NatCen
National Centre for Social Research

English Longitudinal Study of Ageing (ELSA), Wave 4 Nurse Dataset

User Guide

Version 1

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1 Introduction

The English Longitudinal Study of Ageing (ELSA) is a study of people aged 50 and over and their younger partners, who were living in private households in England at the time of the first wave of fieldwork (2002/2003). The sample was drawn from households that had previously responded to the Health Survey for England (HSE) in 1998, 1999 or 2001. As the study progresses, all of our respondents get older and our sample effectively ages, therefore the youngest people need to be replaced as they are no longer represented. In order that our sample continues to be representative, respondents aged 50 to 53[1] (and their older or younger partners) from HSE (Health Survey for England) 2001 - 2004 were sampled for inclusion at Wave 3 and respondents aged 50 to 74 (and their older or younger partners) from HSE 2006 were sampled for inclusion at Wave 4.

As a longitudinal study, the aim is to interview the same group of people each time to measure change in their health, economic and social circumstances. ELSA can complete the picture of what it means to grow older in the new century, and help us understand what accounts for the variety of patterns that are seen. More information about ELSA can be found in the User Guides for the core datasets for Waves 1, 2, 3 and 4 from the UK Data Archive, as well as online at: http://www.ifs.org.uk/elsa/.
There is a document also available from the Data Archive which shows all the ELSA materials that have been released:
"ELSA data and documentation currently available from the Data Archive".

This User Guide relates to the data deposited for the ELSA Wave 4 nurse visit, which was carried out between July 2008 and August 2009. Respondents were asked towards the end of their main Wave 4 interview if they agreed to a nurse visit. An appointment with the respondent was either set at the time by the interviewer or later by the nurses themselves. Respondents will receive a nurse visit every other Wave, and the next one is planned to be carried out with Wave 6 fieldwork, which is scheduled for 2012 - 2013.

ELSA is the result of collaboration between University College London, the Institute of Fiscal Studies, and the National Centre for Social Research (NatCen). Other academic collaborators are based at the Universities of Cambridge, Exeter and East Anglia, who provided expert advice on specific modules.

2 Data Collection Methods

The nurse interview comprised a personal face-to-face CAPI interview and the collection of a number of different measures. The nurse visit has been a feature of HSE since the survey was first carried out in 1991. When the nurse visit was incorporated into ELSA, most modules from the HSE nurse visit were kept and a number of new ones were added in. The modules that were taken from HSE were blood pressure, blood sample, standing and sitting height, weight, waist and hip measurement and lung function. The modules that were added were balance, leg raise, chair rise, grip strength, and the saliva log. The first three of these new measurements, taken alongside the walking speed measurement carried out in the main ELSA interview, form a battery of tests that

[1] The original intention for the Wave 3 Refreshment sample was to include those aged 50, 51, 52 and 53, however due to an error those aged 53 were excluded. Please see the W3 Technical report for further details about this. These 53 year olds have been included as part of the Wave 4 refreshment sample.

have been shown to be highly predictive of level of disability, future use of health care and mortality. These measures were adapted from the EPESE (Established Populations for Epidemiologic Studies of the Elderly) protocol, which looks at older cohorts and the development of disability. [2,3] The grip strength measure was taken from the Survey of Health, Ageing and Retirement in Europe (SHARE). [4]

The changes between HSE and ELSA were made because ELSA focuses on an older population. The collection of saliva, in order to measure cortisol, and the accompanying questionnaire was added because preliminary data from the Whitehall II study showed that cortisol levels are linked to social environments and ageing.[5]

The importance of reading out the questions in the interview *exactly as specified* was emphasised to the nurses. This was essential to ensure comparability of answers. The respondent was offered a copy of their results for several of the measures (blood pressure, height, weight, waist, hip and lung function). These were written on a "Respondent Measurement Record Card", which is archived along with this User Guide. The nurse was asked not to give any interpretation of the results except for blood pressure, and here the nurse was only asked to say whether the measurement was normal or high and, where necessary, whether the respondent should contact their GP.

With the respondent's consent, we also sent them a letter after their nurse visit, which showed whether the result of each of the analyses conducted on the blood was within or outside normal. If any results were out of range, respondents were told that they should contact their GP in the near future.

Again, with the respondent's consent we sent their blood pressure, lung function and blood sample results to their GP. The exact results for the blood analyses were included, and GPs were informed of the normal range for each analysis.

We aimed to send the results to respondents and their GPs within three months of the nurse visit, unless there was a clinical indication to do so more urgently.

For further information on the protocols for the nurse visit please see the "Nurse Project Instructions" which are archived with this User Guide.

3 Sample Design

The ELSA sample has been designed to represent people aged 50 and over, who were living in private households in England in the first wave of ELSA (2002/2003). Three years of the Health Survey for England (HSE) were selected as the sampling frame: 1998, 1999 and 2001. These

[2] Studenski S, Perera S, Wallace D, Chandler JM, Duncan PW, Rooney E, Fox M, Guralnik JM. 2003, 'Physical performance measures in the clinical setting', *J Am Geriatr Soc.,* 51, pp. 314-22.
[3] Kuh D, Hardy R, Butterworth S, Okell L, Richards M, Wadsworth M, Cooper C, Sayer AA. 2006, 'Developmental Origins of Midlife Physical Performance: Evidence from a British Birth Cohort ', *Am J Epidemiol*.
[4] http://www.share-project.org/, retrieved 12/7/2010.
[5] Cohen S, Schwartz JE, Epel E, Kirschbaum C, Sidney S, Seeman T. 2006, 'Socio-economic status, race, and diurnal cortisol decline in the Coronary Artery Risk Development in Young Adults (CARDIA) Study', *Psychosom Med*., 68, pp.41-50.

years were chosen because they were recent and could provide a sufficiently large sample size. ELSA used the core samples for these years, all of which were nationally representative.

At Wave 3 the ELSA sample was refreshed to make the sample representative of the youngest people, aged between 50 and 53[1]. The refreshment sample included new people from HSE 2001 - 2004 who were previously too young to join ELSA (or become an ELSA core member)[6] in 2002, but who were now aged 50 or over (i.e. people aged 50 to 53 and their older/younger partners). At Wave 4 the ELSA sample was further refreshed across a wider age range of 50 to 74 years. This refreshment sample included new people from HSE 2006 and their older/younger partners.

Households from these HSE survey years were selected for the study if at least one HSE interview was conducted with an eligible respondent in the household and they agreed to be re-contacted.

The Technical Report for Wave 3 contains further information about the first Refreshment Sample detailed above, and is available from the UK Data Archive. Please refer to the Methodology chapter of the Wave 4 Main Report or the Wave 4 Technical Report for more details about the Wave 4 refreshment sample. The Wave 4 Main Report will be launched in September 2010 and the Wave 4 Technical Report is forthcoming later in 2010.

Only core sample members who had a Wave 4 interview in person (i.e. not by proxy) were eligible for a nurse interview – this meant that there were **9,592** eligible respondents. Other types of sample member that appear in the main Wave 4 interview archived data set, i.e. partners, were permitted a nurse interview only if they requested one.

The number of eligible respondents who had a productive nurse interview is **8,218**, which is 85.7% of those eligible for a nurse visit. The dataset also contains information for **425** partners (who were not eligible but permitted an interview if requested).

4 Content of Nurse Visit

As with the ELSA main interview, the nurse interview was divided up into a number of modules. Further details about the modules in the main CAPI modules in the nurse visit are given in this section.

Below is a table giving an idea of the eligibility conditions for each module. These conditions are also explained in more detail in this section.

