

*Harmonization of Cross-National Studies
of Aging and Retirement Study
User Guide: Physical and Anthropometric
Measurement*

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Harmonization of Cross-National Studies of Aging to the Health and Retirement Study

USER GUIDE

Physical and Anthropometric Measurement

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Introduction

Identifying comparable measures across global aging surveys is essential for cross-country analysis. This guide provides an overview of the harmonization of the physical and anthropometric measurements across the surveys within the family of Health Retirement Studies (HRS). The surveys included are the Health and Retirement Study (HRS), Mexican Health and Aging Study (MHAS), English Longitudinal Study of Ageing (ELSA), Survey of Health, Ageing, and Retirement in Europe (SHARE), Korean Longitudinal Study of Aging (KLoSA), Japanese Study of Aging and Retirement (JSTAR), The Irish Longitudinal Study on Ageing (TILDA), China Health and Retirement Longitudinal Study (CHARLS), and Longitudinal Aging Study in India (LASI).

The measures we have reviewed in this guide include blood pressure and pulse rate, balance, walking speed, lung function, grip strength, leg raise, chair stand, height, weight, waist circumference, hip circumference, sitting height, knee height, vision, and hearing.

This guide is designed to provide researchers with documentation about the concepts, measures, questions, and protocols of particular physical and anthropometric domains in all HRS-family surveys. It summarizes, compares, and expands the information found in the codebooks, questionnaires, and data descriptions. We hope this guide accelerates scientific advances by helping researchers save time and better understand what can be studied within the HRS-family surveys.

This guide consists of the following chapters. In the first chapter, we describe the collection of physical measures data across studies. In the second chapter, we elaborate on the methodological issues of each measure across surveys. The third chapter presents questionnaires of each survey. The last chapter lists biomarker measurement protocols or nurse guides from each survey.

Executive Summary and Overview

This guide summarizes the data on physical and anthropometric measurements in the Health and Retirement Study (HRS) family studies. This includes HRS [Wave 7 (2004) through Wave 15 (2020)], MHAS [Wave 1 (2001) through Wave 5 (2018)], ELSA [Wave 1 (2002) through Wave 9 (2018)], SHARE [Wave 1 (2004) through Wave 8 (2019)]¹, KLoSA [Wave 1 (2006) through Wave 8 (2020)], JSTAR [Wave 1 (2007) through Wave 4 (2013)], TILDA [Wave 1 (2010) through Wave 5 (2018)], CHARLS [Wave 1 (2011) through Wave 4 (2018)], and LASI [Wave 1 (2017/19)]. The physical and anthropometric measures we have reviewed include blood pressure and pulse rate, balance, walking speed, lung function, grip strength, leg raise, chair stand, height, weight, waist circumference, hip circumference, sitting height, knee height, vision, and hearing. The following descriptions are the summary of each measure.

Blood Pressure and Pulse Rate

- All surveys except for KLoSA [HRS, MHAS, ELSA, SHARE (Germany Wave 4 only), JSTAR, TILDA, CHARLS, and LASI] measured the systolic and diastolic blood pressure of respondents.
- HRS, MHAS, ELSA, JSTAR, CHARLS, and LASI collected the pulse rate of respondents as well.
- Studies vary by number of measurements and preferred arm for measurement.

Balance

- HRS, ELSA, CHARLS, and LASI have three balance positions: semi-tandem, full-tandem, and side-by-side.
- In HRS, CHARLS, and LASI, conditional on the respondent's success in the initial semi-tandem stance, one of the two remaining balance positions were tested. In ELSA, respondents started with side-by-side, then semi-tandem if they completed side-by-side, and finally full-tandem, if they completed semi-tandem.

Walking Speed

- HRS, MHAS, ELSA, SHARE, CHARLS, and LASI measured the walking speed of respondents, with the length of walking courses varying from 2.5 to 4 meters.

¹ Some physical measures (height, waist circumference, and blood pressure) were only done in Germany in Wave 4.

- TILDA did a timed up-and-go test.

Lung Function

- HRS, CHARLS, and LASI took 3 measurements of peak flow rate using 30 second intervals. SHARE took 2 measurements of peak flow.
- ELSA used spirometry to collect forced vital capacity (FVC), forced expiratory volume (FEV) and peak flow (PF) information from three acceptable blows from each eligible respondent in Waves 2 and 4. In Wave 6, ELSA collected FVC and FEV from three measurements using a different spirometer than was used in Waves 2 and 4.

Grip Strength

- All surveys measured grip strength of respondents.
- Studies vary as to whether grip strength was measured in both hands or in the dominant hand only.

Leg Raise

- MHAS and ELSA conducted leg raise tests.
- These two studies differ in age eligibility, duration of the test, whether respondents need to close their eyes during the test, and whether respondents need to alternate legs.

Chair Stand

- Only ELSA, SHARE, and CHARLS ask respondents to complete chair stands.
- These studies differ in the number of chair stands and the sequence of completion.

Height

- HRS used inches, and MHAS, ELSA, SHARE (Germany Wave 4 only), JSTAR, TILDA, CHARLS, and LASI used centimeters as the unit for the height measurement.

Weight

- HRS used pounds, while MHAS, ELSA, TILDA, CHARLS, and LASI used kilograms as the unit for the weight measurement.

Waist Circumference

- HRS used inches, while MHAS, ELSA, SHARE, JSTAR, TILDA, CHARLS, and LASI used

centimeters for the waist circumference measurement.

- Studies differ in measurement protocols (at the level of navel vs. midway between the iliac crest and the costal margin).

Hip Circumference

- MHAS, ELSA, TILDA, and LASI measured hip circumference in centimeters. ELSA and TILDA measured hip circumference at least twice, while MHAS and LASI only measured it once.

Sitting Height

- Sitting height was measured in centimeters in MHAS, ELSA, and JSTAR.

Knee Height

- Knee height was measured in centimeters in MHAS and CHARLS.

Vision

- TILDA used LogMAR chart to measure visual acuity. LASI used the computer-assisted personal interview (CAPI) laptop to measure visual acuity.

Hearing

- In HRS, hearing was objectively tested using a HearCheck Device beginning in 2016.

1. Collection of Physical Measures across Surveys

1.1 HRS

The HRS administered a set of 5 physical measures in 2004, HRS Wave 7, which was only given to a random subsample of approximately 3,300 respondents. While all members of this sample were given the breathing and hand strength tests, smaller subsamples were given varying combinations of the walking test, and height and weight measurements.

Beginning in 2006, HRS Wave 8, a random one-half of the sample was pre-selected to complete an enhanced face-to-face interview, including the performance of the physical measures and collection of the biomarker measurements. This sample was selected at a household-level, and the request for these measures were made to the respondent and to their partner or spouse if applicable. Respondents who were selected for the enhanced face-to-face interview but who resided in a nursing home, were interviewed by proxy, or declined a face-to-face interview in place of a telephone interview were not asked to complete the physical measures or biomarkers. For those selected for an enhanced face-to-face interview, a consent form was administered by the interviewer. Due to the COVID-19 Pandemic, physical measures were not able to be collected in Wave 15.

Standardized physical measures and biomarkers were completed in the following order: blood pressure, lung function, handgrip strength, balance tests, timed walk, height, weight, and waist circumference. Starting in 2016, HRS Wave 13, a hearing test was added and was completed between the blood pressure and lung function measurements.

For more information about the physical measures and biomarker measurements collected by the HRS, see [*HRS: Documentation Report: Documentation of Physical Measures, Anthropometrics and Blood Pressure in the Health and Retirement Study*](#). You can find additional documentation on biomarkers and physical measures at <https://hrs.isr.umich.edu/documentation/user-guides>.

1.2 MHAS

In Waves 1 and 2, anthropometric measurements were collected from the same subsample of

approximately 2,500 respondents at the end of the core interview. In Wave 1, the measurements were collected in the following order: weight, height, waist circumference, hip circumference, calf circumference, knee height, and leg raise. In Wave 2, the measurements were collected in the same order, with the exception of a seated height taking the place of the calf circumference.

In Wave 3, a separate subsample was selected to collect anthropometric measurements, performance tests, and blood samples at the end of the core interview. This subsample consisted of the complete sample of 4 states. In Wave 3, the measurements were collected in the following order: first blood pressure, height, weight, waist, hip, sitting height, knee height, second blood pressure, leg raise, walking speed, grip strength, and blood sample. Anthropometric measurements were not collected in Waves 4 and 5.

For more information about the collection of anthropometric measurements, see the [*Manual of Procedures Anthropometrics and Biological Sample*](#).

1.3 ELSA

ELSA collects limited physical measures during the core interview and the majority of physical measures during nurse interviews. The walking speed test is collected in all waves at the end of the core interview. Additionally, weight is collected at the end of the core interviews in Waves 8 and 9.

ELSA invited the entire sample to participate in nurse interviews in Waves 2, 4, and 6. Half the sample was invited to participate in the nurse interview in Wave 8, with the remaining half invited to participate in Wave 9. As such, ELSA intends for these samples in Waves 8 and 9 to be analyzed together, similar to the samples in other even-numbered waves. During the nurse interview in Waves 2 and 4, measurements were collected in the following order: blood pressure, grip strength, blood sample, height, sitting height, weight, waist circumference, hip circumference, lung function, balance tests, leg raise, chair rise, and saliva sample. During the nurse interview in Wave 6, measurements were collected in the following order: blood pressure, grip strength, blood sample, height, weight, waist circumference, lung function, balance tests, leg raise, chair rise, and hair sample. In Waves 8 and 9, measurements were

collected in the following order: blood pressure, grip strength, and blood sample.

For more information on the nurse visits, see the [User Guide to the Nurse Visit Datasets Waves 2, 4, 6, 8, 9](#) or [VCS70 technical report Appendix B: Nurse Protocols](#).

1.4 SHARE

SHARE conducts physical measures in roughly the middle of the core interviews, except where otherwise noted. In Wave 1, SHARE conducted grip strength then walking speed measurements. In Wave 2, physical measures were collected in the following order: grip strength, lung function, walking speed, and chair stand. During the Wave 3 life history interview, grip strength was collected at the end of the interview. In Wave 4, grip strength and lung function were collected. Additional measurements were taken in Germany in the following order: height measurement, waist circumference, blood pressure, and blood spots. In Wave 5, grip strength, a blood sample, and chair stand measurements were collected. In Wave 6, grip strength, a blood sample, and lung function measurements were collected. In Wave 7, the majority of respondents completed a life history interview with a condensed questionnaire, while those who had completed a life history interview in Wave 3 were given a normal core interview. Grip strength was collected in Wave 7 in the second half of the interview. Grip strength was also collected in Wave 8.

For more information on the collection of physical measures and biomarkers in SHARE, see [SHARE: Scales and Multi-Item Indicators](#) or <https://share-eric.eu/data/data-set-details/biomarker>. For more information on the collection of physical measures and biomarkers in Germany in Wave 4, see [SHARE Wave 4: Innovations & Methodology. Chapter 4: Collection of Biomarkers in the Survey of Health, Ageing, and Retirement in Europe \(SHARE\)](#).

Munich: MEA, Max Planck Institute for Social Law and Social Policy.

1.5 KLoSA

Grip strength measurements have been taken during the core interview in all waves of KLoSA. In Wave 1, it is collected at the end of the health section in the first half of the interview. Starting in Wave 2, it is collected after the cognition section toward the middle of the interview.

For more information, see the 2007 KLoSA Wave 1 User Guide from the Userguide tab at <https://survey.keis.or.kr/eng/klosa/klosa01.jsp>.

1.6 JSTAR

In all waves, JSTAR collects grip strength measurements during the middle of the core interview. During the 5 City interview in Wave 2, additional measurements were collected in the first half of the interview. Early in the interview, height and seated height were collected. A little later in the first half of the interview, blood pressure and waist circumference were also collected.

For more information on the grip strength measurements, see [JSTAR First Results 2009 Report](#). For more information on the additional biomarkers collected in Wave 2, see the [5 City questionnaire](#).

1.7 TILDA

TILDA collects certain physical measures during health assessments conducted in Waves 1 and 3 and collects other physical measures in the core interview in Waves 2 and 4. In Waves 1 and 3, all respondents are invited to complete a health assessment at an assessment center, and those who are unable to do this are invited to do a shorter, home-based assessment. In Wave 1, the following physical measures were collected: height, weight, waist and hip circumference, grip strength, visual acuity, blood pressure, and a blood sample. In Wave 3, the following physical measures were collected: height, weight, waist and hip circumference, grip strength, visual acuity, blood pressure, blood sample, heel ultrasound, and gait assessment. In Waves 2 and 4, grip strength and timed up and go are conducted in the second half of the core interview. In Wave 5, only a timed up and go is conducted in the second half of the core interview.

For more information on the physical measures collected, see [The Irish Longitudinal Study on Ageing \(TILDA\), Wave 2, 2012-2013: TILDA Release Guide](#).

1.8 CHARLS

In Waves 1-3, CHARLS conducted a biomarker interview at the same time as the core interview.

Physical measures were collected in the following order: blood pressure, lung function, grip strength, balance tests, walking speed, chair stands, height, upper arm length, knee height, weight, and waist circumference.

For more information on the collection of physical measures, see the [*China Health and Retirement Longitudinal Study – 2011-2012 National Baseline Users' Guide*](#).

1.9 LASI

LASI collected biomarkers at the end of the core interview in Wave 1. Physical measures were collected in the following order: blood pressure, grip strength, balance tests, walking speed, vision tests, height, weight, waist circumference, hip circumference, lung function, and blood sample.

For more information on the collection of biomarkers, see the LASI Wave 1 questionnaire at <https://g2aging.org/downloads>.

2. Methodological Issues across Surveys

Establishing comparability of physical measures across surveys requires careful evaluation, as each survey may have subtle or even significant differences in how physical parameters are measured. In this chapter, we summarize the methodological similarities and differences for each physical measure across the surveys. Specifically, this section focuses on a few salient features that could potentially affect measurement results.

2.1 Blood Pressure and Pulse Rate

2.1.1 Measurement

HRS, MHAS, ELSA, SHARE (Germany, Wave 4 only), JSTAR, TILDA, CHARLS, and LASI measured the systolic and diastolic blood pressures of respondents (Table 1). HRS, MHAS, ELSA, JSTAR, CHARLS, and LASI collected the pulse rate of respondents as well.

KLoSA does not collect any blood pressure or pulse measurements.

2.1.2 Equipment

Omron monitors were used to measure blood pressure and pulse rate by many surveys. HRS used the OMRON HEM-780 Intellisense automated blood pressure monitor with ComFit cuff, TILDA used the OMRON Model M10-IT, CHARLS used the OMRON HEM-7112 monitor, and LASI used OMRON HEM-780 N monitor. No detailed model information of Omron monitors is available for MHAS, ELSA, and JSTAR. SHARE does not specify which blood pressure monitor was used.

2.1.3 Number of Measurements, Interval, and Measured Arms

HRS, CHARLS, and LASI took blood pressure and pulse measurements using the respondent's left arm 3 times, with 45 to 60 second intervals between measurements. SHARE measured 3 times with a 1-minute gap, but the protocol did not specify which arm was used. TILDA measured 2 times with a 1-minute gap using whichever arm was more convenient to the respondent. MHAS measured 2 times from the left arm, ELSA measured 3 times from the right arm, and JSTAR measured 3 times from the left arm, but the protocols do not specify the time gap between measurements.

2.1.4 Position

All surveys measure blood pressure and pulse in a sitting position if possible. Most surveys (HRS, MHAS, JSTAR, CHARLS, LASI) measure blood pressure and pulse on the left arm. ELSA measured blood pressure and pulse on the right arm, while TILDA used whichever arm was more convenient to the respondent, and SHARE does not specify which arm was used.

Table 1. Summary of Blood Pressure and Pulse Rate Measures in Each Survey

Topic	Survey	HRS	MHAS	ELSA	SHARE	JSTAR	TILDA	CHARLS	LASI
	Measured Wave	w8 - w14	w3	w2, w4, w6, w8/9	w4	w2	w1, w3	w1 - w3	w1
	Country	United States	Mexico	England	Germany only	Japan	Ireland	China	India
Blood Pressure and Pulse Rate	Measures	Systolic, Diastolic, Pulse	Systolic, Diastolic, Pulse	Systolic, Diastolic, Pulse	Systolic, Diastolic	Systolic, Diastolic, Pulse	Systolic, Diastolic	Systolic, Diastolic, Pulse	Systolic, Diastolic, Pulse
	Equipment	Omron HEM- 780; Intellisense automated blood pressure monitor, with ComFit cuff.	Electronic sphygmomanometer (OMRON)	Omron monitors	Electronic blood pressure monitor	OMRON machines	OMRON digital automatic blood pressure monitor (Model M10-IT) with arm cuff.	Omron HEM-7200 Monitor, Batteries, Stopwatch	OMRON HEM-780 N monitor
	Number of Measurements	3	2	3	3	3	2	3	3
	Interval	45 – 60 seconds	-	-	1 min	-	1 min	45 seconds	1 min
	Arms	Left arm	Left arm	Right arm	-	Left arm	Either arm (more convenient)	Left arm	Left arm
	Preferred Position	Seated, arm on a flat surface palm facing up so that the center of upper arm is at the same height as heart	Sitting in an armchair or with a table	Seated	Seated	Position (sitting position/ standing position/Other) can vary	Upright seated position, with arm on a table, asked not to talk or move	Seated, arm on a flat surface palm facing up so that the center of upper arm is at the same height as heart	Seated

"-": indicates this information was not provided by the study.

2.2 Balance

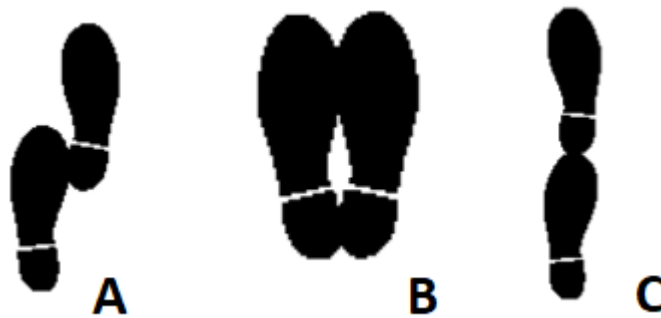
2.2.1 Measurement

HRS, ELSA, CHARLS, and LASI have three balance measures: semi-tandem, full-tandem, and side-by-side (Table 2). In HRS, CHARLS, and LASI, conditional on the respondents' success with the initial semi-tandem stance, one of the two remaining balance positions were tested. In ELSA, conditional on the respondents' success with the previous measure, from one to three positions were tested.

MHAS, SHARE, KLoSA, JSTAR, and TILDA did not conduct balance tests with respondents.

