There is no significant difference between the median replacement rate of married people and never-married women. However, there is some evidence that, under the broader measures of income, never-married men have significantly higher replacement rates than otherwise-similar married people. Since this difference does not arise when using the narrow definition of income, the implication is that never-married men have accumulated more non-pension wealth resources relative to their current income than otherwise-similar married individuals. The results also show that divorced and widowed women have significantly lower replacement rates at the median than married individuals, particularly when looking at the narrow measure of income. When only income from pensions in retirement is counted as income, the median replacement rate among divorced (respectively widowed) women is 20.7 (18.0) percentage points lower than that among otherwise-similar married people. These differences have a lesser tendency to be statistically significant when broader definitions of income are used.

Table B.6 in Appendix B reproduces the results of Table 4.2 but for the subsample restricted to individuals where at least one member of the family is currently in paid work. The advantage of restricting the sample in this way is that, for those individuals in families where neither individual is in paid work, the ratio between their estimated income at the SPA and their current total income may give a misleading indication of the ratio between their income at the SPA and their working-life income. (However, recall that, in large part to mitigate this problem, we have always excluded from our sample those individuals in families where anyone reports being 'retired'.) In general, the results in Table B.6 are not particularly different from those in Table 4.2, although the association between education and median replacement rate tends to exhibit greater statistical significance when the sample is restricted to only those in work.

4.2.2 Risk of falling below the poverty line

Table 4.3 shows the results of an analysis of the association between individual characteristics and the risk (per cent chance) of having an income in retirement that is below the poverty line, i.e. the risk of having to rely on the state to ensure the attainment of a level of income equal to the Pension Credit Guarantee level.[20] In this case, we only

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[20] An equivalent set of results produced when the sample is further restricted to only individuals in a family where at least one individual is in paid work can be found in Table B.7 in Appendix B.

Table 4.3

Risk of inadequate resources: Pension Credit Guarantee level threshold

	Narrow definition of income
Education	
Low (ref.)	
Mid	0.87
High	0.40***
Numeracy	
Group 1 (lowest) (ref.)	
Group 2	0.35***
Group 3	0.19***
Group 4 (highest)	0.21***
Marital status	
Married (ref.)	
Never married, male	3.76***
Divorced, male	1.46
Widowed, male	3.72***
Never married, female	17.14***
Divorced, female	17.16***
Widowed, female	26.80***
Age	
50–54 (ref.)	
55–59	1.05
60–64	1.04
Sample size	2,418

Notes: Coefficients are odds ratios arising from logistic regression. The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. Standard errors are clustered at the benefit unit level. The sample used in the regressions is slightly smaller than the overall sample (2,534 individuals) because education level and numerical ability are missing for some individuals.

consider the risk under the narrowest measure of income in retirement; the risk of falling below the PCG threshold is zero under the broad income measures, as those measures include income received from Pension Credit.

The results are presented in the form of *odds ratios*. The interpretation of results of this type is best explained using an example. Consider the 0.40 figure pertaining to those with high education. This indicates that the risk of an individual with high education having income at their SPA of less than the PCG level is 40% of the risk faced by someone with low education (the reference group for this set of explanatory variables). The stars here indicate that the result is statistically significantly different from 1, i.e. that there is a difference in the risk faced by low- and high-education groups.

That high education is associated with a significantly diminished risk of having inadequate resources on this measure can be compared with the finding in Table 4.2 that having high levels of education was not associated with a higher median replacement rate. It seems that, while more education is not an indicator of the extent to which pre-

retirement income is replaced in retirement, it is a strong indicator of the likelihood of avoiding poverty in retirement. Having a high level of education is also associated with a lesser risk of inadequate resources than having a middle level of education; however, there is no statistically significant difference between the risks for those with low and middle levels of education.

The relationship between numeracy and the likelihood of having inadequate resources in retirement shows up strongly in the unconditional associations shown in Appendix Table B.4: prevalence of inadequacy is high among the group with the lowest level of numeracy, with over 30% likely to be reliant on the state to ensure that they have an income at SPA at least equal to the PCG level, compared with 12% in the population as a whole. It is interesting to note from Table 4.3 that – even after controlling for education, marital status and age – the association between numeracy and risk of inadequate resources is still estimated to be highly significant. Being in the group with the lowest levels of numerical ability is associated with a much greater risk of inadequate resources than being in any of the other three groups.[21]

Marital status also has a significant association with the likelihood of having an income in retirement of less than the PCG level. Never-married and widowed men are significantly more likely to have inadequate resources in retirement than otherwise-similar married people. The differences are even more striking for women: compared with otherwise-similar married individuals, never-married, divorced and (particularly) widowed women are significantly more likely to be at risk of having inadequate resources. For example, never-married women are 17 times more likely, divorced women are also 17 times more likely and widows are nearly 27 times more likely to have inadequate resources than married individuals. Note, however, that while these results are strongly significantly different from 1 and so the direction of the effect is clear, the associated standard errors are large and so some care must be taken in interpreting the precise odds ratios reported.

An interesting question, and one that cannot be answered simply by looking at the results presented in the table, is whether there is a statistically significant difference between the risk of inadequate resources facing men and women of the same marital status. That is, are widows, divorced women and never-married women more likely to have to rely on the state to ensure that they do not fall below the PCG level of income than widowers, divorced men and never-married men respectively? We have tested these three sets of coefficients and, in each case, the risk to women is greater than the risk to men, with statistical significance at at least the 5% level.

4.2.3 Risk of an inadequate replacement rate

Table 4.4 shows the results from an analysis of the association between individual characteristics and the risk of having inadequate income in retirement when adequacy is assessed against a replacement rate benchmark.[22] The benchmark we focus on here is a 67% replacement rate of current net family income (subject to also having an income greater than the Pension Credit Guarantee level). As with Table 4.3, the figures reported are odds ratios and indicate the likelihood of an individual with a given characteristic having inadequate resources relative to an individual in the reference category pertaining to that characteristic. We again consider the replacement rate arising from three

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[21] We have tested whether there are significant differences between the coefficients on each pairwise combination of numeracy groups. There is a significant difference between that on group 2 and both those on groups 3 and 4, but not between those on groups 3 and 4.

[22] An equivalent set of results produced when the sample is further restricted to only individuals in a family where at least one individual is in paid work can be found in Table B.8 in Appendix B.

definitions of income at the SPA – the narrow and the two broad measures of income defined in Section 3.1.2.

The association between having a higher level of education and having a lower risk of inadequate resources is much less strong when adequacy is defined in terms of replacement rates rather than a poverty line. In fact, if anything, the results in Table 4.4 suggest that those with a high level of education are *more* likely to be at risk of not replacing 67% of their current net income at retirement than individuals with low education. Driving this result is the fact that, while those with more education tend to have higher *levels* of income in retirement, that income tends to represent a smaller *proportion* of their pre-retirement income (as was shown by the association between education and median replacement rates in Table 4.2).

Table 4.4
Risk of inadequate resources: 67% replacement rate threshold

	Income definition:		
	Narrow	**Broad (1)**	**Broad (2)**
Education			
Low (ref.)			
Mid	0.94	0.84	0.89
High	1.26*	1.21	1.22
Numeracy			
Group 1 (lowest) (ref.)			
Group 2	0.62***	0.62**	0.61**
Group 3	0.60***	0.73	0.68
Group 4 (highest)	0.72*	0.67	0.63*
Marital status			
Married (ref.)			
Never married, male	1.15	0.72	0.75
Divorced, male	1.08	0.85	0.94
Widowed, male	1.75***	2.01***	1.95***
Never married, female	3.40***	1.45	1.44
Divorced, female	5.72***	2.02*	2.08*
Widowed, female	5.19***	2.33***	2.42***
Age			
50–54 (ref.)			
55–59	0.97	1.07	1.27
60–64	0.85	1.17	1.55*
Sample size	2,418	2,418	2,418

Notes: Coefficients are odds ratios arising from logistic regression. The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. Standard errors are clustered at the benefit unit level. The sample used in the regressions is slightly smaller than the overall sample (2,534 individuals) because education level and numerical ability are missing for some individuals.