Module	Eligibility
Blood pressure	All except if: • Pregnant
Grip Strength	All
Blood Sample	All except if: • Had clotting or bleeding disorder or was on anti-coagulant drugs at time of interview • Had ever had a fit (including epileptic fit, convulsion or convulsion associated with

[6] A Small number of respondents who were previously classified in the original sample taken from HSE 2001 as a 'younger partner' became eligible under the Wave 3 Refreshment sample rules to become an ELSA Core Member. Please see the Wave 3 Technical Report for further details.

	high fever) • Were taking anticoagulant drugs (such as Warfarin, protamine or acenocoumarol). Additionally, respondents were asked to give a fasting blood sample unless they were: • Aged 80 or over • Diabetic and were on treatment • Considered to be malnourished or otherwise unfit to fast (information obtained from interviewer).
Standing and sitting height and Weight	All. Standing height and weight were not measured if the person was chairbound, too unsteady on their feet, or found standing painful. Weight was also not measured if the person weighed over 130kg.
Waist and Hip	All except if chairbound or have a colostomy or ileostomy.
Lung Function	All except if: • Had abdominal or chest surgery in the preceding 3 weeks • Had been admitted to hospital with a heart complaint in the preceding 6 weeks • Had eye surgery in the preceding 4 weeks • Pregnant • Have a tracheotomy.
Balance	Side by side stand – all Semi-tandem – if held side by stand for 10 sec. Full-tandem – if held semi-tandem for 10 sec.
Leg Raise	Eyes open - If aged 69 years or under and held side-by-side stand for 10 sec. Eyes shut - If held the leg raise with eyes open for 30 seconds.
Chair Rise	All
Saliva log	Only pre-selected respondents were eligible – please see Section 4.10 for details.

If a participant was uncomfortable performing any of the tests or if the nurse felt that a procedure was not safe for a given individual, the test should not have been performed.

4.1 Blood pressure

Three measurements were taken of systolic and diastolic pressure as well as pulse rate on the respondent's right arm while they were seated. The respondent was given advice if their results indicated a higher than normal reading. The nurses were instructed to give this advice based on the higher of the last two blood pressure readings – the first reading can be high, as people are sometimes nervous about having their blood pressure taken.

If you wish to compare the blood pressure results to earlier HSE ones, please note that Omron machines were used to take the readings in the ELSA Wave 4 nurse visit and in HSE from 2003 onwards. In HSE prior to 2003, Dinamap machines were used to take the readings. A conversion factor will need to be applied to the results, as the machines are not comparable. Please contact the ELSA or HSE data manager for more details (see Section 8 for contact details).

All respondents were eligible to have their blood pressure measured except those who were pregnant.

4.2 Grip strength

Three measurements of grip strength were taken on both the dominant and non-dominant hand. The respondent was asked which hand was their dominant one. The precise measure carried out was the isometric handgrip strength measure.

All respondents were eligible to have their grip strength measured.

Further details on the grip strength protocol can be found in the "Nurse Project Instructions" and also the "Scriptcard, Chair Rise & Grip Strength" (archived with this User Guide).

4.3 Blood sample

All sample members who gave consent were eligible for a blood sample to be taken. The only exceptions to this were people with clotting or bleeding disorders, people with a history of fits or convulsions, or people who were on anticoagulant drugs (e.g. Warfarin, protamine, acenocoumarol).

Respondents aged 80 or under were asked to fast before their nurse visit so a fasting blood sample could be taken. Respondents were not asked to fast if they had diabetes and were on treatment or if they were considered to be malnourished or otherwise unfit to fast (this information was obtained from the interviewer). Respondents who were asked to fast were given guidelines about when and what they could eat based on their appointment time. These guidelines can be found on the "Appointment Card" (archived with this User Guide).

In the nurse visit, respondents were asked when they had last eaten and, if this was in the last 24 hours, what they had eaten. The CAPI program used their responses to work out if they had fasted adequately. A respondent was considered to have fasted and therefore be eligible for a fasting blood sample if (see FASTELIG):

- They hadn't eaten or drunk anything (apart from water) on the day of their nurse visit OR
- They hadn't eaten or drunk anything (apart from water) in the past 5 hours and had only had a light meal (see appointment record card) or a piece of fruit or drink the last time they ate.

Blood was only taken from respondents on one occasion; so if they had fasted adequately (i.e. met one of the conditions above) then all the analytes for that person should be considered as a fasting sample, otherwise they were non-fasting samples. All the blood analytes (except blood glucose) were measured for all the blood samples (i.e. both fasting and non-fasting samples). Therefore, for some cases the lipids measures were on fasting samples and for others it was on non-fasting samples. If you are doing analyses that are dependent on the blood being a fasting sample, e.g. fasting lipids for metabolic syndrome or cardiac risk, please ensure that you only use the sub-sample of respondents who actually fasted (i.e. FASTELIG=1).

Blood glucose was only measured for people who had fasted.

Respondents were asked if they consented to DNA being extracted from their blood sample and stored for future analysis. A maximum of six small tubes of blood (ranging in size from 2ml to 6 ml) were collected for each respondent. 3 of these were collected from all respondents, an additional

tube was collected if the respondent had fasted, and the final 2 tubes were collected if the respondent consented to have their DNA analysed.

The blood samples were sent to an external laboratory where a number of analyses were carried out, and the levels of certain compounds in the blood were measured, which are detailed further below:

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 cholesterol – This is 'good' cholesterol, which is protective for heart disease.
Triglycerides - Together with total and HDL cholesterol, they provide a lipid profile that can give information on the risk of cardiovascular disease.
LDL cholesterol – This is 'bad' cholesterol; increased levels are associated with atherosclerosis, and thus myocardial infarctions, strokes and peripheral vascular disease.
Ferritin and Haemoglobin (Hb) – These are measures of iron levels in the body and are related to diet and other factors.
C-reactive protein (CRP) – The level of this protein in the blood gives information on inflammatory activity in the body, and it is also associated with risk of heart disease.
Apolipoprotein E (ApoE) – This is involved in the transport of cholesterol and plays a protective role.
Fasting glucose and non-fasting glycated haemoglobin (HBA1c) – Both indicate the presence or risk of type 2 diabetes, which is associated with an increased risk of heart disease. The fasting glucose result is now archived with this version of the data.
White blood cell count (WBC) and mean corpuscular haemoglobin (MCH) – When looked at in combination with ferritin and haemoglobin can indicate anaemia.

The samples were taken in a particular order so that if a situation arose where there was insufficient blood to fill all the tubes, the analyses with the highest priority could still be undertaken. The analyses in order of priority were fibrinogen, full lipids (total cholesterol, HDL cholesterol and triglycerides), ferritin, CRP, ApoE, fasting glucose (if applicable), haemoglobin, glycated haemoglobin, white cell count, mean corpuscular heamoglobin and finally DNA extraction (if consent was given).

Also included in the Blood Sample section of the data are two derived variables. The first, BSOUTC, shows whether taking a blood sample was attempted and, if so, how successful it was. The second, BLOODR, shows whether a blood sample was taken and, if so, whether all the blood tubes were received at the lab for analysis.
For further details about these variables, please see the derived variables section at the end of this User Guide.

4.4 Height and weight measurement

Height was measured both standing and sitting. Sitting height is a measure of pre-pubertal growth. If height or weight could not be measured then an estimate was obtained from the respondent instead. If the nurse thought the measurement was likely to be more than 2 cm (3/4 inch) from the true figure for height or more than 1 kg (2 lbs.) from the true figure for weight, it was considered unreliable and they were asked to code it as such.

The maximum weight that would register accurately on the scales was 130kg (20½ stone). If the nurse thought the respondent exceeded this limit then they were instructed to code “Weight not attempted” and ask the respondent for an estimate instead.

Users of the data are reminded to consider the variables HJREL and WJREL when looking at the measurements in this module as they show whether the data is likely to be reliable or not.

All respondents were eligible to have their height and weight measured.

Using the height and weight measurements obtained, BMI (body mass index) was calculated. This is a measure of body fat based on height and weight that applies to both men and women. BMI values were then grouped according to World Health Organisation definitions of obesity.

Further information on the protocols for the height and weight measurements can be found in the "Nurse Project Instructions" and also the "Frankfort Plane Card". These documents have been archived along with this User Guide.

4.5 Waist and hip measurement

Both these measurements were taken twice each, however, if the second measurement differed from the first by 3cm or more, the nurse was given an error message by the CAPI program and asked to either amend one of the previous responses, or to take a third measurement.
If the nurse believed that the measurements they took were 0.5cm more or less than the true measurement because of problems encountered (e.g. clothing the respondent was wearing), this was considered unreliable.