A semi-tandem stance is standing with the side of the heel of one foot touching the big toe of the other foot (Figure 1A). A side-by-side stance is standing with feet together, side-by-side (Figure 1B). A full-tandem stance is standing with the heel of one foot in front of and touching the toes of the other foot.

Figure 1.



2.2.2 Sequence

In HRS, CHARLS, and LASI, all respondents tried the semi-tandem stance first and then attempted either the full-tandem stance (if the respondent had successfully completed the semi-tandem stance) or side-by-side (if the respondent could not complete the semi-tandem stance). In ELSA, respondents started with side-by-side, then semi-tandem

if they completed side-by-side, and finally full-tandem, if they completed semi-tandem.

2.2.3 Equipment

HRS, CHARLS, and LASI used a diagram showing the foot positions for the different balance stands and a stopwatch. For ELSA, 3 balance positions were demonstrated by nurses.

2.2.4 Age and Duration

All surveys measured the semi-tandem and side-by-side stances for 10 seconds, regardless of the respondent's age. For full-tandem, age and duration vary across surveys. In HRS, CHARLS, and LASI, respondents aged 70 and above were asked to complete a full-tandem test for 30 seconds, while those who were younger than 70 were asked to complete 60 seconds. In ELSA, respondents below age 70 were asked to complete the full-tandem for 30 seconds, whereas respondents aged 70 or above were asked to do it for 10 seconds.

Table 2. Summary of Balance Measures in Each Survey

Topic	Survey	HRS	ELSA	CHARLS	LASI
	Measured Wave	w8 - w14	w2, w4, w6	w1 - w3	w1
	Country	United States	England	China	India
Balance	Measures	up to two of the following: Full tandem, Semi-tandem, Side-by-side	Side by side, Semi-tandem, Full tandem,	up to two of the following: Full tandem, Semi-tandem, Side-by-side	up to two of the following: Full tandem, Semi-tandem, Side-by-side
	Sequence	Semi-tandem and either full-tandem (if successful semi-tandem) or side-by-side (if not)	Side-by-side, semi-tandem (if complete side-by-side), full-tandem (if complete semi-tandem)	Semi-tandem and either full-tandem (if successful semi-tandem) or side-by-side (if not)	Semi-tandem and either full-tandem (if successful semi-tandem) or side-by-side (if not)
	Equipment	A diagram showing the foot positions for the different balance stands and a stop watch.	Each position was demonstrated by nurses	A show card showing the foot positions for the different balance stands and a stop watch.	A diagram showing the foot positions for the different balance stands and a stop watch.
	Age and Duration	Semi-tandem and side-by-side: 10 seconds; Full-tandem: 30 seconds (70+) / 60 seconds (under 70)	Semi-tandem and side-by-side: 10 seconds; Full-tandem: 10 seconds (70+) / 30 seconds (under 70)	Semi-tandem and side-by-side: 10 seconds; Full-tandem: 30 seconds (70+) / 60 seconds (under 70)	Semi-tandem and side-by-side: 10 seconds; Full-tandem: 30 seconds (70+) / 60 seconds (under 70)

2.3 Walking Speed

2.3.1 Measurement

HRS, MHAS, ELSA, SHARE, CHARLS, and LASI measured the walking speed of respondents. TILDA conducted a timed up-and-go test.

KLoSA and JSTAR did not measure the walking speed of respondents.

2.3.2 Equipment

HRS, ELSA, CHARLS, LASI, and TILDA used a stopwatch, tape measure (pre-marked at the specified length), and masking tape (to mark the course). TILDA also required the use of an arm chair. MHAS used a three-meter strip, stopwatch, and registration log. No information is available for SHARE, though it is presumably similar to the other studies.

2.3.3 Course Length and the Number of Measurements

HRS asked respondents aged 65 and older to walk a 98.5 inch (2.5 meter) course two times, on a clear, preferably non-carpeted area which is approximately 12 feet in length. In Wave 7 of HRS, this task was given to a random subsample of all ages. Respondents in MHAS were asked to walk a course 3 meters long two times. ELSA asked respondents aged 60 and older to walk 8 feet (2.4 meters) two times. SHARE asked respondents aged 76 and older in Wave 1 and 75 and older in Wave 2 to walk a 2.5 meter course two times. CHARLS asked respondents aged 60 and older to walk 2.5 meters two times, on a 4 meter long, non-carpeted area. LASI asked respondents to walk a 4-meter distance twice, at a normal speed, on a safe, flat surface free of any obstructions.

TILDA did a timed up-and-go test in which the respondent was asked to stand up from an arm chair, walk 3 meters, turn, walk back, and sit down one time.

Table 3. Summary of Walking Speed Measures in Each Survey

Topic	Survey	HRS	MHAS	ELSA	SHARE	TILDA	CHARLS	LASI
	Measured Wave	w7 - w14	w3	w1 - w9	w1, w2	w2, w4	w1 - w3	w1
	Country	United States	Mexico	England	20+European	Ireland	China	India
Walking Speed	Equipment	Stop watch, tape measure, masking tape	Three-meter strip, stopwatch, registration log	Stop watch, tape measure, masking tape	-	Armed chair, stop watch, tape measure, masking tape	Stop watch, tape measure, masking tape	Stop watch, tape measure, masking tape
	Course Length	98.5 inch (2.5 meters)	3 meters	8 feet (2.4 meters)	2.5 meters	3 meters (there and back)	2.5 meters	4 meters
	Number of Measurements	2	2	2	2	1	2	2
	Additional Specifications	A clear, preferably non-carpeted area, approximately 12 feet in length; Random subsample in w7; Aged 65+ starting in w8	-	Aged 60+	Aged 76+ in w1; Aged 75+ in w2	Timed up-and-go: stand from chair, walk 3 meters, turn, walk back, and sit down	A clear space about 4 meters long in a non-carpeted area; Aged 60+	A course on a safe, flat surface free of any obstructions

"-": indicates this information was not provided by the study.

2.4 Lung Function

2.4.1 Measurement

HRS and CHARLS took 3 measurements of peak flow with 30 second intervals using a peak flow meter. ELSA used spirometers to collect forced vital capacity (FVC), forced expiratory volume (FEV) and peak flow (PF) information from three acceptable blows from each eligible respondent (Table 4). After each attempt, the program advised the nurse whether the blow was acceptable. If it wasn't, the program instructed the nurse to ask the respondent to try again. At least 3 and up to 8 measurements were taken. LASI also used spirometers to collect forced vital capacity (FVC), forced expiratory volume (FEV), and the ratio of FEV1 to FVC (FEV1/FVC) from three acceptable blows, with minimum 30 second intervals, from each eligible respondent. At least 3 and up to 8 measurements were taken. Please note that LASI does not release this data at present. SHARE also measured peak flow at Waves 2, 4, and 6 but no detailed information is available.

MHAS, KLoSA, JSTAR, and TILDA did not measure the lung function of respondents.

2.4.2 Equipment

HRS and SHARE used a Mini-Wright Peak Flow Meter with a disposable mouthpiece. In ELSA, spirometers were used. However, cross-wave comparisons should be done with caution: at Wave 6, due to major technological advances, a different model of spirometer was used to measure lung function. This new model differed significantly from the model used at Waves 2 and 4 and so results across waves should be interpreted separately. CHARLS used an Everpure peak flow meter manufactured in China. LASI used a spirometer with a disposable mouthpiece with a filter.

Table 4. Summary of Lung Function Measures in Each Survey

Topic	Survey	HRS	ELSA	SHARE	CHARLS	LASI
	Measured Wave	w7 - w14	w2, w4, w6	w2, w4, w6	w1 - w3	w1
	Country	United States	England	20+European	China	India
Lung Function	Number of Measurements	3, 30 seconds apart	3 acceptable from up to 8 attempts	2	3, 30 second intervals	3 acceptable from up to 8 attempts
	Equipment	Mini-Wright Peak Flow Meter with a disposable mouthpiece	Spirometer (same model at w2 and w4, different model at w6)	Mini-Wright peak flow meter with a disposable mouthpiece	Everpure peak flow meter with a disposable mouthpiece	Spirometer with a disposable mouthpiece

2.5 Grip Strength

2.5.1 Measurement

All surveys measured the grip strength of respondents.

2.5.2 Equipment

HRS, SHARE, and LASI used a Smedley spring-type hand dynamometer. ELSA used the isometric handgrip strength measure. KLoSA used a TANATA 6103 model dynamometer. JSTAR used a Smedley-type Hand Grip Meter, No. 6103; TANITA, Tokyo, Japan. TILDA used a Baseline (Fabrication Enterprises Inc, White Plains, NY) hydraulic hand dynamometer which consists of a gripping handle with a strain-gauge and an analogue reading scale. CHARLS used a Yeujian WL-1000 dynamometer. MHAS did not provide detailed model information for the dynamometer used.

2.5.3 Number of Measurements, Sequence, and Measured Hand(s)

HRS, MHAS, SHARE, CHARLS, and LASI performed the measurement 2 times with each hand, beginning with the left hand, while KLoSA did two measurements of each hand, beginning with right hand. ELSA measured the grip strength of both hands three times. JSTAR took only 1 grip strength measurement, preferably from the dominant hand.

TILDA's methods of measurement change between waves. In Waves 1 and 3 during the health assessments, two values were recorded for each hand, starting with the non-dominant hand (4 values all together). In Waves 2 and 4 during the core interviews, only one measurement was attempted by the interviewer using the respondent's dominant hand. If the respondent was unable to use their dominant hand, for example due to pain or recent surgery, a measurement was taken using the non-dominant hand.

2.5.4 Position

In HRS, MHAS, TILDA, CHARLS, and LASI the respondents were asked to stand. In the majority of these studies, if the respondent was unable to stand, sitting or lying down was permitted. The respondent's position during the test was recorded in HRS, TILDA Waves 2 and 4, CHARLS, and LASI. In ELSA, SHARE, and KLoSA, no preferred position is

specified but the respondent's position during the grip strength test was recorded (standing; sitting; lying down). In ELSA and SHARE, the majority of respondents were standing, while in KLoSA, the majority of respondents were sitting. In JSTAR, respondents could either stand or sit as long as the arm was not moving.

Across studies, respondents were asked to hold the dynamometer at a right angle (or 90° angle) and squeeze the handle for several seconds.

Table 5. Summary of Grip Strength Measures in Each Survey

Topic	Survey	HRS	MHAS	ELSA	SHARE	KLoSA	JSTAR	TILDA	CHARLS	LASI
	Measured Wave	w7 - w14	w3	w2, w4, w6, w8/9	w1 - w8	w1 - w8	w1 - w4	w1 - w4	w1 - w3	w1
	Country	United States	Mexico	England	20+ European	S. Korea	Japan	Ireland	China	India
Grip Strength	Hands Measured	Both hands	Both hands	Both hands	Both hands	Both hands	Dominant hand	Both hands in w1/3; Dominant hand in w2/4	Both hands	Both hands
	Equipment	Smedley spring-type hand dynamometer	Dynamometer	Isometric handgrip strength measure	Smedley spring-type hand dynamometer	Dynamometer TANATA 6103 Model	Smedley-type Hand Grip Meter, No. 6103; TANITA, Tokyo, Japan	Baseline (Fabrication Enterprises Inc, White Plains, NY) hydraulic hand dynamometer	Yuejian WL-1000 dynamometer	Smedley spring-type hand dynamometer
	Number of Measurements	2	2	3	2	2	1	2 in w1/3; 1 in w2/4	2	2
	Sequence and Measured Hand	Left hand first, then right	Left hand first, then right	Non-dominant hand first, then dominant hand	Left hand first, then right	Right hand first, then left	Dominant hand (preferably)	Non-dominant first, then dominant in w1/3; Dominant hand in w2/4 (preferably)	Left hand first, then right	Left hand first, then right
	Preferred Position	Standing; Position recorded	Standing	Not specified, majority standing; Position recorded	Not specified, majority standing; Position recorded	Not specified, majority sitting; Position recorded	Standing or sitting position does not matter, as long as the arm is not moving	Standing, if not possible sit in an upright chair; Position recorded w2/4	Standing; Position recorded	Standing; Position recorded

2.6 Leg Raise

2.6.1 Measurement and Sequence

In MHAS, respondents were asked to stand on one leg (whichever the respondent feels the safest with) for 10 seconds and then try the same with the other leg for 10 seconds.

In ELSA, only respondents aged 69 and under who successfully completed the side-by-side stance were asked to complete the leg raise. They were asked to stand on one leg with their eyes open for 30 seconds and then, if successful, they were asked to complete the same movement with their eyes closed for 30 seconds.

HRS, SHARE, KLoSA, JSTAR, TILDA, CHARLS, and LASI did not conduct leg raise tests with their respondents.

2.7 Chair Stand

2.7.1 Measurement

ELSA asked all respondents 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 5 rises (age ≥ 70) or 10 rises (age < 70). A nurse recorded the times taken to complete each task.

SHARE asked respondents to stand up from a chair without using their arms. If they succeeded, they were asked to stand up and down as quickly as they could for 5 rises.

CHARLS asked respondents to stand up and down at their fastest pace five times without stopping. Respondents were also asked to do so without using arms.

HRS, MHAS, KLoSA, JSTAR, TILDA, and LASI did not conduct chair stands tests with their respondents.

Table 6. Summary of Leg Raise / Chair Stand Measures in Each Survey

Topic	Survey	MHAS	ELSA	SHARE	CHARLS
	Measured Wave	w1 - w3	w2, w4, w6	w2, w5	w1 - w3
	Country	Mexico	England	20+European	China
Leg Raise	Measures	Stand on one leg for 10 seconds and on the other leg for 10 seconds	Stand on one leg with eyes open for 30 seconds and, if complete, with eyes closed for 30 seconds (Aged ≤69 and held side-by-side stand for 10 seconds)	N/A	N/A
Chair Stands	Measures	N/A	Stand up from a chair. If completed, stand up and down 5 times (if ≥70)/ 10 times (if <70)	Stand up from a chair. If completed, stand up and down five times at fastest pace. (Under age 75 w2)	Stand up and down five times at fastest pace

"N/A": indicates this measure was not collected by the study.

2.8 Height

2.8.1 Unit of Measurement

HRS used inches, and MHAS, ELSA, SHARE, JSTAR, TILDA, CHARLS, and LASI used centimeter as the unit for height measurement.

KLoSA did not measure standing height.

2.8.2 Equipment

HRS, SHARE, and JSTAR used a tape measure, Rafter's square, an adhesive note and pencil for this measure. MHAS, ELSA, and CHARLS used a stadiometer. TILDA used a Seca 240 wall mounted measuring rod. LASI used a pocket stadiometer with spirit level bubble.

2.8.3 Potential Limitations Noted

HRS and JSTAR specify the floor type and whether the respondent was wearing shoes. LASI collects whether the respondent was wearing any artificial limbs.

2.9 Weight

2.9.1 Unit of Measurement

HRS used pounds, MHAS, ELSA, TILDA, CHARLS, and LASI used kilogram as the unit for weight measurement.

SHARE, KLoSA, and JSTAR did not measure weight.

2.9.2 Equipment

HRS used a Healthometer 830KL digital scale for this measure. MHAS used electronic portable scales. TILDA used a SECA electronic floor scale. CHARLS used a scale by a Chinese manufacturer, without any more detailed information. LASI used a Seca 803 digital weight measuring scale. No detailed equipment information is available from ELSA.

2.9.3 Potential Limitations Noted

HRS and CHARLS specify the floor type and whether the respondent was wearing shoes.

LASI records the presence of and measures the weight of any artificial limbs.

2.10 Waist Circumference

2.10.1 Unit of Measurement

HRS used inches, MHAS, ELSA, SHARE, JSTAR, TILDA, CHARLS, and LASI used centimeters for the waist circumference measurement.

KLoSA did not complete a waist circumference measurement.

2.10.2 Measurement Instruction

HRS, SHARE, JSTAR, CHARLS, and LASI measured waist circumference at the height of the navel. MHAS, ELSA, and TILDA measured waist circumference at the point midway between the iliac crest and the costal margin (lower rib).

ELSA nurses measured waist circumference twice. If the second measurement differed from the first by 3 cm or more, the nurse received an error message in the CAPI program and was prompted to either amend one of the previous responses if a mistake had been made entering a measurement, or to take a third measurement. MHAS also measured waist circumference twice. When there was doubt between the first and second measurement, a third measurement was taken to verify the result.

2.10.3 Potential Limitations Noted

HRS, JSTAR, and CHARLS indicate if the respondent wore bulky clothes during the waist measurement. ELSA indicates the potential effect (over- or under-measurement) of a waist measurement problem.

2.11 Hip Circumference

2.11.1 Unit of Measurement

MHAS, ELSA, TILDA, and LASI used centimeters as the unit for hip circumference.

HRS, SHARE, KLoSA, JSTAR, and CHARLS did not measure hip circumference.

2.11.2 Measurement Instruction

MHAS, ELSA, TILDA, and LASI defined the hip circumference as being the widest circumference over the buttocks (and below the iliac crest).

Similar to the waist circumference, ELSA measured hip circumference twice and prompted for corrections or a third measurement if necessary. TILDA also measured hip circumference twice and the larger value was recorded. A third measurement was taken if the difference between the first two measurements was greater than 3 cm. MHAS and LASI measured hip circumference only once.

2.11.3 Potential Limitations Noted

ELSA indicates the potential effect (over- or under-measurement) of a hip measurement problem. LASI indicates if difficulty was encountered during the measurement.

2.12 Sitting Height

2.12.1 Unit of Measurement

Sitting height was measured in centimeters in MHAS, ELSA, and JSTAR.

Sitting height was not measured in HRS, SHARE, KLoSA, JSTAR, CHARLS, or LASI.

2.12.2 Equipment

MHAS used a measuring tape and ruler to measure sitting height. While no detailed equipment information is available for ELSA or JSTAR, if measured similarly to standing height, ELSA likely used a stadiometer, and JSTAR likely used a tape measure, Rafter's square, an adhesive note and pencil.

2.12.3 Measuring Instruction

In MHAS, sitting height was defined as the distance between the vertex (top of the participant's head) and the lower parts of the pelvis (both ischia), which rest on the seat. No detailed equipment information is available for ELSA or JSTAR.

2.13 Knee Height

2.13.1 Unit of Measurement

Knee height was measured in centimeters in MHAS and CHARLS.

Knee height was not measured in HRS, ELSA, SHARE, KLoSA, JSTAR, TILDA, or LASI.

2.13.2 Equipment

MHAS used a fiberglass measuring tape and CHARLS used a Martin caliper.

2.13.3 Measuring Instruction

Both CHARLS and MHAS defined knee height as the distance between the heel to highest part of the knee (above the femoral epicondyles). MHAS measured the left leg, if possible, and CHARLS measured the right leg, if possible.