On the whole, the associations that we estimate between marital status and risk of inadequate resources on the replacement rate benchmark largely mirror those that we found using the poverty line benchmark. However, one particular difference is for individuals who were never married: the results in Table 4.3 indicated that never-married men and women are significantly more likely than otherwise-similar married individuals to have an income in retirement less than the PCG level, while the results in Table 4.4 indicate that never-married men and women are not significantly more likely to have inadequate resources when a broad definition of income is assessed against a replacement rate benchmark. This reflects the fact that while never-married men and women are estimated to have lower incomes in retirement than otherwise-similar married individuals, they also have lower levels of current net income. (It should be noted that having never been married is a relatively uncommon status among this sample of individuals: only 10% of men and 7% of women report never having been married.)

4.2.4 Relationship between risk of inadequacy and current income

One characteristic that is not considered in the conditional analysis above is current income. As discussed in the introduction to Section 4.2, this is because an individual's income at a particular point in time will be an imperfect indicator of the income that they have had throughout their working life (often called their 'permanent income'). However, the association between permanent income and the adequacy of retirement income is of particular policy importance since it could have strong implications for what policies (if any) the government might want to introduce to encourage wealth accumulation. For example, if the people we predict will have inadequate incomes in retirement are those who have had low permanent income with little capacity to increase saving, then the implications for policy will be very different from if they were middle-permanent-income individuals who were simply choosing not to save for retirement.

Figure 4.2
Relationship between estimated inadequacy and income deciles
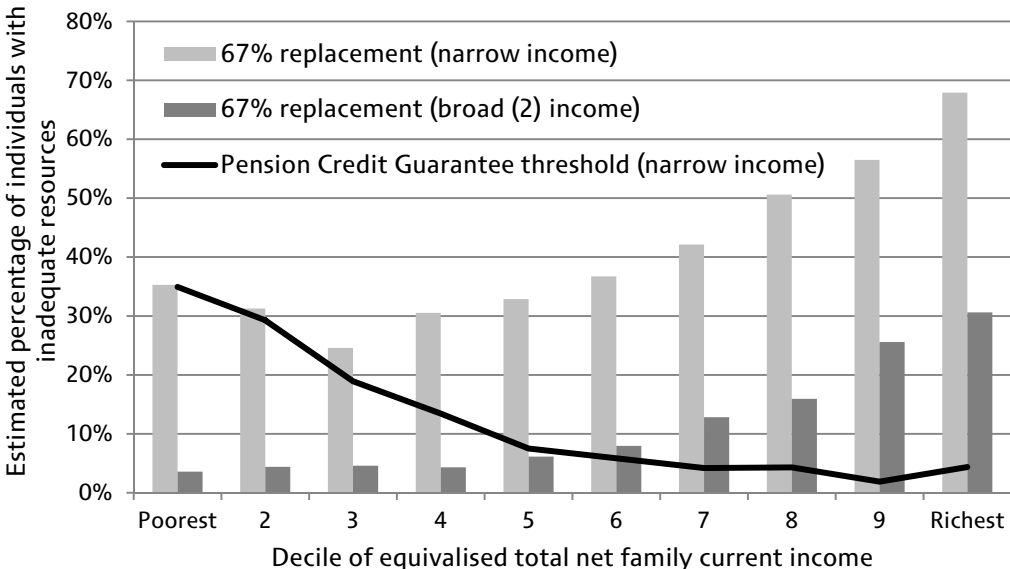
Note: Individuals in our sample are ordered by total net family income (equivalised to take account of family size) and then divided into 10 equally-sized groups, called *deciles*.

A comparison of permanent income and retirement adequacy would require data beyond those that we use in this report. However, to give some simple initial indications about the relationship between income and the adequacy of resources for retirement, and notwithstanding the caveats to the interpretation of the results just highlighted, Figure 4.2 shows the proportion of individuals at risk of inadequacy among each decile of current income.[23]

As would probably be expected, being at risk of having an income in retirement lower than the PCG level is concentrated among those in the lowest current income deciles, who have the lowest capacity (and incentive) to save. Turning to adequacy as defined by a 67% replacement of current income in retirement, the risk of not having an adequate income at the SPA increases with current income across the top 70% of the income distribution when only pension income at retirement is considered ('narrow' income). Among individuals in the third current income decile, we estimate that 25% are at risk of an inadequate pension income at the SPA; this risk increases to nearly 70% among the richest decile. This might be expected for two reasons: first, those with higher incomes will need to save more in private pensions to give themselves a 67% replacement rate, which might be more difficult; second, for the reasons suggested in Section 3.2.2, those with higher incomes might only desire a lower replacement in retirement. Once individuals are assumed to convert their other non-housing wealth into retirement income, and an imputed rental income from housing wealth is accounted for, the proportion of individuals at risk of having inadequate resources falls dramatically, but a relationship between income and the proportion at risk still exists in the upper part of the income distribution (see 'broad (2) income' on Figure 4.2).

The suggestion from Figure 4.2 is therefore that individuals at risk of falling below the poverty line in retirement in the absence of state support are, as would be expected, those with currently low levels of income. However, the current system of state support in the UK is sufficient to ensure that these individuals would not actually have an income below that level, so long as they claim all the benefits to which they are entitled. In terms of a replacement rate benchmark of adequacy, the risk of inadequacy increases fairly dramatically moving up the income distribution.

4.3 Are those at risk aware of it?

Another interesting issue, which potentially affects what policies might be appropriate to address the problem of individuals accumulating insufficient private resources to give them an adequate income in retirement, is whether the individuals who we consider to be at risk of having inadequate resources in retirement consider *themselves* that they are at such a risk.

One feature of ELSA is that it contains a number of questions about individuals' expectations for the future. One question asks respondents, 'What are the chances that at some point in the future you will not have enough financial resources to meet your needs?'. The answer given to this question is indicative of an individual's own assessment of the likely adequacy of their future resources. The distribution of respondents' answers is shown in Figure 4.3. The majority of individuals do acknowledge that there is at least some chance that at some point in the future they will not have enough financial resources to meet their needs: fewer than 10% report a zero chance of this happening to them. However, the majority of individuals report a relatively low probability of it

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[23] Individuals in our sample are ordered by total net family income (equivalised to take account of family size) and then divided into 10 equally-sized groups, called *deciles*.

happening, with only just over one-quarter reporting a probability of future inadequacy that is greater than 50%.

Figure 4.4 explores the relationship between individuals' reported expectations of having inadequate resources in future and whether or not we estimate that they would have inadequate incomes at the SPA. We divide individuals into 10-percentage-point