All respondents were eligible to have their waist and hip measurements taken, unless they were chairbound or had a colostomy or ileostomy.

Further information on the protocols for the waist and hip measurements can be found in the "Nurse Project Instructions" which has been archived along with this User Guide.

4.6 Lung function

Three measurements each were taken of FVC (forced vital capacity), FEV (forced expiratory volume) and PF (peak flow) using a spirometer.

It should be noted that the variables HTFVC and HTFEV (highest technically satisfactory values of FVC and FEV respectively) should not be combined to give a FEV/FVC ratio without checking that they are from the same blow.

All respondents were eligible to have their lung function measured, except for the following:

- Those who had had abdominal or chest surgery in the preceding 3 weeks
- Those who had been admitted to hospital with a heart complaint in the preceding 6 weeks
- Those who had had eye surgery in the preceding 4 weeks
- Those who were pregnant
- Those with a tracheotomy.

Further information on the protocols for the lung function measurement can be found in the "Nurse Project Instructions”, which has been archived along with this User Guide.

4.7 Balance

This module involved the respondent completing three stands (a side-by-side, a semi-tandem and a full-tandem), each of which was demonstrated to the respondent by the nurse beforehand.

The eligibility for the balance module is slightly more complex than for the other modules. All respondents start with the side-by-side, if they held this for 10 seconds they attempted the semi-tandem stand for 10 seconds. Respondents who completed this were then asked to do the full tandem stand. If the respondent was aged 69 and under they were asked to attempt the full tandem stand for 30 seconds; if they were 70 or over they were asked to do the full tandem stand for 10 seconds.

Further details on the balance protocols for each balance test can be found in the "Nurse Project Instructions" and also the "Scriptcard, Balance and Leg Raise". These documents have been archived along with this User Guide.

4.8 Leg rise

Only respondents aged 69 and under who successfully passed the side-by-side stand were asked to complete this module. They were asked to stand on one leg with their eyes open for 30 seconds and then, if they did this, they were asked to complete the same movement with their eyes closed for 30 seconds.

Further details on the leg raise protocol can be found in the "Nurse Project Instructions" and also the "Scriptcard, Balance and Leg Raise".

4.9 Chair rise

This is a measure of lower body strength, during which respondents were asked to stand up from a firm chair without using their arms. If they succeeded, they were asked to stand up and down as quickly as they could for either five rises if they were aged 70 and over, or up to ten rises if aged 69 and under. The nurse recorded the time that respondents took to do the number of rises required. For respondents who did ten rises, the nurse recorded the times taken to do both five and ten rises (in the same attempt) so that all respondents had a time for five rises which could be compared.

Further details on the chair rise protocol can be found in the "Nurse Project Instructions" and also the "Scriptcard, Chair Rise & Grip Strength".

All respondents were eligible for the chair rise.

4.10 Saliva log

All respondents from the Wave 4 refreshment sample were asked to give a saliva sample. We also selected 10% of respondents who gave a saliva sample at Wave 2 to give a further sample at Wave 4 (although we excluded anyone who wrote in their Wave 2 saliva logbook that they would not like to give a sample again in future).
Respondents who had been pre-selected to give saliva sample were asked to collect four samples of their saliva at certain times during a 24-hour period. The purpose of collecting saliva was to measure respondents' cortisol levels, which are related to stress. Respondents were asked to fill in a log book each time they collected a saliva sample that asked how they were feeling at that time. The saliva and log book data will be archived at a later date.

4.11 Other documents used in the data collection process

Filename	Description
Wave 4 Information Leaflet	Leaflet given to respondents containing general information about ELSA
Wave 4 Scriptcard, Chair Rise and Grip Strength	Protocol for Chair Rise and Grip Strength modules, which show the wording that the nurses used when describing the measures to the respondents.
Wave 4 Scriptcard, Balance and Leg Raise	Protocol for Balance and Leg Raise modules.
Wave 4 Respondent Measurement Record Card	Where the nurse recorded height, weight, waist, hip, lung function and blood pressure measurements for the respondent, if the respondent wished.
Wave 4 Respondent Grip Strength Record Card	Where the nurse recorded grip strength measurements, which was sent back to the office in order to check any discrepancies.
Wave 4 Genetics Leaflet.	Leaflet given to respondents about the collection of genetic material as part of the study and why it is being done.
Wave 4 Frankfort Plane Card	More detailed protocol about taking the height measurement.
Wave 4 Nurse Project Instructions	Detailed information about all aspects of the nurse visit, given to nurses to read before they carried out their interviews.
Wave 4 Nurse Leaflet	Leaflet given to respondents containing information about the ELSA nurse visit.
Wave 4 Appointment Record Card	Given to respondents to remind them of their appointment with the nurse and advise them how to prepare for it.
Wave 4 Consent booklets, Office and Respondent copies	The Office Consent Booklet contains the forms the respondent has to sign to give written consent for: - blood pressure readings to be sent to their GP - lung function readings to be sent to their GP - blood samples to be taken - blood test results to be sent to their GP - blood sample for storage for future analysis - blood sample for DNA extraction and storage - saliva samples to be collected. The Respondent Consent Booklet contains a copy of the different consents and permissions that the respondent was asked to sign during the interview, for their records.
Wave 4 Saliva Sample Logbook	Will be archived at a later date.
Questionnaire	An initial version of the questionnaire documentation has been archived with the data.

5 Data Preparation

In preparing the data for archiving, it was necessary to delete certain variables. The following types of variables have been deleted in order to reduce the potential to identify individuals and for other reasons (specified below):

1. Those containing text
2. Those which contained a personal identifier (e.g. name/address)
3. Those considered to be disclosive, such as:
    - Full interview date
    - Full date of birth
4. Timing variables
5. Variables that only contain missing values – excluded because not useful.

There are no geographical variables in either this or the main archived ELSA dataset. Various geographical variables are available under secure arrangements. Please contact the ELSA data manager at NatCen if you would like to request access to these variables.

A number of questions in the interview gave the nurse the opportunity to enter an 'other' answer. In the main ELSA interview, these 'other' responses were then back-coded into the original question where possible. Please note that no editing or back-coding has been done on this data, as the majority of the questions with 'other' responses have not been archived because they dealt with administrative information about conducting the tests. These responses may be looked at in more detail and back coded where possible for a future version of this dataset.

6 Weighting

There are two weighting variables included in the dataset: W4BLDWT and W4NURWT. The first of these applies to the blood sample results only, while the second applies to the rest of the data. They should be used when carrying out any analyses of this data. Only Core Sample members receive a weight.

Weights are necessary to adjust the composition of the responding sample so that it more accurately represents the population of interest. If appropriate weights are not applied then the survey estimates may be biased in favour of those who were more likely to participate in the survey and agree to a nurse visit/blood sample.

7 Variable List

This part of the document categorises all the variables included in the archived Wave 4 nurse dataset, and it is therefore easier to see the coverage of questions asked at this summary level. You will need to look at the other documentation to see in more detail exactly how the question was asked in the interview (see the full nurse visit questionnaire - an initial version of which has been archived with this data), or how a derived variable has been defined (see Appendix 1).