Table 7. Summary of Body Measurements in Each Survey

Topic	Survey	HRS	MHAS	ELSA	SHARE	JSTAR	TILDA	CHARLS	LASI
	Measured Wave	w7 - w14	w1 - w3	w2, w4, w6, w8/9	w4	w2 (5 city)	w1, w3	w1 - w3	w1
	Country	United States	Mexico	England	Germany only	Japan	Ireland	China	India
Height	Unit	inches	centimeters	centimeters (w2, w4, w6)	centimeters	centimeters	centimeters	centimeters	centimeters
Weight	Unit	pounds	kilograms	kilograms	N/A	N/A	kilograms	kilograms	kilograms
Waist Circumference	Unit	inches (w8+)	centimeters	centimeters (w2, w4, w6)	centimeters	centimeters	centimeters	centimeters	centimeters
	Measure Instruction	height of navel	midway between the iliac crest and the costal margin	midway between the iliac crest and the costal margin	height of navel	height of navel	midway between the iliac crest and the costal margin	height of navel	height of navel
Hip Circumference	Unit	N/A	centimeters	centimeters (w2, w4)	N/A	N/A	centimeters	N/A	centimeters
Sitting Height	Unit	N/A	centimeters	Centimeters (w2, w4, w6)	N/A	centimeters	N/A	N/A	N/A
Knee Height	Unit	N/A	centimeters (left leg, if possible)	N/A	N/A	N/A	N/A	centimeters (right leg, if possible)	N/A

"N/A": indicates this information was not asked by the study.

2.14 Vision

2.14.1 Method

TILDA used a LogMAR chart to measure visual acuity. LASI conducted distance and near vision tests on the programmed CAPI laptop to measure visual acuity for both eyes.

Vision was not tested in HRS, MHAS, ELSA, SHARE, KLoSA, JSTAR, or CHARLS.

2.14.2 Equipment and Measurement Protocol

TILDA used LogMAR (Minimal Angle of Resolution) charts designed to be used at 4 meters, employing a different chart for each eye starting with the right eye. The respondent was asked to stand behind the marked line on the floor, cover the eye not being tested, and slowly read each letter starting at the top left-hand corner and reading across, then moving to the line beneath and repeating until all letters were complete. If they were unable to read any letters, they were moved closer to the chart (1 m away) and the score was adjusted.

LASI first asked respondents if they could see light and count the fingers of a hand held two feet in front of their face with each eye open. If this was not possible, then vision tests were skipped for that eye. Respondents were asked to first test distance vision in their left eye then their right by indicating the direction the “E” was facing – up, down, left or right - while the CAPI screen was placed at a 3-meter distance. They were then asked to test near vision in their left eye then their right by indicating the direction the “E” was facing while the screen was at a distance of 40 centimeters.

2.15 Hearing Exam

2.15.1 Method

Starting in 2016 of the HRS, hearing was objectively tested using a HearCheck Device.

MHAS, ELSA, SHARE, KLoSA, JSTAR, TILDA, CHARLS, and LASI did not conduct a hearing exam.

2.15.2 Equipment and Measurement Protocol

In HRS, the HearCheck device was placed over the left ear and the respondent was asked to raise their finger each time they heard a sound. A second test was conducted on the same ear within 20 seconds of the conclusion of the first test. These tests were then repeated on the right ear. The first test was set at 1000 Hz and the second test was set at 3000 Hz.

Table 8. Summary of Vision and Hearing Measurements in Each Survey

Topic	Survey	HRS	TILDA	LASI
	Measured Wave	w13 - w14	w1, w3	w1
	Country	United States	Ireland	India
Vision	Method	N/A	LogMAR	CAPi laptop
Hearing Exam	Method	HearCheck Device	N/A	N/A

3. Questionnaire

To facilitate the cross-country comparisons, this section lists out all physical measure questions or coding information in each survey. Table 9 lists the variable names of each survey.

Table 9A. Inventory of Physical Measures across Surveys (HRS, MHAS, ELSA, SHARE, KLoSA)

Topic		HRS				MHAS		ELSA			SHARE				KLOSA	
		w7	w8 - w12	w13, w14	w15	w1, w2	w3	w1, w3, w5, w7	w2, w4, w6	w8/9	w1, w2	w3 (SHARELIFE)	w4	w5 - w8	w1-w8	
Blood pressure and Pulse Rate	Systolic	N/A	I859, I864, I869		N/A	N/A	SIST1_12, SIST2_12	N/A	sys1, sys2, sys3		N/A	N/A	b4_7_1s b4_7_2s b4_7_3s (Germany Only)	N/A	N/A	
	Diastolic		I860, I865, I870				DIAS1_12, DIAS2_12		dias1, dias2, dias3							
	Pulse		I861, I866, I871				PULSO1_12, PULSO2_12		pulse1, pulse2, pulse3							
	Arm Used		I872				N/A		N/A	N/A						
	Position		I874			N/A	N/A		N/A	N/A			N/A			N/A
	Activity Within 30 Minutes		I875 (w8-w11)	N/A					consub1, consub2, consub3							
	Compliance		I873 (w8-w11)	N/A					N/A	N/A						
Balance	Semi-tandem	N/A	I876, I879, I880	I876, I879, I880, I881	N/A	N/A	N/A	N/A	MMSTTI, MMSTRE	N/A	N/A	N/A	N/A	N/A	N/A	
	Side-by-side		I883, I886, I887	I883, I886, I887, I888					MMSSTI, MMSSRE							
	Full-tandem		I893, I896, I897	I893, I896, I897, I898					MMFTTI, MMFTRE, MMFTRE2							
	Compensatory Movements		I881, I888, I898						N/A							
	Floor Type		I899 (w8-w11)	N/A					N/A							
	Compliance		I891, I902 (w8-w11)	N/A					N/A							

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Table 9B. Inventory of Physical Measures across Survey Cont. (JSTAR, TILDA, CHARLS, LASI)

Topic		JSTAR		TILDA				CHARLS			LASI
		w1, w2 (2 city), w3, w4	w2 (5 city)	w1, w3	w2	w4	w5	w1	w2-w3	w4	w1
Blood pressure and Pulse Rate	Systolic	N/A	d2_002_3_a, d2_002_3_f, d2_002_3_k	BPseatedsystolic1, BPseatedsystolic2, BPseatedsystolicmean	N/A	N/A	N/A	LI859, LI864, LI869	QA003, QA007, QA011	N/A	BM006, BM010, BM014, BM017
	Diastolic		d2_002_3_b, d2_002_3_g, d2_002_3_l	BPseateddiastolic1, BPseateddiastolic2, BPseateddiastolicmean				LI860, LI865, LI870	QA004, QA008, QA012		BM007, BM011, BM015, BM018
	Pulse		d2_002_3_c, d2_002_3_h, d2_002_3_m	N/A				LI861, LI866, LI871	QA005, QA009, QA013		BM008, BM012, BM016, BM019
	Arm Used		d2_004_b	N/A				LI872	QA014		BM020
	Position		d2_004_c	N/A				LI874	QA016		BM021
	Activity Within 30 Minutes		N/A	N/A				LI875	QA017		BM002
	Compliance		N/A	N/A				LI873	QA015		BM022
Balance	Semi-tandem	N/A	N/A	N/A	N/A	N/A	N/A	LI879, LI880	QD002, QD003	N/A	BM038, BM039
	Side-by-side							LI886, LI887	QF002, QF003		BM042, BM043
	Full-tandem							LI896, LI897	QE002, QE003		BM049, BM050
	Compensatory Movements							LI881, LI898, LI888	QD004, QE004, QF004		BM040, BM044, BM051
	Floor Type							LI899, LI889	QE005, QF005		BM045, BM052

	Compliance							LI902	QE006		BM046, BM053
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Table 9C. Inventory of Physical Measures across Surveys Cont. (HRS, MHAS, ELSA, SHARE, KLoSA)

Topic		HRS				MHAS		ELSA			SHARE				KLOSA
		w7	w8 - w12	w13, w14	w15	w1, w2	w3	w1, w3, w5, w7	w2, w4, w6	w8/9	w1, w2	w3 (SHARELIFE)	w4	w5 - w8	w1-w8
Walking Speed	Walking speed	I820, I823, I824			N/A	N/A	TCAM1_12, TCAM2_12	MMWLKA, MMWLKB			ws010_, ws011_, ws012_, ws013_	N/A	N/A	N/A	N/A
	Type of Aid Used	I828					AYUDA1_12, AYUDA2_12	MMAID			ws017_				
	Floor Type	I825 (w7-w11)		N/A			N/A	MMRECR			ws015_				
	Compliance	N/A	I830 (w8-11)	N/A			N/A	N/A			N/A				
Lung Function	Lung Function	I804, I807, I808, I809			N/A	N/A	N/A	N/A	FVC1, FEV1, FVC2, FEV2, FVC3, FEV3	N/A	pf003_, pf004_ (w2)	N/A	pf003 pf004	pf003, pf004 (w6)	N/A
	Effort Level	I810							TECHNI1, TECHNI2, TECHNI3, LFRESP		pf005_ (w2)		pf005	pf005 (w6)	
	Position	I811							LFSTAND (w2,w4)		pf006_ (w2)		pf006	pf006 (w6)	
Grip Strength	Grip Strength:(kg)	I816, I851, I852, I853			N/A	N/A	MDER1_12, MDER2_12, MIZQ1_12, MIZQ2_12	N/A	MMGSD1, MMGSN1, MMGSD2, MMGSN2, MMGSD3, MMGSN3	N/A	gs006_ ; gs007_ ; gs008_ ; gs009_ ;	sl_gs006_ ; sl_gs007_ ; sl_gs008_ ; sl_gs009_ ;	gs006_ ; gs007_ ; gs008_ ; gs009_ ;		c507, c508, c509, c510
	Dominant/Measured Hand	I815					MANOF_12		MMGSDOM		gs004_	sl_gs004_	gs004_		c501
	Position	I818					N/A		MMGSTP		gs013_	sl_gs013_	gs013_		c511
	Effort Level	I817					N/A		N/A		gs012_ (w2)	sl_gs012_	gs012_		c513
	Rested Arm	I819					N/A		MMGSTP		gs014_ (w2)	sl_gs014	gs014_		N/A
Leg Raise	Eyes Open	N/A	N/A	N/A	N/A	L9_1, L9_2	PIEDER_12, PIEIZQ_12	N/A	MMLORE, MMLOTI	N/A	N/A	N/A	N/A	N/A ₃₈	N/A

	Eyes Closed							MMLSRE, MMLSTI						
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Table 9D. Inventory of Physical Measures across Survey Cont. (JSTAR, TILDA, CHARLS, LASI)

[illegible]

	Eyes Closed													
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Table 9E. Inventory of Physical Measures across Surveys Cont. (HRS, MHAS, ELSA, SHARE, KLoSA)

Topic		HRS				MHAS		ELSA			SHARE				KLOSA
		w7	w8 - w12	w13, w14	w15	w1, w2	w3	w1, w3, w5, w7	w2, w4, w6	w8/9	w1, w2	w3 (SHARELIFE)	w4	w5 - w8	w1-w8
Chair Stand	Chair Stand	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MMCRRE, MMRRFTI, MMRRROC, MMRRRE, MMRRTTI	N/A	cs004_, cs008_ (w2 only)	N/A	N/A	cs004_, cs008_ (w5)	N/A
Height	Height	I834			N/A	L4	ESTATU1_12, ESTATU2_12	N/A	HTVAL	N/A	N/A	N/A	b2_5 (Germany)	N/A	N/A
	Compliance	N/A	I903 (w8-w11)	N/A		N/A	N/A		N/A						
Weight	Weight	I838, I841			N/A	L3	PESO1_12, PESO2_12	N/A	WTVAL		N/A	N/A	N/A	N/A	N/A
	Floor Type	I842				N/A	N/A		FLOORC						
	Wore Shoes	I844				N/A	N/A		N/A	N/A					
	Compliance	N/A	I947	N/A		N/A	N/A		N/A	N/A					
Waist Circumference	Waist Circumference	N/A	I907		N/A	L5	CINTURA1_12, CINTURA2_12	N/A	WAIST1, WAIST2, WAIST3	N/A	N/A	N/A	b3_6 (Germany)	N/A	N/A
	Wore Bulky Clothing		I912			N/A	N/A		N/A				N/A		
	Compliance		I910 (w8-w11)	N/A		N/A	N/A		N/A				N/A		
Sitting Height		N/A	N/A	N/A	N/A	L7_1, L7_2 (w2)	ASENT1_12, ASENT2_12, ASILLA1_12, ASILLA2_12	N/A	SITHTRSP, SITHGT (w2, w4)	N/A	N/A	N/A	N/A	N/A	N/A
Knee Height		N/A	N/A	N/A	N/A	L8	rodilla1_12, rodilla2_12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vision		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hear Exam		N/A	N/A	I678, I679,	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

			I680, I681										
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Table 9F. Inventory of Physical Measures across Survey Cont. (JSTAR, TILDA, CHARLS, LASI)

Topic		JSTAR		TILDA				CHARLS			LASI
		w1, w2 (2 city), w3, w4	w2 (5 city)	w1, w3	w2	w4	w5	w1	w2-w3	w4	w1
Chair Stand	Chair Stand	N/A	N/A	N/A	N/A	N/A	N/A	LI003, LI004, LI005, LI006, LI007, LI008	QH003, QH005	N/A	N/A
Height	Height	N/A	d_015_3_b	height (w1), frheight (w3)	N/A	N/A	N/A	LI011	QI002	N/A	BM067
	Compliance	N/A	N/A	N/A	N/A	N/A	N/A	LI012	QI003		BM069
Weight	Weight	N/A	N/A	weight (w1), frweight (w3)	N/A	N/A	N/A	LI841	QL002	N/A	BM071, BM072, BM073
	Floor Type			N/A				LI842	QL003		N/A
	Wore Shoes			N/A				LI844	QL004		N/A
	Compliance			N/A				LI847	QL005		BM074
Waist Circumference	Waist Circumference	N/A	d2_007_3_a, d2_007_3_b	FRWAIST	N/A	N/A	N/A	LI907	QM002	N/A	BM076
	Wore Bulky Clothing		d2_009	N/A				LI912	QM005		BM077
	Compliance		N/A	N/A				LI910	QM004		N/A
Sitting Height		N/A	d_015_4_a, d_015_4_b	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Knee Height		N/A	N/A	N/A	N/A	N/A	N/A	LI019	QK002	N/A	N/A
Vision		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	BM060a, BM060b, BM061, BM062, BM063, BM064
Hear Exam		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

3.1 HRS

In this section, HRS coding information is collected based on Wave 9 (2008).

3.1.1 Blood Pressure and Pulse Rate

3.1.1.1 Systolic

LI859 BLOODPRESSURE 1 SYSTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V859_BloodPressure1_Systolic

BLOOD PRESSURE - 1st SYSTOLIC

First Reading SYSTOLIC

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

LI864 BLOODPRESSURE 2 SYSTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V864_BloodPressure2_Systolic

BLOOD PRESSURE - 2nd SYSTOLIC

Second Reading SYSTOLIC

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

LI869 BLOODPRESSURE 3 SYSTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V869_BloodPressure34_Systolic

BLOOD PRESSURE - 3rd SYSTOLIC

Third Reading SYSTOLIC

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

3.1.1.2 Diastolic

LI860 BLOODPRESSURE 1 DIASTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0 Ref:

SecI2.V860_BloodPressure1_DIASTOLIC

BLOOD PRESSURE - 1st DIASTOLIC

First Reading DIASTOLIC

LI865 BLOODPRESSURE 2 DIASTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V865_BloodPressure2_DIASTOLIC

BLOOD PRESSURE - 2nd DIASTOLIC

Second Reading DIASTOLIC

LI870 BLOODPRESSURE 3 DIASTOLIC

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V870_BloodPressure3_DIASTOLIC

BLOOD PRESSURE - 3rd DIASTOLIC

Third Reading DIASTOLIC

3.1.1.3 Pulse

LI861 BLOODPRESSURE 1 PULSE

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V861_BloodPressure1_Pulse

BLOOD PRESSURE - 1st Pulse

First Reading Pulse

LI866 BLOODPRESSURE 2 PULSE

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V866_BloodPressure2_Pulse

BLOOD PRESSURE - 2nd Pulse

Second Reading Pulse

LI871 BLOODPRESSURE 3 PULSE

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: SecI2.V871_BloodPressure3_Pulse

BLOOD PRESSURE - 3rd PULSE

Third Reading Pulse

3.1.1.4 Arm Used

LI872 BLOODPRESSURE ARM

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V872_BloodPressureArm

BLOOD PRESSURE - Arm

Which arm was used to conduct the measurements?

Answer:

1. LEFT ARM / 2. RIGHT ARM / 8. DK (Don't Know); NA (Not Ascertained) / 9. RF (Refused) / Blank. INAP (Inapplicable); Partial Interview

3.1.1.5 Position

None

3.1.1.6 Activities Within 30 Minutes

LI875 BLOODPRESSURE SMOKE ETC

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V875_BloodPressureSmokeEtc

BLOOD PRESSURE - SMOKE ETC.

Did R smoke, exercise, consume alcohol or food within the 30 minutes prior to completing the blood pressure test?

Answer:

1. YES 5. NO 8. DK (Don't Know); NA (Not Ascertained)

3.1.1.7 Compliance

LI873 BLOODPRESSURE COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V873_BloodPressureCompliance

BLOOD PRESSURE - COMPLIANCE

How compliant was R during this measurement?

Answer:

1.R WAS FULLY COMPLIANT; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN OR OTHER SYMPTOMS OR DISCOMFORTS; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS; Blank.INAP (Inapplicable); Partial Interview

3.1.2 Balance

3.1.2.1 Semi Tandem

LI876 BALANCE TEST - SEMI-TANDEM STAND

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V876_STSTAND

BALANCE TEST – SEMI-TANDEM STAND

Did R complete the semi-tandem stand?

Answer:

1. YES 5. NO

LI879 BALANCE TEST SEMI-TANDEM HOLD FULL TIME

Section: I Level: Respondent Type: Numeric Width: 4 Decimals: 0

Ref: SecI2.V879_SemiTandemHoldFullTime

BALANCE TEST - SEMI-TANDEM STAND

Did R hold semi-tandem stand for full 10 seconds without stepping out of place or grabbing hold of anything?

Answer:

1. YES 5. NO 993. R TRIED BUT WAS UNABLE 999. R CHOSE NOT TO DO IT 10849

LI880 BALANCE TEST SEMI-TANDEM TIME

Section: I Level: Respondent Type: Numeric Width: 6 Decimals: 2

Ref: SecI2.V880_SemiTandemTime

BALANCE TEST - SEMI-TANDEM STAND

Record time in seconds to two decimal places

LI881 BALANCE TEST SEMI-TANDEM COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V881_SemiTandemCompensatory

BALANCE TEST - SEMI-TANDEM STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during semi-tandem stand?