Figure 4.3

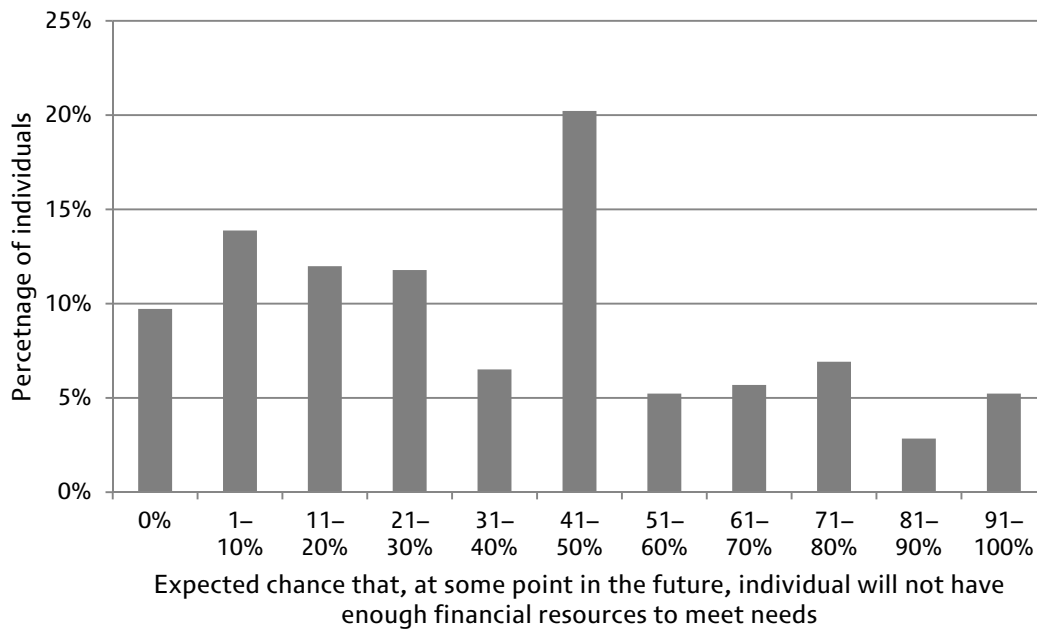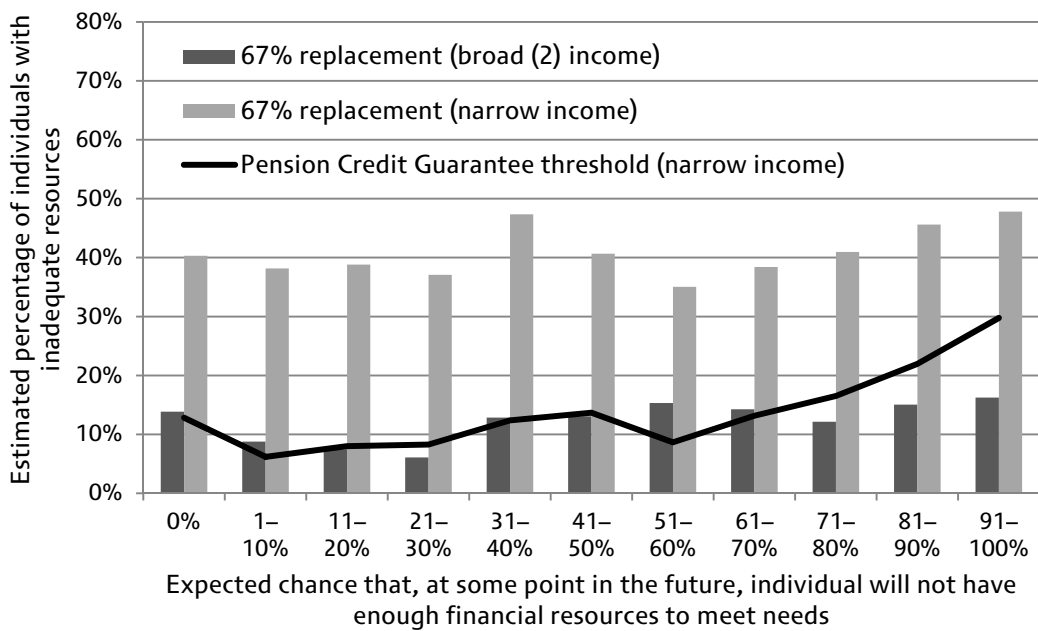Individuals' reported expectations of having inadequate resources in future

Figure 4.4

Relationship between estimated inadequacy and individuals' expectations

groups according to their expectations of future inadequacy and plot the proportion likely to have inadequate resources in retirement under the 67% threshold using the narrow and broad (2) income definitions (the grey bars) and the proportion likely to have income less than the PCG threshold using our narrow definition of income (the black line). Turning first to the replacement rate approach, we predict that a fairly constant proportion of individuals in each of these groups will replace less than 67% of their current income at retirement under both the narrow and broad (2) definitions of income – that is, that there is not a particularly strong correlation between whether we estimate an individual will have less than a 67% replacement rate in retirement and their own expectations of inadequacy.

A potential reason for this is that individuals may not see an income at the SPA that is less than 67% of their current income as necessarily being inadequate. (In particular, the ELSA question is framed in terms of *needs* rather than *wants*.) This explanation is supported somewhat by the stronger relationship observed between individuals' expectations and our assessment of who will have an income at SPA of less than the PCG level (shown by the black line in Figure 4.4). We estimate that 6% of individuals reporting a chance of future inadequacy between 1% and 10% will have an income below the PCG level, compared with 30% of individuals reporting a chance between 91% and 100%. There are, though, a relatively large number of people who we estimate will have an income in retirement of less than the PCG level who do not report a particularly high chance of not having enough financial resources in future. This could be an indication that many individuals are not aware that they are at risk of such low incomes in retirement, or it could be an indication that individuals believe the state will always provide a means-tested safety net that will give them an income sufficient to meet their needs even if their own private income falls below that level.

4.4 Changes in the preparedness of individuals over time

This section considers how the headline statistics for the proportion of individuals at risk of having inadequate resources, reported in Section 4.1 for 2008–09, have changed over time. To do this, we take each wave of ELSA data from 2004–05 to 2010–11 (waves 2–5) and we calculate income at the SPA, and the replacement of contemporaneous income that that level of income equates to, based on those data. As discussed in Chapter 2, these additional waves of ELSA are not fully representative of the population, due to ageing and attrition. When conducting the analysis in this section, we therefore further restrict our sample to those aged 52 and over, which largely compensates for the ageing of the sample between refreshment samples. However, we cannot completely control for attrition from the sample, which is likely to be non-random and potentially associated with preparedness for retirement.[24] These comparisons between ELSA waves should therefore be viewed with caution. We advise particular wariness with respect to comparisons involving the 2010–11 wave, for a number of reasons. First, the sample is smaller than in the case of other ELSA waves, so the results will be more vulnerable to sampling error. Second, the composition of the sample changed between waves 4 and 5; in particular, the average age increased somewhat. This was due to the sample not being 'refreshed' with new members in wave 5 to compensate for attrition. A refreshment sample was, on the

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[24] While we do *weight* our analysis to take account of the propensity to respond, these weights are created taking into account only a relatively small set of individual and household characteristics. If attrition is associated with a characteristic (or characteristics) that is (are) not included in the development of the weights, and this/these characteristic(s) is/are associated with preparedness for retirement, then our results will become less representative of the population over time.

other hand, added in waves 3 and 4.[25] Changes that we observe between waves 4 and 5 therefore could be down to shifting composition of the sample rather than underlying changes in the circumstances of the population of interest. Third, in the 2010–11 data, a greater proportion of the ELSA sample categorise themselves as retired and are thus not included in our sample. Changes in the composition of the underlying sample such as this imply a greater need to be cautious in the interpretation of apparent changes over time.

It should be noted that we calculate state pension entitlements under the state pension system that was legislated for at the time of the ELSA survey in question. Therefore figures for 2004–05 and 2006–07 include state pension income estimated on the basis of the legislation that existed before Pensions Act 2007, while the figures for 2008–09 and 2010–11 include state pension income estimated on the basis of the system after Pensions Act 2007. Consequently, some of the difference in the estimated adequacy figures between 2006–07 and 2008–09 will result from this change in the estimation of state pension entitlements.