The source of each variable is indicated in the final column of each table of variables with abbreviations as follows:

Nurse	Nurse CAPI Questionnaire
Lab	Results from laboratory, i.e. from blood sample testing
Derived	A variable derived from other variables. Most of these are further detailed in Appendix 1: Derived variable specification
Weight	Weighting variable, to be used for analysis

7.1 Individual

Variable	Description	Source
IDAUNIQ	Unique individual serial number	*Identifier*
FINSTAT4	Final status after Wave 4 interview	*Identifier*
HHAGE	Age from dates of birth and nurse visit, used for eligibility for measures	Nurse
CONFAGE	Actual age at nurse visit – collapsed at 90 plus	Nurse
DOBYEAR	Year of birth, collapsed for those aged 90 or over	Derived
DHSEX	Respondent sex from household grid	Nurse

7.2 Nurse Admin

Variable	Description	Source
VISMON	Month of nurse visit	Derived
VISYEAR	Year of nurse visit	Derived
NQVER	Nurse questionnaire version	Nurse

7.3 Blood Pressure

Variable	Description	Source
BPCONST	BP: Consent to BP measurement	Nurse
CONSUBEA	BP: Whether respondent has eaten in the last 30 minutes	Nurse
CONSUBSM	BP: Whether respondent has smoked in the last 30 minutes	Nurse
CONSUBDR	BP: Whether respondent has drunk alcohol in the last 30 minutes	Nurse
CONSUBEX	BP: Whether respondent has done any vigorous exercise in the last 30 minutes	Nurse
CONSUBNO	BP: Whether respondent has done nothing that may affect their BP in the last 30 minutes	Nurse
CUFSIZE	BP: Cuff size used	Nurse
AIRTEMP	BP: Air temperature (centigrade)	Nurse
SYS1	BP: 1st Systolic reading (mmHg)	Nurse
DIAS1	BP: 1st Diastolic reading (mmHg)	Nurse
PULSE1	BP: 1st Pulse reading (bpm)	Nurse
MAP1	BP: 1st Mean Arterial Pressure (MAP) reading (mmHg)	Nurse
FULL1	BP: 1st set of BP readings are complete	Nurse
SYS2	BP: 2nd Systolic reading (mmHg)	Nurse
DIAS2	BP: 2nd Diastolic reading (mmHg)	Nurse

PULSE2	BP: 2nd Pulse reading (bpm)	Nurse
MAP2	BP: 2nd Mean Arterial Pressure (MAP) reading (mmHg)	Nurse
FULL2	BP: 2nd set of BP readings are complete	Nurse
SYS3	BP: 3rd Systolic reading (mmHg)	Nurse
DIAS3	BP: 3rd Diastolic reading (mmHg)	Nurse
PULSE3	BP: 3rd Pulse reading (bpm)	Nurse
MAP3	BP: 3rd Mean Arterial Pressure (MAP) reading (mmHg)	Nurse
FULL3	BP: 3rd set of BP readings are complete	Nurse
WHYNOBP	BP: Whether BP measurements attempted and not obtained or not attempted	Nurse
BPRESPC	(D) Whether BP readings are valid – not ate, drank, smoked or exercised recently	Derived
SYSVAL	(D) Valid Mean Systolic BP	Derived
DIAVAL	(D) Valid Mean Diastolic BP	Derived
PULVAL	(D) Valid Pulse Pressure	Derived
MAPVAL	(D) Valid Mean Arterial Pressure	Derived
RESPBPS	BP: Response to BP measurements	Nurse
NATTBPCO	BP: Full set of BP measurements not collected due to problems with computer	Nurse
NATTBPUP	BP: Full set of BP measurements not collected due to resp being upset/anxious	Nurse
NATTBPER	BP: Full set of BP measurements not collected due to error reading no equipment	Nurse
NATTBPCU	BP: Full set of BP measurements not collected due to problems with cuff fitting	Nurse
NATTBPEQ	BP: Full set of BP measurements not collected due to problems with equipment	Nurse
NATTBPOT	BP: Full set of BP measurements not collected due to other reason	Nurse
DIFBPCNO	BP: No problems in taking BP measurements	Nurse
DIFBPCLE	BP: Difficulty with taking BP measurements - reading taken on left arm	Nurse
DIFBPCUP	BP: Difficulty with taking BP measurements - resp upset/anxious/nervous	Nurse
DIFBPCCU	BP: Difficulty with taking BP measurements - problems with cuff fitting	Nurse
DIFBPCEQ	BP: Difficulty with taking BP measurements - problems with equipment	Nurse
DIFBPCER	BP: Difficulty with taking BP measurements - error reading on equipment	Nurse
DIFBPCOT	BP: Difficulty with taking BP measurements - other problem	Nurse

7.4 Grip Strength

Variable	Description	Source
MMGSWIL	Grip strength: Whether respondent is willing to have grip strength measured	Nurse
MMGSDOM	Grip strength: Dominant hand to be used for grip strength measurements	Nurse
MMGSSTA	Grip strength: Whether respondent is able to use both, one or neither hands	Nurse
MMGSD1	Grip strength: 1st measurement dominant hand (kg)	Nurse
MMGSN1	Grip strength: 1st measurement non-dominant hand (kg)	Nurse
MMGSD2	Grip strength: 2nd measurement dominant hand (kg)	Nurse
MMGSN2	Grip strength: 2nd measurement non-dominant hand (kg)	Nurse
MMGSD3	Grip strength: 3rd measurement dominant hand (kg)	Nurse
MMGSN3	Grip strength: 3rd measurement non-dominant hand (kg)	Nurse
MMGSTP	Grip strength: Position of respondent during grip strength measurements	Nurse
MMGSRES	Grip strength: Number of grip strength measurements obtained	Nurse
MMGSPRRE	Grip strength: Why none or only some measurements were obtained – resp refused	Nurse
MMGSPRPA	Grip strength: Why none or only some measurements were obtained – resp in pain	Nurse
MMGSPREQ	Grip strength: Why none or only some measurements were obtained – equipment fail	Nurse
MMGSPROT	Grip strength: Why none or only some measurements were obtained – other reason	Nurse

7.5 Blood Sample

Variable	Description	Source
CLOTB	Blood sample: Whether has clotting disorder	Nurse
FIT	Blood sample: Whether ever had a fit	Nurse
BSWILL	Blood sample: Consent to take blood sample	Nurse
FASTASK	Blood sample: Whether respondent was asked to fast	Nurse
FASTELI	Blood sample: Eligible for a fasting sample? - based on when and what last ate	Nurse
LIGHTEAT	Blood sample: What did respondent have to eat	
WHATEAT	Blood sample: Other thing that respondent had to eat (not specified in previous question)	Nurse

REFBSCDI	Blood sample: Why taking of blood sample was refused – previous difficulties	Nurse
REFBSCNE	Blood sample: Why taking of blood sample was refused – dislike/ fear of needles	Nurse
REFBSCTE	Blood sample: Why taking of blood sample was refused – recently had blood test	Nurse
REFBSCIL	Blood sample: Why taking of blood sample was refused – current illness	Nurse
REFBSCHI	Blood sample: Why taking of blood sample was refused – worried about HIV or AIDS	Nurse
REFBSCOT	Blood sample: Why taking of blood sample was refused – other reason	Nurse
SAMPTAK	Blood Sample: Whether any blood samples taken (incl. DNA samples)	Nurse
SAMDIFNO	Blood Sample: No problem in taking blood sample	Nurse
SAMDIFIN	Blood Sample: Problem in taking blood sample – incomplete sample	Nurse
SAMDIFVE	Blood Sample: Problem in taking blood sample – collapsing or poor veins	Nurse
SAMDIFSE	Blood Sample: Problem in taking blood sample – second attempt necessary	Nurse
SAMDIFFA	Blood Sample: Problem in taking blood sample – resp felt faint or fainted	Nurse
SAMDIFTO	Blood Sample: Problem in taking blood sample – unable to use tourniquet	Nurse
SAMDIFOT	Blood Sample: Problem in taking blood sample – other problem	Nurse
NOBSMSV	Blood Sample: Reason for not obtaining blood sample – no suitable vein	Nurse
NOBSMUP	Blood Sample: Reason for not obtaining blood sample – resp anxious/nervous	Nurse
NOBSMFA	Blood Sample: Reason for not obtaining blood sample – resp felt faint or fainted	Nurse
NOBSMOT	Blood Sample: Reason for not obtaining blood sample – other reason	Nurse
BSOUTC	(D) Outcome of blood sample (excludes DNA sample)	Derived

7.6 Blood Sample Results

Variable	Description	Source
CFIB	Blood fibrinogen level (g/l)	Lab
CHOL	Blood total cholesterol level (mmol/l)	Lab
HDL	Blood HDL level (mmol/l)	Lab
TRIG	Blood triglyceride level (mmol/l)	Lab
LDL	Blood LDL level (mmol/l)	Lab
RTIN	Blood ferritin level (ng/ml)	Lab
HSCRP	Blood CRP level (mg/l)	Lab
DHEAS	Blood dehydroepiandrosterone (DHEAS) level (umol/l)	Lab
IGF1	Blood insulin-like growth factor (IGF-1) level (nmol/l)	Lab
FGLU	Blood glucose level (mmol/L) - fasting samples only	Lab
HGB	Blood haemoglobin level (g/dl)	Lab
HBA1C	Blood glycated haemoglobin level (%)	Lab
WBC	White blood cell count (x 10^9 cells per litre)	Lab
MCH	Blood mean corpuscular haemoglobin level (pg/cell)	Lab
BLOODR	(D) Whether blood sample was taken and received by the lab	Derived