Answer:

1. YES 5. NO 8. DK (Don't Know); NA (Not Ascertained)

3.1.2.2 Side-by-side

LI883 BALANCE TEST S-B-S COMPLETE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V883_SideBySideComplete

BALANCE TEST - SIDE-BY-SIDE STAND

Did R complete the side-by-side stand?

Answer:

1. YES 5. NO

LI886 BALANCE TEST S-B-S HOLD FULL TIME

Section: I Level: Respondent Type: Numeric Width: 4 Decimals: 0

Ref: SecI2.V886_SideBySideHoldFullTime

BALANCE TEST - SIDE-BY-SIDE STAND

Did R hold side-by-side stand for full 10 seconds without stepping out of place or grabbing hold of anything?

Answer:

1. YES 5. NO 993. R TRIED BUT WAS UNABLE / 999. R CHOSE NOT TO DO IT

LI887 BALANCE TEST SIDE-BY-SIDE TIME

Section: I Level: Respondent Type: Numeric Width: 4 Decimals: 2

Ref: SecI2.V887_SideBySideTime

BALANCE TEST - SIDE-BY-SIDE STAND

Record time in seconds to two decimal places

LI888 BALANCE TEST SIDE-BY-SIDE COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V888_SideBySideCompensatory

BALANCE TEST - SIDE-BY-SIDE STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during side-by-side stand?

Answer:

1.YES 5. NO 8. DK (Don't Know); NA (Not Ascertained)

3.1.2.3 Full tandem

LI893 BALANCE TEST FULL TANDEM COMPLETE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V893_FullTandemComplete

BALANCE TEST - FULL TANDEM STAND

Did R complete the full tandem stand? Answer:

1. YES 5. NO

LI896 BALANCE TEST FULL TANDEM HOLD FULL TIME

Section: I Level: Respondent Type: Numeric Width: 4 Decimals: 0

Ref: SecI2.V896_FullTandemHoldFullTime

BALANCE TEST - FULL TANDEM STAND

Did R hold full tandem stand for full seconds without stepping out of place or grabbing hold of anything?

Answer:

1. YES 5. NO 993. R TRIED BUT WAS UNABLE 999. R CHOSE NOT TO DO IT

LI897 BALANCE TEST FULL TANDEM TIME

Section: I Level: Respondent Type: Numeric Width: 5 Decimals: 2 Ref:

SecI2.V897_FullTandemTime

BALANCE TEST - FULL TANDEM STAND

Record time in seconds to two decimal places

LI898 BALANCE TEST FULL TANDEM COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V898_FullTandemCompensatory

BALANCE TEST - FULL TANDEM STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during full tandem stand?

Answer:

1. YES; 5.NO ; 8.DK (Don't Know); NA (Not Ascertained)

3.1.2.4 Compensatory Movements

LI881 BALANCE TEST SEMI-TANDEM COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V881_SemiTandemCompensatory

BALANCE TEST - SEMI-TANDEM STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during semi-tandem stand?

1. YES ; 5. NO ; 8. DK (Don't Know); NA (Not Ascertained) ; Blank. INAP (Inapplicable); Partial Interview

LI888 BALANCE TEST SIDE-BY-SIDE COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V888_SideBySideCompensatory

BALANCE TEST - SIDE-BY-SIDE STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during side-by-side stand?

1. YES ; 5. NO ; 8. DK (Don't Know); NA (Not Ascertained) ; Blank. INAP (Inapplicable); Partial Interview

LI898 BALANCE TEST FULL TANDEM COMPENSATORY

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V898_FullTandemCompensatory

BALANCE TEST - FULL TANDEM STAND

Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during full tandem stand?

1. YES ; 5. NO ; 8. DK (Don't Know); NA (Not Ascertained) ; Blank. INAP (Inapplicable)

3.1.2.5 Floor type

LI899 BALANCE TEST FULL TANDEM FLOOR SURFACE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V899_FullTandemFloorSurface

BALANCE TEST - FULL TANDEM

Record type of floor surface

1. LINOLEUM/TILE/WOOD ; 2. LOW-PILE CARPET ; 3. HIGH-PILE CARPET ; 4. CONCRETE/brick ; 5. NOT SURE ; 7. OTHER (SPECIFY) ; 8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused) ; Blank. INAP (Inapplicable); Partial Interview

3.1.2.6 Compliance

LI891 BALANCE TEST S-B-S COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V891_SideBySideCompliance

BALANCE TEST - SIDE-BY-SIDE STAND

How compliant was R during this measurement?

1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; Blank. INAP (Inapplicable); Partial Interview

LI902 BALANCE TEST FULL TANDEM COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V902_FullTandemCompliance

BALANCE TEST – FULL TANDEM STAND

How compliant was R during this measurement?

Answer: 1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; 8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused) ; Blank. INAP (Inapplicable); Partial Interview

3.1.3 Walking Speed

3.1.3.1 Walking Speed

LI820 WALKING TEST COMPLETE AT LEAST ONE TRIAL

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V820_

WALKING TEST

Did R complete at least one trial of the walking test?

Answer:

1. YES; 5. NO

LI823 WALKING TEST 1ST TRIAL TIME

Section: I Level: Respondent Type: Numeric Width: 7 Decimals: 2

Ref: SecI2.V823_Twalk1sttrialtime

WALKING TEST – Time from first trial

Record time in seconds to two decimal places

FIRST TRIAL:

SECOND TRIAL:

Enter 993 if R was unable to do it; Enter 999 if R chose not to do it

LI824 WALKING TEST 2ND TRIAL TIME

Section: I Level: Respondent Type: Numeric Width: 5 Decimals: 2

Ref: SecI2.V824_Twalk2ndtrialtime

WALKING TEST – Time from second trial

Record time in seconds to two decimal places

FIRST TRIAL: [T walk 1st trial time]

SECOND TRIAL:

Enter 993 if R was unable to do it; Enter 999 if R chose not to do it

3.1.3.2 Help

LI828 WALKING AID TYPE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V828_Twalktypeofaid

WALKING TEST

Record type of aid used

Answer:

1. NONE; 2. WALKING STICK OR CANE ; 3. ELBOW CRUTCHES ; 4. WALKING FRAME; 7. OTHER (SPECIFY);
8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused)

3.1.3.3 Floor Type

LI825 T WALK FLOOR SURFACE

Section: I Level: Respondent Type: Numeric Width: 5 Decimals: 0

Ref: SecI2.V825_

WALKING TEST

Record type of floor surface

Answer: 1. LINOLEUM/TILE/WOOD ; 2. LOW-PILE CARPET ; 3. HIGH-PILE CARPET ; 4. CONCRETE/brick ; 5. NOT SURE ; 7. OTHER (SPECIFY) ; Blank. INAP (Inapplicable); Partial Interview

3.1.3.4 Compliance

LI830 WALKING TEST R EFFORT

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V830_TwalkReffort

WALKING TEST

How compliant was R during this measurement

Answer: 1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; Blank. INAP (Inapplicable); Partial Interview

3.1.4 Lung Function

3.1.4.1 Lung Function

LI804 BREATH COMPLETE AT LEAST ONE TRIAL

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V804_BreathTest

BREATHING TEST

Did R complete at least one trial of the breathing test?

LI807 PUFF TEST 1

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0 Ref:

Sec12.V807_Puff1

BREATHING TEST

FIRST READING:

SECOND READING:

THIRD READING:

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

User Note: Breathing test is measured in liters per min (L/Min).

LI808 PUFF TEST 2

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: Sec12.V808_Puff2

BREATHING TEST

FIRST READING: [Puff Test 1]

SECOND READING:

THIRD READING:

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

User Note: Breathing test is measured in liters per min (L/Min).

LI809 PUFF TEST 3

Section: I Level: Respondent Type: Numeric Width: 3 Decimals: 0

Ref: Sec12.V809_Puff3

BREATHING TEST

FIRST READING: [Puff Test 1]

SECOND READING: [Puff Test 2]

THIRD READING:

Enter 993 if R tried but was unable to do it.

Enter 999 if R chose not to do it.

User Note: Breathing test is measured in liters per min (L/Min).

3.1.4.2 Effort Level

LI810 R BREATHING TEST EFFORT

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V810_Reffort

BREATHING TEST

How much effort did the R give to this test?

Answer: 1. R GAVE FULL EFFORT ; 2. FULL EFFORT PREVENTED BY ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. FULL EFFORT NOT GIVEN, BUT NO OBVIOUS REASON FOR THIS ; 8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused)

3.1.4.3 Position

LI811 BREATHING TEST R POSITION

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V811_Rposition

BREATHING TEST

What was the r's position for this test?

Answer: 1. STANDING ; 2. SITTING ; 3. LYING DOWN ; 8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused)

3.1.5 Grip Strength

3.1.5.1 Grip Strength

LI816 LEFT HAND FIRST

Section: I Level: Respondent Type: Numeric Width: 6 Decimals: 1

Ref: SecI2.V816_leftfirst

HAND STRENGTH TEST

left hand, first measurement. LEFT

hand, FIRST measurement:

RIGHT hand, FIRST measurement:

LEFT hand, SECOND measurement:

RIGHT hand, SECOND measurement:

Enter the result to the nearest 0.5 kilogram.

Enter 9993 if R was unable to perform this measurement

Enter 9999 if R chose not to do it

LI851 RIGHT HAND FIRST

Section: I Level: Respondent Type: Numeric Width: 6 Decimals: 1

Ref: SecI2.V851_RIGHTfirst

HAND STRENGTH TEST

right hand, first measurement.

LEFT hand, FIRST measurement: [Left first]

RIGHT hand, FIRST measurement:

LEFT hand, SECOND measurement:

RIGHT hand, SECOND measurement:

Enter the result to the nearest 0.5 kilogram.

Enter 9993 if R was unable to perform this measurement

Enter 9999 if R chose not to do it

LI852 LEFT HAND SECOND

Section: I Level: Respondent Type: Numeric Width: 6 Decimals: 1

Ref: SecI2.V852_leftsecond

HAND STRENGTH TEST

left hand, second measurement.

LEFT hand, FIRST measurement: [Left first] RIGHT

hand, FIRST measurement: [RIGHT first] LEFT

hand, SECOND measurement:

RIGHT hand, SECOND measurement:

Enter the result to the nearest 0.5 kilogram.

Enter 9993 if R was unable to perform this measurement

Enter 9999 if R chose not to do it

LI853 RIGHT HAND SECOND

Section: I Level: Respondent Type: Numeric Width: 6 Decimals: 1

Ref: Sec12.V853_RIGHTSecond

HAND STRENGTH TEST

right hand, second measurement.

LEFT hand, FIRST measurement: [Left first] RIGHT

hand, FIRST measurement: [RIGHT first] LEFT

hand, SECOND measurement: [left second] RIGHT

hand, SECOND measurement:

Enter the result to the nearest 0.5 kilogram.

Enter 9993 if R was unable to perform this measurement

Enter 9999 if R chose not to do it

3.1.5.2 Dominant / Measured Hand

LI815 GRIP DOMINANT HAND

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: Sec12.V815_gripdominanthand

HAND STRENGTH TEST

Record r's dominant hand.

User Note: Grip strength is measured in kilograms. Answer: 1. RIGHT HAND; 2. LEFT HAND; 3. BOTH HANDS EQUALLY DOMINANT; 8. DK (Don't Know); NA (Not

Ascertained); 9. RF (Refused)

3.1.5.3 Position

LI818 HAND STRENGTH TEST R POSITION

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

SecI2.V818_Rposition

HAND STRENGTH TEST

What was the r's position for this test?

Answer: 1. STANDING; 2. SITTING; 3. LYING DOWN

3.1.5.4 Effort Level

LI817 GRIP R EFFORT

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

SecI2.V817_gripReffort

HAND STRENGTH TEST

How much effort did the R give to this test? Answer: 1. R GAVE FULL EFFORT; 2. FULL EFFORT PREVENTED BY ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS; 3. FULL EFFORT NOT GIVEN, BUT NO OBVIOUS REASON FOR THIS

3.1.5.5 Rested Arm

LI819 HAND STRENGTH REST ARM

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V819_

HAND STRENGTH TEST

Did the R rest their arm on a support while performing this test?

Answer: 1. YES ; 5. NO ; Blank. INAP (Inapplicable); Partial Interview

3.1.6 Leg Raise

None

3.1.6.1 Eye Open

None

3.1.6.2 Eye Closed

None

3.1.7 Chair Stand

None

3.1.8 Height

LI834 HEIGHT MEASUREMENT

Section: I Level: Respondent Type: Numeric Width: 5 Decimals: 2

Ref: SecI2.V834_Heightinches

HEIGHT

Enter respondent's height in inches. Round to the nearest quarter inch.

3.1.8.1 Compliance

LI903 HEIGHT COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V903_HeightCompliance

HEIGHT

How compliant was R during this measurement?

Answer: 1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; Blank. INAP (Inapplicable); Partial Interview

3.1.9 Weight

LI838 WEIGHT ABLE TO MEASURE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

SecI2.V838_

WEIGHT

Were you able to measure R's weight?

Answer: 1. YES; 5. NO; Blank. INAP (Inapplicable); Partial Interview

LI841 WEIGHT POUNDS MEASUREMENT

Section: I Level: Respondent Type: Numeric Width: 7 Decimals: 2 Ref:

Sec12.V841_Weightpounds

WEIGHT

Enter respondent's weight in pounds as recorded on scale (to the nearest ½ pound).

Enter 993 if R tried but received an error message.

Enter 999 if R chose not to do it.

3.1.9.1 Floor Type

LI842 WEIGHT FLOOR SURFACE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

Sec12.V842_WEIGHTFlooring

WEIGHT

Record type of floor surface

Answer: 1. LINOLEUM/TILE/WOOD; 2. LOW-PILE CARPET; 3. HIGH-PILE CARPET; 4. CONCRETE/brick; 5. NOT SURE; 7. OTHER (SPECIFY); Blank. INAP (Inapplicable); Partial Interview

3.1.9.2 Wore Shoes

LI844 WEIGHT WEARING SHOES

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

Sec12.V844_

WEIGHT

Was R wearing shoes during measurement?

Answer: 1. YES; 5. NO; Blank. INAP (Inapplicable); Partial Interview

3.1.9.3 Compliance

LI947 WEIGHT COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V947_WeightCompliance

WEIGHT

How compliant was R during this measurement?

Answer: 1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; Blank. INAP (Inapplicable); Partial Interview

3.1.10 Waist Circumference

LI907 WAIST MEASUREMENT

Section: I Level: Respondent Type: Numeric Width: 7 Decimals: 2 Ref:

SecI2.V907_WaistMeasurement

WAIST CIRCUMFERENCE -measurement

Enter respondent's Waist Circumference to the nearest quarter inch.

Enter 99993 if R tried but was unable to do it.

Enter 99999 if R chose not to do it.

3.1.10.1 Wore Bulky Clothing

LI912 WAIST BULKY CLOTHES

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0 Ref:

SecI2.V912_WaistBulkyClothes

WAIST CIRCUMFERENCE

Was R wearing bulky clothing during this measurement?

Answer: 1. YES; 5. NO; Blank. INAP (Inapplicable); Partial Interview

3.1.10.2 Compliance

LI910 WAIST COMPLIANCE

Section: I Level: Respondent Type: Numeric Width: 1 Decimals: 0

Ref: SecI2.V910_WaistCompliance

WAIST CIRCUMFERENCE

How compliant was R during this measurement?

Answer: 1. R WAS FULLY COMPLIANT ; 2. R WAS PREVENTED FROM FULLY COMPLYING DUE TO ILLNESS, PAIN, OR OTHER SYMPTOMS OR DISCOMFORTS ; 3. R WAS NOT FULLY COMPLIANT, BUT NO OBVIOUS REASON FOR THIS ; Blank. INAP (Inapplicable); Partial Interview

3.1.11 Hip Circumference

None

3.1.12 Sitting Height

None

3.1.13 Knee Height

None

3.1.14 Vision

None

3.1.15 Hearing Exam

Conducted in Wave 13 (2016) and Wave 14 (2018) only)

I678_HrLTest1

LEFT EAR – TEST 1, 1000 Hz

Enter the number of times the R raised their finger during test 1 (1000 Hz)

Enter 993 if you were unable to complete this test

Enter 999 if R chose not to do it

I679_HrLTest2

LEFT EAR – TEST 2, 3000 Hz

Enter the number of times the R raised their finger during test 2 (3000 Hz)

Enter 993 if you were unable to complete this test

Enter 999 if R chose not to do it

I680_HrRTest1

RIGHT EAR – TEST 1, 1000 Hz

Enter the number of times the R raised their finger during test 1 (1000 Hz)

Enter 993 if you were unable to complete this test

Enter 999 if R chose not to do it

I681_HrRTest2

RIGHT EAR – TEST 2, 3000 Hz

1) Enter the number of times the respondent raised their finger during test 2 (3000 Hz)

2) Remove the disposable ear cup

Enter 993 if you were unable to complete this test Enter

999 if R chose not to do it

3.2 MHAS

In this section, MHAS coding information is collected based on Wave 3 (2012).

3.2.1 Blood Pressure and Pulse Rate

3.2.1.1 Systolic

995.0 First Measurement

First, I would like to measure your blood pressure and pulse. Remain seated while I prepare the arm cuff.

The arm cuff will squeeze your arm a little, but it will not hurt you. Please relax. Make two

measurements—one now and the other a little later. [____] [____][____] SYSTOLIC

Did not get measurement999/999 [____]

1.2 Time first blood pressure measurement was taken HOURS MINUTES [____] [____]

1.3 Result of the measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

SIST1_12

First measurement – systolic pressure

1.13 SECOND MEASUREMENT

Now I will take your blood pressure again. I will need you to continue sitting and be relaxed as possible

to get the measurement. [____] [____][____] SYSTOLIC

Did not get measurement999/999 [____]

1.14 Time second blood pressure measurement was taken HOURS MINUTES [____] [____]

1.15 Result of the second measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

SIST2_12

Second measurement – systolic pressure

3.2.1.2 Diastolic

1.1 First Measurement

First, I would like to measure your blood pressure and pulse. Remain seated while I prepare the arm cuff.