Figure 4.5 shows the estimated distribution of replacement rates at the SPA from pension income for each wave of ELSA between 2004–05 and 2010–11. That the distribution shifts to the right over time is an indication that, in later waves of ELSA, individuals are generally estimated to be able to replace a greater proportion of their income. This suggests that younger cohorts of individuals are better prepared for

Figure 4.5
Change in distribution of replacement rates at SPA over time: narrow income definition
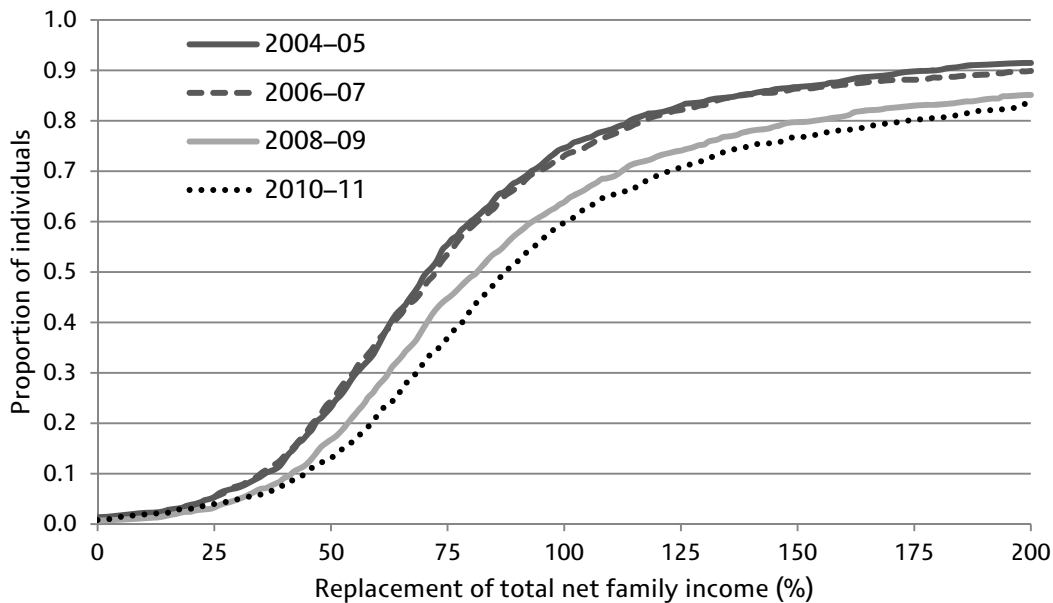
Notes: Sample is restricted to individuals aged 52 or over. For 2004–05 and 2006–07, state pension income is estimated on the basis of state pension legislation that pre-dated the Pensions Act 2007. For 2008–09 and 2010–11, state pension income is estimated on the basis of the system after Pensions Act 2007.

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[25] The ageing of the sample is compounded by the fact that the refreshment sample included in wave 4 contained very few individuals aged 50 and 51. These individuals progressed into our age range (52 to the State Pension Age) in wave 5. The fact that there are not many of them further depresses the proportion of the sample in wave 5 who are at the younger end of the sample.

Figure 4.6
Change in distribution of replacement rates at SPA over time:
broad (2) income definition
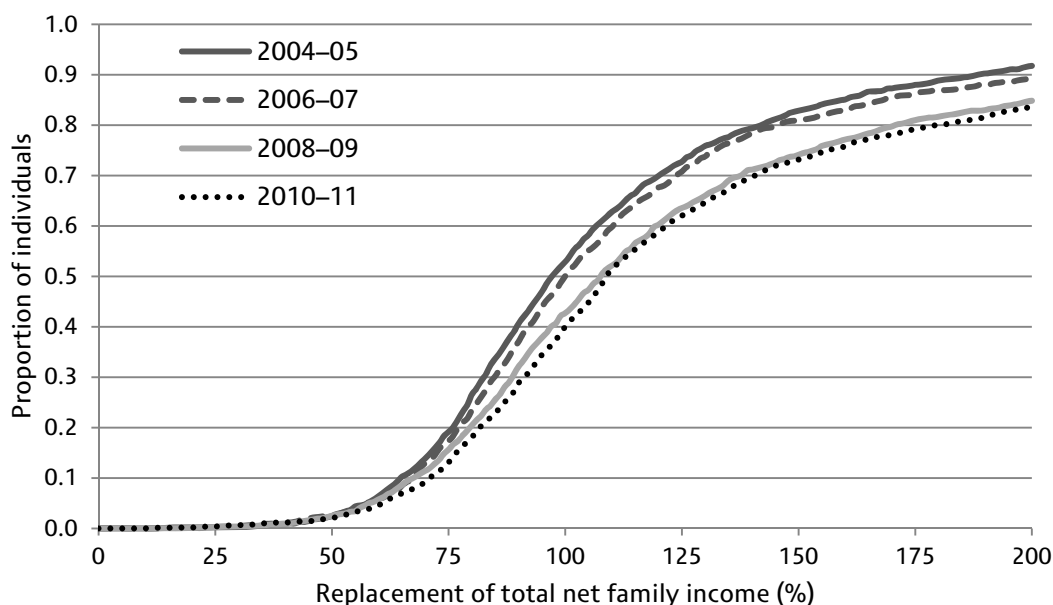
Notes: Sample is restricted to individuals aged 52 or over. For 2004–05 and 2006–07, state pension income is estimated on the basis of state pension legislation that pre-dated the Pensions Act 2007. For 2008–09 and 2010–11, state pension income is estimated on the basis of the system after Pensions Act 2007.

retirement than previous cohorts were at the same age.[26] The estimated median replacement rate was 71% in 2004–05, 72% in 2006–07, 81% in 2008–09 and 87% in 2010–11.

The equivalent figures with replacement rates at the SPA calculated on the basis of the broad (2) definition of income are shown in Figure 4.6. On this measure of income, the difference in the distribution of replacement rates is slightly smaller over time than under the narrow measure of income – the median replacement rate increases from 97% in 2004–05 to 109% in 2010–11 – and a large proportion of the difference appears to occur between 2006–07 and 2008–09.

Table 4.5 shows the result of comparing the estimated income levels and replacement rates from each wave of ELSA with our benchmarks for what constitutes an adequate income. Consistently across all our definitions of income and measures of inadequacy, the proportion of individuals estimated to be at risk of having inadequate resources has declined over time. Looking just at income in retirement from pensions ('narrow' income), the proportion of individuals estimated to be at risk of having an income in retirement below the PCG level fell from 20% in 2004–05 to 12% in 2008–09, while the proportion at risk of having less than 67% (80%) replacement (or having an income lower than the PCG level) fell from 51% (65%) to 41% (53%). On our broad (2) measure of income, the proportion at risk of inadequacy under the 67% (80%) threshold fell from 12% (27%) to 10% (21%) between 2004–05 and 2008–09. Most of these falls can be attributed to the changes introduced in the 2007 Pensions Act.

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[26] 2004–05 figures are for those born between 1940 and 1952, 2006–07 figures are for those born between 1942 and 1954, 2008–09 figures are for those born between 1944 and 1956, and 2010–11 figures are for those born between 1946 and 1958.

Table 4.5

Percentage of individuals with inadequate resources

	Wave of ELSA:			
	2004–05	**2006–07**	**2008–09**	***2010–11*ᵃ**
PCG level threshold				
'Narrow' income	20%	21%	12%	*10%*
'Broad (1)' income	0%	0%	0%	*0%*
'Broad (2)' income	0%	0%	0%	*0%*
67% replacement				
'Narrow' income	51%	50%	41%	*32%*
'Broad (1)' income	14%	13%	12%	*9%*
'Broad (2)' income	12%	10%	10%	*8%*
80% replacement				
'Narrow' income	65%	63%	53%	*45%*
'Broad (1)' income	26%	24%	22%	*18%*
'Broad (2)' income	27%	24%	21%	*18%*
Adapted Pensions Commission				
'Narrow' income	52%	51%	41%	*32%*
'Broad (1)' income	14%	14%	11%	*9%*
'Broad (2)' income	12%	11%	9%	*7%*
Sample size	2,205	2,075	2,455	*1,785*

a. Due to the smaller sample size, concerns about non-random attrition and changes in composition, we advise particular caution in the interpretation of the numbers for 2010–11; for this reason, these numbers are italicised.

