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**The dynamics of ageing:  
The 2012 English  
Longitudinal Study of  
Ageing (Wave 6)  
Technical Report**

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# 1 Introduction

This technical report provides methodological information relating to the sixth wave of the English Longitudinal Study of Ageing (ELSA) in 2012-13. The report aims to provide an overview of the sampling design, study content, fieldwork response, and weighting procedures adopted at wave 6. Reference is also made to earlier waves of the study to provide context for the reader and to highlight key changes made to the study over time. The technical reports for each wave of ELSA should be used in conjunction with other materials deposited at the UK Data Service.<sup>1,2</sup>

The design and collection of data for the ELSA study has been developed through a collaboration between the following institutions:

- Department of Epidemiology and Public Health, University College London
- Institute for Fiscal Studies
- NatCen Social Research
- School of Social Sciences, University of Manchester
- Norwich Medical School, University of East Anglia

Funding for the first six waves of ELSA was provided by the US Institute on Aging (NIA) and a consortium of British Government departments<sup>3</sup>. Ethical approval for the study was granted by the South Central Berkshire Research Ethics Committee (REC) through an application to the National Research Ethics Service (NRES).

ELSA aims to better understand the social and economic conditions, and the health and well-being of older people. Data from all waves of ELSA are available as public use datasets from the UK Data Service. ELSA data has been used to explore the dynamics of ageing, to inform policy debates and for comparative analysis with the Health and Retirement Study (HRS) in the United States, and the Survey of Health and Retirement in Europe (SHARE). Findings from each wave of ELSA are presented in substantive reports (Marmot et al. 2003, Banks et al. 2006, Banks et al. 2008, Banks et al. 2010, Banks et al, 2012, Banks et al, 2014). Further analyses and publications are listed on the ELSA website ([www.ifs.org.uk/elsa](http://www.ifs.org.uk/elsa)).

The next chapter of this technical report (Chapter 2) provides a broad overview of the ELSA study. The sample design adopted at each wave is covered in Chapter 3, and the content and structure of the wave 6 interview and nurse visit are given in Chapters 4 and 5 respectively. Information on the wave 6 fieldwork procedures are

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<sup>1</sup> <http://discover.ukdataservice.ac.uk/series/?sn=200011>

<sup>2</sup> A User Guide covering all the waves is also available. This shows how to analyse the data and provides further information about weights.

<sup>3</sup> Department for Communities and Local Government, Department of Health, Department for Transport, Department for Work and Pensions, and the Office for National Statistics funded wave 6.

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outlined in Chapter 6, and the wave 6 response rates are presented in Chapter 7. Chapter 8 describes the derivation of the longitudinal and cross-sectional weights for use with the wave 6 core dataset.

## 2 Overview Of ELSA

This chapter aims to give a broad overview of the ELSA study design and provide some historical context for readers. It outlines the sampling design used for each Cohort (Section 2.1), the survey instruments included at each wave (Section 2.2), and presents a summary of response rates across the waves (Section 2.3).

### 2.1 ELSA Sample Design

The ELSA sample was designed to be representative of people aged 50 and over living in private households in England. The original cohort at wave 1 (persons born on or before 29<sup>th</sup> February 1952) were selected from households who had previously responded to the Health Survey for England (HSE) in 1998, 1999, and 2001<sup>4</sup>. The ELSA wave 1 interview took place in 2002-03, providing the baseline for the study. Age-eligible sample members who responded at wave 1 were renamed Cohort 1 ‘core members’ to distinguish them as the core element of the continuing ELSA sample. Interviews with core members and their partners were attempted every two years following wave 1 (wave 2 in 2004-05, wave 3 in 2006-07, wave 4 in 2008-09, wave 5 in 2010-11, wave 6 in 2012-13).

To ensure the ELSA study remained representative of the target population, three new cohorts were subsequently added.

- At wave 3, a ‘refreshment’ cohort of people just entering their 50s (born between the 1<sup>st</sup> March 1952 and the 29<sup>th</sup> February 1956) was introduced (henceforth referred to as Cohort 3). At the time of wave 3, the youngest core members from Cohort 1 were now aged 54, so Cohort 3 was introduced to ensure the study still covered the very youngest age range (those aged 50-54). The sample used to form Cohort 3 was selected from four survey years of the HSE (2001 to 2004).
- At wave 4, a cohort of people aged 50-74 (born between 1 March 1933 and 28 February 1958) was introduced (henceforth referred to as Cohort 4). The sample used to form Cohort 4 was selected from HSE 2006. Cohort 4 comprises a “top-up” of people aged 52-74, and a refreshment sample of people aged 50-51.

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<sup>4</sup> HSE 2000 was used to select a sample of individuals for questionnaire testing and piloting

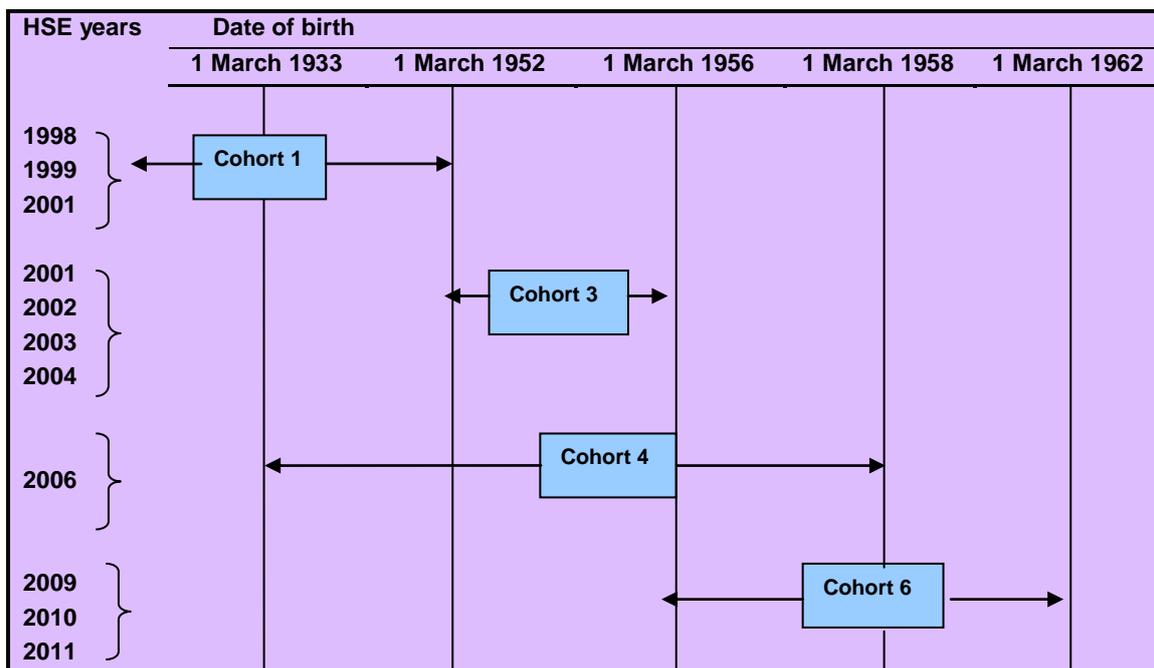
- At wave 6, a further ‘refreshment’ cohort of people aged 50-55 (born between 1<sup>st</sup> March 1956 and 28<sup>th</sup> February 1962) was introduced. The Cohort 6 sample came from three later HSE survey years (2009, 2010 and 2011). The Cohort 6 sample was introduced to ensure that those in their early 50s remained represented in the overall ELSA sample.

There is some overlap between the cohorts in terms of age, but each cohort is still viewed as a distinct group recruited from different years of HSE and introduced to ELSA at different times.

Age-eligible sample members from each new cohort who are interviewed at their first wave, are referred to as “core members”<sup>5</sup>. Partners of core members from each cohort were also eligible for interview, but the main focus for ELSA analysis is on core members as they represent the sampled population of interest.

A summary of the ELSA sample design is shown in Figure 2.1<sup>6</sup>. More detail on the sample selection procedure for each cohort is given in Chapter 3.

**Figure 2.1 ELSA sample design**



<sup>5</sup> The Cohort number was chosen to reflect the wave in which the new sample was added. There is no “Cohort 2” or “Cohort 5” in ELSA because no new sample was issued at wave 2 or at wave 5.

<sup>6</sup> Cohorts 1 and 3 overlap as a number of Cohort 1 younger partners (sampled from HSE 2001) were now aged over 50 in wave 3 and were reclassified as Cohort 3 core members if successfully interviewed at wave 3.

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## 2.2 Survey instruments

This section provides an overview of the survey instruments used in ELSA, namely: the core interview, nurse visit, end of life interview, and telephone interview<sup>7</sup>. The remaining chapters of this report relate only to the main interview (see Chapter 4) and nurse visit (see Chapter 5).

### 2.2.1 Main interview

The core ELSA questionnaire was administered at each wave by Computer Assisted Personal Interviewing (CAPI) in the participants' home. Two paper self-completion questionnaires were also given to respondents to complete at the end of their CAPI interview. One was the core questionnaire, similar to that included in previous waves. The other was a questionnaire focussing on sexual activities and experience (one version for men and one version for women).

As in previous waves, the topic areas covered in wave 6 were: individual and household characteristics; physical, cognitive, mental and psychological health; social participation and social support; housing and consumption, work, pensions, income and assets; expectations for the future, and effort and reward. In addition, an objective measure of health and functioning was collected by means of a timed walk. A shorter interview was attempted with a proxy informant if the core member was unable to respond because of physical or mental ill health, or cognitive impairment. Proxy interviews were also allowed at wave 6 where the respondent was unwilling to respond themselves but agreed that someone else (usually a spouse) could respond on their behalf. Another version of the main core interview was also used for sample members who had moved into an institution (such as a residential or nursing home).

Some new topics at wave 6 included:

- Male state pension age
- Lifetime receipt of inheritance and gifts
- Future housing and care needs
- Revised module on social care receipt
- Revised questions on providing care to others
- Fluid intelligence (number series task)
- Digital inclusion
- Sexual experience, attitudes and desire<sup>8</sup>

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<sup>7</sup> A separate Life History interview was conducted at the wave 3 and information relating to this can be found in the Life History interview user guide (Ward et al, 2009)

<sup>8</sup> These questions were asked in a separate paper self completion questionnaire

Table 2.1 shows the number of respondents at each wave of ELSA. This includes those who had a proxy or partial interview or those who had been interviewed in an institution<sup>9</sup>. At wave 6, a total of 10,601 interviews were conducted. Of these, 9,169 were with core members (5,659 Cohort 1; 888 Cohort 3; 1,796 Cohort 4; 826 Cohort 6).

**Table 2.1 Number of respondents at each ELSA wave split by Cohort**

| ELSA Wave | Number of completed interviews |                     |          |          |       | Partners | Total |
|-----------|--------------------------------|---------------------|----------|----------|-------|----------|-------|
|           | Core members                   |                     |          |          |       |          |       |
|           | Cohort 1                       | Cohort 3            | Cohort 4 | Cohort 6 |       |          |       |
|           | (n)                            | (n)                 | (n)      | (n)      | (n)   | (n)      |       |
| Wave 1    | 11,391                         | N/A                 | N/A      | N/A      | 708   | 12,099   |       |
| Wave 2    | 8,781                          | N/A                 | N/A      | N/A      | 652   | 9,433    |       |
| Wave 3    | 7,535                          | 1,275 <sup>10</sup> | N/A      | N/A      | 960   | 9,770    |       |
| Wave 4    | 6,623                          | 972                 | 2,291    | N/A      | 1,164 | 11,050   |       |
| Wave 5    | 6,242                          | 936                 | 1,912    | N/A      | 1,184 | 10,274   |       |
| Wave 6    | 5,659                          | 888                 | 1,796    | 826      | 1,432 | 10,601   |       |

## 2.2.2 Nurse visit

As at wave 2 and wave 4, core members interviewed at wave 6 were visited by a trained nurse to conduct a series of biomedical and physical performance measures, including the taking of blood samples. Measures collected in the nurse visit were blood pressure, grip strength, blood samples, standing, weight, waist and hip measurement, lung function, balance, leg raises, chair rises and hair samples to measure levels of cortisol<sup>11</sup>. Partners of cohort members were not eligible for the nurse visit.<sup>12</sup> Table 2.2 shows the number of nurse visits conducted with core members at wave 2, wave 4 and wave 6.

<sup>9</sup> Institutional interviews were introduced at wave 2 for those who move out of the private residential sector after the baseline wave

<sup>10</sup> Includes 104 Cohort 1 young partners (from HSE 2001) who changed status in 2006-07 to become Cohort 3 core members.

<sup>11</sup> The hair sample was a new addition at wave 6. In previous waves, saliva samples were taken to measure cortisol.

<sup>12</sup> Partners who requested a nurse visit at wave 6 were allowed one, though this was discouraged because their data will not be used in analysis.

**Table 2.2 Number of nurse visits with core members split by cohort**

| ELSA Wave | Number of nurse visits |          |          |          | Total |
|-----------|------------------------|----------|----------|----------|-------|
|           | Cohort 1               | Cohort 3 | Cohort 4 | Cohort 6 |       |
|           | (n)                    | (n)      | (n)      | (n)      |       |
| Wave 2    | 7,666                  | N/A      | N/A      | N/A      | 7,666 |
| Wave 4    | 5,625                  | 744      | 1,850    | N/A      | 8,218 |
| Wave 6    | 4,768                  | 725      | 1,574    | 664      | 7,731 |

### 2.2.3 End of Life Interview

An “End-of-Life” CAPI interview is carried out for core members who die (and who have not asked to withdraw from the study). Interviewers approach a partner, close friend or relative of the deceased core member to invite them to participate. This approach was successfully adopted by the HRS in the United States, and the content of the HRS interview was revised for use in ELSA.

The End-of-Life interview aims to bring closure to the information already collected from the core member. It can be used to detect possible changes to their health, social, and financial circumstances since their last interview, and to determine what happened to their assets after they died.

The End-of-Life questionnaire covers the following:

- Health of deceased in year preceding death (physical and mental)
- Care and support needed in 3 months preceding death
- Memory and mood of person in last year preceding death
- Problem behaviour (e.g. aggression)
- Financial questions – private health care, funeral expenses, inheritance – houses, businesses, other assets.
- Health Decision making (Advance Directives and Lasting Power of Attorney) (wave 6 only)

Table 2.3 below summarises the number of End-of-Life interviews achieved at the waves it has been included.

**Table 2.3 Number of End-of-Life interviews**

|           | Survey           |
|-----------|------------------|
|           | Total            |
| ELSA Wave | (n)              |
| Wave 2    | 135              |
| Wave 3    | 375              |
| Wave 4    | 242 <sup>a</sup> |
| Wave 6    | 240              |

<sup>a</sup> Note that in previous reports 244 productive cases were reported but the final number of productive cases for analysis is 242.

The data from the End-of-Life interviews is archived with the other ELSA datasets. It is important to note that the increase in End of Life interviews at wave 3 was a reflection of improved procedures to identify and trace potential ‘End of Life’ respondents, rather than due to an increased number of deaths.

## 2.2.4 Telephone Interview

A short telephone interview has been included at each wave since wave 3 for some core members who had refused to be interviewed at previous waves. The content of the telephone interview has remained the same.

The telephone interview was short and collected only a small amount of information (taking about 10 minutes to complete), but it was an important addition to the ELSA strategy for retaining respondents. Overall, it had three main purposes:

- To ascertain why people refuse to continue participating in ELSA;
- To give an indication of how to most effectively encourage people to come back to ELSA in the future;
- To know more about people who do not take part, to work out if their omission is biasing ELSA results in any way.

There were ten straightforward questions which related to health, work and benefits, marital status, and accommodation. Most of the questions were taken directly from the main face-to-face interview, and were chosen because they were quick and simple and covered the key areas of interest. There was a respondent incentive for completing the telephone interview, and no proxy interviews were accepted.

A total of 804 telephone interviews were conducted at wave 3 and this increased to 1,077 at wave 4; 1,153 at wave 5 and 387 at wave 6.

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## 2.3 Response rates across the waves

This section includes a summary of **field** and **study** response rates at each wave. The field response rates are based on core members issued at the start of fieldwork. The study response rates include all core members who were theoretically eligible for the study (i.e. not known to have died or moved out of Britain<sup>13</sup>). Not all those who are eligible for the study response rates are issued to field, as some, for example, were permanent refusers or had remained untraced over a number of waves.

For all response rate measures, respondents were defined as those who gave a full or partial interview either in person or by proxy.

Chapter 7 has a more detailed analysis of wave 6 response rates for core members in each of the four cohorts.

### 2.3.1 Field response rates

Field response rates are often used to evaluate the quality of fieldwork practices. The two main field response rates published to date for ELSA have been the fieldwork household contact rate and the fieldwork cooperation rate (see Table 2.4 below).

The household contact rate is calculated by dividing the number of households where the interviewer made contact with at least one member of the sample by the number of eligible households found during fieldwork (issued plus newly formed households).

The cooperation rate is calculated by dividing the number of achieved individual interviews by the number of eligible individuals contacted by interviewers.

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<sup>13</sup> Note that in previous technical reports, those who had moved into institutions were considered ineligible and not included in response rates. At wave 6, they are included in response rates to be consistent with the approach taken in the wave 6 methods chapter.

**Table 2.4 Fieldwork response rates by wave<sup>14</sup>**

| Type of field response rate |          | Response rates |        |        |        |        |        |
|-----------------------------|----------|----------------|--------|--------|--------|--------|--------|
|                             |          | Wave 1         | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|                             |          | %              | %      | %      | %      | %      | %      |
| Household contact rate      | Cohort 1 | 95             | 97     | 97     | 97     | 97     | 98     |
|                             | Cohort 3 | N/A            | N/A    | 83     | 97     | 94     | 97     |
|                             | Cohort 4 | N/A            | N/A    | N/A    | 92     | 98     | 98     |
|                             | Cohort 6 | N/A            | N/A    | N/A    | N/A    | N/A    | 89     |
| Fieldwork cooperation rate  | Cohort 1 | 70             | 84     | 83     | 77     | 80     | 86     |
|                             | Cohort 3 | N/A            | N/A    | 74     | 81     | 81     | 84     |
|                             | Cohort 4 | N/A            | N/A    | N/A    | 69     | 87     | 85     |
|                             | Cohort 6 | N/A            | N/A    | N/A    | N/A    | N/A    | 62     |

### 2.3.2 Study rates

Various conditional response rates can be used to show how effective ELSA has been at maintaining its original sample. Table 2.5 shows the percentage of age-eligible sample members with an HSE interview who went on to take part in ELSA within each cohort. Table 2.6 shows the percentage of Cohort 1 core members who have taken part at each wave since wave 1. Table 2.7 shows the percentage of Cohort 1 core members who have completed an interview at all waves of ELSA.

#### **Cross-sectional response rates conditional upon wave 0 response**

For each of the ELSA cohorts, potential age-eligible sample members were selected from households that had previously participated at HSE (also known as ELSA wave 0). A cross-sectional rate conditional on wave 0 response can be used to show what proportion of eligible sample members with an HSE interview took part in ELSA the first time they were approached as a potential core member.

<sup>14</sup> External information from the National Health Service Central Register (now held by the Health and Social Care Information Centre - HSCIC) was matched to non-respondents to identify any deaths that had not been revealed in the course of fieldwork during waves 1-3. Individuals whose outcome showed that their eligibility had not been confirmed during fieldwork were all assumed to be eligible for the response rate calculation. From waves 4 to 6 only information from the HSCIC prior to fieldwork or confirmed by fieldwork were coded as deaths.