The arm cuff will squeeze your arm a little, but it will not hurt you. Please relax. Make two measurements—one now and the other a little later. [____][____][____] DIASTOLIC

Did not get measurement999/999 [__|____]

1.2 Time first blood pressure measurement was taken HOURS MINUTES [__|__] [__|__]

1.3 Result of the measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

DIAS1_12

First measurement – diastolic pressure

1.13 SECOND MEASUREMENT

Now I will take your blood pressure again. I will need you to continue sitting and be relaxed as possible to get the measurement. [____][____][____] DIASTOLIC

Did not get measurement999/999 [__|____]

1.14 Time second blood pressure measurement was taken HOURS MINUTES [__|__] [__|__]

1.15 Result of the second measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

DIAS2_12

Second measurement – diastolic pressure

3.2.1.3 Pulse

1.1 First Measurement

First, I would like to measure your blood pressure and pulse. Remain seated while I prepare the arm cuff.

The arm cuff will squeeze your arm a little, but it will not hurt you. Please relax. Make two measurements—one now and the other a little later. [____][____][____] DIASTOLIC

Did not get measurement999/999 [__|____]

1.2 Time first blood pressure measurement was taken HOURS MINUTES [__|__] [__|__]

1.3 Result of the measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

PULSO1_12

First measurement – pulse

1.13 SECOND MEASUREMENT

Now I will take your blood pressure again. I will need you to continue sitting and be relaxed as possible to get the measurement. [____][____][____] DIASTOLIC

Did not get measurement999/999 [__|____]

1.14 Time second blood pressure measurement was taken HOURS MINUTES [__|__] [__|__]

1.15 Result of the second measure

Answer: 1 No issue; 2 Physical problem; 3 No cooperation 4 Refused to provide

PULSO2_12

Second measurement – pulse

3.2.1.4 Position

None

3.2.1.5 Activity within 30 minutes

None

3.2.1.6 Compliance

None

3.2.1.7 Arm Used

None

3.2.2 Balance

None

3.2.3 Walking Speed

3.2.3.1 Walking Speed

1.17 Time for the first test Time to walk 4 meters [____|____]. [____|____] Min. Sec.

If the test was not performed, enter.....00 00 [____] [____]. [____][____]

1.18 If the participant did not attempt or failed the test, indicate reason:

Answer:

1 Tried, but could not do; 2 The participant could not maintain position without help; 3 No attempt, you did not feel safe; 4 No attempt, the did not feel safe; 5 The participant could not understand instructions; 6 Other (specify); 7 Refused to do

TCAM1_12

Walking speed – time for first test

1.19 Time for the second test Time to walk 4 meters [____|____]. [____|____] Min. Sec.

If the test was not performed, enter.....00 00 [____] [____]. [____][____]

1.20 If the participant did not attempt or failed the test, indicate reason:

Answer:

1 Tried, but could not do; 2 The participant could not maintain position without help; 3 No attempt, you did not feel safe; 4 No attempt, the did not feel safe; 5 The participant could not understand instructions; 6 Other (specify); 7 Refused to do

TCAM2_12

Walking speed – time for second test

3.2.3.2 Help

1.21 Aids used during first test

Answer: 1 None; 2 Cane; 7 Other

AYUDA1_12

Walking speed – aids used for first test

1.22 Aids used during second test

Answer:

1 None; 2 Cane; 7 Other

AYUDA2_12

Walking speed – aids used for second test

3.2.3.3 Floor Type

None

3.2.3.4 Compliance

None

3.2.4 Lung Function

None

3.2.5 Grip Strength

3.2.5.1 Grip Strength

INTERVIEWER: Check the answer to question 1.23. If the answer is coded “1” do 1.26 and 1.27; if the answer is code “2”, do 1.27 and if the answer is coded “3”, do only 1.26.

1.26. We will do two measurements with the **left** hand. [][] . [] kg

Tried, but could not do..... 993.0; Did not try 999.0

[][] . [] kg

1.27. We will do two measurements with the **right** hand. [][] . [] kg

Tried, but could not do..... 993.0; Did not try 999.0 [][] . []kg

1.28. Completed the handgrip test

Answer: 1 Yes; 2 No

MDER1_12

Hand grip strength – **right** hand, **first** measurement

MDER2_12

Hand grip strength – **right** hand, **second** measurement

MIZQ1_12

Hand grip strength – **left** hand, **first** measurement

MIZQ2_12

Hand grip strength – **left** hand, **second** measurement

3.2.5.2 Dominant / Measured Hand

1.25 What is your dominant hand, with which you perform most things?

Answer: 1 Right; 2 Left; 3 Both hands

MANOF_12

Hand grip strength – dominant hand?

3.2.5.3 Position

None

3.2.5.4 Effort Level

None

3.2.5.5 Rested Arm

None

3.2.6 Leg Raise

3.2.6.1 Eye Open

Now we will do some exercises to measure your mobility. I will show you how to do the following exercise. I would like you to try to do it. If you think you cannot do it or it is too dangerous for you, please tell me. While standing, please try to stand on one unsupported foot or holding onto anything. Try it with any of your legs, and then try it with the other one. I will keep time, so I will let you know when to start and when to stop (TEN SECONDS). You can stop any time you feel that you are losing your balance. Let's start first with the leg you feel more confident with.

PIEDER_12 Right foot

94 Missing or injured extremity; 95 Tried, but could not do; 96 No attempt was made to be safe; 97 Cannot stand; 99 Refused to do

Passed the test within: Time [____|____] Seconds [____][____]

PIEIQ_12 Left foot

94 Missing or injured extremity; 95 Tried, but could not do ; 96 No attempt was made to be safe; 97 Cannot stand; 99 Refused to do

Passed the test within: Time [____|____] Seconds [____][____]

3.2.6.2 Eye Closed

None

3.2.7 Chair Stand

None

3.2.8 Height

3.2.8.1 Height

1.7 Height |____|____|.____| (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0 Refused to do [____|____].____|

1.7.1 To verify that I measured well, I will do it again.

Height |____|____|.____| (Centimeters mm)

995.0 Tried, but could not do ; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0 Refused to do [____|____].____|

ESTATU1_12

Height – **first** measurement

ESTATU2_12

Height – **second** measurement

3.2.8.2 Compliance

None

3.2.9 Weight

3.2.9.1 Weight

1.8 Now I will measure your weight.

Weight |__|__|__|. |__| (Kilos Grams)

995.000 Tried, but could not do ; 996.000 No attempt was made to be safe; 997.000 Cannot stand;

999.000 Refused to do [__|__|__]. [__|__|__]

1.8.1 To verify that I measured well, I will do it again.

Weight |__|__|__|. |__| (Kilos Grams)

995.000 Tried but could not do; 996.000 No attempt was made to be safe; 997.000 Cannot stand.

999.000 Refused to do [__|__|__]. [__|__|__]

PESO1_12

Weight – **first** measurement

PESO2_12

Weight – **second** measurement

3.2.9.2 Floor Type

None

3.2.9.3 Wore Shoes

None

3.2.9.4 Compliance

None

3.2.10 Waist Circumference

1.9 Waist (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0
Refused to do .

1.9.1 To verify that I measured well, I will do it again.

Waist. (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0
Refused to do .

CINTURA1_12

Waist circumference – **first** measurement

CINTURA2_12

Waist circumference – **second** measurement

3.2.10.1 Wore Bulky Clothing

None

3.2.10.2 Compliance

None

3.2.11 Hip Circumference

1.10 Hip (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0
Refused to do .

1.10.1 To verify that I measured well, I will do it again.

Hip (Centimeters mm)

Refused to do [__|__].[__]

CADERA1_12

Hip circumference – **first** measurement

CADERA2_12

Hip circumference – **second** measurement

3.2.12 Sitting Height

1.11 Sitting Height |__|__|__|. |__| (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0 Refused to do []-[].[]

1.11.1 To verify that I measured well, I will do it again.

Sitting Height... |__| |__| |__| |__| (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0 Refused to do []-[].[]

ASENT1_12

Sitting height – **first** measurement

ASENT2_12

Sitting height – **second** measurement

ASILLA1_12

Height of the chair – **first** measurement

ASILLA2_12

Height of the chair – **second** measurement

3.2.13 Knee Height

1.12 Measurement of knee height

Height |__|__|__|. |__| (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0

Refused to do [__|__|__]. [__]

1.12.1 To verify that I measured well, I will do it again.

Height |__|__|__|. |__| (Centimeters mm)

995.0 Tried, but could not do; 996.0 No attempt was made to be safe; 997.0 Cannot stand; 999.0

Refused to do [__|__|__]. [__]

rodilla1_12

Knee height – **first** measurement

rodilla2_12

Knee height – **second** measurement

3.2.14 Vision

None

3.2.15 Hearing Exam

None

3.3 ELSA

In this section, ELSA coding information is collected based on Wave 4 (2008).

3.3.1 Blood Pressure and Pulse Rate

3.3.1.1 Systolic

SYS

NURSE: Take three measurements from right arm. Enter

[^first / second / third] systolic reading (mmHg). If reading not obtained, enter 999.

If you are not going to get any bp readings at all, enter 996.

Range: 1..999

[Responses to SYS are recorded in variables SYS1 to SYS3]

3.3.1.2 Diastolic

DIAS

Enter [^first / second / third] diastolic reading (mmHg). If reading not obtained, enter 999.

Range: 1..999

[Responses to DIAS are recorded in variables DIAS1 to DIAS3]

3.3.1.3 Pulse

PULSE

Enter [^first / second / third] pulse reading (bpm). If reading not obtained, enter 999.

Range: 1..999

[Responses to PULSE are recorded in variables PULSE1 to PULSE3]

3.3.1.4 Arm Used

None

3.3.1.5 Position

None

3.3.1.6 Activity Within 30 Minutes

CONSUB

May I just check, have you eaten, smoked, drunk alcohol or done any [^BLANK / vigorous] exercise in the past 30 minutes? CODE ALL THAT APPLY.

1 Eaten ; 2 Smoked ; 3 Drunk alcohol ; 4 Done [^BLANK / vigorous] exercise ; 5 (None of these)

[Don't Know and Refusal are not allowed]

[Multiple responses to CONSUBX are recorded in variables CONSUB1 to CONSUB3]

[Code maximum 4 out of 5 possible responses]

3.3.1.7 Compliance

None

3.3.2 Balance

3.3.2.1 Semi Tandem

MMSTRE

NURSE: Record the outcome of the semi-tandem stand.

Answer:

1 Held for 10 seconds; 2 Held for less than 10 seconds; 3 Not attempted

IF Outcome of semi-tandem stand = held for less than 10 seconds [MmSTRe = 2]

MMSTTI

NURSE: Record the time in seconds to two decimal places.

(Enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 6.55.

3.3.2.2 Side by Side

MMSSTI

NURSE: First explain and then demonstrate the side-by-side stand to the respondent.

'Now I will show you the first movement.

I want you to try to stand with your feet together, side-by-side, for about 10 seconds.

You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet.

Try to hold this position until I tell you to stop.

You may support yourself on a chair, table or wall while getting into position.'

NURSE: Press <1> and <Enter> to continue.

Range: 1..1

Other Answer: 6 Participant refused; 7 Other reason

IF Outcome of side-by-side stand = held for 10 seconds [MmSSRe = 1]

MMSSRE

NURSE: Record the outcome of the side-by-side stand.

Answer:

1 Held for 10 seconds; 2 Held for less than 10 seconds; 3 Not attempted

IF Outcome of side-by-side stand = held for less than 10 seconds [MmSSRe = 2]

3.3.2.3 Full Tandem

MMFTTI

NURSE: Record the time in seconds to two decimal places.

(Enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 6.55.

MMFTRE

NURSE: Record the outcome of the full tandem stand.

Answer:

1 Held for [³⁰ / 10] seconds; 2 Held for less than [³⁰ / 10] seconds; 3 Not attempted

*[Variable **MMFTRE2** indicates whether the respondent held the full tandem stand for 10 or 30 seconds (which depended on their age)]*

IF Outcome of full tandem stand = held for less than 30 / 10 seconds [MmFTRe = 2]

3.3.2.4 Compensatory Movements

None

3.3.2.5 Floor type

None

3.3.2.6 Compliance

None

3.3.3 Walking Speed

3.3.3.1 Walking Speed

MMWLKA

INTERVIEWER: Record time in seconds to two decimal places

MMWLKB

INTERVIEWER: Record time in seconds to two decimal places.

3.3.3.2 Help

MMAID

INTERVIEWER: Record type of aid used.

Answer:

1 None; 2 Walking stick or cane; 3 Elbow crutches; 4 Walking frame; 5 Others

IF Type of walking aid used = Other [MmAid = 5]

3.3.3.3 Floor Type

MMRECR

INTERVIEWER: Record type of floor surface.

1 Linoleum/tile/ wood ; 2 Low-pile carpet ; 3 Thick-pile carpet ; 4 Concrete ; 5 Others

3.3.3.4 Compliance

None

3.3.4 Lung Function

3.3.4.1 Lung Function

FVC

Enter FVC reading. If no reading obtained enter '0'.

If you are not going to obtain any readings at all enter '9.95'.

[Responses to FVC are recorded in variables FVC1 to FVC3]

[Highest technically satisfactory FVC reading is recorded in variable HTFVC]

[Whether no LF readings were obtained is computed and recorded in variable No Read] IF

FVC reading (liters) < 9.95 [FVC < 9.95]

[CHECKS N68 - N69]

FEV

Enter FEV reading. If no reading obtained enter '0'.

[Responses to FEV are recorded in variables FEV1 to FEV3]

[Highest technically satisfactory FEV reading is recorded in variable HTFEV]

[CHECKS N70 - N74]

3.3.4.2 Effort Level

TECHNI

Was the technique satisfactory?

Answer: 1 Yes; 2 No

[Responses to TECHNIQUE are recorded in variables TECHNI1 to TECHNI3]

[Whether technique was satisfactory on any of the measurements is computed and recorded in variable NLSATLF]

LFRESP

NURSE CHECK: Code one only.

Answer:

- 1 All blows obtained were technically satisfactory
- 2 Some blows obtained were technically satisfactory
- 3 Attempted, but no technically satisfactory blows obtained
- 4 All blows refused
- 5 None attempted

3.2.4.2 Position**LFSTAND**

NURSE: Were the measurements taken while respondent was standing or sitting?

Answer: 1 Standing; 2 Sitting

3.3.5 Grip Strength**3.3.5.1 Grip Strength****MMGSN1**

NURSE: [^Left / Right (**Non-dominant**)] hand, **first** measurement.

Say: 'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

*IF Whether respondent is able to use both, one or neither hands = [both, unable to use non-dominant]
[MMGSSta = [1, 3]]*

MMGSD1

NURSE: [^Left / Right (**Dominant**)] hand, **first** measurement.

Say: 'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

*IF Whether respondent is able to use both, one or neither hands = [both, unable to use dominant]
[MMGSSta = [1, 2]]*

MMGSN2

NURSE: [^Left / Right (**Non-dominant**)] hand, **second** measurement. Say:

'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

IF Whether respondent is able to use both, one or neither hands = [both, unable to use non-dominant]

[MMGSSta = [1, 3]]

MMGSD2

NURSE: [^Left / Right (**Dominant**)] hand, **second** measurement. Say:

'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

IF Whether respondent is able to use both, one or neither hands = [both, unable to use dominant] [MMGSSta = [1, 2]]

MMGSN3

NURSE: [^Left / Right (**Non-dominant**)] hand, **third** measurement.

Say: 'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

IF Whether respondent is able to use both, one or neither hands = [both, unable to use non-dominant] [MMGSSta = [1, 3]]

MMGSD3

NURSE: [^Left / Right (**Dominant**)] hand, **third** measurement.

Say: 'One, two, three, squeeze!'

Enter the result to the nearest whole value.

Range: 0..100

3.3.5.2 Dominant / Measured Hand

MMGSDOM

NURSE: Which is your dominant hand?

Answer:

1 Right hand; 2 Left hand

3.3.5.3 Position

MMGSTP

NURSE: Record respondent's position.

Answer:

1 Standing without arm support; 2 Sitting without arm support; 3 Standing with arm support; 4 Sitting with arm support

[CHECKS N27 - N38]

3.3.5.4 Effort Level

None

3.3.5.5 Rested Arm

MMGSTP

NURSE: Record respondent's position.

Answer: 1 Standing without arm support ; 2 Sitting without arm support ; 3 Standing with arm support ; 4 Sitting with arm support

3.3.6 Leg Raise

3.3.6.1 Eye Open

MMLORE

NURSE: Record the outcome of the leg raise with eyes open.

Answer:

1 Held for 30 seconds; 2 Held for less than 30 seconds; 3 Not attempted

IF Outcome of leg raise (eyes open) = held for less than 30 seconds [MmLORe = 2]

MMLOTI

NURSE: Record the time in seconds to two decimal places.

(Enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 6.55.

3.3.6.2 Eye Close

MMLSRE

NURSE: Record the outcome of the leg raise with eyes shut.

Answer:

1 Held for 30 seconds; 2 Held for less than 30 seconds; 3 Not attempted

IF Outcome of leg raise (eyes shut) = held for less than 30 seconds [MmLSRe = 2]

MMLSTI

NURSE: Record the time in seconds to two decimal places.

(Enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 6.55.

3.3.7 Chair Stand

MMCRRE

NURSE: Record the outcome of single chair rise measure.

1 Participant stood without using arms

2 Participant used arms to stand

3 Test not completed

IF Outcome of single chair rise measure = Not completed [MmCRRe = 3]

MMRRFTI

NURSE: Record the time in seconds to two decimal places to complete five chair rises (enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 26.55.

[CHECKS N81 - N82]

MMRRRE

NURSE: Record the total number of rises completed.

Range: 0..10

IF Outcome of multiple chair rises (number of rises completed) = [5 - 10] [MMRRRe = [5 - 10]]

MMRRTTI

NURSE: Record the time in seconds to two decimal places to complete ten chair rises (enter the large numbers on the stopwatch display before the decimal point and the small numbers after it).

Use the full stop as the decimal point, e.g., 26.55.

[CHECKS N83 - N85]

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.

3.3.8 Height**3.3.8.1 Height****HTVAL**

NURSE: Record standing height (in centimeters).

Please record height with one decimal digit, using the full stop as decimal point. [Don't know and refusal are not allowed]

[CHECKS N43 - N44]

3.3.8.2 Compliance

None

3.3.9 Weight

3.3.9.1 Weight

WTVAL

NURSE: Record weight (in kilograms).

Record weight with one decimal digit, using the full stop as decimal point. [Don't know and refusal are not allowed]

3.3.9.2 Floor Type

FLOORC

NURSE CODE: Scales placed on?

1 Uneven floor ; 2 Carpet ; 3 Neither

3.3.9.3 Wore Shoes

None

3.3.9.4 Compliance

None

3.3.10 Waist Circumference

3.3.10.1 Waist Circumference

WAIST

NURSE: Measure the waist and hip circumferences to the nearest mm. Enter the [**first / second / third**] Waist Circumference in centimeters. (Remember to include the decimal point.)