Notes: Sample is restricted to individuals aged 52 or over. Income measures are defined in Section 3.1.2 and adequacy thresholds in Section 3.2.2. For 2004–05 and 2006–07, state pension income is estimated on the basis of state pension legislation that pre-dated the Pensions Act 2007. For 2008–09 and 2010–11, state pension income is estimated on the basis of the system after Pensions Act 2007.

That our estimates show that the proportion of individuals at risk of having inadequate resources at the SPA has declined over time would appear to be a desirable finding. However, it is notable that there has been a greater percentage-point decline in the proportion of individuals at risk when adequacy is defined in terms of a replacement rate than when adequacy is defined in terms of an absolute level of income. There are two reasons why the proportion at risk of having a certain replacement rate may fall: first, estimated income at retirement may be greater; second, current income could be lower (and therefore a given income at retirement would represent a greater replacement rate). To give some indication of this, Figures B.3 and B.4 in Appendix B describe the distribution of total equivalised net family current income and estimated equivalised pension income at the SPA over time, adjusted for inflation. These show that the distribution of current net income was largely similar between the waves, while estimated pension income was generally greater in later ELSA waves, suggesting that the reduction in the proportions at risk of inadequate resources is being driven by the accumulation of pension rights rather than by a decline in the income to be replaced.[27]

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[27] Of course, it could also be that, while the distribution of current income looks unchanged, those who have relatively high (low) pension income in later ELSA waves have come from a lower (higher) part of the income distribution than in previous ELSA waves.

CHAPTER 5
Conclusions

This report has investigated the extent to which those currently aged between 50 and the State Pension Age are financially prepared for retirement. Our aim has been to identify the proportion of individuals and the characteristics of those individuals who fall into one of two groups. The first is those who will be reliant on the state benefit system to ensure that they do not fall below a particular poverty line in retirement. The second is those who are likely to see their income fall substantially in retirement.

Our results are neither indicative of a cohort of individuals who are, in the main, likely to face large falls in their standards of living once they retire, nor evidence that the majority of individuals face no challenges when it comes to their retirement finances. Approximately 40% of individuals, if relying on their state and private pension income alone, will either replace less than two-thirds of their current net income in retirement or be forced to rely on the state benefit system to give them at least the minimum level of income implied by the Pension Credit Guarantee. This number falls to approximately 12% once we take account of individuals' housing and non-housing wealth holdings, their expected inheritances and their likely receipt of Pension Credit in retirement. Given that a large percentage of total family wealth is held in the form of housing equity, it is not surprising that including it as a source of income in retirement makes a large difference to the results, but the question of whether individuals should be expected to use their non-pension assets – and, in particular, their housing wealth – to fund their retirement is often a controversial and divisive issue.

We have identified a number of groups who are particularly at risk of having inadequate resources. Single individuals (whether they are divorced, widowed or never married) are more at risk than married individuals and, among single individuals, women tend to be more at risk than men. While we find that education and a dimension of cognitive ability (numeracy) are associated with the risk of having to rely on the state benefit system to ensure that one has more than a minimum absolute level of income in retirement, it is not the case that the more educated and those with greater numerical ability are likely to replace, on average, a greater proportion of their pre-retirement income.

This report has identified *how many* individuals are likely to fall below certain thresholds that can represent the adequacy of retirement resources and it has documented *who* those individuals are. It has not investigated *why* those individuals are likely to have inadequate resources; this topic is the subject of ongoing research by the current authors. Such research will aim to place retirement resources in the context of the entirety of working-life income rather than just income in a particular year shortly before retirement. This is important because the policy prescriptions are likely to be quite different if those who have inadequate resources are largely those who had low (or perhaps volatile) income throughout their working life and therefore would have found it difficult to save more, rather than being those who could have saved more for retirement but simply chose not to.

APPENDIX A
Individuals who class themselves as 'retired' before SPA

In Chapter 2, we noted that we exclude from our analysis those individuals living in families where either partner describes themselves as retired. The reason we do this is that our primary interest in this report is to investigate the changes in income that occur when individuals undergo the transition from working life to retirement. For those who describe themselves as retired, this transition has, at least partially, already occurred. It may therefore not be sensible to apply the methodology of this report, which uses current reported income as an indication of working-life income against which retirement income can then be compared, to these individuals. We are, however, interested in the extent to which their resources in retirement are adequate given their income in working life. In ongoing work, we will use data on their income over their entire working life to make such a comparison.

Since excluding these people makes the sample that we use for analysis in this report even less representative of the population aged between 50 and the SPA (we are already excluding those with a partner aged over the SPA), in this appendix we document some of the characteristics of this group.

Table A.1 summarises the employment status of individuals aged between 50 and the SPA whose partner (if applicable) is also aged under the SPA (a total sample size of 2,946). The first panel gives the number and percentage of individuals by their reported employment status. The second shows the number and percentage of individuals living in families where at least one adult reports a particular employment status. In the second panel, therefore, individuals can appear twice (if they are in a couple with different employment statuses) and the sum of the percentages is greater than 100%.

Focusing on the third row, just over 10% of individuals between the age of 50 and their SPA report themselves as retired and 14% of individuals live in a family where either they or their partner (if they have one) reports themselves as retired. These latter 412 individuals are the ones we exclude from our sample.

Multivariate analysis was conducted to investigate the characteristics associated with being in a family in which at least one individual is retired before the SPA. The results are presented in Table A.2 in terms of odds ratios, which are explained in more detail in Section 4.2.2. For example, the figure 1.52 for mid education indicates that individuals

Table A.1
Employment status

Status	Individual's status		Status of any family member	
	No.	%	No.	%
Employee	1,717	58.3	2,135	72.5
Self-employed	363	12.3	550	18.7
Retired	298	10.1	412	14.0
Unemployed	72	2.4	106	3.6
Long-term sick	291	9.9	386	13.1
Other	205	7.0	396	13.4
Total	2,946	100.0	–	–

with mid education are 1.52 times more likely to be in a family where at least one individual is retired before the SPA than individuals with low education.

Those living in families where at least one member describes himself or herself as retired prior to the SPA are more likely to have more education, have more wealth and, unsurprisingly, be older. This mirrors results in Crawford and Tetlow (2010), who additionally document the fact that those with defined benefit pensions are more likely to describe themselves as retired than those without. The group that we are excluding from

Table A.2

Risk of early retirement

	(1)	(2)
Education		
Low (ref.)		
Mid	1.52***	1.27*
High	1.72***	1.20
Numeracy		
Group 1 (lowest) (ref.)		
Group 2	1.49	1.32
Group 3	1.54	1.24
Group 4 (highest)	1.60	1.22
Marital status		
Married (ref.)		
Never married, male	1.16	1.15
Divorced, male	1.19	1.11
Widowed, male	0.72	0.82
Never married, female	1.05	1.16
Divorced, female	0.68	0.61
Widowed, female	0.26***	0.31***
Age		
50–54 (ref.)		
55–59	2.62***	2.41***
60–64	7.43***	7.15***
Wealth quintile		
Lowest (ref.)		
2		1.04
3		1.29
4		1.86***
Highest		3.26***
Sample size	2,822	2,822

Notes: Coefficients are from a logistic regression of a dummy variable indicating whether an individual is in a family in which at least one individual reports being retired before the SPA on a number of individual characteristics. The 'reference individual' is a married individual, aged 50–54, with low levels of education and numeracy, and (in specification 2) in the lowest wealth quintile. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. Standard errors are clustered at the benefit unit level.