**Table 2.5 Cross-sectional response rates at the wave they joined ELSA, conditional on wave 0 response**

| <b>Cohort</b>                            | <b>Notation</b>   | <b>Meaning</b>  | <b>Numerator</b> | <b>Denominator</b>                | <b>Rate</b> |
|--|-------------------|---|------------------|-----------------------------------|-------------|
| <b>Cross-sectional conditional rates</b> |                   |   |                  |                                   |             |
| Cohort 1                                 | RR <sub>1 0</sub> | The (cross-sectional) W1 response rate conditional upon W0 response | Responding in W1 | Eligible in W1 & respondent in W0 | 65%         |
| Cohort 3                                 | RR <sub>3 0</sub> | The (cross-sectional) W3 response rate conditional upon W0 response | Responding in W3 | Eligible in W3 & respondent in W0 | 56%         |
| Cohort 4                                 | RR <sub>4 0</sub> | The (cross-sectional) W4 response rate conditional upon W0 response | Responding in W4 | Eligible in W4 & respondent in W0 | 65%         |
| Cohort 6                                 | RR <sub>6 0</sub> | The (cross-sectional) W6 response rate conditional upon W0 response | Responding in W6 | Eligible in W6 & respondent in W0 | 54%         |

### Cohort 1 - Cross-sectional response rates conditional upon wave 1 response

Cohort 1 core members have been part of the ELSA study since 2002 (wave 1). It is of interest to see how effective the study has been at maintaining this original panel of core members over time. Table 2.6 presents cross-sectional response rates at each wave for Cohort 1 core members conditional upon wave 1 response.

| <b>Table 2.6 Cross-sectional response rates conditional upon wave 1 response</b> |                   |   |                  |                                   |             |
|--|-------------------|---|------------------|-----------------------------------|-------------|
| <b>Calculated at wave</b>  | <b>Notation</b>   | <b>Meaning</b>  | <b>Numerator</b> | <b>Denominator</b>                | <b>Rate</b> |
| <b>Cross-sectional conditional rates (Cohort 1)</b>                              |                   |   |                  |                                   |             |
| Wave 2   | RR <sub>2 1</sub> | The (cross-sectional) W2 response rate conditional upon W1 response | Responding in W2 | Eligible in W2 & respondent in W1 | 82%         |
| Wave 3   | RR <sub>3 1</sub> | The (cross-sectional) W3 response rate conditional upon W1 response | Responding in W3 | Eligible in W3 & respondent in W1 | 74%         |
| Wave 4   | RR <sub>4 1</sub> | The (cross-sectional) W4 response rate conditional upon W1 response | Responding in W4 | Eligible in W4 & respondent in W1 | 69%         |
| Wave 5   | RR <sub>5 1</sub> | The (cross-sectional) W5 response rate conditional upon W1 response | Responding in W5 | Eligible in W5 & respondent in W1 | 69%         |
| Wave 6   | RR <sub>6 1</sub> | The (cross-sectional) W6 response rate conditional upon W1 response | Responding in W6 | Eligible in W6 & respondent in W1 | 66%         |

## Cohort 1 - Longitudinal conditional response rates

Table 2.7 presents longitudinal conditional response rates at each wave for Cohort 1 core members. They show the proportion of remaining *eligible* wave 1 core members who gave an interview in every wave up to and including the current wave.

| Table 2.7 Longitudinal conditional response rates |                           |   |                                   |  |      |
|---|---------------------------|---|-----------------------------------|--|------|
| Calculated at wave                                | Notation                  | Meaning   | Numerator                         | Denominator  | Rate |
| <b>Longitudinal conditional rates</b>             |                           |   |                                   |  |      |
| 2 <sup>15</sup>                                   | RR <sub>2 1</sub>         | The (longitudinal) conditional W2 response rate | Responding in W2                  | Eligible in W2 & respondent in W1                      | 82%  |
| 3   | RR <sub>3,2 1</sub>       | The (longitudinal) conditional W3 response rate | Responding in W2 & W3             | Eligible in W1, W2 & W3 & respondent in W1             | 71%  |
| 4   | RR <sub>4,3,2 1</sub>     | The (longitudinal) conditional W4 response rate | Responding in W2, W3 & W4         | Eligible in W1, W2, W3 & W4 & respondent in W1         | 63%  |
| 5   | RR <sub>5,4,3,2 1</sub>   | The (longitudinal) conditional W5 response rate | Responding in W2, W3, W4 & W5     | Eligible in W1, W2, W3, W4 & W5 & respondent in W1     | 59%  |
| 6   | RR <sub>6,5,4,3,2 1</sub> | The (longitudinal) conditional W6 response rate | Responding in W2, W3, W4, W5 & W6 | Eligible in W1, W2, W3, W4, W5 & W6 & respondent in W1 | 56%  |

<sup>15</sup> This rate is equivalent to the cross-sectional W2 response rate conditional upon W1 response

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## 3 Sample Design

### 3.1 Introduction

The ELSA wave 1 sample (Cohort 1) was designed to represent people aged 50 and over (persons born on or before 29<sup>th</sup> February 1952) and their partners, living in private residential addresses in England. The wave 1 sample was selected from households that had previously responded to the Health Survey for England (HSE) in 1998, 1999 and 2001. To ensure the study remained representative of those aged 50 and over, new cohorts were added at wave 3 (Cohort 3), wave 4 (Cohort 4) and at wave 6 (Cohort 6). The Cohort 3 sample was selected from the HSE 2001-2004 survey years, the Cohort 4 sample was selected from HSE 2006 and the Cohort 6 sample was selected from HSE 2009, 2010 and 2011. There is some overlap between the cohorts in terms of the age of their sample members. However, the study views each cohort as a distinct group because they were recruited from different years of HSE and were introduced to ELSA at different times.

This chapter provides background information about the use of HSE as a sampling frame for ELSA (Section 3.1). The sampling and eligibility criteria relating to each Cohort is discussed in separate sections of this chapter (Section 3.3 for Cohort 1, Section 3.4 for Cohort 3, Section 3.5 for Cohort 4 and Section 3.6 for Cohort 6).

### 3.2 Health Survey for England as a sampling frame

The HSE is an annual cross-sectional household survey that collects a wide range of health data and biometric measures. Each of the main HSE samples is designed to be representative of the English population living in private residential addresses.<sup>16</sup> Interviewing for HSE is continuous and the sample is issued to interviewers evenly throughout the year. The HSE response rates for households and individuals are presented by survey year in Table 3.1 (HSE years used as a sampling frame for ELSA are shown by grey shading).

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<sup>16</sup> People living in institutions, who are likely to be older and, on average, in poorer health than those in private residential addresses are not covered by the HSE.

| <b>Table 3.1 HSE response rates</b>  |                             |           |           |           |           |           |           |
|--|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>Response rate</b>   | <b>HSE year (1998-2004)</b> |           |           |           |           |           |           |
|  | 1998<br>%                   | 1999<br>% | 2000<br>% | 2001<br>% | 2002<br>% | 2003<br>% | 2004<br>% |
| Co-operating households  | 74                          | 76        | 75        | 74        | 76        | 73        | 72        |
| Individual response  | 69                          | 70        | 68        | 67        | 67        | 66        | 66        |
|  | <b>HSE year (2005-2011)</b> |           |           |           |           |           |           |
|  | 2005<br>%                   | 2006<br>% | 2007<br>% | 2008<br>% | 2009<br>% | 2010<br>% | 2011<br>% |
| Co-operating households  | 74                          | 68        | 66        | 64        | 68        | 66        | 66        |
| Individual response  | 64                          | 61        | 58        | 58        | 61        | 59        | 59        |
| Note: Households described as 'co-operating' are those where at least one eligible person was interviewed. |                             |           |           |           |           |           |           |

Household response rates ranged from 76% in 1999 and 2002 to 64% in 2008 with a recovery to between 66% and 68% in subsequent years; individual response rates from 70% in 1999 to 59% in 2010 and 2011. Further details about the HSE are available from its Technical Reports (Erens and Primatesta, 1999; Erens, Primatesta and Prior, 2001; Prior et al., 2003; Sproston and Primatesta, 2003; Sproston and Primatesta, 2004; Sproston and Mindell, 2006; Craig and Mindell, 2008; Craig and Hirani, 2010; Craig and Mindell, 2011; Craig and Mindell, 2012).

Around 8,000 adult respondents are typically included each year in the HSE, around 85% per cent of whom agree to a follow-up visit by a nurse. Different annual rounds of the survey focus on different health outcomes (e.g. cardiovascular disease in 2003, 2006 and 2011) or on different subgroups of the population (e.g. ethnic minorities in 1999 and 2004, those living in institutions in 2000, and people aged 65 and over living in private residential addresses in 2005).

### 3.3 ELSA Cohort 1

This section describes the sampling and eligibility criteria for ELSA wave 1 (Cohort 1). Age-eligible sample members were followed up from HSE 1998, 1999 and 2001. HSE 1998 and 2001 had a single general population ('core') sample that was nationally representative. The HSE 1999 sample design had two components: a 'core' sample that was nationally representative and a boost sample that represented ethnic minorities. The ethnic minority boost sample was discarded for ELSA sampling since there was insufficient resource to include a sufficient sample to boost the representation of minority ethnic groups in ELSA.

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### 3.3.1 Eligibility criteria at wave 1 (Cohort 1)

HSE households were only selected for ELSA wave 1 if they included at least one individual who was age-eligible and who, according to administrative records remained alive and gave permission to be recontacted in the future. Age-eligibility meant being born on or before 29<sup>th</sup> February 1952, and living in a private household in England at the time of the HSE interview. A sample of 11,578 households was issued for interview in ELSA wave 1 and the process of selecting the wave 1 sample is summarised in the wave 1 technical report (Taylor et al. 2007). No indication was given to respondents at the time of their HSE interview that they would be approached for the ELSA study at a later date.

### 3.3.2 Eligibility in wave 1 fieldwork and identifying new partners

The sample at wave 1 reflected the household composition as recorded at the time of HSE interviewing. However, the ELSA interview was conducted between one and four years after the HSE interview took place. As a result, some changes were anticipated (e.g. relationships between individuals would change; individuals would have joined the household or left to form a new household, as well as entire households moving). There were three particular ways in which the status of an individual could change between HSE and ELSA wave 1:

- The status of the selected individuals needed to be checked during fieldwork to ascertain whether they were living in a private residential address in England at the time of the wave 1 interview. Any who had moved out of England or out of the private residential sector (e.g. into a care home or institution) were not interviewed.
- The status of young partners was also checked. Young partners were approached for interview if, at the time of the wave 1 interview, they were still living with an age-eligible sample member. Young partners identified from HSE who had split from the age-eligible sample member before the wave 1 interview were not followed up for interview.
- A further subgroup of individuals was identified during wave 1 fieldwork. New partners (C1NP1) were defined as the cohabiting spouses or partners of age-eligible sample members at the time of the first ELSA interview, of any age, who had joined the household since the HSE.

Identification of new partners during fieldwork meant that there were three types of individual who were eligible to take part in wave 1, as illustrated in Figure 3.1.

### Figure 3.1 Eligibility criteria for wave 1 interview

- **Sample members (C1SM)** were individuals who were living within the household at the time of the HSE interview in 1998, 1999 and 2001, were born on or before 29 February 1952 (age-eligible) and were still living at a private residential address in England at the time of the wave 1 interview (2002-03). Those 11,391 individuals successfully interviewed in wave 1 were later renamed '**Cohort 1 core members (C1CM)**'.
- **Young partners (C1YP)** were the cohabiting spouses or partners of eligible sample members, who were living within the household at the time of the HSE in 1998, 1999 and 2001, and were still cohabiting with the sample member in wave 1. Cohort 1 young partners were born after 29 February 1952.
- **New partners (C1NP1)** were the cohabiting spouses or partners of eligible sample members at the time of the first ELSA interview, of any age, who had joined the household since the HSE interview.

#### 3.3.3 Eligibility criteria for Cohort 1 at later waves

Only households with at least one interview with a core member at wave 1 were followed up at wave 2. However, eligible core members were not *issued* in wave 2 if all wave 1 respondents in the household had explicitly asked at the end of the last interview not to be recontacted.<sup>17</sup>

Cohort 1 core members remained eligible for interview in subsequent waves unless they had since died, or had moved out of Britain. Individuals who moved out of the private residential sector (e.g. into a residential or nursing home) after their wave 1 interview were still approached for an institutional interview (developed for use at wave 2 onwards).

Several other categories of individuals were also eligible for an interview in each wave. These were the partners of Cohort 1 core members (core partners, younger partners, or new partners, as described in Figure 3.2).

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<sup>17</sup> Respondents who explicitly asked not to be recontacted in the future were asked to rejoin the study at the next wave if someone else in the household had implicitly consented to be recontacted.

### Figure 3.2 Summary of the Eligibility criteria for Cohort 1 at later waves

- **Core members (C1CM)** were individuals who had been living within the household at the time of the HSE interview in 1998, 1999 and 2001, were born on or before 29 February 1952 and were subsequently interviewed as part of wave 1 living in a private residential address in England. They were not eligible for follow-up interviews if they had since died, asked not to be revisited, or moved out of Britain.
- **Core partners (C1CP)** were individuals who, like core members, had been living within the household at the time of the HSE interview and were born on or before 29 February 1952. However they were not interviewed as part of wave 1, so missing the baseline survey. As a consequence they were *only* approached at subsequent waves by virtue of them being the partner of a core member.
- **Young partners (C1YP)** were the cohabiting spouses or partners of core members, who were living within the household at the time of the HSE, and were still cohabiting with the sample member in wave 1. Young partners were born after 29 February 1952. (Cohort 1 young partners sampled from HSE 2001 who took part at wave 3 changed status in wave 3 to become Cohort 3 core members; see Section 3.3). Young partners who stopped living with their core member partner were only interviewed once following the split with their core member partner.
- **New partners (C1NP1, C1NP2, C1NP3, C1NP4, C1NP5, C1NP6)** were the cohabiting spouses or partners of core members at the time of *the interviews at a particular wave* who had joined the household since the original HSE interview. As with young partners, new partners who stopped living with their core member partner were only interviewed once following the split with their core member partner.

were assigned a zero cross-sectional weight at wave 3). The process of selecting the Cohort 3 sample from the 2001-2004 HSE years is summarised in the wave 3 technical report (Scholes et al. 2009).

The eligibility criteria for Cohort 3 is described in Figure 3.3. From wave 4 onwards, Cohort 3 core members were no longer eligible for interview if they had died, or moved out of Great Britain. Like Cohort 1, those Cohort 3 core members who moved into a care home or institution were approached for an interview at wave 4.

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<sup>18</sup> Only the general population ('core') sample was used from HSE 2004.

**Figure 3.3 Summary of the eligibility criteria for Cohort 3 members for the wave 6 ELSA interview (2012-13)**

- **Core members (C3CM)** were individuals who were living within the household at the time of HSE (2001-04) and were born between 1 March 1952 and 29 February 1956 (age-eligible) and were subsequently interviewed as part of the wave 3 interview at a private residential address in England. They were not eligible if they had since died, asked not to be revisited or moved out of Britain.
- **Young and old partners (C3YP/C3OP)** were individuals who, like core members, had been living within the household at the time of HSE interview (2001 to 2004) and were still cohabiting at the time of the wave 3 interview. Younger partners were born *after* 29 February 1956 and old partners *before* 1 March 1952. New or old partners who stopped living with their core member partner were only interviewed once following the split with their core member partner.
- **New partners (C3NP3, C3NP4, C3NP5, C3NP6)** were the cohabiting spouses or partners of eligible sample members at the time of the wave 3, 4, 5 or 6 interview, of any age, who had joined the household since the HSE interview.

### 3.5 ELSA Cohort 4

This section describes the sampling process for Cohort 4 selected from HSE 2006<sup>19</sup> at wave 4. The selection criteria for Cohort 4 was people born between 1 March 1933 and 29 February 1958 (minimum age 50, maximum age 74). The HSE 2006 year was chosen because it had included a nurse visit with blood sample collection which would enable HSE data to be compared with the nurse visit at wave 4.

At the time of wave 4, Cohort 1 core members were aged 56 and over, and Cohort 3 core members were aged 52-56. The Cohort 4 sample therefore had two main purposes; it firstly 'refreshed' the sample by adding the youngest age group back in (age 50-51), and secondly 'topped-up' the proportion of 52-74 year olds in the study (to help with prior wave attrition). Those aged 75 and over were not selected for Cohort 4 because the increased mortality associated with this group would make it difficult to utilise the longitudinal power of the study. Selection of those aged 50-74 also meant that most would not yet have made the transition into disability and dependence (core outcomes for longitudinal analysis).

As before, people were eligible if they had been living in a responding HSE household in 2006 and were, at the time of the ELSA 2008-09 interview, still living at

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<sup>19</sup> For HSE methodology and documentation see Craig & Mindell. 2008.

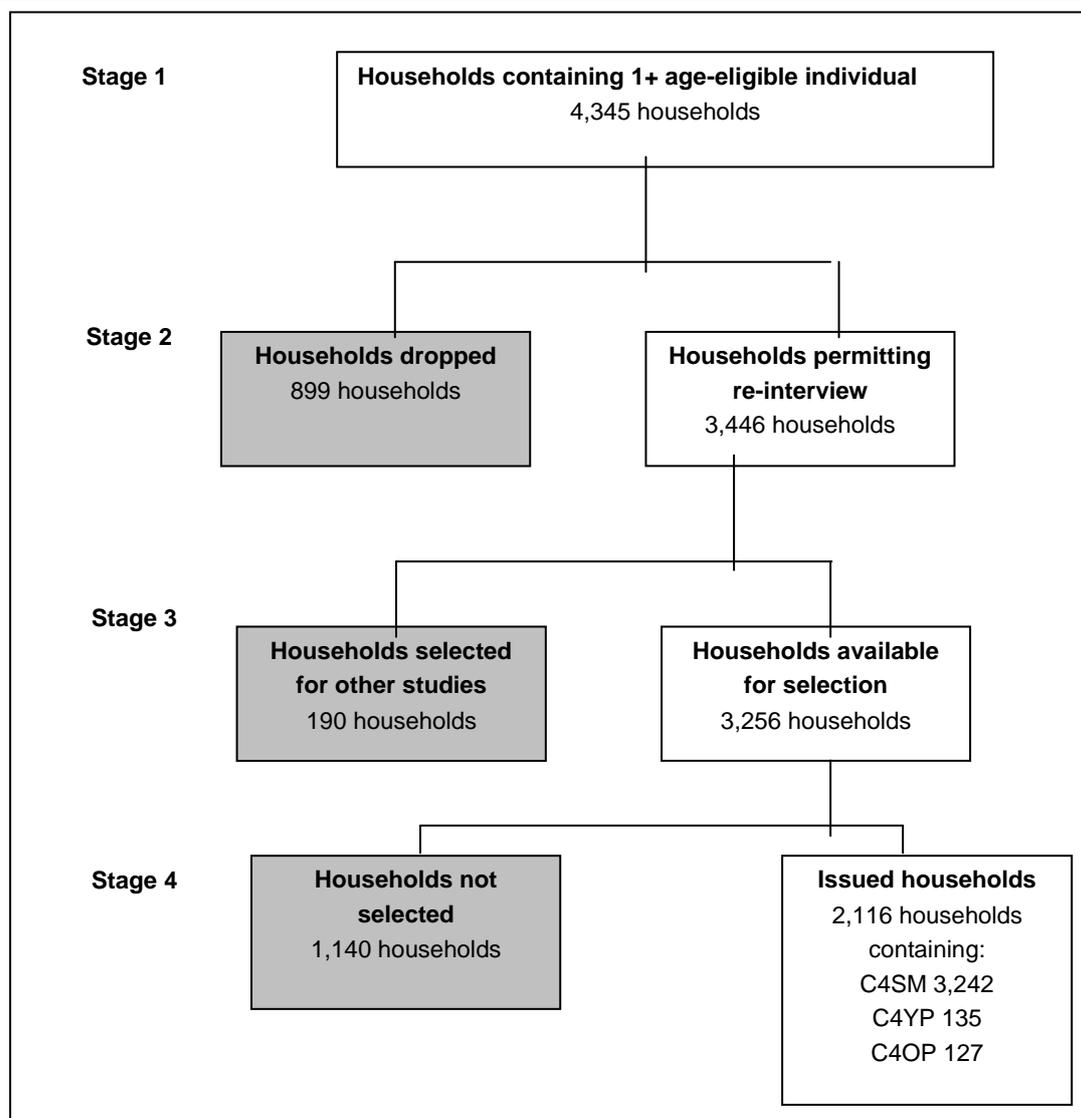
a private residential address in England. As for Cohorts 1 and 3, partners were also interviewed (see Figure 3.5).

Age-eligible sample members from the 2001-2004 HSE years mistakenly not issued in wave 3 (see Section 3.3) were followed up for interview in wave 4. In total, 248 were interviewed from the 492 age-eligible individuals that were issued at wave 4 instead of wave 3, and these have been treated as Cohort 4 core members.

The process of selecting the Cohort 4 sample from the 2006 HSE year (excluding the omitted cases from wave 3) is summarised below.

**Figure 3.4 Cohort 4 sample definition**

|      |  |
|------|--|
| C4SM | Age-eligible sample member (born between 1 March 1933 and 29 February 1958) <sup>a</sup> |
| C4YP | Young partner  |
| C4OP | Old partner  |



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The top of Figure 3.4 shows the subset of 4,345 HSE 2006 responding households that included at least one age-eligible individual (Stage 1). Age-eligibility meant being born between 1 March 1933 and 29 February 1958.

Not all age-eligible individuals were included in the Cohort 4 sampling frame. Inclusion was conditional on at least one age-eligible individual agreeing to further contact post HSE. Sample members and young/old partners were not included in the final Cohort 4 sample if *all* HSE respondents born between 1 March 1933 and 29 February 1958 had refused, when asked, to being recontacted in the future. This is shown in Stage 2 of Figure 3.4. Using this criterion meant that 899 of the 4,345 households were removed from the final ELSA sample because no age-eligible individual had consented to recontact. Overall, 3,446 households contained at least one age-eligible individual agreeing to further contact.

The eligibility criteria for Cohort 4 is shown in Figure 3.5. For all sample types relating to Cohort 4, interviews were only conducted at households in England, and only within residential addresses. That is to say, if an individual had moved out of England or into an institution since their HSE interview, they were treated as ineligible and were not followed-up for interview at wave 4. As with the other cohorts, individuals from Cohort 4 who have now taken part in their first ELSA interview at wave 4, will remain eligible for future ELSA interviews if they later move into an institution or into Scotland or Wales.