If measurement not obtained, enter '999.9'.

[Don't know and refusal are not allowed]

[Responses to WAIST are recorded in variables WAIST1 to WAIST3]

3.3.10.2 Wore Bulky Clothing

None

3.3.10.3 Compliance

None

3.3.11 Hip Circumference

HIP

NURSE: Measure the waist and hip circumferences to the nearest mm.

Enter the [**first / second / third**] measurement of hip circumference in centimeters. (Remember to include the decimal point.)

If measurement not obtained, enter '999.9'. [Don't know and refusal are not allowed]

[Responses to HIP are recorded in variables HIP1 to HIP3]

[CHECK N56]

3.3.12 Sitting Height

Height was measured both standing and sitting in waves 2 and 4, and just standing in wave 6.

SITHTRSP

NURSE: Measure sitting height and code below.

Include 'disguised' refusals such as 'It will take too long', 'I have to go out' etc. at code 2: Height refused.

Answer:

1 Sitting height measured; 2 Sitting height refused; 3 Sitting heights attempted, not obtained; 4 Sitting heights not attempted

[Responses to SITHTRSP are recorded in variable SITHTRS]

IF whether sitting height measurement was attempted or obtained = Measured [SitHtRsp = 1]

SITHGT

NURSE: Record sitting height (in centimeters).

Please record sitting height with one decimal digit, using the full stop as decimal point.

IF Sitting height - centimeters = RESPONSE [SitHgt = RESPONSE]

3.3.13 Knee Height

None

3.3.14 Vision

None

3.3.15 Hearing Exam

None

3.4 SHARE

In this section, SHARE coding information is collected based on Wave 4 (2011) when possible, and from Wave 2 (2006) and Wave 5 (2013) where specified. Note that information of measures collected only in Germany (blood pressure, measured height, waist circumference in Wave 4 (2011)) is not collected.

3.4.1 Blood Pressure and Pulse Rate

Blood pressure is taken only in Wave 4 (2011) in Germany.

3.4.2 Balance

None

3.4.3 Walking Speed

In Wave 1 (2004) and Wave 2 (2006) only

3.4.3.1 Walking Speed

WS010_ RESULT OF FIRST TRIAL

IWER: RECORD RESULT OF THE FIRST TRIAL

Answer:

1. Completed successfully 2. Attempted but unable to complete 3. Stopped by the interviewer because of safety reasons 4. Not attempted, respondent felt it would be unsafe 5. Participant unable to understand instructions 6. Respondent refused

IF WS010_ (RESULT OF FIRST TRIAL) = 1. Completed successfully

WS011_ TIME OF FIRST WALKING SPEED TEST

IWER: RECORD TIME IN SECONDS TO TWO DECIMAL PLACES

_____ (0. 50..30.00)

WS012_ RESULT OF SECOND TRIAL

IWER: REPEAT WALKING SPEED TEST; RECORD RESULT OF THE SECOND TRIAL

Answer:

1. Completed successfully 2. Attempted but unable to complete 3. Stopped by the interviewer because of safety reasons 4. Not attempted, respondent felt it would be unsafe 5. Participant unable to understand instructions 6. Respondent refused

IF WS012_ (RESULT OF SECOND TRIAL) = 1. Completed successfully

WS013_ TIME OF SECOND WALKING SPEED TEST

IWER: RECORD TIME IN SECONDS TO TWO DECIMAL PLACES

_____ (0. 50..30.00)

3.4.3.2 Type of Aid Used

WS017_ TYPE OF AID USED DURING TEST

IWER: RECORD TYPE OF AID

1. None ; 2. Walking stick or cane ; 3. Elbow crutches ; 4. Walking frame ; 97. Other

3.4.3.3 Floor Type

WS015_ RECORD TYPE OF FLOOR SURFACE

IWER: RECORD TYPE OF FLOOR SURFACE

1. Linoleum/tile/wood
2. Low-pile carpet
3. Thick-pile carpet
4. Concrete
5. Not sure
97. Other

3.4.3.4 Compliance

None

3.4.4 Lung Function

3.4.4.1 Lung Function

In Wave 2 (2006), Wave 4 (2011), Wave 6 (2015) only

PF003_ValFirstMeas VALUE FIRST MEASUREMENT

IWER: Enter value first measurement

(Record 30 if less than 60; record 890 if past last tick mark; record 993 if R tried but was unable; or record 999 if R chose not to do it.)

_____ (30...999)

PF004_ValSecMeas VALUE SECOND MEASUREMENT

IWER: Enter value second measurement

(Record 30 if less than 60; record 890 if past last tick mark; record 993 if R tried but was unable; or record 999 if R chose not to do it.)

_____ (30...999)

3.4.4.2 Effort Level

PF005_EffortR EFFORT R GAVE TO THIS MEASUREMENT

IWER: How much effort did R give to this measurement?

Answer:

1. R gave full effort ; 2. R was prevented from giving full effort by illness, pain, or other symptoms or discomforts ; 3. R did not appear to give full effort, but no obvious reason for this

3.4.4.3 Position

PF006_PositionR POSITION OF R FOR THIS TEST

IWER: What was the R's position for this test?

Answer:

1. Standing; 2. Sitting; 3. Lying down

3.4.5 Grip Strength

3.4.5.1 Grip Strength

GS006_FirstLHand

LEFT HAND, FIRST MEASUREMENT.

IWER: Enter the results to the nearest integer value.

_____ (0...100)

GS007_SecondLHand

LEFT HAND, SECOND MEASUREMENT.

IWER: Enter the results to the nearest integer value.

_____ (0...100)

GS008_FirstRHand

RIGHT HAND, FIRST MEASUREMENT.

IWER: Enter the results to the nearest integer value.

_____ (0...100)

GS009_SecondRHand

RIGHT HAND, SECOND MEASUREMENT.

IWER: Enter the results to the nearest integer value.

_____ (0...100)

3.4.5.2 Dominant / Measured Hand

GS004_DominantHand

Which is your dominant hand?

Answer: 1. Right hand 2. Left hand

3.4.5.3 Position

Not measured in Wave 1 (2004)

GS013_Position THE POSITION OF R FOR THIS TEST

IWER: What was the R's position for this test?

Answer: 1. Standing; 2. Sitting; 3. Lying down

3.4.5.4 Effort Level

(Measured in all other waves except in Wave 1 (2004/05))

GS012_ Effort HOW MUCH EFFORT R GAVE

IWER: How much effort did R give to this measurement?

Answer: 1. R gave full effort ; 2. R was prevented from giving full effort by illness, pain, or other symptoms or discomforts ; 3. R did not appear to give full effort, but no obvious reason for this

3.4.5.5 Rested Arm

GS014_ R RESTED HIS/HER ARMS ON A SUPPORT

IWER: Did R rest his/her arms on a support while performing this test?

Answer: 1. Yes ; 5. No

3.4.6 Leg Raise

None

3.4.7 Chair Stand

In Wave 2 (2006) and Wave 5 (2013) only

CS004_ SINGLE CS TEST RESULTS

IWER: RECORD SINGLE CHAIR STAND TEST RESULTS

Answer: 1. R stood up without using arms 2. R used arms to stand up 3. Test not completed

CS008_ TIME IN SECONDS USED FOR FIVE STANDS

IWER: RECORD TIME IN SECONDS USED FOR 5 STANDS. TYPE 99 IF R FAILED TO COMPLETE 5 STANDS IN ONE MINUTE

_____ (0. 00..99.00)

3.4.8 Height

Measured height is taken only in Wave 4 (2011) in Germany

3.4.9 Weight

None

3.4.10 Waist Circumference

Waist Circumference is taken only in Wave 4 (2011) in Germany

3.4.11 Hip Circumference

None

3.4.12 Sitting Height

None

3.4.13 Knee Height

None

3.4.14 Vision

None

3.4.15 Hearing Exam

None

3.5 KLoSA

In this section, KLoSA coding information is collected based on Wave 4 (2012).

3.5.1 Blood Pressure and Pulse Rate

None

3.5.2 Balance

None

3.5.3 Walking Speed

None

3.5.4 Lung Function

None

3.5.5 Grip Strength

3.5.5.1 Grip Strength

C507. Now, I'm going to measure your **RIGHT HAND**. Please put your elbow onto your side and make a right angle around your elbow. Make sure the scale of the dynamometer is set to zero. Ready? Squeeze it now.

(Unit: Kg)

[IWER: R is asked to take off his/her ring or watch for safety.]

FIRST READING [range: 0~50]

C508. Now, I'm going to measure your **RIGHT HAND** again. Please set the scale of the dynamometer to zero, Squeeze it now. (Unit: Kg.)

SECOND READING [range: 0~50]

C509. Now, I'm going to measure your **LEFT HAND**, please put your elbow onto your side and make a right angle around your elbow. Make sure the scale of the dynamometer is set to zero. Ready? Squeeze it now. (Unit: Kg.)

[IWER: R is asked to take off his/her ring or watch for safety.]

FIRST READING [range: 0~50]

C510. Now, I'm going to measure your **LEFT HAND** again, please set the scale of the dynamometer to zero. Squeeze it now. (Unit: Kg.)

SECOND READING [range: 0~50]

3.5.5.2 Dominant / Measured Hand

C501. Now I would like to measure the strength of your hand in a gripping action. Which is your dominant hand?

Answer: 1. Right hand; 3. Left hand; 5. Both hands equally dominant

3.5.5.3 Position

C511. IWER: What was R's position for this test?

Answer: 1. standing; 3. Sitting; 5. lying down

3.5.5.4 Effort Level

C513. IWER: How much effort did R give to this measurement?

Answer: 1. R gave full effort ; 2. R was prevented from giving full effort by illness, pain, symptoms or discomfort ; 3. R did not appear to give full effort without an obvious reason ; 4. R did not measure for a personal reason

3.5.5.5 Rested Arm

None

3.5.6 Leg Raise

None

3.5.7 Chair Stand

None

3.5.8 Height

None

3.5.9 Weight

None

3.5.10 Waist Circumference

None

3.5.11 Hip Circumference

None

3.5.12 Sitting Height

None

3.5.13 Knee Height

None

3.5.14 Vision

None

3.5.15 Hearing Exam

None

3.6 JSTAR

In this section, JSTAR coding information is collected based on Wave 2 5-city (2009).

3.6.1 Blood Pressure and Pulse Rate

3.6.1.1 Systolic

09D2-002-3

[Interviewer: Please measure the blood pressure following to the manual in the accompanying sheet. When you finish the procedure, choose "Completed the measurement." If it was interrupted for some reason, choose "Terminated the measurement" and move on to the next screen.

	Systolic BP (mmHg)	Diastolic BP (mmHg)	Pulse rate (/minute)	Time (automatically fill in the time of entering systolic BP)
First				(h, min)
Second				(h, min)
Third				(h, min)

1. Completed the measurement (When you finish the measurement, please let the respondent know the results orally)
2. Terminated the measurement

d2_002_3_a

First measurement - systolic pressure

d2_002_3_f

Second measurement - systolic pressure

d2_002_3_k

Third measurement - systolic pressure

3.6.1.2 Diastolic

Refer to the table in 3.6.1.1 Systolic

d2_002_3_b

First measurement - diastolic pressure

d2_002_3_g

Second measurement - diastolic pressure

d2_002_3_l

Third measurement - diastolic pressure

3.6.1.3 Pulse

Refer to the table in 3.6.1.1 Systolic

d2_002_3_c

First measurement - pulse pressure

d2_002_3_h

Second measurement - pulse pressure

d2_002_3_m

Third measurement - pulse pressure

3.6.1.4 Arm Used

d2_004_b

Measurement arm: 1. Right 2. Left

3.6.1.5 Position

d2_004_c

Measurement posture: 1. Sitting position ; 2. Standing position ; 3. Other

3.6.1.6 Activity Within 30 Minutes

None

3.6.1.7 Compliance

None

3.6.2 Balance

None

3.6.3 Walking Speed

None

3.6.4 Lung Function

None

3.6.5 Grip Strength

3.6.5.1 Grip Strength

f_004_2

Indicate which hand was measured

1. Right 2. Left

f_004_3_a

Grip strength Choices:

1. ____ kg 2. Not possible to measure, or measurement failed

f_004_3_b

Grip strength: ____ kg

f_005_2

Indicate which hand was measured for remeasurement.

1. Right 2. Left

f_005_3_a

Grip strength (remeasurement) Choices:

1. ____ kg 2. Not possible to measure, or measurement failed

f_005_3_b

Grip strength (remeasurement): ____kg

3.6.5.2 Dominant / Measured Hand

f_003:

Which is your dominant hand?

Answer:

1.Right; 2. Left; 3. Don't know; 4. Refused to answer;

3.6.5.3 Position

None

3.6.5.4 Effort Level

f_002

Assess the condition of the respondent.

Answer: 1. Respondent can use both hands 2. Respondent cannot use right hand 3. Respondent cannot use left hand 4. Respondent cannot use either hand 5. Don't know

3.6.5.5 Rested Arm

None

3.6.6 Leg Raise

None

3.6.7 Chair Stand

None

3.6.8 Height
(Wave 2 core5 2009 Only)

3.6.8.1 Height

d_015_3_b

1. Standing height measurement result (_____) centimeters

3.6.8.2 Compliance
None

3.6.9 Weight
None

3.6.10 Waist Circumference
3.6.10.1 Waist Circumference

d2_007_3_a, d2_007_3_b

[Interviewer: Please measure the waist size following the manual in the accompanying sheet.]

Answer: 1. Result: () cm 2. Stopped the measurement

Only two or three half-width digit numbers are valid. Otherwise display the error message, enter the value correctly in centimeters." "

3.6.10.2 Wore Bulky Clothing

d2_009:

Measurement condition [Interviewer: Do not read aloud the following and check the condition when you measure the waist size.]

A: Whether he/she was wearing thick clothes during the measurement

Answer: 1. Yes; 2. No

3.6.10.3 Compliance
None

3.6.11 Hip Circumference

None

3.6.12 Sitting Height

In Wave 2 core5 (2009) codebook Only

d_015_4_a

Seated Height

1. Measurement result (_____) centimeter 2. Stop measurement in 3 digits or error message (please correctly enter the result in centimeters)

d_015_4_b

Measurement result (_____) centimeter

3.6.13 Knee Height

None

3.6.14 Vision

None

3.6.15 Hearing Exam

None

3.7 TILDA

In this section, TILDA coding information is collected based on Wave 1 (2010) and Wave 2 (2012).

3.7.1 Blood Pressure and Pulse Rate

In Wave 1 (2010) only

3.7.1.1 Systolic

BPseatedsystolic1

Seated systolic blood pressure measurement 1 (mm Hg)

BPseatedsystolic2

Seated systolic blood pressure measurement 2 (mm Hg)

BPseatedsystolicmean

Mean seated systolic blood pressure (mm Hg)

3.7.1.2 Diastolic

BPseateddiastolic1

Seated diastolic blood pressure measurement 1 (mm Hg)

BPseateddiastolic2

Seated diastolic blood pressure measurement 2 (mm Hg)

BPseateddiastolicmean

Mean seated diastolic blood pressure (mm Hg)

3.7.1.3 Pulse

None

3.7.1.4 Arm Used

None

3.7.1.5 Position

None

3.7.1.6 Activity Within 30 Minutes

None

3.7.1.7 Compliance

None

3.7.2 Balance

None

3.7.3 Walking Speed

A timed up and go test was conducted in Wave 2 (2012), Wave 4 (2016) and Wave 5 (2018) only.

3.7.3.1 Walking Speed

tug007

Height of chair from the seat to the ground to nearest cm

tug009m

IWER: Enter time taken to complete walk in minutes, seconds and centiseconds. ____ minutes (0-10)
____seconds (0 – 59) ____centiseconds (0 – 99)

tug009s

IWER: Enter time taken to complete walk in minutes, seconds and centiseconds. ____ minutes (0-10)
____seconds (0 – 59) ____centiseconds (0 – 99)

tug009c

IWER: Enter time taken to complete walk in minutes, seconds and centiseconds. ____minutes (0-10)
____seconds (0 – 59) ____centiseconds (0 – 99)

3.7.3.2 Type of Aid Used

tug011

IWER: RECORD TYPE OF AID USED DURING TEST

Answer: 1. None ; 2. Walking stick or cane ; 3. Elbow crutches ; 4. Walking frame ; 95. Other

3.7.3.3 Floor Type

tug010

IWER: RECORD TYPE OF FLOOR SURFACE

Answer: 1. Linoleum/tile/wood ; 2. Low-pile carpet ; 3. Thick-pile carpet ; 4. Concrete ; 5. Not sure ; 95.
Other

3.7.3.4 Compliance

None

3.7.4 Lung Function

None

3.7.5 Grip Strength

3.7.5.1 Grip Strength

GRIPtest1D

Grip strength test 1 for **dominant** hand (kg)

GRIPtest2D

Grip strength test 2 for **dominant** hand (kg)

GRIPtest1ND

Grip strength test 1 for **non-dominant** hand (kg)

GRIPtest2ND

Grip strength test 2 for **non-dominant** hand (kg)

FRgripstrengthD

Mean grip strength for dominant hand (kg)

FRgripstrengthND

Mean grip strength for non-dominant hand (kg)

3.7.5.2 Dominant / Measured Hand**GRIPtestdominant**

Dominant hand

3.7.5.3 Position**gs007**

Respondent's position during test

IWER: Record respondent's position.

Answer: 1. Standing without arm support ; 2. Sitting without arm support ; 3. Standing with arm support ; 4. Sitting with arm support

3.7.5.4 Effort Level

None

3.7.5.5 Rested Arm

None

3.7.6 Leg Raise

None

3.7.7 Chair Stand

None

3.7.8 Height

3.7.8.1 Height

In Wave 1 (2010) and Wave 3 (2014) only

height

Objective height measurement (cm)

3.7.8.2 Compliance

None

3.7.9 Weight

3.7.9.1 Weight

In Wave 1 (2010) and Wave 3 (2014) only

weight

Objective weight measurement (kg)

3.7.9.2 Floor Type

None

3.7.9.3 Wore Shoes

None

3.7.9.4 Compliance

None

3.7.10 Waist Circumference

In Wave 1 (2010) only

3.7.10.1 Waist Circumference

FRWAIST

Waist circumference (cm)

3.7.10.2 Wore Bulky Clothing

None

3.7.10.3 Compliance

None

3.7.11 Hip Circumference

In Wave 1 (2010) only

FRHIP

Hip circumference (cm)

3.7.12 Sitting Height

None

3.7.13 Knee Height

None

3.7.14 Vision

None

3.7.15 Hearing Exam

None

3.8 CHARLS

In this section, CHARLS coding information is collected based on Wave 1 (2011).