Table A.3

Risk of not working but not being retired

	(1)	(2)
Education		
Low (ref.)		
Mid	0.64***	0.72***
High	0.43***	0.56***
Numeracy		
Group 1 (lowest) (ref.)		
Group 2	0.47***	0.56***
Group 3	0.31***	0.42***
Group 4 (highest)	0.32***	0.46***
Marital status		
Married (ref.)		
Never married, male	0.91	0.68*
Divorced, male	0.83	0.66
Widowed, male	0.98	0.66**
Never married, female	0.63*	0.47***
Divorced, female	0.83	0.76
Widowed, female	1.08	0.74*
Age		
50–54 (ref.)		
55–59	1.05	1.11
60–64	1.06	1.09
Wealth quintile		
Lowest (ref.)		
2		0.34***
3		0.34***
4		0.28***
Highest		0.26***
Sample size	2,822	2,822

Notes: Coefficients are from a logistic regression of a dummy variable indicating whether an individual is in a family in which at least one individual is out of work, but does not report being retired, before the SPA on a number of individual characteristics. The 'reference individual' is a married individual, aged 50–54, with low levels of education and numeracy, and (in specification 2) in the lowest wealth quintile. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively. Standard errors are clustered at the benefit unit level.

our sample, therefore, is likely predominately drawn from those with higher permanent (lifetime) incomes.

Turning back to Table A.1, it is clear that most of the individuals not in paid work do not describe themselves as retired: a total of nearly 20% of individuals aged between 50 and their SPA (whose partner, if applicable, is also aged under the SPA) are either unemployed, long-term sick or 'other'. We *do* include these individuals in our sample, as it is quite likely that an income transition awaits them when they reach their SPA – perhaps

from out-of-work benefits onto the state pension or Pension Credit, or perhaps into receipt of private pension income.

Multivariate analysis was also conducted to investigate the characteristics associated with being in a family in which at least one individual is out of work, but not reporting being retired, before the SPA. The results, shown in Table A.3, are very different from those in Table A.2. Those most likely to be in families in which at least one individual is not in paid work but not retired are more likely to have low education, low numerical ability and low wealth.

This appendix has very briefly summarised the characteristics that are associated with being in a family in which at least one individual reports being retired prior to the SPA. The main point to keep in mind about this 14% of individuals whom we exclude from our sample is that they are probably drawn predominantly from a section of the population that has higher permanent income and wealth levels. Those not in paid work but not describing themselves as retired are likely drawn predominantly from sections of the population that, on these same dimensions, are very different: they have lower permanent income and wealth levels.

APPENDIX B
Additional tables and figures

Figure B.1

Sensitivity of estimated pension income at SPA to the assumed retirement age
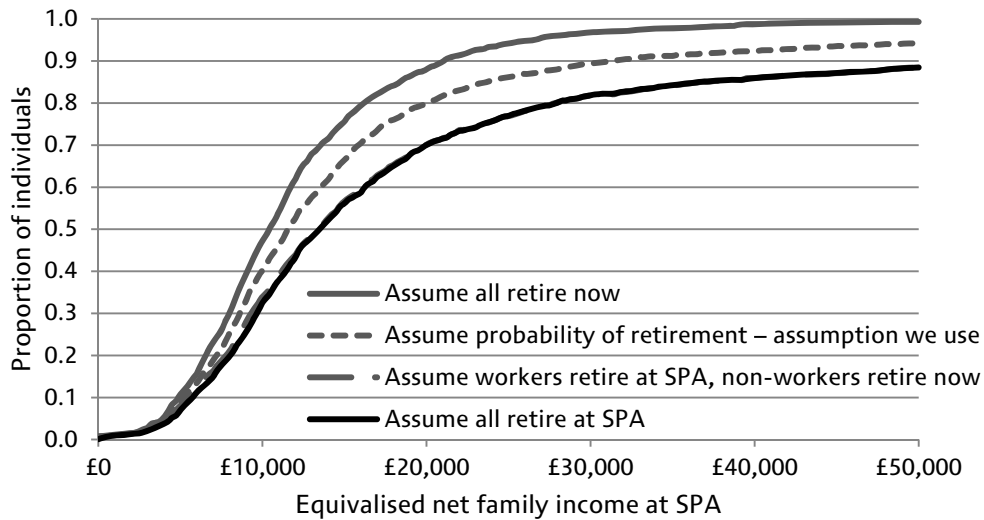
Notes: Sample is individuals aged between 50 and the SPA who do not report being retired and whose partner (if applicable) is also aged under the SPA and does not report being retired. N=2,534.

Figure B.2

Sensitivity of estimated income at SPA to definition of 'income' used
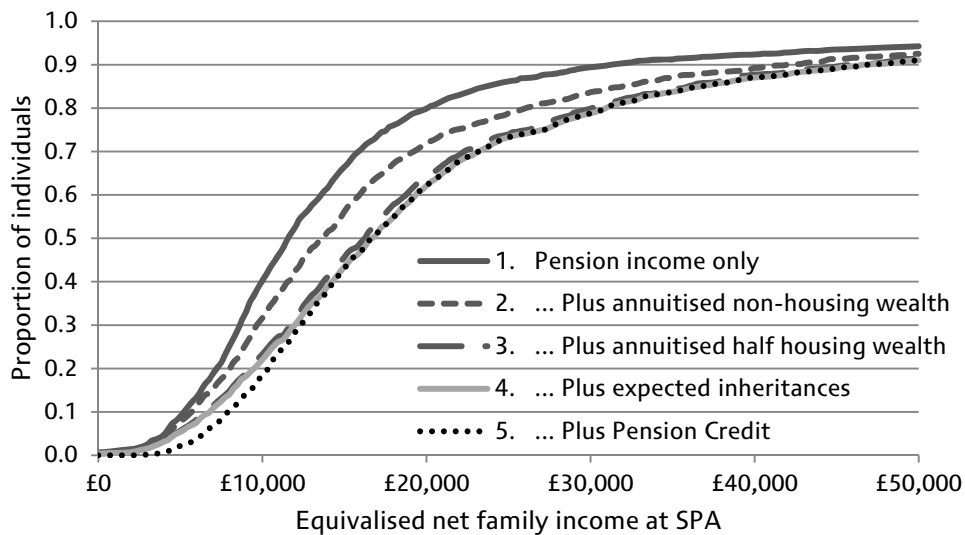
Notes: Sample is individuals aged between 50 and the SPA who do not report being retired and whose partner (if applicable) is also aged under the SPA and does not report being retired. N=2,534.

Table B.1

Percentage of individuals with inadequate resources, assuming 3% annuity rate for non-pension wealth and 3% housing rental yield

Income definition	Adequacy threshold:			
	PCG	67%	80%	Adapted Pensions Commission
Pension income only ('narrow')	12%	41%	53%	41%
... plus non-housing wealth	10%	33%	45%	33%
... plus half housing wealth	8%	25%	37%	25%
... plus expected inheritances	7%	23%	34%	23%
... plus Pension Credit ('broad (1)')	0%	16%	28%	15%
'Broad (2)' – includes imputed rental income from housing wealth	0%	14%	27%	13%

Notes: Sample size = 2,534. Income measures are defined in Section 3.1.2 and adequacy thresholds in Section 3.2.2.

Table B.2

Percentage of individuals with inadequate resources, assuming 7% annuity rate for non-pension wealth and 7% housing rental yield

Income definition	Adequacy threshold:			
	PCG	67%	80%	Adapted Pensions Commission
Pension income only ('narrow')	12%	41%	53%	41%
... plus non-housing wealth	10%	28%	39%	29%
... plus half housing wealth	7%	16%	26%	17%
... plus expected inheritances	6%	15%	24%	16%
... plus Pension Credit ('broad (1)')	0%	10%	19%	9%
'Broad (2)' – includes imputed rental income from housing wealth	0%	8%	17%	7%

Notes: Sample size = 2,534. Income measures are defined in Section 3.1.2 and adequacy thresholds in Section 3.2.2.