7.7 Height and Weight

Variable	Description	Source
RESPHTS	Standing height: Whether standing height measurement was attempted or obtained	Nurse
HEIGHT	Standing height: Standing height (cm) including unreliable measurements	Nurse
RESNHI	Standing height: Reason for refusal of height measurement	Nurse
EHTCH	Standing height: Whether estimated height will be in metric or imperial measures	Nurse
EHTM	Standing height: Estimated height (metres)	Nurse
EHTFT	Standing height: Estimated height (feet)	Nurse
EHTIN	Standing height: Estimated height (inches)	Nurse
ESTHT	Standing height: Final measured/estimated height (cm) incl. unreliable measures	Nurse
HTVAL	(D) Valid height (cm)	Derived
HTOK	(D) Whether height measure is valid	Derived
NOHTBCUN	Standing height: Reason for not obtaining height measurement – respondent is unsteady	Nurse
NOHTBCST	Standing height: Reason for not obtaining height measurement – resp cannot stand upright	Nurse
NOHTBCCH	Standing height: Reason for not obtaining height measurement – resp is chairbound	Nurse
NOHTBCBE	Standing height: Reason for not obtaining height measurement – resp is confined to bed	Nurse

NOHTBCSH	Standing height: Reason for not obtaining height measurement – resp is unable to remove shoes	Nurse
NOHTBCPA	Standing height: Reason for not obtaining height measurement – resp is ill or in pain	Nurse
NOHTBCEQ	Standing height: Reason for not obtaining height measurement – equipment unavailable	Nurse
NOHTBCOT	Standing height: Reason for not obtaining height measurement – other reason	Nurse
RELHITE	Standing height: Reliability of standing height measurement according to nurse	Nurse
HINREL	Standing height: Reason for standing height measurement to be unreliable	Nurse
SITHTRS	Sitting height: Whether sitting height measurement was attempted or obtained	Nurse
SITHGT	Sitting height measurement (cm)	Nurse
RESPWTS	Weight: Whether weight measurement was attempted or obtained	Nurse
WEIGHT	Weight (kg) including unreliable measures	Nurse
RESNWT	Weight: Reason for refusal of weight measurement	Nurse
EWTCH	Weight: Whether estimated weight will be in metric or imperial measures	Nurse
EWTKG	Weight: Estimated weight (kg)	Nurse
EWTST	Weight: Estimated weight (stone)	Nurse
EWTL	Weight: Estimated weight (lb)	Nurse
ESTWT	Weight: Final measured or estimated weight (kg) including unreliable measures	Nurse
WTVAL	(D) Valid weight (Kg) inc. estimated>130kg	Derived
WTOK	(D) Whether weight measure is valid	Derived
NOWTBCUN	Weight: Reason for not obtaining measurement – respondent is unsteady	Nurse
NOWTBCST	Weight: Reason for not obtaining measurement – respondent cannot stand upright	Nurse
NOWTBCCH	Weight: Reason for not obtaining measurement – respondent is chairbound	Nurse
NOWTBCBE	Weight: Reason for not obtaining measurement – respondent is confined to bed	Nurse
NOWTBCSH	Weight: Reason for not obtaining measurement – resp is unable to remove shoes	Nurse
NOWTBCHE	Weight: Reason for not obtaining measurement – resp weighs more than 130kg	Nurse
NOWTBCPA	Weight: Reason for not obtaining measurement – respondent is ill or in pain	Nurse
NOWTBCSC	Weight: Reason for not obtaining measurement – scales not working	Nurse
NOWTBCOT	Weight: Reason for not obtaining measurement – other reason	Nurse
FLOORC	Weight: Surface scales places on	Nurse
RELWAIT	Weight: Reliability of weight measurement	Nurse
BMI	(D) BMI - inc. unreliable measurements (kg/m^2)	Derived
BMIVAL	(D) Valid BMI - inc. estimated>130kg	Derived
BMIOK	(D) Whether BMI measure is valid	Derived
BMIOBE	(D) Valid BMI grouped according to WHO definitions	Derived

7.8 Waist and Hip

Variable	Description	Source
WHWILL	Waist/Hip: Consent to waist/hip measurements	Nurse
WAIST1	Waist: 1st waist measurement (cm)	Nurse
HIP1	Hip: 1st hip measurement (cm)	Nurse
WAIST2	Waist: 2nd waist measurement (cm)	Nurse
HIP2	Hip: 2nd hip measurement (cm)	Nurse
WAIST3	Waist: 3rd waist measurement (cm)	Nurse
HIP3	Hip: 3rd hip measurement (cm)	Nurse
WSTVAL	(D) Valid Mean Waist (cm)	Derived
HIPVAL	(D) Valid Mean Hip (cm)	Derived
WHVAL	(D) Valid Mean Waist/Hip ratio	Derived
WSTOKB	(D) Whether waist measurements are valid	Derived
HIPOKB	(D) Whether hip measurements are valid	Derived
WHOKB	(D) Whether waist/hip measure is valid	Derived
YNOWH	Waist/Hip: Reason why none or only some measurements were obtained	Nurse
RESPWH	Waist/Hip: Response to waist/hip measurements	Nurse
WHPNABCH	Waist/Hip: Reason for not obtaining waist and hip measurements – resp chairbound	Nurse
WHPNABBE	Waist/Hip: Reason for not obtaining waist and hip measurements – resp confined to bed	Nurse
WHPNABST	Waist/Hip: Reason for not obtaining waist and hip measurements – resp is stooped	Nurse
WHPNABPR	Waist/Hip: Reason for not obtaining waist and hip measurements – resp did not	Nurse

	understand	
WHPNABEM	Waist/Hip: Reason for not obtaining waist and hip measurements – resp sensitive about size	Nurse
WHPNABBU	Waist/Hip: Reason for not obtaining waist and hip measurements – no time	Nurse
WHPNABOT	Waist/Hip: Reason for not obtaining waist and hip measurements – other reason	Nurse
WJREL	Waist: Whether problems with waist measurement	Nurse
PROBWJ	Waist: Problems likely to increase/decrease waist measurement	Nurse
HJREL	Hip: Whether problems with hip measurement	Nurse
PROBHJ	Hip: Problems likely to increase/decrease hip measurement	Nurse

7.9 Lung Function Admin

Variable	Description	Source
HASURG	Lung function: Whether respondent had abdominal or chest surgery in last 3 weeks	Nurse
EYESURG	Lung function: Whether respondent has had eye surgery in the last 4 weeks	Nurse
HASTRO	Lung function: Whether admitted to hospital for heart complaint in last 6 weeks	Nurse
CHESTINF	Lung function: Whether respondent had any respiratory infection in last 3 weeks	Nurse
INHALER	Lung function: Whether used an inhaler/puffer in last 24 hours	Nurse
INHALHRS	Lung function: How many hours ago inhaler/puffer used	Nurse
LFWILL	Lung function: Willing to have lung function measured	Nurse
LFTEMP	Lung function: Air temperature (centigrade)	Nurse
FVC1	Lung function: 1st FVC reading (litres)	Nurse
FEV1	Lung function: 1st FEV reading (litres)	Nurse
PF1	Lung function: 1st PF reading (litres per minute)	Nurse
TECHNI1	Lung function: Whether respondent's technique was satisfactory for 1st reading	Nurse
FVC2	Lung function: 2nd FVC reading (litres)	Nurse
FEV2	Lung function: 2nd FEV reading (litres)	Nurse
PF2	Lung function: 2nd PF reading (litres per minute)	Nurse
TECHNI2	Lung function: Whether respondent's technique was satisfactory for 2nd reading	Nurse
FVC3	Lung function: 3rd FVC reading (litres)	Nurse
FEV3	Lung function: 3rd FEV reading (litres)	Nurse
PF3	Lung function: 3rd PF reading (litres per minute)	Nurse
TECHNI3	Lung function: Whether respondent's technique was satisfactory for 3rd reading	Nurse
NLSATLF	Lung function: Whether technique was satisfactory on any measurements	Nurse
HTFVC	Lung function: Highest technically satisfactory FVC reading (litres)	Nurse
HTFEV	Lung function: Highest technically satisfactory FEV reading (litres)	Nurse
HTPF	Lung function: Highest technically satisfactory PF reading (litres per minute)	Nurse
NOREAD	Lung function: No readings obtained	Nurse
YNOLF	Lung function: Reason why no measurements were obtained	Nurse
LFSTAND	Lung function: Measurements taken while standing or sitting?	Nurse
LFRESP	Lung function: How many technically correct blows were obtained	Nurse
PROBLFRE	Lung function: Reason why not all measurements were obtained – refused to continue	Nurse
PROBLFBR	Lung function: Reason why not all measurements were obtained – breathlessness	Nurse
PROBLFCO	Lung function: Reason why not all measurements were obtained – coughing fit	Nurse
PROBLFEQ	Lung function: Reason why not all measurements were obtained – equipment failed	Nurse
PROBLFOT	Lung function: Reason why not all measurements were obtained – other reason	Nurse
NOATTLF	Lung function: Reason why refused or no measurements obtained	Nurse
LFNOMEA	(D) Reason why lung function not measured	Derived