### Figure 3.5 Eligibility criteria for wave 6 interview (Cohort 4)

- **Core members (C4CM)** were individuals who were living within the household at the time of HSE (2006) and were born between 1 March 1933 and 29 February 1958 (age-eligible) and were subsequently interviewed at wave 4 at a private residential address in England. They were not eligible if they had since died, asked not to be revisited or moved out of Britain.
- **Young and old partners (C4YP/C4OP)** were the cohabiting spouses or partners of eligible sample members, who were living within the household at the time of HSE, and were still cohabiting with the eligible sample member at the time of the wave 4 interview. Young partners were born after 29 February 1958 and old partners were born before 1 March 1933.
- **New partners (C4NP, C4NP5, C4NP6)** were the cohabiting spouses or partners of eligible sample members at the time of the wave 4, 5 or 6 interview, of any age, who had joined the household since the original HSE interview.

### 3.6 ELSA Cohort 6

At wave 6, the aim was to supplement Cohort 1 with people born between 1 March 1956 and 28 February 1962 so that the ELSA sample would, in 2012-13, still cover people aged 50-55. The sources for the new recruits were the 2009, 2010 and first half of 2011 HSE years. As before, individuals were eligible if they had been living in a responding HSE household, at least one household member had not refused future follow up contact to HSE and were, at the time of the ELSA 2012-13 interview, still living at a private residential address in England. Partners were also interviewed. These people formed Cohort 6.

There were 10,799 households in total available to sample from (based on HSE 2009-11). 1,311 of these contained at least one age eligible person (50-55) who had agreed to be re-interviewed. We selected all the 1,530 available age eligible people in these households (all of whom had to have previously been interviewed themselves for HSE and agreed to follow-up). We also sampled 723 partners of these 1,530 people. The original selected sample therefore included 2,253 people. The issued sample after further checks and removal of anyone known to have died comprised 2,244 individuals, living in 1,310 households.

The eligibility criteria for Cohort 6 is described in Figure 3.6.

#### Figure 3.6 Eligibility criteria for wave 6 interview (Cohort 6)

- **Eligible Sample members (C6SM)** were individuals who were living within the household at the time of HSE (2009, 2010, 2011) and were born between 1 March 1956 and 29 February 1962 (age-eligible). The interviewer ascertained that the individual was living in a private residential address in England at the time of the ELSA wave 6 interview. Those 826 successfully interviewed in wave 6 were designated '**Cohort 6 core members (C6CM)**'.
- **Young and old partners (C6YP/C6OP)** were the cohabiting spouses or partners of eligible sample members, who were living within the household at the time of HSE, and were still cohabiting with the eligible sample member at the time of the wave 6 interview. Young partners were born after 29 February 1962 and old partners were born before 1 March 1956.
- **New partners (C6NP)** were the cohabiting spouses or partners of eligible sample members at the time of the wave 6 interview, of any age, who had joined the household since the original HSE interview.

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## 4 The Main Interview

This chapter provides an overview of the structure and content of the main interview at wave 6. Section 4.1 outlines the content of each module and explains how they were administered by the interviewer. The changes made to the questionnaire at wave 6 are highlighted in Section 4.2, and variants of the main interview are discussed in Section 4.3.

### 4.1 ELSA questionnaire modules

As in previous waves, the wave 6 main survey comprised a computer aided personal interview (CAPI) and paper self-completion questionnaire. The ELSA wave 6 interview covered a wide range of topics (see Figure 4.1). It was similar to the questionnaire used in previous waves, although every module was reviewed. Some questions were repeated exactly (e.g. to measure income and assets), some questions asked directly about change (e.g. to capture perceived changes in memory and concentration) and some were adapted to allow respondents to update or amend past responses (e.g. about work, pensions and specific health conditions). Figure 4.1 provides an overview of the content of the main ELSA interview at wave 6. For further information see Appendix A which has a breakdown of interview content by wave of the survey.

#### Figure 4.1 Main interview modules wave 6

**Household Demographics (HD)** – collection or updating of demographic information about everyone living in the household, including sex, age and relationships to each other, and collection or updating of information about children. This module also checks the eligibility for ELSA of all current household members (including New Partners).

**Individual Demographics (ID)** – collection or updating of details about respondents' legal marital status, relatives and parent's age and cause of death, and number of living children.

**Health (HE)** – collection or updating of self-reported general health, chronic illness or disability; eyesight, hearing; specific diagnoses and symptoms; pain; difficulties with activities of daily living (ADLs); use of social care; health behaviours (e.g. smoking and physical activity); mental health, urinary incontinence; falls and fractures; quality of healthcare respondents received for particular health conditions.

**Social Participation (SP)** – covers social networks and the use of public transport.

**Work and Pensions (WP)** – collection or updating of current work activities; current and past pensions; reasons for job change and health-related job limitations.

**Income and Assets (IA)** – assessment of the income that respondents received from a variety of sources over the previous 12 months: wages, state pensions, private pensions, other annuity income and state benefits; and collected financial and non-financial assets, receipt of inheritances and gifts. Couples decided who the respondent would be for a single financial unit, although it is suggested that the person who answered the IA module in wave 5 did so again in wave 6.

**Housing (HO)** – collection or updating of current housing situation (including size and quality), housing-related expenses, ownership of durable goods and cars; consumption including food in and out of home, fuel, durables, leisure, clothing and transfers. Only one eligible ELSA respondent in the household answered the module. Respondents decided themselves who the household respondent should be, but again, it is preferable that the person who answered the HO module in wave 5 answered this module again in wave 6.

**Cognitive Function (CF)** – measured different aspects of the respondent's cognitive function, including memory, speed and mental flexibility, with a new fluid intelligence number sequence test.

**Expectations (EX)** – measured expectations for the future in a number of dimensions; financial decision-making and relative deprivation; future housing and care needs.

**Psychosocial Health (PS)** – measured how the respondent viewed his or her life across a variety of dimensions.

**Effort and Reward (ER)** – informal care giving & volunteering, assessed motivations behind voluntary work and caring for others; and the relationship between effort and reward; provision of care and use of respite services.

**Final questions and consents (FQ)** – collection of any missing demographic information and updating of respondents' contact details, stable address, details of any proxy informants and requests permission to link to health and economic data from various administrative sources. In addition to the standard consents, consent was also collected for the nurse visit.

**Walking ('gait') speed test (MM)** – all respondents aged 60 years and over completing the main interview on their own behalf were eligible for the walking speed test, which was performed as part of the main ELSA interview. The test involved timing how long it took to walk a distance of eight feet. Respondents began with both feet together at the beginning of the course. The interviewer started timing as soon as the respondent placed either foot down on the floor across the start line. They were asked to walk (not race) to the other end of the course at their usual speed, just as if they were walking down the street to the shops, and to walk all the way past the other end of the tape before stopping. Timing was stopped when either foot was placed on the floor across the finish line. Respondents were then asked to repeat the test by lining up their feet and walking back along the course, all the way past the other end.

**Core self-completion questionnaires (administered by paper) (SC)** – covering quality of life, social participation, mobility, control at work, life satisfaction, social networks, diet, alcohol consumption, time use and feelings; and use of digital technology.

**Sexual activity self-completion questionnaire administered by paper) (SX)** – covering sexual experience, attitudes and desire

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Where households contained two or more eligible individuals one person was nominated as the informant for that household. Similarly, one individual was asked to be the informant for the income and assets module on behalf of each benefit unit (BU). Benefit and financial units are defined in Figure 4.2.

### Figure 4.2 Benefit and financial units

**Benefit units (BUs)** – are defined from individuals within the same household using their age and marital status. A BU is a single adult or couple plus any dependent children. A couple is defined as two adults that are married or living as married. An adult is defined as an individual who is aged 19+ or aged 16-18 and married. Any children are included in the BU with the appropriate adult parent. Many of the financial derived variables in the ELSA dataset are derived at the BU level. The IA section, however, is asked once per **financial unit**.

**Financial units** – are equivalent to BUs with the exception that couples who keep their finances separate are defined as two financial units and each answers the IA module on their own behalf. Hence the BU can be different to a financial unit. For couples that keep their finances separate, income and assets information reported separately by each member of the couple is combined to obtain a BU definition of income and wealth.

The ELSA CAPI programme allows flexibility in administering the interview. Respondents could be interviewed individually, or in households with more than one eligible respondent, interviewed at the same time (in a single session) using concurrent interviewing techniques. In a concurrent session the same block of questions was asked alternately of each person. Concurrent interviews tend to be quicker than two separate individual interview sessions, and are generally more convenient for respondents.

In concurrent interviewing sessions, the following sections were asked of both respondents concurrently:

- Individual demographics (ID)
- Health (HE)
- Social participation (SP)
- Work and pensions (WP)

Although interviews tended to follow the same module order, interviewers could choose where some modules were positioned in the interview. For example, the walking 'gait' speed test could be administered at any time after the Health (HE) module, and it was possible for interviewers to skip the Income and Assets (IA) or Housing (HO) modules if it was more convenient to do them at another time.

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Five sections formed the ‘private modules’ block:

- Cognitive Function (CF);
- Expectations (EX);
- Psychosocial Health (PS)
- Effort and Reward (ER); and
- Final Questions (FQ)
- Contact Block (CB)

Wherever possible, modules which form the “private block” were administered with no other household members present. If two respondents were being interviewed concurrently, while the first respondent was being asked the private block, the second responding individual was asked to fill in the self-completion questionnaire in a separate room. The two respondents then switched places. At wave 6, because there were two self-completions per person and the core self-completion was longer than before, the interview was arranged so that during concurrent interviews respondents completed the sexual activity questionnaire while the other person did the “private block”. For existing sample the core self-completion was sent for respondents to complete in advance. For refreshment sample the respondents could move onto the core questionnaire during the interview if they had time and then complete the rest after the interview and return the questionnaire by post.

The interview ended with a request for confirmation or amendment of consent to obtain health and economic data from administrative sources. Participants were asked to provide their National Insurance Number (NINO) and give permission for the ELSA team to link their survey data to official records held by the Department of Work and Pensions (DWP) and Her Majesty’s Revenue and Customs (HMRC) (i.e. National Insurance contributions, welfare and benefit receipt, tax credits claims, tax records, savings and pensions).

During their HSE interview respondents were asked to give permission to link their records to mortality and cancer registration data. At the end of each ELSA interview, respondents were reminded of the permission they had previously given, and if they had not given permission to link to mortality records they were asked again. Additional consent was also asked to link their records to Hospital Episode Statistics (HES).

## 4.2 Wave 6 questionnaire changes

This section provides an overview of the main questionnaire changes at wave 6. Overall, seven modules were affected: health, work and pensions, income and assets, housing and consumption, expectations, effort and reward, and cognitive function. At wave 6 there was a separate sexual relationships and activities self-

completion for men and women. Table 4.1 highlights the main changes for each module at wave 6 by listing the new topics introduced, the questions reinstated from earlier waves, and topics chosen for omission. Only the major changes are described here, but all changes (including those made to routing) can be found in the wave 6 interviewer project instructions.

| <b>Table 4.1 Questionnaire changes at wave 6</b> |  |  |  |
|--|--|--|--|
| <b>Revised Module</b>                            |  |  |  |
|  | <b>New Topics</b>  | <b>Topics reinstated from earlier wave(s)</b>  | <b>Topics omitted at wave 4</b>  |
| <b>Health</b>                                    | <ul style="list-style-type: none"> <li>• <i>Bowel incontinence</i></li> <li>• <i>Use of social care and payments for care</i></li> </ul>   | <ul style="list-style-type: none"> <li>• <i>Sleep</i></li> <li>• <i>Balance</i></li> </ul> | <ul style="list-style-type: none"> <li>• <i>Rose Angina and pain when walking</i></li> <li>• <i>Respiratory problems</i></li> <li>• <i>Dental health</i></li> </ul>      |
| <b>Work and Pensions</b>                         | <ul style="list-style-type: none"> <li>• <i>Knowledge of male state pension age</i></li> </ul>   |  |  |
| <b>Income and Assets</b>                         | <ul style="list-style-type: none"> <li>• <i>Lifetime receipt of gifts and inheritances</i></li> </ul>  |  | <ul style="list-style-type: none"> <li>• <i>Perceived financial position relative to others</i></li> </ul>   |
| <b>Housing and consumption</b>                   |  |  | <ul style="list-style-type: none"> <li>• <i>Pets</i></li> <li>• <i>Contributions to child trust funds</i></li> </ul>   |
| <b>Expectations</b>                              | <ul style="list-style-type: none"> <li>• <i>Movement into nursing home</i></li> <li>• <i>Future housing and care needs</i></li> </ul>  |  |  |
| <b>Effort and Reward</b>                         | <ul style="list-style-type: none"> <li>• <i>Care provided to others</i></li> </ul>   |  |  |
| <b>Cognitive function</b>                        | <ul style="list-style-type: none"> <li>• <i>Numerical ability and literacy for refreshment sample</i></li> <li>• <i>Fluid intelligence</i></li> </ul>                              |  | <ul style="list-style-type: none"> <li>• <i>Verbal fluency</i></li> <li>• <i>Prospective memory</i></li> <li>• <i>Accuracy and speed of mental processing</i></li> </ul> |
| <b>Self-completion</b>                           | <ul style="list-style-type: none"> <li>• <i>Well-being (and time use)</i></li> <li>• <i>Digital inclusion</i></li> <li>• <i>Sexual experience, attitudes and desire</i></li> </ul> |  |  |

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The changes outlined in Table 4.1 are described below:

### **Health Module (HE)**

New questions on bowel incontinence were added at wave 6. Participants were asked about any problems experienced with their bowels. Those participants experiencing incontinence in the last 12 months were asked whether it persisted for more than a month.

New questions about receipt of social care were added to wave 6 to follow on from existing questions about ADLs and IADLs. These replaced previous questions about care received. Participants were asked about the nature of care received, who it was received from, the amount received, and payment made for care. These were designed to be as comparable as possible to the questions used on the Health Survey for England from 2012. For more detail about their development see: <http://www.natcen.ac.uk/our-research/research/social-care-questions-for-over-65s/>

Questions relating to sleep were reinstated from wave 5. Participants were asked how often they experience problems with their sleep patterns (e.g. trouble falling asleep), the number of hours sleep they get on an average week night, and the overall quality of their sleep.

### **Work and Pensions (WP)**

New questions relating to knowledge of the male state pension age were included in wave 6.

### **Income and Assets (IA)**

Questions about perceived financial position relative to others were omitted and new questions about lifetime receipt of gifts and inheritances were added at wave 6.

### **Housing and consumption (HO)**

Questions relating to the amount of contributions made to Child Trust Funds in the last year were omitted for wave 6.

### **Expectations (EX)**

Some new questions were added at wave 6 about movement into a nursing home and future housing and care needs.

### **Effort and Reward Module (ER)**

New questions were added to wave 6 about care provided to others (e.g. who they provide it to; hours provided) and support the participant may receive if they provide care for 20 or more hours per week.

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### **Cognitive Function (CF)**

Questions used to measure numerical problem solving were added at wave 6 (fluid intelligence). Other tests measuring prospective memory, verbal fluency, accuracy and speed asked at wave 5 were omitted from wave 6. For those who had not been asked them before (mainly the wave 6 refreshment sample) the numeracy and literacy questions were included.

### **Self-completion (SC)**

New self-completion questionnaires were introduced at wave 6, with one booklet for men and one for women. This covered attitudes, current sexual activity and experiences, sexual partners and lifetime desires and experiences.

## **4.3 Variants of the main ELSA interview**

The main variants of the ELSA interview are discussed in this section. All of these types of main interview are considered to be “productive” interviews, therefore in wave 6 for the first time, institutional interviews were eligible for inclusion in the response rate calculations in Chapter 7.

### **4.3.1 Proxy interviews**

If cognitive impairment, physical or mental ill health prevented a respondent from conducting a face-to-face interview, a proxy interview was attempted (i.e. asking someone else to do the interview on behalf of the respondent). Likewise if the respondent was away in hospital or temporary care throughout the whole fieldwork period, a proxy interview was permitted. New guidance regarding the use of proxy interviews was introduced at wave 4 and continued at Wave 5 and 6. Interviewers could now offer a proxy interview for those who were extremely reluctant to complete the interview themselves.

The proxy informant (i.e. the person who answered on behalf of the eligible respondent) was any adult aged 16 and over who knew enough about the respondent’s circumstances to be able to provide information about them. Where possible, a close family member such as a partner, son or daughter was approached, but other people such as care workers sometimes fulfilled this role.

Where the respondent lacked mental capacity a new form was introduced so that a consultee could declare whether the respondent would have wanted to take part if they were able. This had to be completed before a proxy interview could take place in the case of those respondents who could not take part because they lacked mental capacity.

Table 4.2 lists the modules included in the proxy interview. Proxy respondents were asked to provide information but were *not* asked to second-guess more subjective information such as attitudes, perceptions of ageing or expectations of the future. Only respondents conducting a full/partial main interview in person were given the self-completion questionnaire.

| <b>Table 4.2 Proxy interview modules</b> |                                 |
|--|---------------------------------|
| <b>Module</b>                            | <b>Description</b>              |
| HD*                                      | Household Demographics          |
| ID                                       | Individual Demographics         |
| HE                                       | Health (variant on main module) |
| WP                                       | Work and Pensions               |
| IA*                                      | Income and Assets               |
| HO*                                      | Housing                         |
| FQ                                       | Final questions and consents    |
| CB                                       | Contact block                   |

All proxy interviews included questions on individual demographics, health, work and pensions and final questions/consents. However, the three modules asterisked in Table 4.2 were asked only in specific circumstances:

- In cases where there was at least one other person in the household eligible for interview, the Household Demographics and Housing modules would already be completed, and would therefore not be asked of a proxy informant. In cases where there was no-one else in the household eligible for interview, these two sections were completed as part of the proxy interview.
- In cases where there was no-one else in the financial unit eligible for interview, the proxy interview included the Income and Assets section. If one member of a couple needed a proxy interview, the other member was automatically asked the IA section on behalf of the couple when they were interviewed in person. The question normally included, about whether or not they share finances, was not asked. If both members of a couple needed a proxy interview, the IA section was only asked in one of their proxy interviews, and referred to both of their finances. For single people requiring a proxy, the IA section was always asked as part of the proxy interview.

### 4.3.2 Partial interviews

Some respondents do not manage to complete the whole interview (e.g. due to time constraints or interruptions). If respondents get as far as the Work and Pensions

(WP) module but do not answer all the questions to the end of the interview it is deemed a “partial interview”. The implication of this for analysis is that there were varying totals of respondents for items depending on the position of the item in the questionnaire and the number of partial interviews accrued at that point.

### 4.3.3 Institutional interviews

Core members who move into an institution (care or nursing home) after their first ELSA interview are still eligible for interview. The institutional interview has the same modules as the core wave 6 interview, and the content remains broadly the same for non-proxy and proxy institutional interviews.

| <b>Module</b> | <b>Description</b>              |
|---------------|---------------------------------|
| HD            | Household Demographics          |
| ID            | Individual Demographics         |
| HE            | Health (variant on main module) |
| WP            | Work and Pensions               |
| IA            | Income and Assets               |
| HO            | Housing                         |
| FQ            | Final questions and consents    |
| CB            | Contact block                   |

Questions asked in the Income and Assets module and the Housing module are influenced by whether the person in the institution has a partner who lives with them, and whether they share finances or not (see below). Additional questions about partners at the start of the institutional interview control which modules are asked. For single people in an institution the same modules appear on-route as in a normal interview, but with fewer questions in Income and Assets and Housing.

The new social care questions introduced at wave 6 were designed for those living in their own homes so were not asked of those living in institutions.

#### **Structure of Institutional Interview for couples:**

|                                     | <b>Questions asked of spouse at home</b> | <b>Questions asked of spouse in institution</b> |
|-------------------------------------|--|---|
| Partners who share finances         | All IA<br>All HO                         | No IA<br>HO = consumption only                  |
| Partners who have separate finances | All IA<br>All HO                         | All IA<br>HO = consumption only                 |

**If both members of the couple are in an institution the following structure applies:**

|                                     | <b>Questions asked of spouse interviewed first in institution</b> | <b>Questions asked of spouse interviewed second in institution</b> |
|-------------------------------------|---|--|
| Partners who share finances         | All IA<br>HO = reduced set of questions                           | All IA<br>HO = reduced set of questions                            |
| Partners who have separate finances | All IA<br>HO = reduced set of questions                           | All IA<br>HO = reduced set of questions                            |

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## 5 The Nurse Visit

### 5.1 Setting up the nurse visit

All core members who had completed the main wave 6 interview in person (i.e. not by proxy) were eligible for a nurse visit. Each element of the nurse visit was entirely voluntary, so it was possible for respondents to agree to some measures and not others. On the whole, the same measures were also taken at wave 2 and wave 4, however there were changes to some measurements and protocols. There were changes to the lung function protocol which is described on the following page. In addition at wave 6 cortisol was measured using a hair sample rather than saliva sample. At waves 2 and 4 a hip measurement was taken in addition to a waist measurement. This was not included at wave 6 since waist measurement gives a better measure of central obesity. In addition the sitting height measure (taken at waves 2 and 4) was not included at wave 6.