3.8.1 Blood Pressure and Pulse Rate

LI857-LI875: IWER: Record measurements in chart: (Enter '993' in systolic reading if R tried but was unable to do it. Enter '999' if R chose not to do it.)

Measurement	Time of Reading	Systolic	Diastolic	Pulse
1	(LI857) __ __ : __ __	(LI859) 60..300,993,999 mmHg	(LI860) 30..150mmHg	(LI861) 25..150P
2	(LI862) __ __ : __ __	(LI864) 60..300,993,999 mmHg	(LI865) 30..150mmHg	(LI866) 25..150P
3	(LI867) __ __ : __ __	(LI869) 60..300,993,999 mmHg	(LI870) 30..150mmHg	(LI871) 25..150P

3.8.1.1 Systolic

LI857 (Measurement 1) Time of Reading

LI859 (Measurement 1) Systolic Reading

LI862 (Measurement 2) Time of Reading

LI864 (Measurement 2) Systolic Reading

LI867 (Measurement 3) Time of Reading

LI869 (Measurement 3) Systolic Reading

3.8.1.2 Diastolic

LI857 (Measurement 1) Time of Reading

LI860 (Measurement 1) Diastolic Reading

LI862 (Measurement 2) Time of Reading

LI865 (Measurement 2) Diastolic Reading

LI867 (Measurement 3) Time of Reading

LI870 (Measurement 3) Diastolic Reading

3.8.1.3 Pulse

LI857 (Measurement 1) Time of Reading

LI861 (Measurement 1) Pulse Reading

LI862 (Measurement 2) Time of Reading

LI866 (Measurement 2) Pulse Reading

LI867 (Measurement 3) Time of Reading

LI871 (Measurement 3) Pulse Reading

3.8.1.4 Arm Used

LI872 Which arm was used to conduct the measurements? (Circle one)

Answer:

1 Left arm; 2 Right arm

3.8.1.5 Position

LI874 What was R's position for this test?

Answer:

1. Standing

2. Sitting

3. Lying down

3.8.1.6 Activity Within 30 Minutes

LI875 Did the R smoke, exercise, consume alcohol or food within the 30 minutes prior to completing the blood pressure test?

Answer: 1. Yes ; 5. No ; 8. Don't know

3.8.1.7 Compliance

LI873 How compliant was R during this measurement?

Answer: 1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R was not fully compliant, but no obvious reason for this

3.8.2 Balance

3.8.2.1 Semi Tandem

LI879 Did R hold semi-tandem stand for a full 10 seconds without stepping out of place or grabbing hold of anything?

Answer: (Circle one)

1. YES; 5. NO →Enter amount of time R held stand in seconds to two decimal places:

LI880 _____. _____0..10 Sec ;993. R tried but was unable; 999. R chose not to do it

3.8.2.2 Side by Side

LI886 Did R hold side-by-side stand for a full 10 seconds without stepping out of place or grabbing hold of anything?

Answer: (Circle one)

1. YES; 5. NO →Enter amount of time R held stand in seconds to two decimal places:

LI887 _____. _____0..10; 993. R tried but was unable; 999. R chose not to do it

3.8.2.3 Full Tandem

LI896 Did R hold full-tandem stand for a full [30/60] seconds without stepping out of place or grabbing hold of anything

Answer: (Circle one)

1. YES; 5. NO →Enter amount of time R held stand in seconds to two decimal places:

LI897 _____. _____Sec; ;993. R tried but was unable; 999. R chose not to do

3.8.2.4 Compensatory Movements

LI881 Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during

semi-tandem stand?

Answer: (Circle one)

LI898 Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during full-tandem stand?

Answer: (Circle one)

1. Yes ; 5. No ; 8. Don't know

LI888 Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during side-by-side stand? (Circle one)

Answer: (Circle one)

1. YES; 5. NO; 8. Don't Know

3.8.2.5 Floor Type

LI899 Record the type of floor surface that the balance measures were conducted on.

Answer: (Circle one)

1. Linoleum/tile/wood ; 2. Carpet ; 3. Clay ; 4. Concrete ; 5. Not sure 97. Other

(Specify): _____

LI889 Record the type of floor surface that the balance measures were conducted on.

Answer: (Circle one)

1. Linoleum/tile/wood; 2. carpet; 3. Clay; 4. Concrete; 5. Not sure; 97. Other

(Specify): _____

3.8.2.6 Compliance

LI902 How compliant was R during the balance measurements?

Answer:

1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R did not appear to be fully compliant, but no obvious reason for this

3.8.3 Walking Speed

3.8.3.1 Walking Speed

LI823 (Measure 1) Waling Speed Time (second)

LI824 (Measure 2) Waling Speed Time (second)

3.8.3.2 Type of Aid Used

LI828 Record type of aid used.

Answer: (Circle one)

1 None ; 2 Walking stick or cane ; 3 Elbow crutches ; 4 Walking frame ; 97 Other (Specify): _____

3.8.3.3 Floor Type

LI825 Record type of floor surface. (Circle one)

1 Linoleum/tile/wood ; 2 Carpet ; 3 Clay ; 4 Concrete ; 5 Not sure ; 97 Other (Specify): _____

3.8.3.4 Compliance

LI830 How compliant was R during the balance measurements?

Answer:

1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R did not appear to be fully compliant, but no obvious reason for this

3.8.4 Lung Function

3.8.4.1 Lung Function

LI807-LI811: IWER: Record measurements in chart: (Record 30 if less than 60; Record 890 if past last tick mark; Record 993 if R tried but was unable; or Record 999 if R chose not to do it.)

Measurement#	Measurement Reading
1	30..800, 890, 993, 999 (LI807)
2	30..800, 890, 993, 999 (LI808)
3	30..800, 890, 993, 999 (LI809)

3.8.4.2 Effort Level

LI810 IWER: How much effort did R give to this test? (Circle one)

Answer: 1) R gave full effort; 2) R was prevented from giving full effort by illness, pain, or other symptoms or discomforts; 3) R did not appear to give full effort, but no obvious reason for this

3.8.4.3 Position

LI811 IWER: What was R's position for this test? (Circle one)

Answer: 1) standing 2) sitting; 3) lying down

3.8.5 Grip Strength

3.8.5.1 Grip Strength

LI816 (Measure 1) Left Hand

LI851 (Measure 1) Right Hand

LI852 (Measure 2) Left Hand

LI853 (Measure 2) Right Hand

3.8.5.2 Dominant / Measured Hand

LI815 "Which is your dominant hand?"

Answer: (Circle one)

1 Right hand; 2 Left hand; 3 Both hands equally dominant

3.8.5.3 Position

LI818 IWER: What was R's position for this test?

Answer: (Circle one)

1 Standing ; 2 Sitting ; 3 Lying down

3.8.5.4 Effort Level

LI817 IWER: How much effort did R give to this test?

Answer: (Circle one)

1 R gave full effort ; 2 R was prevented from giving full effort by illness, pain, or other symptoms or discomforts ; 3 R did not appear to give full effort, but no obvious reason for this

3.8.5.5 Rested Arm

LI819 IWER: Did the R rest their arm on a support while performing the test? (Circle one)

Answer: 1 Yes ; 5 No

3.8.6 Leg Raise

None

3.8.7 Chair Stand

LI003 Did R can stand up straight and then sit down again at his/her

usual pace five times without stopping in between and without using arms to push off (Circle one)

1 Yes, enter amount of time R held stand in seconds to two decimal places: (**LI004**): _____.

___Sec

5 No, enter amount of time R held stand in seconds to two decimal places (**LI005**): _____Sec

993 R tried but was unable.

999..... R chose not to do it.

Record the number of stands R completed: **(LI006)**_____0...5times

Record the chair height from floor to seat in the space provided: **(LI007)**_____0..999cm

LI008 Did R use his/her trunk arms during repeated chair stands?

Answer (Circle one)

1.YES; 5. NO; 8. Don't Know

3.8.8 Height

3.8.8.1 Height

LI011 (Measure 1) (0-210, centimeter)

3.8.8.2 Compliance

LI012 How compliant was R during the balance measurements?

Answer:

1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R did not appear to be fully compliant, but no obvious reason for this

3.8.9 Weight

3.8.9.1 Weight

LI841 (Measure 1) (0-150, kg)

3.8.9.2 Floor Type

LI842 Record type of floor surface. (Circle one)

Answer: 1 Linoleum/tile/wood ; 2 Carpet ; 3 Clay ; 4 Concrete ; 5 Not sure ; 97 Other (Specify):_____

3.8.9.3 Wore Shoes

LI844 Was R wearing shoes during the measurement?

Answer: 1 Yes ; 5 No

3.8.9.4 Compliance

LI847 How compliant was R during the balance measurements?

Answer:

1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R did not appear to be fully compliant, but no obvious reason for this

3.8.10 Waist Circumference

3.8.10.1 Waist Circumference

LI907 (Measure 1) (0-999, centimeter)

3.8.10.2 Wore Bulky Clothing

LI912 Was the R wearing bulky clothing during this measurement? (Circle one)

1 Yes ; 5 No

3.8.10.3 Compliance

LI910 How compliant was R during the balance measurements?

Answer:

1. R was fully compliant ; 2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts ; 3. R did not appear to be fully compliant, but no obvious reason for this

3.8.11 Hip Circumference

None

3.8.12 Sitting Height

None

3.8.13 Knee Height

LI019 (RIGHT KNEE HEIGHT) (0-150, centimeter)

3.8.14 Vision

None

3.8.15 Hearing Exam

None

3.9 LASI

In this section, LASI coding information is collected based on Wave 1 (2017/19).

3.9.1 Blood Pressure and Pulse Rate

3.9.1.1 Systolic

BM005 (Measurement 1) Time of Reading

BM006 (Measurement 1) Systolic Reading

BM009 (Measurement 2) Time of Reading

BM010 (Measurement 2) Systolic Reading

BM013 (Measurement 3) Time of Reading

BM014 (Measurement 3) Systolic Reading

BM017 (Measurement 4) Average of measurement2 & 3 systolic readings

3.9.1.2 Diastolic

BM005 (Measurement 1) Time of Reading

BM007 (Measurement 1) Diastolic Reading

BM009 (Measurement 2) Time of Reading

BM011 (Measurement 2) Diastolic Reading

BM013 (Measurement 3) Time of Reading

BM015 (Measurement 3) Diastolic Reading

BM018 (Measurement 4) Average of measurement2 & 3 diastolic readings

3.9.1.3 Pulse

BM005 (Measurement 1) Time of Reading

BM008 (Measurement 1) Pulse Reading

BM009 (Measurement 2) Time of Reading

BM012 (Measurement 2) Pulse Reading

BM013 (Measurement 3) Time of Reading

BM016 (Measurement 3) Pulse Reading

BM019 (Measurement 4) Average of measurement2 & 3 pulse readings

3.9.1.4 Arm Used

BM020 Which arm was used to conduct the measurements?

1. Left arm
2. Right arm

3.9.1.5 Position

BM021. What was R's position for this test?

1. Standing
2. Sitting
3. Lying down

3.9.1.6 Activity Within 30 Minutes

BM002. Did you smoke, exercise, or consume alcohol or food within the 30 minutes prior the blood pressure test?

1. Yes
2. No

3.9.1.7 Compliance

BM022. How compliant was R during this measurement?

1. R was fully compliant
2. R was prevented from fully complying due to illness, pain, or other symptoms or discomfort

3. R was not fully compliant

3.9.2 Balance

3.9.2.1 Semi Tandem

BM038 Did R hold **semi-tandem stand** for a full 10 seconds without stepping out of place or grabbing hold of anything?

1. Yes

2. No (Time in seconds): **BM039** _____

3.9.2.2 Side by Side

BM042 Did R hold **side-by-side stand** for a full 10 seconds without stepping out of place or grabbing hold of anything?

1. Yes

2. No (Time in seconds) **BM043** _____

3.9.2.3 Full Tandem

BM049_IWER: Did R hold full-tandem stand for a full [30/60] seconds without stepping out of place or grabbing hold of anything?

1. Yes

2. No Enter amount of time R held stand in seconds (up to 2 decimal points): **BM050** _____

[Hard check: If R age \geq 70, then BM050 $>$ 30]

[If R age $<$ 70, then BM050 $>$ 60]

3.9.2.4 Compensatory Movements

BM040 Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during semi-tandem stand?

1. Yes

2. No

BM044 Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during side-by-side stand?

1. Yes
2. No

BM051_IWER: Did R use any compensatory movements of his/her trunk, arms or legs to steady him/herself during the full-tandem stand?

1. Yes
2. No

3.9.2.5 Floor Type

BM045 Record the type of floor surface that the balance measures were conducted on.

1. Wood/ Tile/ Linoleum
2. Concrete
3. Kutcha/ Mud

BM052 Record the type of floor surface that the balance measures were conducted on.

1. Wood/ Tile/ Linoleum
2. Concrete
3. Kutcha/ Mud

3.9.2.6 Compliance

BM046. How compliant was R during the balance measurement?

1. R was fully compliant
2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts
3. R was not fully compliant, but no obvious reason for this

BM053_IWER: How compliant was R during the balance measurements?

1. R was fully compliant

2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts
3. R did not appear to be fully compliant, but no obvious reason for this

3.9.3 Walking Speed

3.9.3.1 Walking Speed

BM056 (Measurement 1) Walking Speed Time (seconds)

BM057 (Measurement 2) Walking Speed Time (seconds)

3.9.3.2 Type of Aid Used

BM058. Record type of aid used

1. None
2. Walking stick or cane
3. Elbow crutches
4. Walking frame
5. Other, please specify _____

3.9.3.3 Floor Type

None

3.9.3.4 Compliance

BM059. How compliant was R during this measurement?

1. R was fully compliant
2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts
3. R was not fully compliant, but no obvious reason for this

3.9.4 Lung Function

3.9.4.1 Lung Function

BM085

[Instruction for Interviewer:

Step1: CAPI should be connected with Spirometry instrument.

Step2: Scan the barcode on mouthpiece

Step3: Enter the barcode number twice: BM085_1&BM085_2. CAPI will check BM085_1=BM085_2. If not, re-enter

Step4: Perform the test; and record the spirometry readings in BM085a, BM085b & BM085c]

BM085_1 Barcode Number:

BM085_2 Barcode Number:

BM085_1 & BM085_2 up to 14 digits

BM085a: FVC _____. ____

BM085b: FEV1 _____. ____

BM085c: PEF _____. ____

3.9.4.2 Effort Level

BM087 How much effort did R give to this test?

1. R gave full effort
2. R was prevented from giving full effort by illness, pain, or other symptoms or discomfort.
3. R did not appear to give full effort, but no obvious reason for this

3.9.4.3 Position

BM086 What was R's position for this test?

1. Standing
2. Sitting
3. Lying down

3.9.5 Grip Strength

3.9.5.1 Grip Strength

BM028 (Measurement 1) Left Hand

BM029 (Measurement 1) Right Hand

BM030 (Measurement 2) Left Hand

BM031 (Measurement 2) Right Hand

3.9.5.2 Dominant / Measured Hand

BM026 Which is your dominant hand?

1. Right hand
2. Left hand
3. Both hands equally dominant

3.9.5.3 Position

BM033 What was R's position for this test?

1. Standing
2. Sitting
3. Lying down

3.9.5.4 Effort Level

BM032 How much effort did R give to this test?

1. R gave full effort
2. R was prevented from giving full effort by illness, pain, or other symptoms or discomforts
3. R did not appear to give full effort, but no obvious reason for this

3.9.5.5 Rested Arm

BM034. Did R rest their arm on a support while performing the test?

1. Yes
2. No

3.9.6 Leg Raise

None

3.9.7 Chair Stand

None

3.9.8 Height

3.9.8.1 Height

[Instruction for Interviewer: Demonstrate the measurement. Record measurement in table below. Record R's height in centimeters (rounded to the nearest 0.1 cm)]

BM067 Height Measurement (cm)

3.9.8.2 Compliance

BM069. How compliant was R during this measurement?

1. R was fully compliant
2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts
3. R was not fully compliant, but no obvious reason for this

3.9.9 Weight

3.9.9.1 Weight

[Instruction for Interviewer: Record measurement in kilograms in table below: Enter 993 if R tried but received an error message. Record R's weight up to 2 decimal points]

BM071 Weight Measurement (kg)

BM072. Was R wearing an artificial limb or orthosis during the measurement?

1. Yes, then record the weight of the artificial limb **BM073.** ____.
2. No

3.9.9.2 Floor Type

None

3.9.9.3 Wore Shoes

None

3.9.9.4 Compliance

BM074. How compliant was R during this measurement?

1. R was fully compliant
2. R was prevented from fully complying due to illness, pain, or other symptoms or discomforts
3. R was not fully compliant, but no obvious reason for this

3.9.10 Waist Circumference

3.9.10.1 Waist Circumference

Record measurement in table below: Enter 999 if R chose not to do it. Record R's waist circumference to the nearest 0.1 cm

BM076 Waist Circumference Measurement (cm)

3.9.10.2 Wore Bulky Clothing

BM077 Was R wearing bulky clothing during this measurement?

1. Yes
2. No

3.9.10.3 Compliance

None

3.9.11 Hip Circumference

Record measurement in table below: Enter 999 if R chose not to do it. Record R's waist circumference to the nearest 0.1 cm

BM079 Hip Circumference Measurement (cm)

3.9.12 Sitting Height

None

3.9.13 Knee Height

None

3.9.14 Vision

BM060

We are now going to test your distance vision and near vision.

Can you see light and count the fingers of handheld 2 feet in front of your face with one eye open and when wearing your glasses or contacts?

BM060a Left eye: 1. Yes 2. No

BM060b Right eye: 1. Yes 2. No

BM061 Distance Vision **Left Eye** Measurement

BM062 Distance Vision **Right Eye** Measurement

BM063 Near Vision **Left Eye** Measurement

BM064 Near Vision **Right Eye** Measurement

3.9.15 Hearing Exam

None

4. Biomarker Measurement Protocols

In this section, biomarker measurement protocols or nurse guides from each survey are listed.

4.1 HRS

4.1.1 Blood Pressure and Pulse Rate

4.1.1.1 Measurement

Three measurements, 45-60 seconds apart, were taken on the respondent's left arm.

Data recorded for each measurement include systolic and diastolic blood pressure, pulse, and the time of day the reading was taken.

4.1.1.2 Equipment

Omron HEM-780 Intellisense Automated blood pressure monitor with ComFit cuff.