7.10 Balance

Variable	Description	Source
MMBCSC	May be prevented from balancing or standing up from chair due to health reasons	Nurse
MMSSSC	Side-by-side stand: Whether respondent feels it is safe to attempt stand	Nurse
MMSSRE	Side-by-side stand: Outcome	Nurse
MMSSTI	Side-by-side stand: Time position held (seconds)	Nurse
MMSSNA	Side-by-side stand: Reason not attempted	Nurse
MMSTSC	Semi-tandem stand: Whether respondent feels it is safe to attempt stand	Nurse
MMSTRE	Semi-tandem stand: Outcome	Nurse

MMSTTI	Semi-tandem stand: Time position held (seconds)	Nurse
MMSTNA	Semi-tandem stand: Reason not attempted	Nurse
MMFTSC	Full tandem stand: Whether respondent feels it is safe to attempt stand	Nurse
MMFTTI	Full tandem stand: Time position held (seconds)	Nurse
MMFTRE2	(D) Outcome of full tandem stand according to age	Derived
MMFTNA	Full tandem stand: Reason not attempted	Nurse

7.11 Leg Raise

Variable	Description	Source
MMLOSC	Leg raise (eyes open): Whether respondent feels it is safe to attempt it	Nurse
MMLORE	Leg raise (eyes open): Outcome	Nurse
MMLOTI	Leg raise (eyes open): Time leg raise held (seconds)	Nurse
MMLONA	Leg raise (eyes open): Reason not attempted	Nurse
MMLSSC	Leg raise (eyes shut): Whether respondent feels it is safe to attempt it	Nurse
MMLSRE	Leg raise (eyes shut): Outcome	Nurse
MMLSTI	Leg raise (eyes shut): Time leg raise held (seconds)	Nurse
MMLSNA	Leg raise (eyes shut): Reason not attempted	Nurse

7.12 Chair Rise

Variable	Description	Source
MMCRAV	Chair rise: Whether suitable chair available	Nurse
MMCRSC	Chair rise: Whether respondent feels it is safe to attempt single chair rise	Nurse
MMCRRE	Chair rise: Single chair rise outcome	Nurse
MMCRNA	Chair rise: Reason single chair rise not attempted	Nurse
MMRRSC	Chair rise: Whether respondent feels it is safe to attempt multiple chair rises	Nurse
MMRRRE	Chair rise: Outcome of multiple chair rises (number of rises completed)	Nurse
MMRRFTI	Chair rise: Time to complete 5 rises (seconds)	Nurse
MMRRTTI	Chair rise: Time to complete ten rises (seconds) - only eligible if under 70 yrs	Nurse
MMRROC	(D) Chair rise: Outcome of multiple chair rises, split by age	Derived
MMRRNA	Chair rise: Reason multiple chair rises not attempted	Nurse

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9 Appendix – Derived Variable and Recoding Specification

This section of the User Guide gives further detail about derived variables that are being archived and any existing variables that were re-coded or combined. In the case of many of the variables an explanation of the derivation is given as well as the SPSS syntax. Explanations of variables used in the derivations that haven't been archived are also provided.

9.1 DOBYEAR

This variable is the same as NDOBY (not archived - year of birth from the Nurse Data) but year of birth has been re-coded to –7 for everyone aged 90 or over (age from HHAGE). This is done as there are relatively few ELSA respondents over 90 and it is considered disclosive to give their actual year of birth.

```
compute dobyear=ndoby.
execute.
do if hhage>=90.
compute dobyear=-7.
end if.
execute.
variable label dobyear '(D) Year of birth, collapsed for those aged 90 or
over'.
value labels dobyear
-7 'Year of birth of respondent aged 90 or over'.
```

9.2 BPRESPC

The information from RESPBPS (the number of blood pressure readings obtained), FULL1-3 (whether blood pressure readings were ok) and CONSUB1-4 (whether the respondent did anything that might affect their blood pressure just before it was taken) is combined in this variable. This variable is a measure of whether the BP readings are *technically* valid, i.e. the respondent had not eaten, drunk, smoked, or exercised in the half hour prior to the measurement being taken.

```
RECODE respbps (1=1)(2,3=4)(4,5,6=5) into bprespc.
execute.
IF ANY(full,2,-8,-9) | ANY(full2,2,-8,-9) | ANY(full3,2,-8,-9) bprespc=4.
IF (respbps=1 & ANY(1,consubx1,consubx2,consubx3, consubx4)) bprespc= 2.
IF (respbps=1 & ANY(-9,consubx1,consubx2,consubx3, consubx4)) bprespc= 3.
IF (bpconst=1 & respbps=5) bprespc=4.
VARIABLE LABEL bprespc "(D) Whether BP readings are valid".
VALUE LABELS bprespc
  1 'Valid blood pressure measurement'
  2 'Ate, drank, smoked, exercised in previous half hour'
  3 'Not known if ate, drank, smoked or exercised'
  4 'Three valid readings not obtained'
  5 'Refused, attempted but not obtained, not attempted'.
execute.
```

9.3 DIAVAL, SYSVAL, MAPVAL and PULVAL

These variables give the mean of the second and third readings for diastolic, systolic, arterial pressure and pulse pressure. To clarify, the mean values for the four blood pressure measurements are calculated on the second and third measurements only, as the first measurement is often higher as respondents can be anxious about having their blood pressure taken. Only the *technically* valid readings are given in this variable (i.e. when the respondent had not eaten, drunk, smoked, or exercised in the half-hour prior to the measurement being taken).

```
do if respbps=1 and bprespc=1.
COMPUTE diaval=(dias2 + dias3)/2.
COMPUTE sysval=(sys2 + sys3)/2.
COMPUTE mapval=(map2 + map3)/2.
COMPUTE pulval=sysval-diaval.
end if.
VARIABLE LABELS diaval "(D) Valid Mean Diastolic BP".
VARIABLE LABELS sysval "(D) Valid Mean Systolic BP".
VARIABLE LABELS mapval "(D) Valid Mean Arterial Pressure".
VARIABLE LABELS pulval "(D) Valid Pulse Pressure".
recode diaval sysval mapval pulval (sysmis=-1).
add value labels diaval sysval mapval pulval
 -1 'Either invalid or incomplete set of BP readings obtained'.
```