The nurse telephoned the respondent in all cases before the visit in order to arrange or confirm the appointment and to discuss preparation for the visit. If the respondent was willing, the nurse highlighted the following key points over the phone (which were also on the respondent's appointment record card):

- That they should not eat, smoke, drink alcohol or do any vigorous exercise for 30 minutes before the visit.
- That they should wear light, non-restrictive clothing and avoid wearing thick belts or long garments that would prevent them from seeing their feet (important for the physical performance measures).

### 5.2 Consent and eligibility

Nurses established whether respondents were eligible to have a blood sample taken by asking if they: (1) had a clotting or bleeding disorder, (2) ever had a fit or convulsion, (3) were taking anticoagulant drugs (such as Warfarin, Protamine or Acenocoumarol) or (4) were pregnant.

If they were eligible to have a blood sample, nurses then determined whether they were eligible to fast. Respondents were not eligible to fast if they: (1) were aged 80 or over, (2) were diabetic and on treatment, or (3) were malnourished or otherwise unfit to fast (as judged by the nurse). If they were eligible and willing to fast, nurses then explained the fasting rules as set out in the wave 6 nurse visit project instructions.<sup>20</sup> The nurses emphasised that respondents could still drink water and that they could take their medication as normal.

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<sup>20</sup> [http://www.elsa-project.ac.uk/uploads/elsa/docs\\_w6/project\\_instructions\\_nurse.pdf](http://www.elsa-project.ac.uk/uploads/elsa/docs_w6/project_instructions_nurse.pdf)

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Before carrying out each measure, nurses checked the exclusion criteria with respondents and asked for their consent. In total, there were seven different consent forms presented in a booklet that respondents were asked to sign. Respondents were also asked whether they would like to receive a copy of their blood sample results. The signed consent forms covered the following:

- send blood pressure information to GP;
- allow blood sample to be taken;
- send blood results to GP;
- send blood results to respondents;
- allow remaining blood to be stored for future analysis;
- allow extraction and storage of DNA for use in future medical research studies;
- send lung function results to GP;
- allow hair to be tested for cortisol and future medical research studies of causes, diagnoses, treatment or outcome of disease.

If a cause for medical concern was identified during the nurse visit then the respondent's GP was notified *if* the respondent had given prior permission. The protocols for each of the measures taken can also be found in the project instructions.<sup>20</sup>

### 5.3 Measures taken during the nurse visit

At wave 6 the same measures were collected at wave 4 except for:

- the exclusion of the hip measurement;
- the exclusion of the sitting height measurement;
- a change to the lung function protocol; and
- the replacement of the saliva sample with a hair sample to measure cortisol.

## Figure 5.1 Nurse visit measures at wave 6

### Blood pressure

**Lung function** – a measure of how much air respondents could exhale from lungs, and was measured using a spirometer. At wave 6 due to major technical advances, new spirometers were introduced to measure lung function. The data from lung function measures at earlier waves are not comparable with wave 6 lung function data.

**Blood samples** – respondents under the age of 80, who were not diabetics on treatment, and who were not deemed unfit (when screened by the nurse at the time of making the appointment) were asked to fast before giving the samples. A list of the uses to which the sample was put is given in Figure 3-4.

**Hair sample** – respondents were asked to give a small sample of hair to measure cortisol, which is an indicator of stress. At previous waves a saliva sample had been used to measure cortisol. At wave 6 the hair sample replaced the saliva sample.

**Anthropometric measures** – weight, standing height, and waist and hip measurement (to assess the distribution of body fat across the body).

In addition, nurses took four **physical performance** measures: grip strength, chair rises, balance and leg raises. Taken together with the gait speed (or timed walk) measure carried out during the main interview, these provide an excellent way of tracking change in physical well-being over time. The four measures are set out below:

**i) Grip strength** – a measure of upper body strength, during which the respondent was asked to squeeze a grip gauge up to three times with each hand.

**ii) Chair rises** – a measure of lower body strength, during which respondents were asked to stand up from a firm chair without using their arms. If they succeeded, they were asked to stand up and sit down as quickly as they could for either five rises if aged 70 years and over, or up to ten rises if aged 69 years and under.

**iii) Balance** – balance is an important function of locomotion. Respondents were asked to stand side by side with their feet together (tandem) for 10 seconds. If they succeeded, they were asked to stand heel of one foot against the side of the big toe of the other for 10 seconds (semi-tandem). If respondents passed this, those aged 70 and over were asked to stand feet aligned heel to toe (full tandem) for 10 seconds and for those aged 50-69 this was for 30 seconds.

**(iv) Leg raises** – important function of locomotion and measure of high function in younger age groups. Respondents aged 50-69 who had passed the side by side balance tests were asked to raise one leg off the floor with their eyes open for 30 seconds. If they had succeeded with this they were asked to raise one leg off the floor with their eyes closed for 30 seconds.

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Up to six small blood tubes were collected from core member respondents and their partners (only if explicitly requested) who gave consent for this in order to examine the items set out in Figure 5.2.

### **Figure 5.2 Blood sample measures at wave 6**

**Fibrinogen** – a protein necessary for blood clotting. High levels are also associated with a higher risk of heart disease.

**Total cholesterol** – cholesterol is a type of fat present in the blood, related to diet. Too much cholesterol in the blood increases the risk of heart disease.

**HDL and LDL cholesterol** – HDL cholesterol is ‘good’ cholesterol which protects against heart disease. LDL is ‘bad’ cholesterol; increased levels are associated with increased risk of heart disease.

**Triglycerides** – together with total and HDL cholesterol, triglycerides provide a lipid profile, which can give information on the risk of cardiovascular disease.

**Ferritin and haemoglobin** – these are measures of iron levels in the body, related to diet and other factors.

**C-reactive protein** – the level of this protein in the blood gives information on inflammatory activity in the body and is also associated with risk of heart disease.

**Insulin-like growth factor 1 (IGF-1)** – this is a hormone that helps control reactions to stress and regulate various body processes including digestion, the immune system, mood, and energy usage.

**Fasting glucose and glycated haemoglobin** – both indicate the presence or risk of type 2 diabetes, which is associated with an increased risk of heart disease.

**White cell count (WCC) and Mean corpuscular haemoglobin (MHC)** – When looked at in combination with Ferritin and haemoglobin can indicate anaemia.

**Vitamin D** – Obtained from the diet and from sunshine, Vitamin D is needed for healthy bones.

**Genetics** – genetic factors are associated with some common diseases, such as diabetes and heart disease, and relate to general biological aspects of the ageing process. Possible changes in telomere length were also examined; the length of telomeres play a critical role in determining the ageing process.

If the respondent had fasted and had given consent for DNA extraction then all six blood tubes were filled. They were filled in a specific order so that, if a situation arose where there would be insufficient blood to fill all the tubes, the analyses with the highest priority could still be undertaken. If the respondent had not fasted, the

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fasting tube was not taken, and if the respondent did not consent to DNA extraction then only the first four vials were drawn.

## 6 Fieldwork Procedures

Fieldwork for the sixth wave of ELSA began in early May 2012 and finished in June 2013. Eligible individuals were sent an advance letter inviting them to participate. Interviewers then visited the households or telephoned in advance to set up the interviews.

249 interviewers worked over the course of wave 6. Before starting work, all new interviewers and those who had not worked on waves 4 and 5 underwent a two day personal briefing by a researcher. Interviewers who had worked on waves 4 and 5 were self-briefed using a briefing DVD and written materials followed up with a telephone conference call with a member of the research team. The briefings covered all fieldwork procedures including training on how to administer the assessments (walking speed and cognitive function). The briefings also fully explained the documents needed for the study and provided an introduction to all questions within the CAPI interview. Interviewers were also provided with written study guidelines to reinforce their learning from the briefing.

This chapter provides background information about the fieldwork procedures employed in wave 4: the follow-up rules (Section 6.1); how deaths were identified (Section 6.2); tracing procedures adopted if respondents could not be contacted (Section 6.3); and methods used to encourage response (Section 6.4).

### 6.1 Fieldwork follow-up rules

#### 6.1.1 Cohorts 1, 3 and 4 Core Members

There were four main reasons why interviewers did **not** follow-up members from Cohorts 1, 3 or 4 at wave 6.

- deaths
- moves out of Britain
- living in a household where all eligible respondents refused to be re-contacted immediately after their first ELSA interview (note – these households have been excluded from the issued sample for all subsequent waves).
- If young or old partners who had once lived with the core member had already been interviewed since the split.

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At each wave, decisions about whether to issue individual cases are made by the survey team. For example, some cases were not issued at wave 6 if they had:

- moved from their address at a previous wave and could not subsequently be traced
- written a formal letter in the past and asked to be removed from the sample
- contacted the study team prior to the start of wave 6 fieldwork and asked not to be visited by the interviewer
- consistently refused to be interviewed at consecutive waves

It is important to note that the fieldwork response calculations in Chapter 7 are based only on those cases issued to field interviewers at wave 6. In contrast, study response rates only exclude those who have died, moved out of Britain or into an institution. All other core members are considered eligible in the study response rates even if they did not have the opportunity to be interviewed at wave 6 (i.e. through non-issue to field). At wave 6 there was a review of the refusers strategy and a larger number of refusers were removed from the sample before issue than at wave 5.

### 6.1.2 Cohort 6 Sample Members

Wave 6 represents the first attempt at face to face contact since their HSE interview in 2009, 2010 and the first half of 2011. The main reasons why interviewers did **not** follow-up age-eligible sample members from HSE 2009, 2010 and the first half of 2011 were:

- deaths
- no longer living at a private residential address
- no longer living in England
- had not agreed to be recontacted after their HSE interview<sup>21</sup>

## 6.2 Deaths

Deaths were reported to the survey team through two methods. All participants who gave their permission in HSE or ELSA were ‘flagged’ with the Health and Social Care Information Centre (previously by the National Health Service Central Register (HSCIC) at the Office for National Statistics). 94% of core members have been flagged on this register. This register keeps track of registrations with General

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<sup>21</sup> Households where all age-eligible sample members refused recontact after HSE were omitted from the issued sample. However, if one age-eligible sample member refused recontact after HSE but another age-eligible person in the household hadn’t, the household was still issued to interviewers (and all age-eligible persons remained eligible for interview).

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Practitioners (GPs) but also with official death registrations and with people who leave the UK health system. Most of the deaths were confirmed through the NHSCR. In addition, some deaths were reported to NatCen by relatives of ELSA participants and by interviewers who learnt of the deaths when trying to contact the household.

### 6.3 Tracing movers

Procedures are in place to track respondents who move between waves to ensure that the more mobile sections of the ELSA sample are not lost.

If the whole household had moved since the wave 5 interview, or a core member who had consented to be recontacted in future waves had moved away, interviewers were directed to try the following possible routes to trace movers:

- attempt telephone contact with the respondent (number may still connect to respondent)
- attempt to find a follow-up address
- approach the present occupants, neighbours, or friends to obtain the new address
- approach the person(s) living at the 'stable address' provided previously by the respondent – respondents had been asked to give the name and contact details of someone who could be contacted if they moved
- approach the 'proxy nominee' who was nominated to conduct an interview on behalf of the respondent should the need arise in the future
- Consider public records such as phone books, electoral register, local shops, letting agency, estate agent, post office

A 'mover letter' was offered if interviewers identified a member of the public who was aware of the core member's new address but was reluctant to reveal it to the interviewer. This letter, which was forwarded with a pre-paid envelope by the member of the public who had been identified, asked the core member to contact the office with their new address.

Some movers were traced through the Health and Social Care Information Centre. If permission was given to link to the central register, the Primary Care Trust (PCT) in which the respondent lived was determined, and the PCT was asked to forward a letter to the GP of the ELSA sample member. The GP was then requested to forward another letter to the individual which requested that they get in touch directly with the ELSA team. At wave 6, details for 398 individuals were sent to HSCIC. As a result of information about PCT received from the HSCIC, NatCen contacted 82 different PCTs. NatCen received address details back from 17

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respondents. Overall, an address was established for 4% of cases sent for HSCIC tracing at wave 6.

## 6.4 Other methods to encourage response

A number of different approaches were used to encourage participation among the issued sample, including the measures outlined in Figure 6.1.

### Figure 6.1 Methods of encouraging response in wave 6

- Each respondent was sent an advance letter and given an information leaflet. The advance letter offered an incentive payment in the form of a £20 gift card which was provided at the end of the ELSA interview. Newsletters with an update on ELSA findings and the research team were sent in advance for existing sample members and handed to refreshment sample respondents at the interview.
- There were two advance letters: one for refreshment sample members and one for existing sample members. A decision was to keep the choice of letters simpler at wave 6 and to send them from the office.
- Where possible, respondents were assigned to the same interviewer in wave 6 as they had been in wave 4 or at previous waves.
- Interviewers initially made contact by telephone with those who had been interviewed at all of the five previous waves of ELSA and were under 80. It was felt that respondents who agreed to all ELSA interviews were less likely to refuse at wave 6 and were therefore the best candidates for this method. In all other cases interviewers initially made contact by a personal visit with respondents. Interviewers were asked to make at least four calls at varying times of the day and on different days of the week (with at least one call at the weekend).
- Interviewers were asked to return to the address a few weeks or months later if they found someone to be temporarily away, or if one of the core members was unwell at the time of their first visit.
- In cases where households had split, interviews were sought at both the old and new households to ensure that all eligible individuals had a chance to respond.
- Many households for which the first interview attempt had not been successful were reissued to another interviewer. The second approach was preceded by a new letter, explaining the importance of interviewing persons in the respondent's age bracket. The letter offered a £20 gift card.
- Self-completion questionnaires that had not been returned by respondents were also followed up. Non-respondents were first followed up by the nurse during their visit (they carried spare questionnaires and return envelopes in case required).
- An important part of the strategy for retaining respondents are telephone interviews. These were conducted in order to better understand reluctance to continue participating in ELSA, and to understand how we might most effectively encourage people to come back to ELSA in the future. In addition, these interviews go some way towards dealing with non-response and collected key data on the respondents at this sixth wave.

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## 6.5 Feedback to participants

Newsletters represent an important means of keeping in touch with respondents. Wave 1 respondents received the first of these in the Spring of 2004. The newsletter provided a preview of findings emerging from the previous wave of ELSA. A respondent website ([www.natcen.ac.uk/elsa](http://www.natcen.ac.uk/elsa)) was set up with information about all six waves to date. Existing participants were also sent the most recent wave 6 newsletter with their advance letters at the beginning of fieldwork in April/May 2012. Refreshment sample members were given the newsletter at the interview.

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## 7 Response Rates At Wave 6

This chapter starts by providing an overview of achieved interviews at wave 6 (Section 7.1) and then outlines the eligibility criteria used for calculation of the response rates (Section 7.2). The main response rates for each cohort are presented in Sections 7.3 and 7.4 and response to the nurse visit is covered in Section 7.5.

Two main types of response rates are shown in this chapter. Section 7.3 has the **fieldwork response rates** based on the total issued sample at wave 6. These do not take into account core members who were not followed up for interview at wave 6 (for example because *all* responding members in the household refused to be recontacted after their first ELSA interview - see Chapter 6).

Three different fieldwork response rates are presented:

1. *Fieldwork household contact rate* – calculated by dividing the number of households where the interviewer made contact with at least one member of the sample by the number of eligible households found during fieldwork.
2. *Fieldwork cooperation rate* – calculated by dividing the number of achieved individual interviews by the number of eligible individuals contacted by interviewers.
3. *Individual response rate* – calculated by dividing the total number of individuals with a wave 6 interview by the total number of individuals eligible for wave 6. In this case, eligibility meant those core members issued at wave 6 who were not known to have died or moved outside of Great Britain.

Section 7.4 presents the **study response rates**. These cover all eligible core members regardless of whether they were actually issued to field at a given wave. Core members are eligible in ELSA study response rates unless they were found to have died or moved out of Britain. Note that in previous waves those who had moved into institutions were also treated as un-eligible in study response rates. In this report and the wave 6 methods chapter they have been treated as eligible for the purpose of response rates.

Figure 7.1 overleaf illustrates the different types of wave 6 cross-sectional conditional response rates presented in Section 7.4.

**Figure 7.1 Types of wave 6 cross-sectional conditional rates**

| Cohort                                   | Notation   | Meaning   | Numerator        | Denominator                       |
|--|------------|---|------------------|-----------------------------------|
| <b>Cross-sectional conditional rates</b> |            |   |                  |                                   |
| Cohort 1                                 | $RR_{6 1}$ | The (cross-sectional) W6 response rate conditional upon W1 response | Responding in W6 | Eligible in W6 & respondent in W1 |
|  | $RR_{6 5}$ | The (cross-sectional) W6 response rate conditional upon W5 response | Responding in W6 | Eligible in W6 & respondent in W5 |
| Cohort 3                                 | $RR_{6 3}$ | The (cross-sectional) W6 response rate conditional upon W3 response | Responding in W6 | Eligible in W6 & respondent in W3 |
|  | $RR_{6 5}$ | The (cross-sectional) W6 response rate conditional upon W5 response | Responding in W6 | Eligible in W6 & respondent in W5 |
| Cohort 4                                 | $RR_{6 4}$ | The (cross-sectional) W6 response rate conditional upon W4 response | Responding in W6 | Eligible in W6 & respondent in W4 |
|  | $RR_{6 5}$ | The (cross-sectional) W6 response rate conditional upon W5 response | Responding in W6 | Eligible in W6 & respondent in W5 |
| Cohort 6                                 | $RR_{6 0}$ | The (cross-sectional) W6 response rate conditional upon W0 response | Responding in W6 | Eligible in W6 & respondent in W0 |

Figure 7.2 below illustrates the longitudinal conditional response rate for Cohort 1 presented in Section 7.5.

**Figure 7.2 Longitudinal response rate (wave 6)**

| Cohort                                | Notation           | Meaning   | Numerator                       | Denominator  |
|---------------------------------------|--------------------|---|---------------------------------|--|
| <b>Longitudinal conditional rates</b> |                    |   |                                 |  |
| Cohort 1                              | $RR_{6,5,4,3,2 1}$ | The (longitudinal) conditional wave 6 response rate | Responding in W2,W3,W4, W5 & W6 | Eligible in W1,W2,W3, W4, W5 & W6 & respondent in W1 |

### 7.1 Response to main interview

Productive respondents in this section are defined as those who gave a full or partial interview either in person or by proxy (including those in institutions). Table 7.1 gives a breakdown of the number of interviews for core members and their partners. Core members form the main group for analysis of response rates (representing those aged 50 and over). Overall there were 9,169 interviews with core members across the four cohorts at wave 6.

| <b>Table 7.1 Sample type of wave 6 respondents by Cohort</b> |                    |                 |                 |                 |              |
|--|--------------------|-----------------|-----------------|-----------------|--------------|
| <i>Base: all respondents</i>                                 |                    |                 |                 |                 | <i>ELSA</i>  |
|  | <b>ELSA Cohort</b> |                 |                 |                 | <b>Total</b> |
|  | <b>Cohort 1</b>    | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b> |              |
| <b>Row Description</b>                                       |                    |                 |                 |                 |              |
| Core member  | 5,659              | 888             | 1,796           | 826             | 9,169        |
| Core partner   | 124                | 12              | 26              | 28              | 190          |
| Younger partner  | 271                | 194             | 91              | 146             | 702          |
| Older partner  |                    | 93              | 109             | 144             | 346          |
| New partner  | 119                | 36              | 29              | 10              | 194          |
| Unweighted N   | 6,173              | 1,223           | 2,051           | 1,154           | 10,601       |

These numbers (for partner s) differ very slightly from those in the Methods chapter \*(Banks et al, 2014) owing to further work since that was published.

Table 7.2 shows that almost two thirds of core members with a wave 6 interview were from the original Cohort (62%). A fifth of core member interviews at wave 6 were from Cohort 4 (20%), and around one in ten were from each of Cohort 3 (10%) and Cohort 6 (9%).

**Table 7.2 Core member respondents in wave 6, by type of interview***Base: core member respondents in wave 6, including those in institutions*

|  | <b>Cohort 1</b> | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b> |
|--|-----------------|-----------------|-----------------|-----------------|
|  | <b>(n)</b>      | <b>(n)</b>      | <b>(n)</b>      | <b>(n)</b>      |
| <b>Type of interview in wave 6</b>           |                 |                 |                 |                 |
| Full interview in person                     | 5,351           | 845             | 1,736           | 803             |
| Full interview by proxy                      | 215             | 32              | 53              | 22              |
| Partial interview in person                  | 23              | 10              | 5               | 1               |
| Partial interview by proxy                   | 1               | 0               | 0               | 0               |
| Institutional interview in person            | 11              | 1               | 0               | N/A             |
| Institutional interview by proxy             | 58              | 0               | 2               | N/A             |
| <i>Total</i>                                 | <i>5,659</i>    | <i>888</i>      | <i>1,796</i>    | <i>826</i>      |
| <i>% of all interviews with core members</i> | <i>62%</i>      | <i>10%</i>      | <i>20%</i>      | <i>9%</i>       |

## 7.2 Ineligibility and unknown eligibility

Core members were classified as ineligible in response rate calculations if it became *known* that they had died, moved outside Britain or outside of England (Cohort 6 only). Table 7.3 shows that 25% of the original core members from Cohort 1 were ineligible by the time of wave 6. The smaller proportion of ineligibles found for Cohort 3, 4 and 6 can be explained by the younger age profile of these groups (i.e. fewer deaths).