Table B.3
Median replacement rates (%), by characteristics

	Narrow	Broad (1)	Broad (2)	Sample size
Sex				
Male	83	117	108	1,357
Female	76	114	105	1,177
Marital status				
Married	82	117	107	1,826
Never married, male	93	140	122	138
Divorced, male	*97*	*125*	*119*	*32*
Widowed, male	79	104	99	172
Never married, female	*76*	*114*	*106*	*87*
Divorced, female	*65*	*119*	*102*	*54*
Widowed, female	66	106	100	225
Education				
Low	82	113	106	855
Mid	82	119	108	1,047
High	73	117	106	574
Numeracy				
Group 1 (lowest)	79	123	118	189
Group 2	82	115	106	898
Group 3	81	118	107	809
Group 4 (highest)	78	114	106	580
Income quintile				
1 (lowest)	174	238	181	494
2	87	124	112	491
3	81	109	101	493
4	66	95	90	515
5 (highest)	58	88	86	541
Region				
North East	79	109	103	145
North West	79	115	105	325
Yorkshire & Humber	79	111	101	288
East Midlands	78	111	104	294
West Midlands	83	122	112	266
East of England	81	113	104	309
London	82	128	114	238
South East	77	117	105	422
South West	82	123	108	245

Continues

Table B.3 continued

	Narrow	Broad (1)	Broad (2)	Sample size
Probability of financial insecurity				
0	79	114	105	236
1–19	80	119	108	360
20–49	79	118	107	725
50	82	112	104	478
51–79	81	113	103	303
80–100	82	116	108	326
Housing tenure				
Owner-occupier	79	117	106	2,073
Renter	84	114	114	461
Pension				
Current	80	112	104	1,327
Non-current only	85	119	108	663
None	75	122	113	544
Health				
No problem	78	114	105	1,822
Problem	86	123	114	712
Wealth quintile				
1 (lowest)	84	107	107	509
2	82	104	99	527
3	82	112	102	518
4	83	124	108	509
5 (highest)	67	145	118	471
Age group				
50–54	81	115	108	869
55–59	79	117	107	1,338
60–64 (men only)	88	117	104	327
All	81	116	107	2,534

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired. Where results are based on a sample size of less than 100, figures are italicised. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. Quintiles of wealth and income are calculated on our sample and not on the entire ELSA sample. Probability of financial insecurity is defined in Section 4.3. Individuals are categorised here as having a health problem if they report that they have a 'long-standing illness, disability or infirmity' that 'limit[s their] activities in any way'.

Table B.4
Percentages at risk of inadequacy (Pension Credit Guarantee level threshold), by characteristics

	Narrow definition of income	**Sample size**
Sex		
Male	6.6	1,357
Female	19.1	1,177
Marital status		
Married	4.4	1,826
Never married, male	15.9	138
Divorced, male	*6.3*	*32*
Widowed, male	15.7	172
Never married, female	*43.7*	*87*
Divorced, female	*48.1*	*54*
Widowed, female	52.9	225
Education		
Low	17.0	855
Mid	12.5	1,047
High	6.1	574
Numeracy		
Group 1 (lowest)	31.7	189
Group 2	15.5	898
Group 3	8.5	809
Group 4 (highest)	7.1	580
Income quintile		
1 (lowest)	32.4	494
2	17.5	491
3	7.7	493
4	2.7	515
5 (highest)	3.1	541
Region		
North East	17.2	145
North West	14.8	325
Yorkshire & Humber	15.3	288
East Midlands	7.8	294
West Midlands	12.8	266
East of England	12.0	309
London	12.6	238
South East	9.0	422
South West	14.7	245

Continues

Table B.4 continued

	Narrow definition of income	Sample size
Probability of financial insecurity		
0	12.3	236
1–19	7.2	360
20–49	9.2	725
50	12.8	478
51–79	11.6	303
80–100	23.3	326
Housing tenure		
Owner-occupier	7.9	2,073
Renter	33.0	461
Pension		
Current	5.0	1,327
Non-current only	11.9	663
None	31.3	544
Health		
No problem	9.3	1,822
Problem	20.4	712
Wealth quintile		
1 (lowest)	30.3	509
2	9.9	527
3	8.3	518
4	6.5	509
5 (highest)	7.0	471
Age group		
50–54	12.3	869
55–59	13.5	1,338
60–64 (men only)	8.3	327
All	12.4	2,534

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired. Where results are based on a sample size of less than 100, figures are italicised. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. Quintiles of wealth and income are calculated on our sample and not on the entire ELSA sample. Probability of financial insecurity is defined in Section 4.3. Individuals are categorised here as having a health problem if they report that they have a 'long-standing illness, disability or infirmity' that 'limit[s their] activities in any way'.

Table B.5
Percentages at risk of inadequacy (67% replacement rate threshold), by
characteristics

	Narrow	Broad (1)	Broad (2)	Sample size
Sex				
Male	35.7	10.2	8.6	1,357
Female	48.3	13.9	12.4	1,177
Marital status				
Married	35.5	10.3	8.9	1,826
Never married, male	37.7	8.0	6.5	138
Divorced, male	*34.4*	*9.4*	*9.4*	*32*
Widowed, male	47.1	19.2	16.9	172
Never married, female	*65.5*	*14.9*	*12.6*	*87*
Divorced, female	*75.9*	*18.5*	*16.7*	*54*
Widowed, female	72.4	20.0	17.8	225
Education				
Low	41.6	12.4	10.8	855
Mid	39.3	10.1	9.0	1,047
High	46.2	14.3	12.0	574
Numeracy				
Group 1 (lowest)	51.3	15.3	13.8	189
Group 2	40.2	10.9	9.7	898
Group 3	38.8	12.2	10.4	809
Group 4 (highest)	42.2	11.9	10.2	580
Income quintile				
1 (lowest)	32.8	1.6	1.6	494
2	27.7	3.5	2.9	491
3	31.2	8.1	6.5	493
4	50.7	16.9	14.4	515
5 (highest)	62.8	27.9	25.0	541
Region				
North East	45.5	13.1	9.0	145
North West	43.4	11.4	9.8	325
Yorkshire & Humber	40.3	11.5	10.4	288
East Midlands	39.1	13.6	13.3	294
West Midlands	40.2	12.8	11.7	266
East of England	42.7	12.6	10.7	309
London	40.3	13.4	12.2	238
South East	42.7	10.4	8.3	422
South West	40.8	10.2	8.6	245

Continues

Table B.5 continued

	Narrow	Broad (1)	Broad (2)	Sample size
Probability of financial insecurity				
0	41.1	16.5	14.0	236
1–19	41.4	9.2	8.3	360
20–49	40.4	8.6	7.3	725
50	40.2	12.1	11.7	478
51–79	38.0	15.2	11.9	303
80–100	45.7	16.0	13.8	326
Housing tenure				
Owner-occupier	39.6	11.0	9.0	2,073
Renter	50.5	16.5	16.5	461
Pension				
Current	37.5	12.0	10.0	1,327
Non-current only	37.9	10.0	8.9	663
None	55.9	14.3	13.1	544
Health				
No problem	41.1	12.4	10.8	1,822
Problem	42.8	10.8	9.3	712
Wealth quintile				
1 (lowest)	47.7	18.5	17.3	509
2	34.2	13.5	10.2	527
3	36.9	11.8	10.4	518
4	38.9	9.0	8.1	509
5 (highest)	51.2	6.6	5.5	471
Age group				
50–54	42.6	11.5	8.9	869
55–59	42.5	12.1	10.9	1,338
60–64 (men only)	34.9	12.5	12.2	327
All	41.6	12.0	10.4	2,534

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired. Where results are based on a sample size of less than 100, figures are italicised. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. Quintiles of wealth and income are calculated on our sample and not on the entire ELSA sample. Probability of financial insecurity is defined in Section 4.3. Individuals are categorised here as having a health problem if they report that they have a 'long-standing illness, disability or infirmity' that 'limit[s their] activities in any way'.