9.4 BSOUTC

This variable combines information from SAMPF1 – 4 (not archived, these showed whether the blood sample tubes were filled or not) as well as CLOTB, FIT and BSWILL. It is an outcome variable for the blood sample. Please note that BSOUTC only equals 1 if **all** the blood samples were taken for this respondent (excluding the ones for DNA analysis), i.e. the respondent must have had a fasting blood sample.

```
compute bsoutc=-1.
execute.
if any (1, sampf1, sampf2, sampf3, sampf4) bsoutc=2.
if sampf1=1 and sampf2=1 and sampf3=1 and sampf4=1 bsoutc=1.
if sampf1=2 and sampf2=2 and sampf3=2 and sampf4=2 bsoutc=3.
if sampf1=2 and sampf2=2 and sampf3=-1 and sampf4=2 bsoutc=3.
if clotb=1 or fit=1 bsoutc=4.
if bswill=2 bsoutc=5.
execute.
variable labels bsoutc '(D) Outcome of blood sample (excludes DNA
sample)'.
value labels bsoutc
  1 'Full sample taken - all tubes at least partially filled'
  2 'Partial sample taken - at least one tube (partially) filled'
  3 'No sample taken - no tubes filled or partially filled'
  4 'Respondent not eligible due to clotting disorder or fit'
  5 'Respondent did not consent to sample being taken'.
```

9.5 BLOODR

This variable shows whether a respondent had a blood sample taken (excluding fasting bloods) and whether the lab then received the sample for analysis. In particular it highlights those respondents, whose blood samples were taken but not received.

```
compute bloodr=-1.
execute.
if chol~=-1 and hdl~=-1 and trig~=-1 and ldl~=-1 and rtin~=-1 and
hscrp~=-1 and dheas~=-1 and igf1~=-1 and hba1c~=-1 and cfib~=-1 and
hgb~=-1 and wbc~=-1 and mch~=-1 bloodr=1.
if any (-1, chol, hdl, trig, ldl, rtin, hscrp, dheas, igf1, hba1c, cfib,
hgb, wbc, mch) bloodr=2.
if chol=-1 and hdl=-1 and trig=-1 and ldl=-1 and rtin=-1 and hscrp=-1 and
dheas=-1 and igf1=-1 and hba1c=-1 and cfib=-1 and hgb=-1 and wbc=-1 and
mch=-1 bloodr=3.
if chol=-11 bloodr=4.
value labels bloodr
  1 'All bloods taken were received by lab'
  2 'Some bloods taken were not received by lab'
  3 'No bloods taken were received by lab'
  4 'No blood sample taken'.
variable labels bloodr '(D) Whether blood sample was taken and received
by the lab'.
```

9.6 HTOK

This variable combines information from RESPHTS (whether height was measured) and RELHITE (whether the nurse thought the height measurement was reliable). This variable is an indication of whether the height measurement was *technically* valid (i.e. whether the nurse considered the measure to have been reliable or not).

```
RECODE resphts (1=1)(2=3)(3=4)(4=5) (-1=-1) INTO htok.
IF relhite=3 htok=2.
VARIABLE LABELS htok "(D) Whether height measure is valid".
VALUE LABELS htok
  1 "Valid (according to nurse)"
  2 "Height not usable (not valid according to nurse)"
  3 "Refused"
  4 "Attempted but not obtained"
  5 "Not attempted".
```

9.7 WTOK

This variable combines information from RESPWTS (whether weight was measured) and RELWAIT (whether the nurse thought the weight measurement was reliable). This variable is an indication of whether the weight measurement was *technically* valid (i.e. whether the nurse considered the measure to have been reliable or not).

```
RECODE respwts (1=1)(2=3)(3=4)(4=5)(-1=-1) INTO wtok.
IF relwaitb=3 wtok=2.
```

```
VARIABLE LABELS wtok "(D) Whether weight measure is valid".
VALUE LABELS wtok
  1 "Valid (according to nurse)"
  2 "Weight not usable (not valid according to nurse)"
  3 "Refused"
  4 "Attempted but not obtained"
  5 "Not attempted".
```

9.8 HTVAL

This variable is the same as HEIGHT but excludes measurements that were considered to be unreliable by the nurse.

```
COMPUTE htval=-1.
IF htok=1 htval=height.
VARIABLE LABELS htval "(D) Valid height (cm)".
Value labels htval –1 ‘Not applicable’.
```

9.9 WTVAL

This variable is the same as WEIGHT but excludes measurements that were considered to be unreliable by the nurse. This variable also includes estimated weight (ESTWT) for respondents who weighed more than 130kg and could therefore not have their weight measured on the scales.

```
COMPUTE wtval=-1.
IF wtok=1 wtval=weight.
if range(estwt,130,500) & any(wtok,3,4,5) wtval=estwt.
VARIABLE LABELS wtval "(D) Valid weight (Kg) inc. estimated>130kg".
Value labels wtval –1 ‘Not applicable’.
```

9.10 BMI

This is a calculation of the body mass index, which is derived from height and weight. Please note that this variable includes measurements that were considered unreliable by the nurse.

```
COMPUTE bmi=-1.
IF height>0 & weight>0 bmi=(weight*100*100)/(height*height).
variable labels bmi '(D) BMI - inc unreliable measurements (kg/m2)'.
value labels bmi -1 "Not Applicable".
```

9.11 BMIVAL

This variable provides the body mass index (BMI) measurements that were considered to be reliable by the nurse. If the respondent’s height measurement was considered to be reliable (from HTOK) but the weight measurement was an estimate (necessary if the respondent’s weight was greater than 130kg, ESTWT), then BMI is calculated using these measurements.

```
COMPUTE bmival=-1.
IF (bmiok=1) bmival=bmi.
IF (range(estwt,130,500) & ANY(wtok,3,4,5) & htok=1)
```

```
  bmival=(estwt * 100 * 100)/(height * height).
VARIABLE LABELS bmival "(D) Valid BMI - inc estimated>130kg".
```

9.12 BMIOK

This variable combines information regarding the technical validity of the height and weight measurements (HTOK and WTOK respectively) into an indication of whether the BMI (body mass index) value that is derived from them is valid. Only respondents for whom both the height and weight measurements were considered to be reliable by the nurse are considered to have valid BMI measures.

```
IF ANY(1,htok) & wtok=1 bmiok=1.
IF ANY(2,htok,wtok) bmiok=2.
IF ANY(3,htok,wtok) bmiok=3.
IF ANY(4,htok,wtok) bmiok=4.
IF ANY(5,htok,wtok) bmiok=5.
IF htok=-1 bmiok=-1.
IF wtok=-1 bmiok=-1.
VARIABLE LABELS bmiok "(D) Whether BMI measure is valid".
VALUE LABELS bmiok
  1 "Valid (according to nurse)"
  2 "Height/weight not usable (not valid according to nurse)"
  3 "Height/weight refused"
  4 "Height/weight attempted but not obtained"
  5 "Height/weight not attempted".
```

9.13 BMIOBE

This variable contains technically valid body mass index (BMI) measurements (BMIVAL) grouped according to the current World Health Organisation definitions of obesity (see this webpage for further information).

```
recode bmival (0 thru 18.4=1) (18.5 thru 24.9=2) (25 thru 29.9=3) (30
thru hi=4) (lo thru-1=copy)
into bmiobe.
execute.
variable label bmiobe "(D) Valid BMI grouped according to WHO
definitions".
value labels bmiobe
  1 'Under 18.5, underweight'
  2 '18.5 or over but less than 25, normal range'
  3 '25 or over but less than 30, overweight: pre-obese'
  4 '30 or over, overweight: obese'.
```