**Table 7.3 Core members ineligible by wave 6 (Cohort 1, 3 and 4) and sample members from HSE ineligible at wave 6 (Cohort 6)***Base: core members ineligible by wave 6*

|  | <b>Cohort 1</b> | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b>            |
|--|-----------------|-----------------|-----------------|----------------------------|
| <b>Reason for ineligibility</b>                          | <b>(n)</b>      | <b>(n)</b>      | <b>(n)</b>      | <b>(n)</b>                 |
| Deaths   | 2,682           | 26              | 82              | 9                          |
| Moves out of Britain (all Cohorts) or England (Cohort 6) | 157             | 14              | 13              | 10                         |
| <i>Total</i>   | <i>2,839</i>    | <i>40</i>       | <i>95</i>       | <i>18</i>                  |
| <i>% of original core members</i>                        | <i>25%</i>      | <i>3%</i>       | <i>4%</i>       | <i>&lt;1%<sup>22</sup></i> |

<sup>22</sup> This figure represents the proportion of sample members selected from HSE that were found to be ineligible at start of wave 6.

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### Unknown eligibility

Eligibility of some core members in wave 6 was not known. Known eligibility means essentially that the core member remained a member of the target population in wave 6 and should therefore be included in the response rate calculation. In some cases, eligibility may have been unknown because the household was unwilling to provide information needed to make that determination or core members could not be traced.

Response rates can be adjusted to include the sub-group of individuals ‘unknown, but likely to have been eligible for interview’. Like earlier waves, the proportion of core members with unknown eligibility in wave 6 was small (1% of Cohort 1 core members were coded as non-contacts or not successfully traced). The response rate calculations set out in this chapter therefore make the assumption that the sub-groups with unknown eligibility were in fact eligible.

## 7.3 Fieldwork response rates

Fieldwork response rates provide useful measures of fieldwork performance. The rates presented in this section include only those core members who were issued to field interviewers at the start of wave 6. It excludes those known to have become ineligible (see Section 7.2) or those selectively removed from the issued sample at wave 6 (for example due to a prior refusal or through being previously unable to trace).

All response rates presented here derived from the AAPOR (American Association for Public Opinion Research<sup>23</sup>) approach using the standard definitions and method used at NatCen. They have been calculated from a number of sources: outcome codes from fieldwork, sampling recontact information and mortality updates.<sup>24</sup>

### 7.3.1 Proportion of eligible core members issued to field at wave 6

Table 7.4 below shows the proportion of eligible core members that were issued to the field at wave 6 (i.e. those not known to have died or moved out of Great Britain). Seventy-nine per cent of eligible Cohort 1 core members, 88% of Cohort 3 members and almost 100% of Cohort 4 members had an opportunity to be interviewed at wave 6. Cohort 6 is omitted from the table because this was their first ELSA wave so all age-eligible cases were issued. Note that the percentage of eligible core members issued to fieldwork was lower than at wave 5 since there was a review of refusers and persistent refusers and non-contacts were not issued to the

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<sup>23</sup> <http://www.aapor.org/AAPORKentico/Communications/AAPOR-Journals/Standard-Definitions.aspx>

<sup>24</sup> This was information about deaths of respondents who had agreed to have their records linked to the HSCIC register (formerly the ONS National Health Service Central Register (NHSCR)). The mortality

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main fieldwork at wave 6. They were contacted in the telephone refusers survey instead. The reason for this was so that field resources were targeted more efficiently.

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update provided information about deaths before the start of wave 6 fieldwork which was used to determine the composition of the issued sample.

**Table 7.4 Proportion of eligible core members issued to field at wave 6**

| <i>Base: all eligible core members</i>     |                 |                 |                 |
|--|-----------------|-----------------|-----------------|
|  | <b>Cohort 1</b> | <b>Cohort 3</b> | <b>Cohort 4</b> |
|  | %               | %               | %               |
| Issued to field interviewers at wave 6     | 79              | 88              | 100             |
| Not issued to field interviewers at wave 6 | 21              | 12              | <1              |
| Total                                      | 100             | 100             | 100             |
| <i>Unweighted (N)</i>                      | 8,552           | 1,236           | 2,195           |

Each of the fieldwork response rates for wave 6 are described below and presented in Table 7.5. When considering contact and cooperation rates the focus is on performance at this wave only (i.e. fieldwork activity and the willingness of those households/individuals *issued* for follow-up to take part in the survey). For all measures, respondents were defined as those who gave a full or partial interview either in person or by proxy.

### 7.3.2 Fieldwork household contact rate

The household contact rate was calculated by dividing the number of households where the interviewer made contact with at least one member of the sample by the total number of eligible households found during fieldwork. This is an indicator of the combined quality of the contact details from the sampling frame and the processes used to track movers (outlined in Section 6.3). Over the full fieldwork period a household contact rate of 98% was achieved for Cohort 1, 97% for Cohort 3, and 98% for Cohort 4 core members and 89% for Cohort 6.

### 7.3.3 Fieldwork co-operation rate

The co-operation rate was calculated by dividing the number of achieved individual interviews by the number of eligible individuals contacted by interviewers. Over the full fieldwork period at wave 6 an individual co-operation rate of 86% was achieved for Cohort 1 core members, 84% for Cohort 3 core members, 85 % for Cohort 4 core members and 62% for Cohort 6 age-eligible sample members.

### 7.3.4 Individual response rate

The individual response rate is defined as “total individuals with a wave 6 interview divided by total individuals eligible for wave 6”. In this case, eligibility means those core members issued at wave 6 who were not known to have died or moved outside of Great Britain. The highest response rate was among core members in Cohort 1 (85%). Response among Cohort 3 and Cohort 4 was similar (82% and 83%

respectively). The lowest response rate was among Cohort 6 (55%), which is to be expected as this is the first wave they have been invited to take part.

**Table 7.5 Fieldwork response rates at wave 6 split by Cohort**

| <i>Base: eligible core members issued to field at wave 6</i> |                 |                 |                 |                 |
|--|-----------------|-----------------|-----------------|-----------------|
|  | <b>Cohort 1</b> | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b> |
| <b>Fieldwork response rates</b>                              | %               | %               | %               | %               |
| Fieldwork household contact rate                             | 98              | 97              | 98              | 89              |
| Fieldwork cooperation rate                                   | 86              | 84              | 85              | 62              |
| Individual response rate                                     | 85              | 82              | 83              | 55              |

### 7.3.5 Reasons for non-response

Table 7.6 gives a breakdown of the reasons recorded by interviewers for non-response at wave 6. It is based on contacts issued to the field at the start of wave 6 who were eligible for the response rates. Refusals made up the greatest proportion of non-response for all cohorts, ranging from 70% in Cohort 6 to 82% in Cohort 4. Problems with non-contact and movers were greatest for Cohort 6 (24%) as no other attempt had been made to contact them since their HSE interview which took place sometime in 2009, 2010 or the first half of 2011. In contrast, core members from the other cohorts had been sent Christmas Cards since their last ELSA interview (thereby providing an opportunity to update address records).

**Table 7.6 Reasons for non-response at wave 6 split by Cohort**

| <i>Base: all non-responding eligible core members issued to field at wave 6</i> |                    |                 |                 |                 |
|---|--------------------|-----------------|-----------------|-----------------|
|   | <b>ELSA Cohort</b> |                 |                 |                 |
|   | <b>Cohort 1</b>    | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b> |
|   | %                  | %               | %               | %               |
| Refusal   | 74                 | 79              | 82              | 70              |
| Moved/non-contact   | 11                 | 15              | 13              | 24              |
| Other unproductive <sup>25</sup>  | 16                 | 6               | 6               | 6               |
| <i>Unweighted (N)</i>   | <i>1,007</i>       | <i>201</i>      | <i>358</i>      | <i>683</i>      |

<sup>25</sup> This included being ill at home, in hospital, physically or mentally unable to participate, language difficulties, "other" reasons.

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## 7.4 Study response rates

Study response rates can be used to measure how effective a longitudinal study has been at maintaining its original panel of members. For ELSA study rates, core members would only be deemed ineligible if they had died or moved out of GB. Therefore those who were not issued for an interview at wave 6 (e.g. due to prior refusal or being untraced) are still treated as eligible in the study response rates but not in the fieldwork response rates. Indeed, it would be misleading to evaluate the quality of the fieldwork effort using the broader study response rates shown in Section 7.3 because interviewers are not given the opportunity to interview all eligible non-respondents.

The individual study response rates were calculated for wave 6 by dividing the number of achieved individual interviews by the number of *eligible* individuals (that is to say, individuals not known to have died or moved out of Britain. All ineligible cases were set aside before the response rates were calculated.

Again respondents were defined as core members who gave a full or partial interview either in person or by proxy. Different types of conditional study response rates are relevant for each cohort and are presented separately below.

### 7.4.1 Cohort 1

#### ***The (cross-sectional) wave 6 response rate conditional upon wave 1 response***

Cohort 1 core members, by definition, took part at wave 1 and therefore represent the original core panel for follow-up at subsequent waves. In order to work out the proportion of eligible core members interviewed at wave 6, the following response rate was calculated as conditional upon response in wave 1. However, inclusion in either the numerator or denominator was *not* conditional upon response in all intermediate waves. Hence the total respondents in wave 6 does include those Cohort 1 core members who returned to the ELSA study at wave 6 after missing one or more prior waves. A conditional response rate of 66% was achieved for Cohort 1 core members at wave 6.

$$\text{RR6|1} = \frac{\text{Respond in wave 6 (if also respond in wave 1)}}{\text{Eligible core members in wave 6 (if also respond in wave 1)}}$$

Total C1CMs ineligible up to wave 6 = 2,839

Total C1CMs eligible at wave 6 = 8,552

Total C1CM interviews at wave 6 = 5,659<sup>26</sup>

5,659/8,552= 66%

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<sup>26</sup> Including 69 institutional interviews

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***The (cross-sectional) wave 6 response rate conditional upon wave 5 response***

Conditioning the response rate calculation on the previous wave is useful for monitoring the retention of core members from one wave to the next. 92% of core members from Cohort 1 who participated at wave 5 and remained eligible at wave 6, also had a wave 6 interview.

$$RR_{6|5} = \frac{\text{Respond in wave 6 (if also respond in wave 5)}}{\text{Eligible core members in wave 6 (if also respond in wave 5)}}$$

Total C1CMs with wave 5 interview=6,242

Total C1CMs with wave 5 interview ineligible at wave 6 = 310

Total C1CMs with wave 5 interview eligible at wave 6=5,932

Total C1CMs with wave 5 and wave 6 interviews = 5,445.

$$5,445/5,932 = 92\%$$

***The (longitudinal) conditional wave 6 response rate***

The longitudinal response rate shows the proportion of core members that have been interviewed at each wave of the study from those that were eligible at each wave. This group is selected for longitudinal analysis. The longitudinal conditional rate at wave 6 was 56%.

$$RR_{6,5,4,3,2|1} = \frac{\text{Respond in waves 2,3, 4, 5 and 6}}{\text{Eligible core members in waves 1, 2, 3, 4, 5 and 6 (if also respond in wave 1)}}$$

Total C1CMs eligible at wave 2, 3, 4, 5, 6 = 8,552.

Total C1CMs with interviews at wave 2, 3, 4, 5, and 6=4,766

$$4,766/8,552 = 56\%$$

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## 7.4.2 Cohort 3

### ***The (cross-sectional) wave 6 response rate conditional on wave 3 response***

Wave 3 represents the baseline wave of ELSA for core members belonging to Cohort 3. Therefore the wave 6 response rate conditional upon response at wave 3 reflects the proportion of core members from Cohort 3 with a wave 6 interview (of those that were still eligible). A response rate of 72% was achieved for Cohort 3 core members at wave 6.

$$RR_{6|3} = \frac{\text{Respond in wave 6 (if also respond in wave 3)}}{\text{Eligible core members in wave 6 (if also respond in wave 3)}}$$

Total C3CMs eligible at wave 6 = 1,236

Total C3CMs with wave 6 interview = 888

$$888/1,236 = 72\%$$

### ***The (cross-sectional) wave 6 response rate conditional upon wave 5 response***

Conditioning the response rate calculation on the previous wave is useful for monitoring the retention of core members from one wave to the next. 91% of core members from Cohort 3 who participated at wave 5 and remained eligible at wave 6, also had a wave 6 interview.

$$RR_{6|5} = \frac{\text{Respond in wave 6 (if also respond in wave 5)}}{\text{Eligible core members in wave 6 (if also respond in wave 5)}}$$

Total C3CMs with wave 5 interview=936

Total C3CMs with wave 5 interview ineligible at wave 6 = 6

Total C3CMs with wave 5 interview eligible at wave 6=930

Total C3CMs with wave 5 and wave 6 interviews = 848

$$848/930 = 91\%$$

### 7.4.3 Cohort 4

#### ***The (cross-sectional) wave 6 response rate conditional upon W4 response***

Wave 4 represents the baseline wave of ELSA for core members belonging to Cohort 4. Therefore the wave 6 response rate conditional upon response at wave 4 reflects the proportion of core members from Cohort 4 with a wave 6 interview (of those that were still eligible). A response rate of 82% was achieved for Cohort 4 core members who were still eligible at wave 6.

$$RR6|4 = \frac{\text{Respond in wave 6 (if also respond in wave 4)}}{\text{Eligible core members in wave 6 (if also respond in wave 4)}}$$

Total C4CMs eligible at wave 6 = 2,195

Total C4CMs with interview at wave 6 = 1,796

$$1,796/2,195=82\%$$

#### ***The (cross-sectional) wave 6 response rate conditional upon wave 5 response***

Conditioning the response rate calculation on the previous wave is useful for monitoring the retention of core members from one wave to the next. 92% of core members from Cohort 4 who participated at wave 5 and remained eligible at wave 6, also had a wave 6 interview.

$$RR6|5 = \frac{\text{Respond in wave 6 (if also respond in wave 5)}}{\text{Eligible core members in wave 6 (if also respond in wave 5)}}$$

Total C4CMs with wave 5 interview=1,912

Total C4CMs with wave 5 interview ineligible at wave 6 = 39

Total C4CMs with wave 5 interview eligible at wave 6=1,873

Total C4CMs with wave 5 and wave 6 interviews = 1,722

$$1,722/1,873 = 92\%$$

## 7.4.4 Cohort 6

### *The (cross-sectional) wave 6 response rate conditional upon W0 response*

Wave 6 represents the baseline wave of ELSA for core members belonging to Cohort 6. At this stage, the most useful study response rate for this group is the cross-sectional rate conditional upon response at HSE (wave 0). It shows the proportion of age-eligible sample members issued at wave 6 with an HSE interview, that were recruited as core members at wave 6. A response rate of 54% was achieved for Cohort 6 members.

From wave 7 onwards the cross-sectional conditional rate quoted for Cohort 6 will be based on the core members recruited at wave 6 rather than using HSE as the starting point (in order to track the proportion of Cohort 6 members that are retained by the study).

$$RR_{6|0} = \frac{\text{Respond in wave 6 (if also respond in wave 0)}}{\text{Eligible potential core members in wave 6 (if also respond in wave 0)}}$$

Total actual C6CMs with HSE interview = 826

Total *potential* C6CMs eligible at wave 6 with HSE interview = 1,523

Total eligible from HSE = 1,523

$$826/1523=54\%$$

## 7.5 Response to wave 6 nurse visit

Core members who had completed a full or partial wave 6 interview in person were eligible for a nurse visit (see Chapter 5). Participants gave their consent to be visited by the nurse at the end of the main interview.

Table 7.7 below shows response to the nurse visit to be greatest amongst Cohort 4 core members (90%) and lowest amongst Cohort 6 members (83%).

The most common reason for non-response to the nurse visit was refusal. Other reasons for non-response included being too ill or away at the time of fieldwork. A minority who did agree to take part from each cohort could not be contacted by the nurse. This may have reflected some people's circumstances, but in other cases could be interpreted as a hidden refusal.

**Table 7.7 Response to nurse visit at wave 6 split by Cohort***Base: all core members with a fully or partially productive main interview*

|                                  | ELSA Cohort |          |          |          |
|----------------------------------|-------------|----------|----------|----------|
|                                  | Cohort 1    | Cohort 3 | Cohort 4 | Cohort 6 |
|                                  | %           | %        | %        | %        |
| Productive nurse visit           | 89          | 85       | 90       | 83       |
| Refusal                          | 9           | 10       | 8        | 11       |
| Non-contact                      | <1          | 1        | <1       | 1        |
| Other unproductive <sup>27</sup> | 2           | 4        | 2        | 5        |
| <i>Unweighted (N)</i>            | 5386        | 856      | 1741     | 804      |

Table 7.8 shows that 76% of Cohort 1 core members who had a nurse visit at wave 2 and were issued to wave 6 still eligible also had a nurse visit at wave 6. The level of non-response to the nurse visit invitation was extremely low amongst this group (3%), however about 17% of those with a wave 2 nurse visit did not complete a full or partial interview in person at wave 6 (despite being issued and eligible at wave 6) and therefore were not invited to do the follow-up nurse visit.

In addition there were 2,010 core members with a productive nurse visit at wave 2 who were not longer eligible or were not issued to wave 6 fieldwork for another reason and they are not shown in Table 7.8.

**Table 7.8 The cross-sectional wave 6 nurse visit response rate conditional on response to wave 2 nurse visit***Base: core members with a wave 2 nurse visit that were issued at wave 6 (and who remained eligible at wave 6)*

|  | (n)  | %   |
|--|------|-----|
| Productive nurse visit                               | 4305 | 76  |
| Refusal to nurse visit                               | 304  | 5   |
| Non-contact by nurse                                 | 14   | <1  |
| Other nurse unproductive <sup>28</sup>               | 78   | 1   |
| No full or partial interview at wave 6               | 776  | 14  |
| Full or partial interview by proxy so no nurse visit | 179  | 3   |
| <i>Unweighted (N)</i>                                | 5656 | 100 |

In addition there were 25 productive nurse visits for core members who were not issued to wave 6 but had a productive interview and then completed a nurse visit.

<sup>27</sup> This included being ill at home, in hospital, physically or mentally unable to participate, language difficulties, "other" reasons.

<sup>28</sup> This included being ill at home, in hospital, physically or mentally unable to participate, language difficulties, "other" reasons.

**Table 7.9 The cross-sectional wave 6 nurse visit response rate conditional on response to wave 4 nurse visit**

*Base: core members with a wave 4 nurse visit that were issued at wave 6 (and who remained eligible at wave 6)*

|  | (n)         | %          |
|--|-------------|------------|
| Productive nurse visit                               | 6167        | 81         |
| Refusal to nurse visit                               | 344         | 5          |
| Non-contact by nurse                                 | 29          | <1         |
| Other nurse unproductive <sup>29</sup>               | 97          | 1          |
| No full or partial interview at wave 6               | 837         | 11         |
| Full or partial interview by proxy so no nurse visit | 140         | 2          |
| <i>Unweighted (N)</i>                                | <i>7614</i> | <i>100</i> |

In addition there were 25 productive nurse visits for core members who were not issued to wave 6 but had a productive interview and then completed a nurse visit.

<sup>29</sup> This included being ill at home, in hospital, physically or mentally unable to participate, language difficulties, “other” reasons.

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## 8 Weighting

This chapter describes the weighting strategy used to adjust for differential non-response at wave 6. The derivation of the main interview weights (longitudinal and cross-sectional) is described in Section 8.1. Section 8.2 describes the weighting for those responding to the self-completion questionnaire and Section 8.3 covers the weights for those with a nurse visit and those who gave a blood sample.

Advice on using the weights is provided in the “User Guide Waves 1 to 6” available from the UK Data Service.

### 8.1 Longitudinal and cross-sectional weights introduction

Longitudinal datasets such as ELSA can be analysed either cross-sectionally or longitudinally. Cross-sectional analysis uses data collected in one wave only, whilst longitudinal analysis involves data collected from more than one wave for the purposes of analysing change. Cross-sectional and longitudinal weights support these two different objectives.

In wave 6, as in previous waves, both longitudinal and cross-sectional weights have been created. Longitudinal weights are defined for the subset of core members who have taken part in *all* six waves of ELSA. Cross-sectional weights are defined for all core members belonging to the target population (i.e. living in a private household in England) who responded to wave 6, including new entrants to the study and people who missed one or more of the preceding waves (who we shall refer to as wave non-responders).

The cross-sectional and longitudinal weights are described in turn, beginning with the longitudinal weights.

### 8.2 Longitudinal weights

As in previous waves, the longitudinal weighting strategy focused only on those Cohort 1 core members who had responded at all waves up to and including the current wave (we shall refer to these individuals as the longitudinal group). The wave 6 longitudinal weight builds on the wave 5 longitudinal weight (which in turn was based on the wave 4, 3 and 2 longitudinal weights). The sequential nature of the weighting means that the longitudinal weight adjusts for historical non-response as well as non-response since the last wave. In other words it adjusts for non-response to HSE plus each of the six waves of ELSA.