Table B.6

Median regression of replacement rates for those in work

| | Income definition: | | |
	Narrow	Broad (1)	Broad (2)
Education			
Low (ref.)			
Mid	0.5	7.7*	2.9
High	−7.1**	10.1**	4.1
Numeracy			
Group 1 (lowest) (ref.)			
Group 2	4.2	0.7	−4.8
Group 3	3.8	2.5	−4.0
Group 4 (highest)	1.6	2.3	−5.1
Marital status			
Married (ref.)			
Never married, male	−4.4	−0.8	0.1
Divorced, male	−5.1	10.9	9.5
Widowed, male	−18.4***	−23.9***	−13.8***
Never married, female	−11.9*	−16.8*	−12.4*
Divorced, female	−18.7**	−17.9	−13.5
Widowed, female	−18.8***	−22.1***	−13.6***
Age			
50–54 (ref.)			
55–59	−0.3	−1.8	−3.7
60–64	1.8	−4.6	−7.9**
Constant	79.2***	110.4***	111.1***
Sample size	2,116	2,116	2,116

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired, and who are either in paid work or have a partner in paid work. The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively.

Table B.7
Risk of inadequate resources (Pension Credit Guarantee level threshold)
for those in work

|	Narrow definition of income
Education	
Low (ref.)	
Mid	0.87
High	0.48***
Numeracy	
Group 1 (lowest) (ref.)	
Group 2	0.56*
Group 3	0.30***
Group 4 (highest)	0.33***
Marital status	
Married (ref.)	
Never married, male	5.77***
Divorced, male	3.36
Widowed, male	5.88***
Never married, female	18.83***
Divorced, female	12.92***
Widowed, female	18.35***
Age	
50–54 (ref.)	
55–59	0.92
60–64	0.85
Sample size	2,116

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired, and who are either in paid work or have a partner in paid work. Coefficients are odds ratios arising from logistic regression. The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively.

Table B.8
Risk of inadequate resources (67% replacement rate threshold)
for those in work

|	Income definition:		
	Narrow	**Broad (1)**	**Broad (2)**
Education			
Low (ref.)			
Mid	0.92	0.75*	0.81
High	1.28*	1.08	1.10
Numeracy			
Group 1 (lowest) (ref.)			
Group 2	0.84	0.59**	0.61*
Group 3	0.82	0.65	0.63
Group 4 (highest)	0.95	0.59*	0.59*
Marital status			
Married (ref.)			
Never married, male	1.66**	1.07	1.12
Divorced, male	1.59	0.82	0.93
Widowed, male	2.67***	2.88***	2.75***
Never married, female	3.34***	1.64	1.57
Divorced, female	4.90***	2.71**	2.74**
Widowed, female	3.64***	2.65***	2.66***
Age			
50–54 (ref.)			
55–59	0.93	1.08	1.30
60–64	0.83	1.20	1.60**
Sample size	2,116	2,116	2,116

Notes: Sample is restricted to individuals aged between 50 and the SPA who do not report themselves to be retired, whose partner (if applicable) is also aged below the SPA and does not report themselves as retired, and who are either in paid work or have a partner in paid work. Coefficients are odds ratios arising from logistic regression. The 'reference person' is a married individual, aged 50–54, with low levels of education and numeracy. Education is defined as: 'low' – leaving full-time education at or below the CSL; 'mid' – leaving full-time education between the CSL and age 18; and 'high' – leaving full-time education above age 18. ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels respectively.

Figure B.3
Change in distribution of current income over time
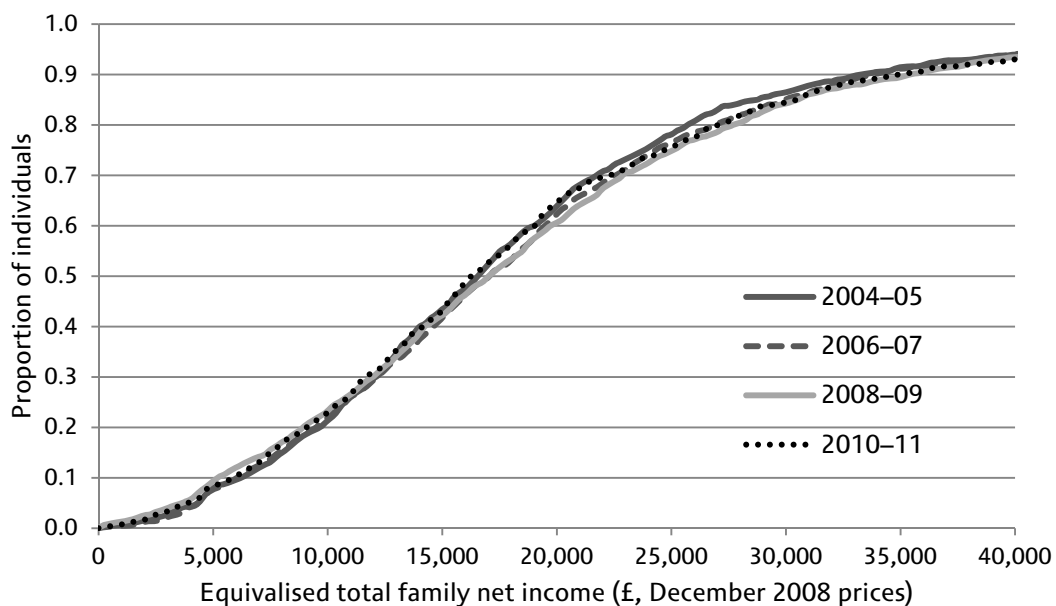
Note: Sample is restricted to individuals aged 52 or over.

Figure B.4
Change in distribution of pension income at SPA over time
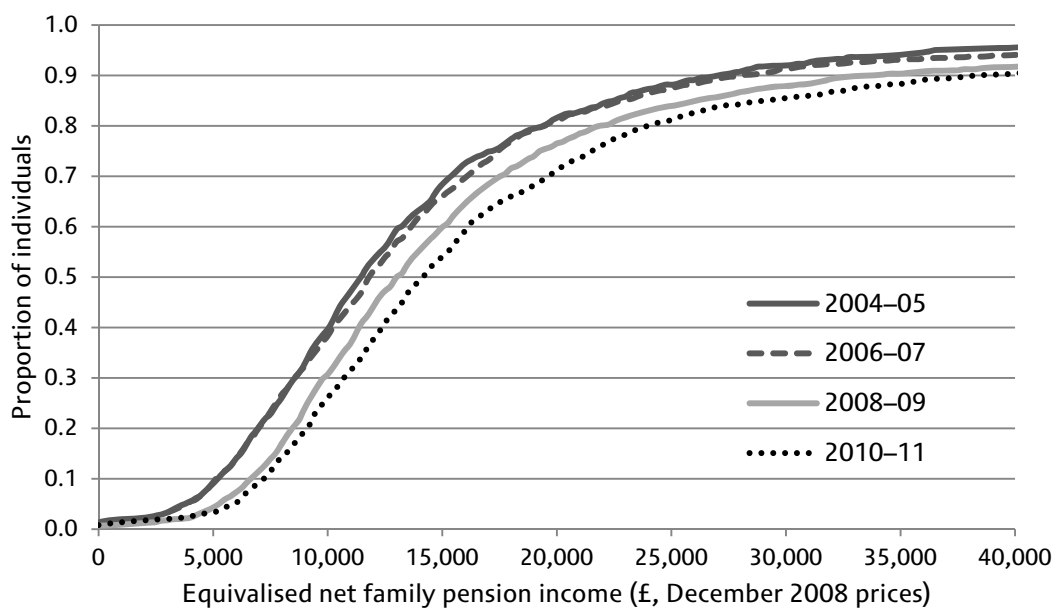
Notes: Sample is restricted to individuals aged 52 or over. For 2004–05 and 2006–07, state pension income is estimated on the basis of state pension legislation that pre-dated the Pensions Act 2007. For 2008–09 and 2010–11, state pension income is estimated on the basis of the system after Pensions Act 2007.

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