9.14 WSTOKB

This variable shows which of the three waist measurements are valid. It is worked out initially as a re-coded version of RESPWH (whether waist and hip measurements are valid). Three temporary variables are created (XXST12, XXST13 and XXST23, not archived) which show the difference between each waist measurement. If the difference between the first and second measurements is 3cm or less, and the waist measurement is, at worst, only slightly unreliable (WJREL) then these

measurements are coded as usable. Similarly, the difference between the first and third, and second and third measurements is then considered. Note that some individual re-coding of cases which had 999.9 for one of their waist measurements was necessary.

```
RECODE respwh (1=1)(2=1)(3=8)(4=9)(-6,-2,-1=COPY) INTO wstokb.
COMPUTE xxwst12=abs(waist-waist2).
COMPUTE xxwst13=abs(waist-waist3).
COMPUTE xxwst23=abs(waist2-waist3).
IF respwh=1 & xxwst12<=3 & any(wjrel,1,2,3) wstokb=1.
DO IF respwh=1 & xxwst12>3.
COMPUTE wstokb=6.
IF xxwst13<=3 wstokb=2.
IF xxwst23<=3 wstokb=3.
END IF.
IF respwh=1 & xxwst12<=3 & xxwst13<=3 & xxwst23<=3 wstokb=4.
DO if respwh=1 or respwh=2.
If any(waist, -1, -2) & any(waist2, -1, -2) wstokb=7.
If any(waist, -1, -2) & any(waist3, -1, -2) wstokb=7.
If any(waist2, -1, -2) & any(waist3, -1, -2) wstokb=7.
End if.
IF ANY(wjrel,4,-9) wstokb=5.
execute.
VARIABLE LABELS wstokb "(D) Whether waist measurements are valid".
VALUE LABELS wstokb
  1 'Usable 1st & 2nd measurements'
  2 'Usable 1st & 3rd measurements'
  3 'Usable 2nd & 3rd measurements'
  4 'Usable 1st & 2nd & 3rd measurements'
  5 'Not useable: unreliable (according to nurse)'
  6 'Not useable: difference > 3cm'
  7 'Partial response'
  8 'Refused'
  9 'Not attempted or not obtained'.
execute.
```

9.15 WSTVAL

This variable gives the mean of the useable waist measurements (WSTOKB).

```
COMPUTE wstval=-1.
IF wstokb=1 wstval=(waist+waist2)/2.
IF wstokb=2 wstval=(waist+waist3)/2.
IF wstokb=3 wstval=(waist2+waist3)/2.
IF wstokb=4 wstval=(waist+waist2+waist3)/3.
VARIABLE LABEL wstval "(D) Valid Mean Waist (cm)".
Add value labels wstval –1 ‘Not applicable’.
```

9.16 HIPOKB

This variable shows which of the three hip measurements are valid. Its derivation is very similar to that of WSTOKB, in that the differences between the measures are assessed in temporary

variables (XXHIP12, XXHIP13, and XXHIP23, not archived), and it is then calculated which measurements are usable. Note that some individual re-coding of cases which had 999.9 for one of their hip measurements was necessary.

```
RECODE respwh (1=1)(2=1)(3=8)(4=9)(-6,-2,-1=COPY) INTO hipokb.
COMPUTE xxhip12=abs(hip-hip2).
COMPUTE xxhip13=abs(hip-hip3).
COMPUTE xxhip23=abs(hip2-hip3).
IF respwh=1 & xxhip12<=3 & any(hjrel,1,2,3) hipokb=1.
DO IF respwh=1 & xxhip12>3.
COMPUTE hipokb=6.
IF xxhip13<=3 hipokb=2.
IF xxhip23<=3 hipokb=3.
END IF.
IF respwh=1 & xxhip12<=3 & xxhip13<=3 & xxhip23<=3 hipokb=4.
do if respwh=1 or respwh=2.
if any (hip, -1, -2) & any (hip2, -1, -2) hipokb=7.
if any (hip, -1, -2) & any (hip3, -1, -2) hipokb=7.
if any (hip2, -1, -2) & any (hip3, -1, -2) hipokb=7.
end if.
IF ANY(hjrel,4,-9) hipokb=5.
execute.
VARIABLE LABELS hipokb "(D) Whether hip measurements are valid".
VALUE LABELS hipokb
  1 'Usable 1st & 2nd measurements'
  2 'Usable 1st & 3rd measurements'
  3 'Usable 2nd & 3rd measurements'
  4 'Usable 1st & 2nd & 3rd measurements'
  5 'Not useable: unreliable (according to nurse)'
  6 'Not useable: difference > 3cm'
  7 'Partial response'
  8 'Refused'
  9 'Not attempted'.
execute.
```

9.17 HIPVAL

This variable gives the mean of the useable hip measurements (HIPOKB).

```
COMPUTE hipval=-1.
IF hipokb=1 hipval=(hip+hip2)/2.
IF hipokb=2 hipval=(hip+hip3)/2.
IF hipokb=3 hipval=(hip2+hip3)/2.
IF hipokb=4 hipval=(hip+hip2+hip3)/3.
VARIABLE LABEL hipval "(D) Valid Mean Hip (cm)".
Add value labels hipval –1 ‘Not applicable’.
```

9.18 WHOKB

This variable draws on WSTOKB and HIPOKB to calculate the usability of the waist and hip measurements.

```
RECODE wstokb(-6,-2,-1=COPY) into whokb.
IF RANGE(wstokb,1,4) & RANGE(hipokb,1,4) whokb=1.
IF ANY(5,wstokb,hipokb) | ANY(6,wstokb,hipokb) whokb=2.
IF ANY(7,wstokb,hipokb) whokb=3.
IF ANY(8,wstokb,hipokb) whokb=4.
IF ANY(9,wstokb,hipokb) whokb=5.
VARIABLE LABELS whokb "(D) Whether waist/hip measure is valid".
VALUE LABELS whokb
  1 "Valid"
  2 "Waist/Hip not usable"
  3 "Waist/Hip partial response"
  4 "Waist/Hip refused"
  5 "Waist/Hip not attempted".
```

9.19 WHVAL

This variable gives the mean waist/hip ratio if both the waist and hip measurements are considered to be useable (WSTOKB and HIPOKB).

```
COMPUTE whval=-1.
IF whokb=1 whval=wstval/hipval.
VARIABLE LABEL whval "(D) Valid Mean Waist/Hip ratio".
Add value labels whval –1 ‘Not applicable’.
```

9.20 MMRROC

This variable was derived to clarify the outcome of the number of chair rises completed by age. It is based on MMRRRE. Respondents aged 70 or over were only asked to do 5 chair rises whereas younger respondents were asked to do 10 chair rises.

```
compute mmrroc=-1.
if mmrrre>4 and hhage>=69 mmrroc=1.
if mmrrre>-1 and mmrrre<5 and hhage>=69 mmrroc=2.
if mmrrre>-1 and hhage<=70 mmrroc=4.
if mmrrre=10 and hhage<=70 mmrroc=3.
if mmrrsc=2 mmrroc=5.
add value labels mmrroc
  1 'Completed 5 rises, respondent aged 70 or over'
  2 'Completed less than 5 rises, respondent aged 70 or over'
  3 'Completed 10 rises, respondent aged less than 70'
  4 'Completed less than 10 rises, respondent aged less than 70'
  5 'Not attempted - did not feel it was safe'
-1 'Not applicable - did not do single rise successfully'.
variable labels mmrroc '(D) Chair rise: Outcome of multiple chair rises,
split by age'.
```

9.21 LFNOMEA

This variable shows more clearly the reason why lung function was not measured.

```
compute lfnomea=-1.
if lfwill=-1 lfnomea=1.
if xlftemp=1 lfnomea=2.
if noread=1 or lfwill=3 lfnomea=3.
if lfwill=2 lfnomea=4.
variable labels lfnomea '(D) Reason why lung function not measured'.
add value labels lfnomea
 -1 'Not applicable'
  1 'Respondent ineligible for LF measurement for medical reasons'
  2 'Temperature too cold for LF measurement to take place'
  3 'Not attempted or obtained for reason other than refusal'
  4 'Respondent refused'.
```

9.22 MMFTRE2

This variable was derived to clarify the outcome of the full-tandem stand by age. It uses MMFTRE (not archived), which was the original outcome variable.

```
compute mmftre2=-1.
recode mmftre (3=5) into mmftre2.
do if hhage >=70.
recode mmftre (1=1) into mmftre2.
recode mmftre (2=2) into mmftre2.
end if.
do if hhage <70.
recode mmftre (1=3) into mmftre2.
recode mmftre (2=4) into mmftre2.
end if.
execute.
value labels mmftre2
 -1 "Ineligible - did not hold semi-tandem stand for 10 seconds"
  1 'Held for 10 seconds, respondent aged 70 or over'
  2 'Held for less than 10 seconds, respondent aged 70 or over'
  3 'Held for 30 seconds, respondent aged less than 70'
  4 'Held for less than 30 seconds, respondent aged less than 70'
  5 'Stand not attempted'.
variable labels mmftre2 '(D) Outcome of full tandem stand according to
age'.
```