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Of the 5,262 core members from Cohort 1 who responded to all waves i.e. 1, 2, 3, 4 and 5, a total of 5,014 remained eligible for the main interview in wave 6. Their response to wave 6 was modelled using logistic regression analysis on a range of household and individual-level information collected at previous waves. Partial and proxy interviews were considered to be a response, but those living in institutions were not included. (The analysis was conducted using the longitudinal weight derived in wave 5 to ensure that the wave 6 weight did not replicate the adjustments made by the wave 5 weight.)

The results showed significant differences between respondents and non-respondents on a number of characteristics:

- Age (at wave 1) by sex;
- Government Office Region ;
- Number in household;
- Whether had a long-term limiting illness;
- White/non-white ethnicity;
- Self-reported general health.

A longitudinal weight was calculated for the set of 4,711 core members who responded to all six waves of ELSA and remain living in private households. The weighting strategy in wave 6 aimed to minimise any bias arising from sample loss after wave 5. The longitudinal weight aims to be representative of those living in England at a single point in time (i.e. at wave 1 in 2002) so those who subsequently move to Scotland or Wales are still assigned a longitudinal weight.

Taking the inverse of the estimated probability of response (from the logistic regression model) created a non-response weight for wave 6. (For example, a response probability of 0.8 corresponds to a weight of 1.25, while a lower response probability of 0.5 corresponds to a higher weight of 2.) This was then multiplied by the wave 5 longitudinal weight (and scaled to a mean of 1) to produce the wave 6 longitudinal weight. The sequential nature of the weighting<sup>30</sup> means that we have adjusted for non-response to HSE and each of the six waves of ELSA. A total of 4,711 core members received a Wave 6 longitudinal weight.

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<sup>30</sup> Longitudinal weights are based on a sequence of attrition models, one for each wave. Each time the resulting non-response weight is multiplied by the weight created at the previous wave. In this case, the weight derived in wave 6 builds on the wave 5 weight, which, in turn, built on the weight created in wave 4 etc.

### 8.3 Cross-sectional weights

A cross-sectional weight was derived that can be used to analyse all core members responding at wave 6. This allows for the inclusion of Cohort 3, Cohort 4 and Cohort 6 core members including ‘wave non-responders’ (those core members from Cohorts 1, 3 and 4 who returned to the study at wave 6 after missing one or more previous waves). The cross-sectional sample at wave 6 aims to be representative of those aged 50+ living in England in 2012. As described below, we weight to population estimates for England, so by definition we cannot (and do not) include anyone now living in Scotland or Wales in the cross-sectional weighting.

Core members responding at wave 6 can be described as the *combined sample*. Non-response adjustments were carried out separately for each cohort but for the final calibration step the combined sample was split into two main groups by age (at interview): those aged 61+ and those aged 50-60.

The sample Cohorts 1, 3, 4 and 6 cut across these two groups as shown in Table 8.1 below.

| <b>Table 8.1 Core members responding at wave 6</b>                                  |                      |                 |                 |                 |                 |
|---|----------------------|-----------------|-----------------|-----------------|-----------------|
| <i>Core member respondents in wave 6 (2012-13), excluding those in institutions</i> |                      |                 |                 |                 |                 |
|   | <b>Age at wave 6</b> | <b>Cohort 1</b> | <b>Cohort 3</b> | <b>Cohort 4</b> | <b>Cohort 6</b> |
| <b><i>Those aged 61+:</i></b>   |                      |                 |                 |                 |                 |
| Cohort 1 longitudinal group   | 61+                  | 4,634           |                 |                 |                 |
| Cohort 1 wave non-responders  | 61+                  | 855             |                 |                 |                 |
| Cohort 4 (aged 61+)   | 61+                  |                 |                 | 1,181           |                 |
| <b><i>Those aged 50-60:</i></b>   |                      |                 |                 |                 |                 |
| Cohort 1 aged 60  | 60                   | 79              |                 |                 |                 |
| Cohort 3  | 56-60                |                 | 884             |                 |                 |
| Cohort 4 (aged 54-60)   | 54-60                |                 |                 | 609             |                 |
| Cohort 6  | 50-56                |                 |                 |                 | 826             |
|   |                      |                 |                 |                 |                 |
|   |                      |                 |                 |                 |                 |
| <b>Total</b>  |                      | <b>5,568</b>    | <b>884</b>      | <b>1,790</b>    | <b>826</b>      |

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The cross-sectional weight was calculated using the following steps:

1. Non-response to wave 6 was analysed for Cohort 3 core members who had responded to all previous waves (3 to 5). The response rate amongst those eligible was very found to be very high (93%), therefore an adjustment for non-response between waves 5 and 6 was not judged to be necessary.
2. A non-response weight was derived for Cohort 4 core members who had responded to both waves 4 *and* 5 to adjust for non-response between waves 5 and 6.
3. A non-response weight was derived for Cohort 6 core members to adjust for non-response at wave 6.
4. Population estimates for core members aged 61+ at wave 6 were derived from the longitudinal group (those Cohort 1 core members responding to all five waves of ELSA) combined with Cohort 4 core members aged 61+.
5. The non-response weights for *all* core members aged 61+ at wave 6 (i.e. the two groups mentioned above in point 3 plus wave non-responders) were then calibrated to these population estimates plus estimates of age/sex and region from 2012 household population estimates.<sup>31</sup>
6. The non-response weights for all core members aged 50-60 at wave 6, were calibrated to 2012 population estimates of age/sex and region.**Error! Bookmark not defined.**
7. Finally the calibration weights from steps 5 and 6 above were combined and scaled so that the average weight was equal to 1.

These steps are discussed in turn.

### 8.3.1 Non-response weight for Cohort 3

This was not found to be necessary as the response rate was very high (93%).

### 8.3.2 Non-response weights for Cohort 4

For the 1,932 Cohort 4 core members eligible for the main interview in wave 6 who responded to waves 4 *and* 5 (and remaining in private households in England), response to wave 5 was modelled on a range of household and individual-level information collected at wave 5. The analysis was conducted using the non-response weight derived in wave 5 to ensure that the wave 6 weight did not replicate any adjustment made by the wave 5 weight. The results showed significant differences between respondents and non-respondents on a number of characteristics:

- Age by sex;
- Government Office Region;
- White/non-white ethnicity;

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<sup>31</sup> Age is defined here as age at 1 March 2012, immediately prior to the beginning of wave 6 fieldwork.

- Housing tenure.

Taking the inverse of the estimated probability of response created a non-response weight to adjust for potential non-response bias between wave 6 and wave 5 for a total of 1,775 respondents.

### 8.3.3 Non-response weights for Cohort 6

A cohort of people born between 1 March 1956 and 28 February 1962 was added to the ELSA sample at wave 6. They were selected from the Health Survey for England 2009-2011 and are collectively referred to as Cohort 6 (or the refreshment sample at wave 6). This group can be seen as comprising two distinct groups:

- Those born between 1 March 1958 and 28 February 1962 (aged 50-53 at wave 6), a new cohort of people who refresh the sample at the lower end of the age range and thereby make the ELSA wave 6 sample representative of those aged 50+ (rather than those aged 54+ as it otherwise would be)<sup>32</sup>.
- Those born between 1 March 1956 and 28 February 1958 (aged 54-55 at wave 6) who effectively “top-up” the sample of cohort 4 members.

Their response to wave 6 was modelled on a range of household and individual-level information collected from HSE. The results showed significant differences between respondents and non-respondents on a number of characteristics:

- Sex;
- Government Office Region;
- Marital status;
- Household type;
- National Statistics Socio-Economic Classification (NS-SEC);
- Housing tenure.

Taking the inverse of the estimated probability of response created a non-response weight to adjust for potential non-response bias between HSE and ELSA.

### 8.3.4 Population estimates for those aged 61+ in March 2012

Core members aged 61+ responding at wave 6 belonged to one of three groups:

- 1) Cohort 1 core members who had taken part in all five waves of ELSA<sup>33</sup>
- 2) Cohort 4 core members who took part in waves 4, 5 and 6<sup>34</sup>;
- 3) Wave non-responders: Core members from Cohorts 1 and 4 who had returned to the study at wave 6 after missing one or more previous waves<sup>35</sup>

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<sup>32</sup> Note this information is slightly different from that in the Wave 6 methods chapter. The information here is correct.

<sup>33</sup> 10 of these respondents had moved to either Wales or Scotland and were therefore given zero cross-sectional weights

<sup>34</sup> 3 of these respondents had moved to Scotland and were therefore given zero cross-sectional weights

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It is often speculated that wave non-responders are likely to have characteristics that differ from those who have taken part at all waves (Lynn et al., 1994). At wave 3, it was found that the following socio-demographic features were predictive of wave non-response when compared with response to all waves:

- Housing tenure;
- White/non-white ethnicity;
- Highest educational qualifications;
- Marital status.

In order to combine the three groups to create a representative sample of persons aged 61+, it was necessary to make sure, as far as possible, that the characteristics of the combined sample match those of the population. In order to do this, estimates of population characteristics were required.

The first two groups already had weights derived to adjust for non-response at wave 6, previous waves of ELSA and HSE. Combining these groups provided a basis from which to estimate the population characteristics of those aged 61+. Before these estimates could be derived two adjustments were necessary:

- i) the non-response weights of those aged 61-78 were scaled down so that this group were in the correct proportion as compared to those aged 79 and over;
- ii) these weights were then calibrated to mid-2012 household population estimates of age/sex and region.

Estimates of housing tenure, white/non-white ethnicity, highest educational qualifications and marital status were then derived from the combined groups weighted by the resulting weights (the same characteristics were used as in waves 3, 4 and 5 for consistency).

### **8.3.5 Cross-sectional weights for those aged 61+ calibrated using population estimates**

The non-response weights for *all* core members aged 61+ at wave 6 (i.e. the two groups already combined plus the third group of wave non-responders) were then adjusted using calibration weighting so that the resulting weights, when applied to the three groups combined, provide a sample profile that matches the population estimates on the four socio-demographic characteristics plus estimates of age/sex and region of those aged 61+ (from mid-2012 household population estimates, see Table 8.3). This means that the distribution of tenure, for example, in the final weighted sample (i.e. after the calibration adjustment) corresponds exactly to the estimated population distribution; the same is true for the distributions of the three other characteristics and for age/sex and region. This is shown in Table 8.2.

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<sup>35</sup> 13 of these respondents had moved to either Wales or Scotland and were therefore given zero cross-sectional weights

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Column 3 of the table shows the weighted marginal distributions (pre-calibration) for this combined group aged 61+. The weights within each of the three sub-groups that made up this combined group were scaled to their respective un-weighted sample sizes (i.e. so that each had a mean weight of 1). The pre-calibration weights were as follows:

- the 4,634 core members who had taken part in all six waves were given their wave 5 longitudinal weight;
- the 855 Cohort 4 core members aged 61+ were given their Cohort 4 non-response weight ( as described above)
- the 79 wave non-responders were given the longitudinal weight they received for the last wave in which they took part e.g. those who missed wave 5 but took part in wave 4 were given their wave 4 longitudinal weight

Use of these weights ensured that appropriate non-response adjustments had been made to each group prior to calibration.

Column 4 shows the final weighted marginal distributions (post-calibration) across the four variables. As expected, the post- calibration weighted distributions match the target distributions (shown in column 2) on each of these four dimensions.

**Table 8.2 Distributions of key variables used in calibration weighting**

*Core member respondents aged 61+ in wave 6 (2012-13), excluding those in institutions*

| <b>Wave 6 characteristics</b>         | <b>Col.2<br/>Target<br/>distribution (all<br/>61+ in England<br/>from Cohorts 1<br/>&amp; 4)</b> | <b>Col.3<br/>Combined<br/>weighted<br/>sample 61+<br/>(pre-calibration)</b> | <b>Col.4<br/>Combined<br/>weighted<br/>sample 61+<br/>(post-<br/>calibration)</b> |
|---------------------------------------|--|---|---|
|                                       | %  | %   | %   |
| <b>Tenure</b>                         |  |   |   |
| Own outright                          | 73.3   | 75.1  | 73.3  |
| Mortgage                              | 8.6  | 9.1   | 8.6   |
| Renting                               | 18.1   | 15.9  | 18.1  |
| <b>Marital status</b>                 |  |   |   |
| Single, never married                 | 4.7  | 4.8   | 4.7   |
| Married, first and only marriage      | 55.1   | 54.1  | 55.1  |
| Remarried                             | 9.5  | 9.6   | 9.5   |
| Separated/divorced                    | 10.3   | 10.8  | 10.3  |
| Widowed                               | 20.5   | 20.7  | 20.5  |
| <b>Ethnicity</b>                      |  |   |   |
| White                                 | 96.9   | 97.5  | 96.9  |
| Non-white                             | 3.1  | 2.5   | 3.1   |
| <b>Educational status</b>             |  |   |   |
| Degree or equivalent                  | 15.0   | 17.2  | 15.0  |
| A level/higher education below degree | 21.5   | 23.1  | 21.5  |
| O level or other                      | 18.0   | 18.6  | 18.0  |
| CSE or other / No qualifications      | 45.6   | 41.1  | 45.6  |
| <b>Base</b>                           |  |   |   |
| <i>Unweighted</i>                     | <i>5,763</i>   | <i>6,670</i>  | <i>6,670</i>  |

### 8.3.6 Cross-sectional weights for those aged 50-60 calibrated using population estimates

Responding core members aged 50–60 at wave 6 came from Cohorts 3, 4 and 6<sup>36</sup>. These groups were combined and their non-response weights were adjusted using calibration weighting so that the resulting weights provide a sample profile that match population estimates of age/sex and region (from mid-2012 household population estimates) for those aged 50–60.

### 8.3.7 Putting the cross-sectional weights together

The final step in the calculation of the cross-sectional weights was to take the calibrated weights from the two groups (50-60 and 61+) combined and to scale them so that they are in the correct proportion in the final weighted sample. The final weights were then scaled so that the average weight was equal to 1. The profile of the combined core member respondents, weighted by the cross-sectional weight, is presented in Table 8.4.

**Table 8.3 Household population estimates**

Mid-2012 England household population (aged 50 and over)

| Age   | Men       | Women     | Total      | Men  | Women | Total |
|-------|-----------|-----------|------------|------|-------|-------|
|       |           |           |            | %    | %     | %     |
| 50-55 | 2,050,897 | 2,090,789 | 4,141,686  | 23.7 | 21.8  | 22.7  |
| 56-60 | 1,464,948 | 1,506,869 | 2,971,817  | 16.9 | 15.7  | 16.3  |
| 61-64 | 1,184,208 | 1,237,611 | 2,421,819  | 13.7 | 12.9  | 13.3  |
| 65-69 | 1,348,159 | 1,425,084 | 2,773,243  | 15.6 | 14.8  | 15.2  |
| 70-74 | 962,314   | 1,068,591 | 2,030,905  | 11.1 | 11.1  | 11.1  |
| 75-79 | 763,262   | 905,061   | 1,668,323  | 8.8  | 9.4   | 9.1   |
| 80-84 | 519,555   | 705,401   | 1,224,956  | 6.0  | 7.3   | 6.7   |
| 85+   | 368,560   | 663,714   | 1,032,274  | 4.3  | 6.9   | 5.7   |
| Total | 8,661,903 | 9,603,120 | 18,265,023 | 100  | 100   | 100   |

<sup>36</sup> 3 of these respondents had moved to Wales and were therefore given a zero cross-sectional weight

**Table 8.4 Achieved (combined) sample of core members, by age in 2012-13 and sex (weighted)**

Core member respondents in wave 6 (2012-13), including proxies but excluding those in institutions

| Age at wave 6 interview | Men          | Women        | Total        | Men  | Women | Total |
|-------------------------|--------------|--------------|--------------|------|-------|-------|
|                         |              |              |              | %    | %     | %     |
| 50-55                   | 1,018        | 1,038        | 2,056        | 23.7 | 21.8  | 22.7  |
| 56-60                   | 727          | 748          | 1,475        | 16.9 | 15.7  | 16.3  |
| 61-64                   | 588          | 614          | 1,202        | 13.7 | 12.9  | 13.3  |
| 65-69                   | 669          | 708          | 1,377        | 15.6 | 14.8  | 15.2  |
| 70-74                   | 478          | 531          | 1,008        | 11.1 | 11.1  | 11.1  |
| 75-79                   | 379          | 449          | 828          | 8.8  | 9.4   | 9.1   |
| 80-84                   | 258          | 350          | 608          | 6.0  | 7.3   | 6.7   |
| 85+                     | 183          | 330          | 512          | 4.3  | 6.9   | 5.7   |
| <i>Weighted N</i>       | <i>4,300</i> | <i>4,768</i> | <i>9,068</i> | 100  | 100   | 100   |
| <i>Unweighted N</i>     | <i>4,042</i> | <i>5,026</i> | <i>9,068</i> | 100  | 100   | 100   |

**Table 8.5 Achieved (combined) sample of core members, by age in 2012-13 and sex (unweighted)**

Core member respondents in wave 6 (2012-13), including proxies but excluding those in institutions

| Age at wave 6 interview | Men          | Women        | Total        | Men          | Women        | Total        |
|-------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                         |              |              |              | %            | %            | %            |
| 50-55                   | 354          | 458          | 812          | 8.8          | 9.1          | 9.0          |
| 56-60                   | 715          | 871          | 1,586        | 17.7         | 17.3         | 17.5         |
| 61-64                   | 606          | 773          | 1,379        | 15.0         | 15.4         | 15.2         |
| 65-69                   | 797          | 916          | 1,713        | 19.7         | 18.2         | 18.9         |
| 70-74                   | 585          | 686          | 1,271        | 14.5         | 13.6         | 14.0         |
| 75-79                   | 512          | 644          | 1,156        | 12.7         | 12.8         | 12.7         |
| 80-84                   | 264          | 364          | 628          | 6.5          | 7.2          | 6.9          |
| 85+                     | 209          | 314          | 523          | 5.2          | 6.2          | 5.8          |
| <i>Base</i>             |              |              |              |              |              |              |
| <i>Unweighted</i>       | <i>4,042</i> | <i>5,026</i> | <i>9,068</i> | <i>100.0</i> | <i>100.0</i> | <i>100.0</i> |

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## 8.4 Self-completion weights

For the 9,068 core members living in private households in England who completed a full or partial wave 6 main interview, response to the main self-completion questionnaire was modelled on a range of household and individual level information collected from the ELSA wave 6 main interview. In a separate exercise, response to the sexual activities self-completion questionnaire was modelled using the same data. The weighting strategy aimed to minimise any bias arising from differential non-response to each self-completion questionnaire. The analyses were conducted on data weighted by the wave 6 cross-sectional weight.

### 8.4.1 Main self-completion weights

The results for the main self-completion questionnaire showed significant differences between core member respondents to the self-completion and non-respondents on a number of characteristics:

- Age by sex;
- Government Office Region;
- Highest educational qualifications;
- White/non-white ethnicity;
- Housing tenure;
- Self-reported general health;
- Whether had a long-term limiting illness;
- Number in household;
- Financial unit type;
- Current work/activity status;
- Whether had help with showcards.

A non-response weight for the 7,903 self-completion respondents was created by taking the inverse of the estimated probability of response. The final self-completion weight was a product of this non-response weight and the wave 6 cross-sectional weight.

### 8.4.2 Sexual activity self-completion weights

The results for the sex self-completion questionnaire showed significant differences between core member respondents and non-respondents on the following characteristics:

- Age by sex;
- Government Office Region;
- Highest educational qualifications;
- White/non-white ethnicity;
- Marital status;

- 
- Self-reported general health;
  - Whether had help with showcards.

A non-response weight for the 6,201 respondents to the sex self-completion was created by taking the inverse of the estimated probability of response. The final sex self-completion weight was a product of this non-response weight and the wave 6 cross-sectional weight.

## 8.5 Nurse visit and blood sample weights

### 8.5.1 Nurse visit weights

For 9,068 core members living in private households in England who completed a full or partial wave 6 main interview, response to the nurse visit was modelled on a range of household and individual level information collected from ELSA wave 6. The weighting strategy aimed to minimise any bias arising from differential non-response to the nurse visit. The analysis was conducted on data weighted by the wave 6 interview weight.

The results showed significant differences between core member respondents to the nurse visit and non-respondents on a number of characteristics:

- Age by sex;
- Government Office Region;
- Highest educational qualifications;
- White/non-white ethnicity;
- Marital status;
- Self-reported general health;
- Whether had a long-term limiting illness;
- Financial unit type;
- Current work/activity status;
- Frequency of taking part in mildly energetic activities;
- Self-reported hearing;
- Whether ever smoked.

A non-response weight for the 7,699 respondents with a nurse visit was created by taking the inverse of the estimated probability of response. The final nurse visit weight was a product of this non-response weight and the wave 6 cross-sectional weight.

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## 8.5.2 Blood sample weights

For the 7,699 core members living in private households in England who took part in the nurse visit, response to the blood sample was modelled on a range of household and individual level information collected from ELSA wave 6. The weighting strategy for the blood sample aimed to minimise any bias arising from differential non-response in provision of a blood sample. The analysis was conducted on data weighted by the wave 6 nurse weight.

The results showed significant differences between core member respondents to the blood sample and non-respondents on a number of characteristics. Non-responders to the blood sample showed differences compared to responders across the following characteristics:

- Age by sex;
- Government Office Region;
- Highest educational qualifications;
- White/non-white ethnicity;
- Self-reported general health;
- Whether had a long-term limiting illness;
- Financial unit type;
- Whether has children and whether they are living with them or not;
- Frequency of taking part in vigorous activities;
- Frequency of taking part in mildly energetic activities;
- Current work/activity status.

A non-response weight for the 6,180 respondents with a blood sample was created by taking the inverse of the estimated probability of response. The final blood sample weight was a product of this non-response weights and the wave 6 nurse weight.

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## Appendix A Key Survey Measures By Wave

Appendix Table A.1: Demographic data at each wave of ELSA

|   | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|---|--------|--------|--------|--------|--------|--------|--------|
| <b>Demographics</b>                                     |        |        |        |        |        |        |        |
| Household membership                                    | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Changes in household membership                         |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Living parents, siblings, children, and grandchildren   | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Marital status  | ✓      | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Ethnic group  | ✓      | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Country of birth  | ✓      | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Educational qualifications                              | ✓      | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Age completed full-time education                       |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Occupation of main carer when respondent was aged 14 yr |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |

Note: Cells in parentheses (✓) only updated if circumstances change

Appendix Table A.2: Content of the economics data at each wave of ELSA

|   | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|---|--------|--------|--------|--------|--------|--------|--------|
| <b>Household Income</b>                       |        |        |        |        |        |        |        |
| Earnings                                      |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| State benefits (by source and recipient)      |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Private pensions                              |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Asset income (by asset category)              |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Other income (including receipt of lump sums) |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Financial assets (12 categories)              |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Physical assets (5 categories)                |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Business wealth                               |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Debt (3 categories)                           |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Primary housing wealth and mortgage debt      |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Equity release and home reversion plans       |        | ✓      | ✓      | ✓      | ✓      |        |        |
| Life time receipt of inheritances and gifts   |        |        |        |        |        |        | ✓      |
| Life insurance                                |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Current plan details                          |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Date joined plan                              |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Current contributions                         |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Self-reported accrued pension wealth          |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Past pension details (up to 3 past pensions)  |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Plan names                                    |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| State pension statements                      |        |        |        | ✓      |        |        |        |

|  | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|--|--------|--------|--------|--------|--------|--------|--------|
| <b>Household Income</b>  |        |        |        |        |        |        |        |
| Knowledge of female state pension age  |        |        |        | ✓      | ✓      | ✓      | ✓      |
| Knowledge of male state pension age  |        |        |        |        |        |        | ✓      |
| State pension deferral   |        |        |        |        | ✓      | ✓      | ✓      |
|  |        |        |        |        |        |        |        |
| Main job details   | ✓      | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Health and work disability   |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Normal pay and hours   | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Secondary and other economic activity details  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Age and reason for retirement if retired   |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Employer name and permission to contact  |        | ✓      | (✓)    | (✓)    | (✓)    | (✓)    | (✓)    |
| Compulsory retirement ages   |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Health limiting ability to work  |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Desired/offered/requested workplace adaptations  |        |        | ✓      | ✓      | ✓      | ✓      |        |
| Housing (rent and mortgage payments)   | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Vehicle ownership  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Durable ownership  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Durable purchases  |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Food in, food out  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Fuel expenditures  |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Health insurance contributions   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Leisure  |        |        | ✓      |        | ✓      | ✓      | ✓      |
| Clothing   |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Transfers (incl. charitable giving and Child Trust Funds (except Wave 4 and 5 when CTF asked about explicitly) |        |        | ✓      |        | ✓      | ✓      | ✓      |
| Contributions to Child Trust Funds   |        |        |        |        | ✓      | ✓      |        |

|  | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|--|--------|--------|--------|--------|--------|--------|--------|
| <b>Household Income</b>  |        |        |        |        |        |        |        |
| Mortality  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Employment   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Bequest and inheritances   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Health limit ability to work   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Income adequacy  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Movement into nursing home   |        |        | ✓      |        |        |        | ✓      |
| House value  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Moving house   |        |        | ✓      |        |        |        | ✓      |
| Public and private pension income                                      |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Self-reported financial planning period                                |        | ✓      | ✓      |        |        |        |        |
| Perceived financial position relative to neighbours/friends/colleagues |        |        | ✓      | ✓      | ✓      | ✓      |        |
| Future housing and care needs  |        |        | ✓      |        |        |        | ✓      |
| Risk module (subgroup)   |        |        |        |        |        | ✓      |        |

Note: Cells in parentheses ( ✓ ) only updated if circumstances change

Note: Cells in square brackets [ ✓ ] only collected for new sample members or people who have not responded before

**Appendix Table A.3: Measures of health, disability, and health behaviour at each wave of ELSA**

|   | Wave 0 | Wave 1 | Wave 2 | Wave 3  | Wave 4  | Wave 5  | Wave 6  |
|---|--------|--------|--------|---------|---------|---------|---------|
| Self-rated general health; (Limiting) long-standing illness   | ✓      | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Mobility: difficulties walking ¼ mile & symptoms if try   |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Eyesight and hearing – self-reported health and difficulties.<br>Whether had glaucoma/diabetic eye disease/cataract/macular degeneration, Cataract surgery  |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Dental health – self reported oral health and related difficulties  |        |        |        | ✓       |         | ✓       |         |
| If age 65+ years, whether blood pressure checked in last year   |        | ✓ 65+  | ✓ 65+  | ✓ (all) | ✓ (all) | ✓ (all) | ✓ (all) |
| Physician diagnosed conditions:<br>Ischaemic heart disease, stroke, diabetes, raised cholesterol, quality of care, chronic lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson’s disease, Alzheimer’s, dementia. |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Falls and resulting fractures if age 60+y, including quality of care at except W7   |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Hip and knee replacements received, including quality of care at except W7  |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Pain: overall rating (mild/mod/severe) and for back, hip, knees, including quality of care at except W7   |        | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |
| Balance, quality of care, dizziness   |        | ✓      | ✓      |         | ✓       |         | ✓       |
| Sleep disturbance   |        |        |        |         | ✓       |         | ✓       |
| Diagnostic symptom assessments: Rose Angina, MRC Respiratory Questionnaire;   | ✓      | ✓      | ✓      | ✓       | ✓       | ✓       | ✓       |

|   | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|---|--------|--------|--------|--------|--------|--------|--------|
| Edinburgh Claudication Questionnaire  |        |        |        | ✓      |        | ✓      |        |
| Disabilities: Mobility problems, ADLS and IADLS listed.<br>Aids used, Sources of help, Who pays<br>Age 65+y: whether use meals on wheels, day centres,<br>lunch clubs |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓ +    |
| Urinary incontinence  | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Bowel incontinence  |        |        |        |        |        |        | ✓      |
| Quality of care for urinary incontinence  |        | ✓      | ✓      |        |        |        |        |
| Menopause   |        |        |        |        | ✓      | ✓      | ✓      |
| Cancer screening participation  |        |        |        |        |        | ✓      | ✓      |
| Polypharmacy (Nurse visit)  |        |        |        |        |        |        | ✓      |
| <b>Health behaviours</b>  |        |        |        |        |        |        |        |
| Smoking history, quality of care for cessation  | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Alcohol consumption: usual frequency, heaviest<br>consumption day last week (questions have changed but<br>been stable since W3)                                      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Physical activity: frequency do vigorous/moderate/mild<br>exercise,<br>Whether job sedentary or physically active   | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Consumption of fruit and vegetables   |        |        |        | ✓      | ✓      | ✓      | ✓      |
| <b>Mental health</b>  |        |        |        |        |        |        |        |
| Psychiatric and emotional problems, quality of care   |        | ✓      | ✓      | ✓      | ✓      |        |        |
| General Health Questionnaire (GHQ-12)   | ✓      | ✓      |        | ✓      |        |        |        |
| CES-D depression scale  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |

|  | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|--|--------|--------|--------|--------|--------|--------|--------|
| <b>Physical examination and performance data (Interviewer visit)</b> |        |        |        |        |        |        |        |
| Walking speed performance test                                       |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| <b>Physical examination and performance data (Nurse visit)</b>       |        |        |        |        |        |        |        |
| Height (and sitting at W2 and W4)                                    | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Weight   | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Waist (and hip measurement at w2 and w4)                             | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Blood pressure   | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Lung function  | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Chair stands;  |        |        | ✓      |        | ✓      |        | ✓      |
| Balance – 3 positions  |        |        | ✓      |        | ✓      |        | ✓      |
| Leg raise (eyes open and closed)                                     | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Grip Strength  |        |        | ✓      |        | ✓      |        | ✓      |
| Saliva sample (for cortisol)   |        |        | ✓      |        | ✓      |        |        |
| Hair sample (for cortisol)   |        |        |        |        |        |        | ✓      |
| <b>Blood assays</b>  |        |        |        |        |        |        |        |
| Triglycerides  | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Total and HDL-cholesterol  | ✓      |        | ✓      |        | ✓      |        | ✓      |
| LDL Cholesterol  |        |        | ✓      |        | ✓      |        | ✓      |
| C-reactive protein, fibrinogen                                       | ✓      |        | ✓      |        | ✓      |        | ✓      |
| Haemoglobin and ferritin   | ✓      |        | ✓      |        | ✓      |        | ✓      |
| White blood cell count   |        |        |        |        | ✓      |        | ✓      |
| Fasting lipids, glucose, glycated haemoglobin                        |        |        | ✓      |        | ✓      |        | ✓      |
| Cortisol (from saliva).  |        |        | ✓      |        | ✓      |        |        |

|                            | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|
| IgE / DHM IgE              | ✓      |        |        |        |        |        |        |
| IGF-1                      |        |        |        |        | ✓      |        | ✓      |
| DHEAS                      |        |        |        |        | ✓      |        |        |
| Vitamin D                  |        |        |        |        |        |        | ✓      |
| DNA extraction and storage |        |        | ✓      |        | [✓]    |        | [✓]    |
| Apolipoprotein             |        |        | ✓      |        |        |        |        |
| Mean corpuscular Hb (MCH)  |        |        |        |        | ✓      |        | ✓      |

*Note: Cells in square brackets [✓] only collected for new sample members or people who have not responded before*  
+ Questions on aids and sources of help changed in Wave 6.

**Appendix Table A.4: Measures of cognitive function at each wave of ELSA**

|  | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|--|--------|--------|--------|--------|--------|--------|--------|
| <b>Memory</b>  |        |        |        |        |        |        |        |
| Self-rated memory  |        | ✓      | ✓      | ✓      | ✓      |        |        |
| Orientation in time  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Word-list recall, immediate and delayed (verbal learning and recall) |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Prospective memory   |        | ✓      | ✓      | ✓      | ✓      | ✓      |        |
| <b>Executive function</b>  |        |        |        |        |        |        |        |
| Word-finding (verbal fluency)  |        | ✓      | ✓      | ✓      | ✓      | ✓      |        |
| Letter cancellation (accuracy and speed of mental processing)        |        | ✓      | ✓      | ✓      | ✓      | ✓      |        |
| <b>Basic cognitive skills/abilities</b>                              |        |        |        |        |        |        |        |
| Fluid Intelligence (adaptive number series)                          |        |        |        |        |        |        | ✓      |
| Numerical ability  |        | ✓      |        |        | ✓      |        | [✓]    |
| Literacy   |        |        | ✓      |        |        | ✓      | [✓]    |
| <b>Other variables</b>   |        |        |        |        |        |        |        |
| Quality of cognitive interview (interviewer's assessment)            |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Proxy interview of cognitive functioning – IQCODE scale              |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
|  |        |        |        |        |        |        |        |

*Note: Cells in parentheses [✓] only collected for new sample members or people who have not responded before*

**Appendix Table A.5: Psychosocial measures at each wave of ELSA**

|   | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|---|--------|--------|--------|--------|--------|--------|--------|
| <b>Social and civic participation</b>   |        |        |        |        |        |        |        |
| Informal care giving  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Volunteering  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Provision of unpaid help  |        |        |        |        | ✓      | ✓      | ✓      |
| Civic, social and cultural participation  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Accessing local amenities and services  |        | ✓      | ✓      |        | ✓      | ✓      | ✓      |
| TV watching   |        |        |        |        | ✓      | ✓      | ✓*     |
| Social networks   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Social support  | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Social isolation/loneliness   |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Transport   |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Social capital (satisfaction with area)   |        | ✓      |        | ✓      |        |        |        |
| Perceived discrimination  |        |        |        |        |        | ✓      |        |
| Religiosity   |        |        |        |        |        | ✓      |        |
| Digital inclusion   |        |        |        |        |        |        | ✓      |
|   |        |        |        |        |        |        |        |
| <b>Psychosocial factors</b>   |        |        |        |        |        |        |        |
| Control and demand  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Effort-reward balance   |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Subjective social status  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Relative deprivation and perceived financial difficulties<br>(a duplicate of a question under heading expectations) |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Ages at which middle age ends and old age begins  |        | ✓      |        | ✓      |        |        |        |
| Self-perceived and desired ages   |        |        | ✓      |        | ✓      |        | ✓**    |

|  | Wave 0 | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 |
|--|--------|--------|--------|--------|--------|--------|--------|
| <b>Social and civic participation</b>      |        |        |        |        |        |        |        |
| Experience and perceptions of ageing       |        |        | ✓      |        |        | ✓      |        |
| Sense of Collectiveness                    |        |        |        |        | ✓      |        |        |
| Altruism                                   |        |        |        |        | ✓      |        |        |
| Pet ownership                              |        |        |        |        |        | ✓      |        |
|  |        |        |        |        |        |        |        |
| <b>Psychological and social well-being</b> |        |        |        |        |        |        |        |
| Quality of life (CASP-19)                  |        | ✓      | ✓      | ✓      | ✓      | ✓      | ✓      |
| Satisfaction With Life Scale-SWLS (Diener) |        |        | ✓      | ✓      | ✓      | ✓      | ✓      |
| Ryff well-being scale                      |        |        | ✓      |        |        |        |        |
| Positive affect                            |        |        |        |        |        | ✓      |        |
| Personality                                |        |        |        |        |        | ✓      |        |
| Time use and affect                        |        |        |        |        |        |        | ✓      |
| ONS wellbeing questions                    |        |        |        |        |        |        | ✓      |

\* TV watching included as part of the wellbeing time use and affect questions

\*\* only self perceived age, not desired age

# Model Of Response To Main Interview (Cohort 1)

Appendix Table B.1 Model of response to main interview (Cohort 1)

| Term                                       | Odds ratio | 95% confidence interval |       |
|--|------------|-------------------------|-------|
|  |            | Lower                   | Upper |
| <b>Age (at wave 1) by sex (p=.090)</b>     |            |                         |       |
| Male 50-54                                 | 1          |                         |       |
| Male 55-59                                 | 1.16       | 0.66                    | 2.04  |
| Male 60-64                                 | 1.03       | 0.57                    | 1.85  |
| Male 65-69                                 | 0.64       | 0.37                    | 1.10  |
| Male 70-74                                 | 0.68       | 0.37                    | 1.25  |
| Male 75-79                                 | 0.60       | 0.30                    | 1.23  |
| Male 80+                                   | 0.40       | 0.15                    | 1.09  |
| Female 50-54                               | 0.81       | 0.50                    | 1.31  |
| Female 55-59                               | 1.12       | 0.65                    | 1.94  |
| Female 60-64                               | 0.86       | 0.50                    | 1.48  |
| Female 65-69                               | 0.71       | 0.41                    | 1.22  |
| Female 70-74                               | 0.83       | 0.46                    | 1.51  |
| Female 75-79                               | 0.44       | 0.24                    | 0.80  |
| Female 80+                                 | 0.53       | 0.25                    | 1.15  |
| <b>Government Office Region (p=.060)</b>   |            |                         |       |
| North East                                 | 1          |                         |       |
| North West                                 | 1.00       | 0.61                    | 1.63  |
| Yorkshire and the Humber                   | 1.48       | 0.86                    | 2.55  |
| East Midlands                              | 1.30       | 0.76                    | 2.23  |
| West Midlands                              | 2.06       | 1.15                    | 3.69  |
| East of England                            | 1.51       | 0.89                    | 2.56  |
| London                                     | 0.96       | 0.56                    | 1.64  |
| South East                                 | 1.26       | 0.77                    | 2.06  |
| South West                                 | 1.64       | 0.95                    | 2.81  |
| <b>Self-assessed health (p&lt;.001)</b>    |            |                         |       |
| Very good                                  | 1          |                         |       |
| Good                                       | 0.85       | 0.53                    | 1.38  |
| Fair                                       | 0.84       | 0.52                    | 1.37  |
| Bad/very bad                               | 0.44       | 0.27                    | 0.74  |
| <b>White/non-white ethnicity (p=.015)</b>  |            |                         |       |
| White                                      | 1          |                         |       |
| Non-white                                  | 4.61       | 1.34                    | 15.85 |
| <b>Limiting long-term illness (p=.017)</b> |            |                         |       |
| No limiting long-term illness              | 1          |                         |       |
| Non limiting long-term illness             | 1.73       | 1.18                    | 2.54  |
| Limiting long-term illness                 | 1.09       | 0.81                    | 1.49  |
| <b>Number in household (p=.009)</b>        |            |                         |       |
| 1  | 1          |                         |       |
| 2  | 0.64       | 0.48                    | 0.86  |
| 3  | 0.62       | 0.40                    | 0.98  |
| 4  | 1.41       | 0.58                    | 3.41  |

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*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only the Cohort 1 core members who had taken part in waves 1-5 *and* were considered eligible for wave 6 were included in the model.
2. The data were weighted by the wave 3 main interview weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate number of degrees of freedom.

# Model Of Response To Main Interview (Cohort 4)

Appendix Table C.1 Model of response to main interview (Cohort 4)

| Term  | Odds ratio | 95% confidence interval |       |
|---|------------|-------------------------|-------|
|   |            | Lower                   | Upper |
| <b>Age (at wave 4) by sex (p=.535)</b>        |            |                         |       |
| Male 50-54                                    | 1          |                         |       |
| Male 55-59                                    | 0.86       | 0.45                    | 1.66  |
| Male 60-64                                    | 0.79       | 0.37                    | 1.68  |
| Male 65-69                                    | 1.02       | 0.43                    | 2.43  |
| Male 70-74                                    | 1.36       | 0.48                    | 3.79  |
| Female 50-54                                  | 0.82       | 0.41                    | 1.65  |
| Female 55-59                                  | 0.62       | 0.33                    | 1.16  |
| Female 60-64                                  | 0.69       | 0.33                    | 1.44  |
| Female 65-69                                  | 1.29       | 0.51                    | 3.30  |
| Female 70-74                                  | 1.28       | 0.49                    | 3.34  |
| <b>Government Office Region (p=.875)</b>      |            |                         |       |
| North East                                    | 1          |                         |       |
| North West                                    | 0.93       | 0.40                    | 2.12  |
| Yorkshire and the Humber                      | 1.10       | 0.46                    | 2.64  |
| East Midlands                                 | 0.91       | 0.39                    | 2.15  |
| West Midlands                                 | 1.42       | 0.58                    | 3.49  |
| East of England                               | 1.05       | 0.46                    | 2.43  |
| London  | 0.97       | 0.41                    | 2.32  |
| South East                                    | 0.81       | 0.37                    | 1.79  |
| South West                                    | 1.21       | 0.51                    | 2.88  |
| <b>Housing tenure (p=.002)</b>                |            |                         |       |
| Own it outright                               | 1          |                         |       |
| Buying it with the help of a mortgage or loan | 0.60       | 0.41                    | 0.89  |
| Rent it                                       | 0.48       | 0.31                    | 0.74  |
| <b>White/non-white ethnicity (p=.036)</b>     |            |                         |       |
| White   | 1          |                         |       |
| Non-white                                     | 0.51       | 0.27                    | 0.96  |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only Cohort 4 core members who had taken part in wave 5 and were considered eligible for wave 6 were included in the model.
2. The data were weighted by the Wave 5 weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.

# Model Of Response To Main Interview (Cohort 6)

Appendix Table D.2 Model of response to main interview (Cohort 6)

| Term  | Odds ratio | 95% confidence interval |       |
|---|------------|-------------------------|-------|
|   |            | Lower                   | Upper |
| <b>Sex (p=.604)</b>                           |            |                         |       |
| Male  | 1          |                         |       |
| Female  | 1.06       | 0.86                    | 1.31  |
| <b>Government Office Region (p=.034)</b>      |            |                         |       |
| North East                                    | 1          |                         |       |
| North West                                    | 0.82       | 0.49                    | 1.38  |
| Yorkshire and the Humber                      | 1.10       | 0.64                    | 1.87  |
| East Midlands                                 | 1.48       | 0.84                    | 2.61  |
| West Midlands                                 | 1.53       | 0.91                    | 2.57  |
| East of England                               | 1.31       | 0.77                    | 2.23  |
| London  | 1.07       | 0.63                    | 1.82  |
| South East                                    | 1.59       | 0.97                    | 2.61  |
| South West                                    | 1.22       | 0.71                    | 2.12  |
| <b>Marital status (p=.017)</b>                |            |                         |       |
| Single  | 1          |                         |       |
| Married/co-habiting                           | 0.47       | 0.27                    | 0.82  |
| Separated/divorced/widowed                    | 0.70       | 0.42                    | 1.16  |
| <b>White/non-white ethnicity (p&lt;.001)</b>  |            |                         |       |
| White   | 1          |                         |       |
| Non-white                                     | 0.45       | 0.31                    | 0.64  |
| <b>Household type (p=.006)</b>                |            |                         |       |
| 1 adult                                       | 1          |                         |       |
| 2 adults                                      | 1.51       | 0.92                    | 2.50  |
| Family  | 2.03       | 1.19                    | 3.47  |
| Large adult household                         | 2.07       | 1.25                    | 3.44  |
| <b>Housing tenure (p=.036)</b>                |            |                         |       |
| Own it outright                               | 1          |                         |       |
| Buying it with the help of a mortgage or loan | 1.25       | 0.96                    | 1.62  |
| Rent it                                       | 0.88       | 0.63                    | 1.22  |
| <b>NS-SEC (p=.050)</b>                        |            |                         |       |
| Managerial and professional occupations       | 1          |                         |       |
| Intermediate occupations                      | 1.52       | 1.04                    | 2.23  |
| Small employers and own account workers       | 0.77       | 0.55                    | 1.08  |
| Lower supervisory and technical occupations   | 0.94       | 0.64                    | 1.39  |
| Semi-routine occupations                      | 1.13       | 0.86                    | 1.50  |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only Cohort 6 core members who had taken part in HSE *and* were considered eligible for wave 6 were included in the model.
2. The data were weighted by the HSE main interview weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.

# Model Of Response To Self-Completion Questionnaires

Appendix Table E.1 Model of response to main self-completion questionnaire

| Term   | Odds ratio | 95% confidence interval |       |
|--|------------|-------------------------|-------|
|  |            | Lower                   | Upper |
| <b>Age (at wave 6 interview) by sex (p&lt;.001)</b>  |            |                         |       |
| Male 50-55   | 1          |                         |       |
| Male 56-60   | 1.08       | 0.84                    | 1.39  |
| Male 61-64   | 1.73       | 1.25                    | 2.39  |
| Male 65-69   | 1.32       | 0.94                    | 1.85  |
| Male 70-74   | 1.68       | 1.12                    | 2.53  |
| Male 75-79   | 1.30       | 0.85                    | 1.98  |
| Male 80-84   | 0.95       | 0.61                    | 1.47  |
| Male 85+   | 0.50       | 0.32                    | 0.78  |
| Female 50-55   | 1.14       | 0.91                    | 1.43  |
| Female 56-60   | 1.97       | 1.48                    | 2.63  |
| Female 61-64   | 1.75       | 1.24                    | 2.47  |
| Female 65-69   | 2.08       | 1.44                    | 3.02  |
| Female 70-74   | 2.50       | 1.63                    | 3.84  |
| Female 75-79   | 1.83       | 1.21                    | 2.78  |
| Female 80-85   | 0.88       | 0.60                    | 1.30  |
| Female 85+   | 0.58       | 0.40                    | 0.84  |
| <b>Government Office Region (p&lt;.001)</b>          |            |                         |       |
| North East   | 1          |                         |       |
| North West   | 0.68       | 0.50                    | 0.92  |
| Yorkshire and the Humber                             | 0.88       | 0.64                    | 1.21  |
| East Midlands  | 1.06       | 0.76                    | 1.48  |
| West Midlands  | 0.99       | 0.72                    | 1.36  |
| East of England                                      | 1.31       | 0.94                    | 1.82  |
| London   | 1.30       | 0.93                    | 1.80  |
| South East   | 1.32       | 0.97                    | 1.80  |
| South West   | 1.28       | 0.92                    | 1.78  |
| <b>Highest educational qualification (p&lt;.001)</b> |            |                         |       |
| Degree or equivalent                                 | 1          |                         |       |
| A level/higher education below degree                | 1.01       | 0.83                    | 1.22  |
| O level or other                                     | 1.06       | 0.86                    | 1.31  |
| CSE or other   | 0.83       | 0.65                    | 1.07  |
| No qualifications                                    | 0.64       | 0.52                    | 0.79  |
| <b>White/non-white ethnicity (p&lt;.001)</b>         |            |                         |       |
| White  | 1          |                         |       |
| Non-white  | 0.42       | 0.33                    | 0.53  |

|   |      |      |      |
|---|------|------|------|
| <b>Housing tenure (p&lt;.001)</b>             |      |      |      |
| Own it outright                               | 1    |      |      |
| Buying it with the help of a mortgage or loan | 0.65 | 0.55 | 0.78 |
| Rent it                                       | 0.84 | 0.70 | 0.99 |
| <b>Self-assessed health (p&lt;.001)</b>       |      |      |      |
| Very good                                     | 1    |      |      |
| Good  | 0.72 | 0.56 | 0.93 |
| Fair  | 0.44 | 0.34 | 0.56 |
| Bad/very bad                                  | 0.57 | 0.43 | 0.75 |
| <b>Limiting long-term illness (p=.005)</b>    |      |      |      |
| No limiting long-term illness                 | 1    |      |      |
| Non limiting long-term illness                | 1.29 | 1.07 | 1.56 |
| Limiting long-term illness                    | 0.93 | 0.79 | 1.11 |
| <b>Number in household (p=.073)</b>           |      |      |      |
| 1   | 1    |      |      |
| 2   | 0.90 | 0.71 | 1.14 |
| 3   | 0.73 | 0.56 | 0.95 |
| 4   | 0.81 | 0.60 | 1.09 |
| <b>Financial unit type (p&lt;.001)</b>        |      |      |      |
| Single  | 1    |      |      |
| Couple, but finances separate                 | 1.05 | 0.81 | 1.35 |
| Couple with joint finances                    | 1.46 | 1.18 | 1.81 |
| <b>Activity status (p&lt;.001)</b>            |      |      |      |
| Retired/semi-retired                          | 1    |      |      |
| Employed                                      | 0.73 | 0.57 | 0.92 |
| Self-employed                                 | 0.62 | 0.47 | 0.83 |
| Unemployed, permanently sick/ disabled        | 0.58 | 0.45 | 0.76 |
| Looking after home or family                  | 0.65 | 0.48 | 0.89 |
| <b>Help needed with showcards (p&lt;.001)</b> |      |      |      |
| No help needed with showcards                 | 1    |      |      |
| Help needed with showcards                    | 0.42 | 0.33 | 0.53 |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only core members who had completed a full/partial wave 6 main interview were included in the model.
2. The data were weighted by the wave 5 main interview weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.

**Appendix Table E.2 Model of response to sexual activity self-completion questionnaire**

| Term   | Odds ratio | 95% confidence interval |       |
|--|------------|-------------------------|-------|
|  |            | Lower                   | Upper |
| <b>Age (at wave 6 interview)</b>                     |            |                         |       |
| <b>by sex (p&lt;0.001)</b>                           |            |                         |       |
| Male 50-55   | 1          |                         |       |
| Male 56-60   | 0.99       | 0.80                    | 1.22  |
| Male 61-64   | 1.11       | 0.88                    | 1.40  |
| Male 65-69   | 1.11       | 0.89                    | 1.39  |
| Male 70-74   | 0.96       | 0.75                    | 1.23  |
| Male 75-79   | 0.95       | 0.73                    | 1.24  |
| Male 80-84   | 0.77       | 0.57                    | 1.04  |
| Male 85+   | 0.45       | 0.32                    | 0.64  |
| Female 50-55   | 0.93       | 0.77                    | 1.13  |
| Female 56-60   | 1.24       | 1.00                    | 1.55  |
| Female 61-64   | 1.27       | 1.00                    | 1.60  |
| Female 65-69   | 1.49       | 1.18                    | 1.87  |
| Female 70-74   | 1.19       | 0.93                    | 1.52  |
| Female 75-79   | 1.00       | 0.78                    | 1.29  |
| Female 80-85   | 0.59       | 0.45                    | 0.78  |
| Female 85+   | 0.39       | 0.29                    | 0.53  |
| <b>Government Office Region (p&lt;.001)</b>          |            |                         |       |
| North East   | 1          |                         |       |
| North West   | 1.02       | 0.82                    | 1.28  |
| Yorkshire and the Humber                             | 1.43       | 1.12                    | 1.82  |
| East Midlands  | 1.34       | 1.05                    | 1.71  |
| West Midlands  | 0.93       | 0.73                    | 1.17  |
| East of England                                      | 2.01       | 1.58                    | 2.56  |
| London   | 1.55       | 1.22                    | 1.98  |
| South East   | 1.46       | 1.16                    | 1.82  |
| South West   | 1.25       | 0.99                    | 1.58  |
| <b>Highest educational qualification (p&lt;.001)</b> |            |                         |       |
| Degree or equivalent                                 | 1          |                         |       |
| A level/higher education below degree                | 1.08       | 0.93                    | 1.24  |
| O level or other                                     | 1.00       | 0.86                    | 1.17  |
| CSE or other   | 0.83       | 0.70                    | 1.00  |
| No qualifications                                    | 0.66       | 0.57                    | 0.76  |
| <b>White/non-white ethnicity (p&lt;.001)</b>         |            |                         |       |
| White  | 1          |                         |       |
| Non-white  | 0.32       | 0.26                    | 0.40  |
| <b>Marital status (p=.001)</b>                       |            |                         |       |
| Single   | 1          |                         |       |
| Married/in civil partnership                         | 1.28       | 1.07                    | 1.53  |
| Re-married   | 1.60       | 1.28                    | 2.00  |
| Separated/divorced                                   | 1.15       | 0.94                    | 1.42  |
| Widowed  | 1.25       | 1.00                    | 1.56  |

| <b>Self-assessed health</b>                   |      |      |      |
|---|------|------|------|
| <b>(p&lt;.001)</b>                            |      |      |      |
| Very good                                     | 1    |      |      |
| Good  | 0.89 | 0.75 | 1.05 |
| Fair  | 0.69 | 0.59 | 0.82 |
| Bad/very bad                                  | 0.82 | 0.69 | 0.97 |
| <b>Help needed with showcards (p&lt;.001)</b> |      |      |      |
| No help needed with showcards                 | 1    |      |      |
| Help needed with showcards                    | 0.38 | 0.31 | 0.47 |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only core members who had completed a full/partial wave 6 main interview were included in the model.
2. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.

# Model Of Response To Nurse visit/Blood samples

Appendix Table F.1 Model of response to nurse visit

| Term   | Odds ratio | 95% confidence interval |       |
|--|------------|-------------------------|-------|
|  |            | Lower                   | Upper |
| <b>Age (at wave 6 interview) by sex (p&lt;.001)</b>  |            |                         |       |
| Male 50-55   | 1          |                         |       |
| Male 56-60   | 1.03       | 0.80                    | 1.33  |
| Male 61-64   | 1.71       | 1.25                    | 2.34  |
| Male 65-69   | 1.04       | 0.76                    | 1.41  |
| Male 70-74   | 1.01       | 0.71                    | 1.43  |
| Male 75-79   | 1.11       | 0.75                    | 1.64  |
| Male 80-84   | 0.73       | 0.48                    | 1.10  |
| Male 85+   | 0.66       | 0.42                    | 1.04  |
| Female 50-55   | 0.93       | 0.74                    | 1.16  |
| Female 56-60   | 1.07       | 0.83                    | 1.38  |
| Female 61-64   | 1.28       | 0.94                    | 1.75  |
| Female 65-69   | 1.24       | 0.90                    | 1.71  |
| Female 70-74   | 1.20       | 0.84                    | 1.71  |
| Female 75-79   | 1.04       | 0.72                    | 1.51  |
| Female 80-85   | 0.71       | 0.49                    | 1.05  |
| Female 85+   | 0.52       | 0.35                    | 0.76  |
| <b>Government Office Region (p&lt;.001)</b>          |            |                         |       |
| North East   | 1          |                         |       |
| North West   | 0.68       | 0.51                    | 0.92  |
| Yorkshire and the Humber                             | 0.93       | 0.68                    | 1.28  |
| East Midlands  | 0.98       | 0.71                    | 1.36  |
| West Midlands  | 0.91       | 0.66                    | 1.24  |
| East of England                                      | 1.01       | 0.74                    | 1.38  |
| London   | 0.81       | 0.59                    | 1.11  |
| South East   | 1.14       | 0.84                    | 1.55  |
| South West   | 1.09       | 0.79                    | 1.49  |
| <b>Highest educational qualification (p&lt;.001)</b> |            |                         |       |
| Degree or equivalent                                 | 1          |                         |       |
| A level/higher education below degree                | 1.17       | 0.98                    | 1.40  |
| O level or other                                     | 1.07       | 0.89                    | 1.29  |
| CSE or other   | 1.10       | 0.87                    | 1.40  |
| No qualifications                                    | 0.72       | 0.60                    | 0.87  |
| <b>White/non-white ethnicity (p&lt;.001)</b>         |            |                         |       |
| White  | 1          |                         |       |
| Non-white  | 0.49       | 0.39                    | 0.61  |

|   |      |      |      |
|---|------|------|------|
| <b>Marital status (p=.007)</b>                              |      |      |      |
| Single  | 1    |      |      |
| Married/in civil partnership                                | 1.33 | 0.99 | 1.80 |
| Re-married  | 1.71 | 1.22 | 2.40 |
| Separated/divorced  | 1.37 | 1.07 | 1.77 |
| Widowed   | 1.38 | 1.05 | 1.81 |
| <b>Self-reported general health(p&lt;.001)</b>              |      |      |      |
| Very good   | 1    |      |      |
| Good  | 1.14 | 0.93 | 1.41 |
| Fair  | 0.68 | 0.55 | 0.83 |
| Bad/very bad  | 1.01 | 0.79 | 1.29 |
| <b>Limiting long-term illness (p=.015)</b>                  |      |      |      |
| No limiting long-term illness                               | 1    |      |      |
| Non limiting long-term illness                              | 1.25 | 1.05 | 1.49 |
| Limiting long-term illness                                  | 0.97 | 0.83 | 1.14 |
| <b>Financial unit type (p=.003)</b>                         |      |      |      |
| Single  | 1    |      |      |
| Couple, but finances separate                               | 0.65 | 0.50 | 0.86 |
| Couple with joint finances                                  | 0.81 | 0.62 | 1.06 |
| <b>Activity status (p&lt;.001)</b>                          |      |      |      |
| Retired/semi-retired  | 1    |      |      |
| Employed  | 0.64 | 0.52 | 0.79 |
| Self-employed   | 0.68 | 0.52 | 0.89 |
| Unemployed, permanently sick/ disabled                      | 0.68 | 0.52 | 0.88 |
| Looking after home or family                                | 0.64 | 0.49 | 0.84 |
| <b>Frequency does mild sports or activities (p&lt;.001)</b> |      |      |      |
| More than once a week                                       | 1    |      |      |
| Once a week   | 0.90 | 0.73 | 1.11 |
| One to three times a month                                  | 0.65 | 0.48 | 0.87 |
| Hardly ever, or never                                       | 0.54 | 0.45 | 0.64 |
| <b>Self-reported hearing (p&lt;.001)</b>                    |      |      |      |
| Excellent   | 1    |      |      |
| Very good   | 1.13 | 0.95 | 1.33 |
| Good  | 1.40 | 1.18 | 1.65 |
| Fair  | 1.43 | 1.17 | 1.76 |
| Poor  | 0.89 | 0.68 | 1.18 |
| <b>Whether ever smoked (p=.032)</b>                         |      |      |      |
| Never smoked  | 1    |      |      |
| Ever smoked   | 0.87 | 0.77 | 0.99 |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only core members who had completed a full/partial wave 5 main interview were included in the model.
2. The data were weighted by the wave 5 main interview weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.

**Appendix Table F.2 Model of response to blood sample**

| Term   | Odds ratio | 95% confidence interval |       |
|--|------------|-------------------------|-------|
|  |            | Lower                   | Upper |
| <b>Age (at wave 6 interview)</b>                     |            |                         |       |
| <b>by sex (p&lt;.001)</b>                            |            |                         |       |
| Male 50-55   | 1          |                         |       |
| Male 56-60   | 0.90       | 0.73                    | 1.12  |
| Male 61-64   | 1.19       | 0.93                    | 1.52  |
| Male 65-69   | 0.90       | 0.71                    | 1.13  |
| Male 70-74   | 0.77       | 0.60                    | 0.99  |
| Male 75-79   | 0.75       | 0.57                    | 0.97  |
| Male 80-84   | 0.60       | 0.44                    | 0.81  |
| Male 85+   | 0.58       | 0.41                    | 0.81  |
| Female 50-55   | 0.87       | 0.72                    | 1.06  |
| Female 56-60   | 0.83       | 0.67                    | 1.03  |
| Female 61-64   | 1.05       | 0.82                    | 1.33  |
| Female 65-69   | 1.16       | 0.92                    | 1.47  |
| Female 70-74   | 0.88       | 0.69                    | 1.12  |
| Female 75-79   | 0.78       | 0.60                    | 1.00  |
| Female 80-85   | 0.56       | 0.42                    | 0.74  |
| Female 85+   | 0.39       | 0.29                    | 0.52  |
| <b>Government Office Region</b>                      |            |                         |       |
| <b>(p&lt;.001)</b>                                   |            |                         |       |
| North East   | 1          |                         |       |
| North West   | 0.87       | 0.69                    | 1.10  |
| Yorkshire and the Humber                             | 0.98       | 0.77                    | 1.26  |
| East Midlands  | 1.08       | 0.84                    | 1.39  |
| West Midlands  | 1.09       | 0.85                    | 1.39  |
| East of England                                      | 0.92       | 0.73                    | 1.17  |
| London   | 0.83       | 0.65                    | 1.06  |
| South East   | 1.02       | 0.81                    | 1.29  |
| South West   | 1.12       | 0.88                    | 1.43  |
| <b>Highest educational qualification (p&lt;.001)</b> |            |                         |       |
| Degree or equivalent                                 | 1          |                         |       |
| A level/higher education below degree                | 1.24       | 1.08                    | 1.43  |
| O level or other                                     | 1.17       | 1.01                    | 1.36  |
| CSE or other   | 1.01       | 0.85                    | 1.22  |
| No qualifications                                    | 0.85       | 0.73                    | 0.99  |
| <b>White/non-white ethnicity</b>                     |            |                         |       |
| <b>(p&lt;.001)</b>                                   |            |                         |       |
| White  | 1          |                         |       |
| Non-white  | 0.54       | 0.44                    | 0.66  |
| <b>Self-assessed health</b>                          |            |                         |       |
| <b>(p&lt;.001)</b>                                   |            |                         |       |
| Very good  | 1          |                         |       |
| Good   | 1.04       | 0.87                    | 1.23  |
| Fair   | 0.68       | 0.58                    | 0.81  |
| Bad/very bad   | 0.74       | 0.61                    | 0.90  |
| <b>Limiting long-term illness</b>                    |            |                         |       |
| <b>(p=.034)</b>                                      |            |                         |       |
| No limiting long-term illness                        | 1          |                         |       |
| Non limiting long-term illness                       | 1.05       | 0.92                    | 1.20  |
| Limiting long-term illness                           | 0.87       | 0.77                    | 0.99  |

|  |             |      |      |
|--|-------------|------|------|
| <b>Number in household</b>                                   |             |      |      |
| <b>(p=.039)</b>  |             |      |      |
| 1  | <b>1</b>    |      |      |
| 2  | <b>1.00</b> | 0.88 | 1.12 |
| 3  | <b>0.85</b> | 0.72 | 1.01 |
| 4  | <b>0.82</b> | 0.68 | 0.98 |
| <b>Frequency does moderate sports or activities (p=.026)</b> |             |      |      |
| More than once a week  | <b>1</b>    |      |      |
| Once a week  | <b>0.95</b> | 0.82 | 1.10 |
| One to three times a month                                   | <b>0.93</b> | 0.76 | 1.12 |
| Hardly ever, or never  | <b>0.79</b> | 0.68 | 0.92 |
| <b>Frequency does mild sports or activities (p&lt;.001)</b>  |             |      |      |
| More than once a week  | <b>1</b>    |      |      |
| Once a week  | <b>0.84</b> | 0.71 | 0.99 |
| One to three times a month                                   | <b>0.85</b> | 0.66 | 1.10 |
| Hardly ever, or never  | <b>0.67</b> | 0.57 | 0.80 |
| <b>Self-reported hearing (p&lt;.001)</b>                     |             |      |      |
| Excellent  | <b>1</b>    |      |      |
| Very good  | <b>1.07</b> | 0.94 | 1.23 |
| Good   | <b>1.26</b> | 1.10 | 1.45 |
| Fair   | <b>1.39</b> | 1.18 | 1.63 |
| Poor   | <b>0.90</b> | 0.71 | 1.14 |
| <b>Whether ever smoked (p=.050)</b>                          |             |      |      |
| Never smoked   | <b>1</b>    |      |      |
| Ever smoked  | <b>0.91</b> | 0.82 | 1.00 |

*Notes:*

1. The dependent variable in the logistic regression model was 1 = response; 0 = non-response. Only core members who took part in the nurse visit were included in the model.
2. The data were weighted by the wave 6 nurse weight prior to running the model.
3. The p-value (quoted in parentheses) for each variable is based on a **Wald** test with the appropriate degrees of freedom.