4.1.1.3 Protocol

- Respondents were instructed to sit down with both feet on the floor and their left arm comfortably supported (on a table for example) with the palm facing up. Respondents were asked to roll their sleeve up unless they had on a short sleeve shirt or a thin shirt.
- The cuff was adjusted to the respondent's arm ensuring that it made direct contact with the skin, the bottom of the cuff was approximately half an inch above the elbow and the air tube ran down the middle of the respondent's arm.
- The interviewer pressed the start button.
- The cuff inflated automatically and then deflated while displaying the systolic and diastolic blood pressure and pulse.
- The interviewer recorded the systolic and diastolic blood pressure and pulse, as well as the time of the reading.
- The interviewer used a stopwatch and waited 45-60 seconds before beginning the next measurement.
- Three readings were taken.
- Interviewers were instructed to turn the monitor away from the respondent so that the respondent would not see the readings during the measurements, as viewing the reading could affect subsequent blood pressure and pulse measurements. Interviewers were instructed to remain quiet and not to respond to a respondent's inquiry regarding

the reading while the three measurements were being taken. If the lowest blood pressure reading obtained was higher than 160 systolic or higher than 110 diastolic (160/110), interviewers were instructed to record the measurements on a pre-designed card instructing the respondent to consult their physician as soon as possible.

4.1.2 Balance

4.1.2.1 Measurement

Up to two of the following measures of balance were conducted: Full Tandem, Semi-Tandem, Side-by-Side.

4.1.2.2 Equipment

A diagram showing the foot positions for the different balance stands and a stopwatch.

4.1.2.3 Protocol: Semi-Tandem

- All respondents attempted the Semi-Tandem stand.
- Interviewers assessed the appropriateness of the respondent's footwear before conducting the test. If necessary, respondents were asked to remove their shoes or to wear low or no heeled shoes. The interviewer was instructed to conduct the test in an area where the floor was level, preferably with no or low-pile carpet. If a respondent was not able to perform the test for the full amount of time, the interviewer recorded the amount of time the position was held.
- The respondent was asked to stand up with the side of the heel of one foot touching the big toe of the other foot for about 10 seconds.
- The respondent could put either foot in front and use their arms, bend their knees or move their body to maintain balance, but was instructed to try not to move their feet.
- If necessary, the interviewer was instructed to gently support the respondent's arm to help them get into the semi-tandem position. The interviewer stood to the side of the respondent to be in position to assist if a respondent lost their balance.
- The respondent was instructed to try to hold this position until told to stop.

- The interviewer stopped the stopwatch after 10 seconds or when the respondent stepped out of position or grabbed the interviewer's arm.

4.1.2.4 Protocol: Full-Tandem

- If they were able to hold Semi-Tandem for 10 seconds, they were then asked to do the Full-Tandem stand.
- Same protocol as for semi-tandem, except that the respondent was asked to stand with the heel of one foot in front of and touching the toes of the other foot for about [30/60] seconds.
- Respondents aged 65 or older were asked to complete a 30 second full-tandem balance test while those younger than 65 were asked to complete a 60 second full-tandem balance test.
- The interviewer stopped the stopwatch after [30/60] seconds or when the respondent stepped out of position or grabbed the interviewer's arm.

4.1.2.5 Protocol: Side-by-side

- If they were unable to hold the Semi-Tandem for 10 seconds, they were asked to perform the Side-by-Side Tandem stand.
- Same protocol as for semi-tandem, except that the respondent was asked to stand to stand with both feet together, side-by-side, for about 10 seconds.
- The interviewer stopped the stopwatch after 10 seconds or when the respondent stepped out of position or grabbed the interviewer's arm.

4.1.3 Walking Speed

4.1.3.1 Measurement

Respondents were timed as they walked the 98.5-inch (2.5 meters) course two times (there and back).

4.1.3.2 Equipment

Stopwatch, Tape Measure (pre-marked at 98.5 inches), Masking Tape (to mark the course)

4.1.3.3 Protocol

- The interviewer set up a walking course by placing the tape measure on the floor to measure the full distance.
- The interviewer placed a strip of masking tape, approximately 8 inches long, on the floor to mark the starting and ending points of the course.
- The interviewer retrieved the tape measure from the floor and instructed the respondent to place their toes at the start of the course.
- The interviewer said, “Ready, begin” to signal to the respondent to begin walking.
- The interviewer started the stopwatch once the respondent’s foot was across the starting line and fully touching the floor.
- The respondent was instructed to walk at their normal pace just past the end of the course.
- The interviewer stopped the stopwatch as soon as the respondent’s foot was completely past the masking tape marking the finish line and fully touched the floor.
- The interviewer reset the stopwatch and instructed the respondent to walk back to the other side.
- The interviewer timed the second walk as well and recorded the information in the booklet.

All respondents aged 65 years or older meeting the criteria described above and who do not have any problems from recent surgery, injury, or other health conditions that might prevent them from walking were eligible for the timed walk test. Additionally, sufficient space was necessary to conduct the test. A clear, preferably non-carpeted area, approximately 12 feet in length was needed to set up the walking course.

Respondents were instructed to wear appropriate footwear (low or no heel). The interviewer walked just to the side and slightly behind the respondent so as to clearly see the respondent’s feet as they crossed the line, but also to gently support the respondent if they lost their balance or started to fall. This measure could be completed with a walking aid, such as a cane or a walker, if a respondent normally used an aid to walk.

4.1.4 Lung Function

4.1.4.1 Measurement

Three measurements, 30 seconds apart, were conducted.

4.1.4.2 Equipment

Mini-Wright Peak Flow Meter with a disposable mouthpiece.

4.1.4.3 Protocol

- The interviewer handed the peak flow meter and a disposable mouthpiece to the Respondent and asked that they place the mouthpiece firmly on the meter.
- Respondents were instructed to stand up, take a deep breath, place their lips around the mouthpiece and blow as hard and as fast as possible.
- The interviewer recorded the value indicated by the pointer and reset the meter.
- The interviewer used a stopwatch and waited 30 seconds before beginning the next measure.
- Up to three readings were obtained.
- Interviewers were instructed to stop the measurement if the respondent became dizzy, wheezy or had a coughing attack. If the respondent coughed or laughed during a measurement, the measurement was repeated.

4.1.5 Grip Strength

4.1.5.1 Measurement

Two measurements were taken for each hand, left hand first, then right hand.

4.1.5.2 Equipment

Smedley spring-type hand dynamometer.

4.1.5.3 Protocol

- The dynamometer was fit to the respondent's hand and the respondent practiced once with their dominant hand in a standing position with their arm at their side at a 90-degree angle.
- The respondent was instructed to squeeze the meter as hard as they were able for a couple of seconds and to then let go.

- After the practice measurement, the respondent was instructed to switch to their nondominant hand
- Two measurements were taken with each hand, alternating hands.
- After each measurement, the interviewer recorded the result and handed the dynamometer back to the respondent.
- If the respondent was unable to stand, the measurement was completed with the respondent seated. If the respondent had difficulty holding the dynamometer, the respondent was allowed to perform the measurement with their upper arm resting on a table or other object for support. If the measurement was only performed with one hand, the interviewer instructed the respondent to wait 30 seconds between each measurement.

4.1.6 Leg Raise

None

4.1.7 Chair Stand

None

4.1.8 Height

4.1.8.1 Unit of Measurement

Inches

4.1.8.2 Equipment

Tape measure, Rafter's square, Self-adhesive Note, Pencil

4.1.9 Weight

4.1.9.1 Unit of Measurement

Pounds

4.1.9.2 Equipment

Healthometer 830KL digital scale

4.1.10 Waist Circumference

4.1.10.1 Unit of Measurement

Inches (Starting from Wave 8)

4.1.10.2 Measure Instruction

Waist circumference was measured at the height of the navel regardless of whether this was the smallest point or the natural waist. If the respondent was unable to place the measure around their waist, the interviewer could help them to do so. The measure was conducted over a thin layer of clothing.

4.1.11 Hip Circumference

None

4.1.12 Sitting Height

None

4.1.13 Knee Height

None

4.1.14 Vision

4.1.14.1 Method

None

4.1.15 Hearing Exam

4.1.15.1 Method

None

4.1.13.2 Equipment

HearCheck Device, Disposable Ear Cup

4.1.13.3 Measuring Instruction

Demonstrate using the HearCheck device:

- 1) Remove any obstructions from your ears (long hair, glasses, jewelry, etc.)
- 2) Press device against your ear
- 3) Explain that you will say “Ready, begin” to begin the test
- 4) You will ask the R to raise their finger when they hear each sound; demonstrate by lifting your finger 2-3 times

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- 1) Ask the respondent to ensure both of their ears are free of obstructions that would prevent the ear-cup from fully enclosing the ear (R should remove glasses, earrings, headwear, etc. and pull hair away from ear)
- 2) Ensure the hearing test is being conducted in a quiet environment (no noise from radio, television, pets or other sources)
- 3) Insert a new disposable ear-cup into the HearCheck Device

LEFT EAR –TESTS 1 AND 2 [F1 – Help]

- 1) Ask the respondent to remove any hearing aid(s) they are currently wearing. Make sure they will be able to see or hear you signaling the start and end of the tests.
- 2) Gently place the cup of the device over the respondent’s left ear
- 3) Say “Ready, begin.”
- 4) Press the Start button to initiate test 1 (1000 Hz).
- 5) Count the number of times the respondent raises their finger during test 1.
- 6) Press Start button within 20 seconds to continue with test 2 (3000 Hz).
- 7) Count the number of times the respondent raises their finger during test 2.

RIGHT EAR – TESTS 1 AND 2 [F1 – Help]

- 1) Move the device to the R’s right ear
- 2) Press Start button to start test 1 (1000 Hz) on the right ear
- 3) Count the number of times the respondent raises their finger during test 1

- 4) Press Start button within 20 seconds to continue with test 2 (3000 Hz)
- 5) Count the number of times the respondent raises their finger during test 2

4.2 MHAS

4.2.1 Blood Pressure

4.2.1.1 Measurement

2 measurements of Systolic, Diastolic pressure and Pulse from left arm.

4.2.1.2 Equipment

Electronic sphygmomanometer (OMRON), AA batteries, Pen or pencil,

4.2.1.3 Protocol

Prepare the sphygmomanometer, i.e. install the cuff hose to the sphygmomanometer on the left and turn on the blue on/off button. The systolic and diastolic readings appear at the bottom left of the screen, when turned on 688 shows up for each measurement and 188 shows up for pulse along with the clock with the appropriate time.

Explain to the participant the procedure you will perform to make the measurement

Ask the participant to sit and to put out their left arm, help the participant in case they need help.

Ask the participant to remove rings, bracelets or watches, etc.

The participant should be comfortably sitting in an armchair or with a table to allow the arm to be fully extended and supported during measurement

Locate the brachial pulse with the index and middle fingers, adjust the cuff so that the hose is not obstructed and stays along the path of the artery

Place the cuff around the arm, about an inch above the elbow

Ensure that the whole cuff is in contact with the skin but is not too tight

Once the cuff is properly placed, press the grey START button to inflate the cuff and just before the pressure in the cuff begins to decrease, the blood pressure measurement that is to be recorded will appear on the screen

120/80 mmHg is considered a normal value in adults, but may vary depending on body type, age, and sex of the individual.

4.2.2 Balance

None

4.2.3 Walking Speed

4.2.3.1 Measure

Respondents were timed as they walked the 3 meter course two times.

4.2.3.2 Equipment

Three-meter strip, stopwatch, registration log

4.2.3.3 Protocol

Now I will observe how you walk normally. If you use a cane or other device to walk, you may use it during this time.

First trial of the gait speed test: This is the walking path. I will ask you to walk to the end of the path with your normal speed, as though walking on the street to go to the store. Show the path to the participant. Walk all the way to pass the other side of the tape before stopping. Do you feel that this is safe? Ask the participant to stand with both feet touching the start line. When you are ready, I will say Ready, start!

When the participant understands this instruction, say "Ready, Start"

Press the start button on the stopwatch while the participant starts walking. Walk behind and to the side of the participant. Stop taking the time when one foot of the participant is completely across the finish line

Second trial of the Gait Speed Test:

Now I would like to walk the path again. Remember to walk at your normal pace, and continue until you reach the end of the path. Ask the participant to stand with both feet touching the start line

When you are ready, I will say Ready, start! When the participant understands this

instruction, say “Ready, Start”. Press the start button on the stopwatch while the participant starts walking. Walk behind and to the side of the participant. Stop taking the time when one of the participant’s foot is completely across the line.

4.2.4 Lung Function

None

4.2.5 Grip Strength

4.2.5.1 Measurement

Two measurements were taken for each hand, left hand measure first, then right hand.

4.2.5.2 Equipment

Dynamometer

4.2.5.3 Protocol

“Now we will measure your hand strength. I will ask you to squeeze an object as hard as you can for couple of seconds and then release. We will perform the test on both of your hands.”

Have the participant remove their rings or other jewelry.

While the participant is using their dominant hand, adjust the dynamometer for the participant, moving it up and down so that the bar rests between the index and ring finger.

In a standing position, hold the dynamometer at a 90° angle and squeeze the handle for a few seconds. Ensure that the participant is in the correct position: standing with the arm forming a 90° angle

Ensure that the dynamometer reads zero

Explain the procedure again

Allow the participant to practice with their dominant hand. If the participant cannot use their dominant hand, have them practice with the other hand and wait 30 seconds between each test

This test should be done twice on each hand.

4.2.6 Leg Raise

4.2.6.1 Measurement

None

4.2.6.2 Equipment

None

4.2.6.3 Protocol

Please try to stand on one foot without support or grabbing anything. You can try on any leg and then we will try with the other one. I will keep the time so that I can tell you when to start and stop (10 seconds). We can stop at any time if you feel you are about to lose your balance. Let's start with the leg you feel the safest with.

4.2.7 Chair Stand

None

4.2.8 Height

4.2.8.1 Unit of Measurement

Centimeter

4.2.8.2 Equipment

Stadiometer

4.2.9 Weight

4.2.9.1 Unit of Measurement

Kilograms

4.2.9.2 Equipment

Electronic portable scales

4.2.10 Waist Circumference

4.2.10.1 Unit of Measurement

Centimeter

4.2.10.2 Measure Instruction

- The participant should be standing relaxed with bare skin showing along the waist, arms crossed and resting on the shoulders with shoes off
- Feel along and locate both of the participant's inferior and superior iliac crests on and the last rib and identify the midpoint between the superior iliac crest and the last rib
- Using the tape measure, measure the midaxillary distance on the right side and again on the left side
- Once the midaxillary distance have been marked with pen in both sides, locate the measuring tape and wrap it around the waist leaving the "o" visible and ensuring there are no folds in the tape, then take the measurement. Remember the measurement should be recorded in centimeters and millimeters.
- Keep your fingers from getting between the tape and the participants waist, which can lead to false readings.

4.2.11 Hip Circumference

4.2.11.1 Unit of Measurement

Centimeter

4.2.11.2 Measure Instruction

The participant should stand with feet about 20cm apart, with weight evenly distributed on both bare feet, wearing the least amount of clothing possible

The circumference is taken horizontally along the widest area of the buttocks

The measurement is made on the widest or bulkiest part of the buttocks

The trochanters can be used as a line of reference for the measure

The anthropometrist should stand so that they are able to see the widest part of the buttocks to place the measuring tape horizontally along this plane

The tape should fit tight on the body but not to the point of squeezing

The reading should be taken on the left side, to avoid being improper or making the participant uncomfortable.

4.2.12 Sitting Height

4.2.12.1 Unit of Measurement

Centimeter

4.2.12.2 Equipment

Measuring tape, ruler, pen, registration log, measurement log

4.2.12.3 Measure Instruction

It is the distance between the vertex and the lower parts of the pelvis (both ischia), which rest on the seat. Normally, this measure should be carried out with participants sitting in a chair with bare feet flat on the floor. The participant's head should be oriented in the Frankfort Plane Position, they should be in the most erect position, with the upper back and back of the head firmly against the back of the chair, forming a 90-degree angle with the thighs. Record the measurement in the measurement log. Remember to use centimeters and millimeters. Have the participant stand up from the chair. This procedure is to be performed on the participant twice. Should there be any doubt between the first and second measurement, a third measurement should be made as a confirmation.

4.2.13 Knee Height

4.2.13.1 Unit of Measurement

Centimeter

4.2.13.2 Equipment

Fiberglass measuring tape, pen, registration log, measurement log

4.2.13.3 Equipment

Before proceeding with the measurement, you will ask the participant to uncover their leg up three finger widths above the knee. In case there is a physical impediment, help

the participant with this step.

Measure the distance between the heel and the highest part of the knee joint, on the external lateral part, with the participant's leg bent at a 90-degree angle between the thigh and calf. Standing in front of the participant, have the participant bend the knee to from a 90-degree angle and to sit in a comfortable position. The point is first located by first looking with the thumb or index finger the depression at the knee joint, surrounded by three protuberances (femoral epicondyle, anterolateral border of the tibia and fibular head); second, press down on this spot using the lateral thumb of your right hand and locate the border of the tibia and finally, palpate towards the back until the point coinciding with the external proximal tibial plateau. This point is at least one third of the distance between the anterior and posterior points of the knee. Once the anatomical point has been identified, have the participant stand, while keeping the anatomical point always marked. To take the measurement, use the left leg if possible with the respondent sitting, with shoes off and with the knee at a right angle (in bedridden people the leg should be bent at a 90 degree angle). Measure the distance between the anatomical point located before and the point where the heel makes contact with the ground. The measure should be made with a straight line passing through the lateral malleolus. Round off the measure to every 0.5 cm. Record the measure.

4.2.14 Vision

None

4.2.15 Hearing Exam

None

4.3 ELSA

4.3.1 Blood Pressure and Pulse Rate

4.3.1.1 Measurement

Three measurements of systolic pressure, diastolic pressure and pulse were taken from right arm.

4.3.1.2 Equipment

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 nurse visits.

4.3.1.3 Protocol

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.

4.3.2 Balance

4.3.2.1 Measurement

The eligibility for the balance module depends on age of respondent and performance during the stands.

4.3.2.2 Equipment

A diagram showing the foot positions for the different balance stands and a stopwatch.

4.3.2.3 Protocol: Side-by-side

- All respondents start with the side-by-side.
- Stand with feet together side by side.

4.3.2.4 Protocol: Semi-Tandem

- If they held side-by-side for 10 seconds, they attempted the semi-tandem stand for

10 seconds.

- Stand with the side of the heel of one foot touching the big toe of the other foot.

4.3.2.5 Protocol: Full-Tandem

- Respondents who completed side-by-side and semi-tandem 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.
- Stand with the heel of one foot in front of and touching the toes of the other foot.

4.3.3 Walking Speed

4.3.3.1 Measure

Respondents were timed as they walked the 8 foot (2.4-meter) course two times (there and back).

4.3.3.2 Equipment

Stopwatch, Tape Measure, Masking Tape (to mark the course)

4.3.3.3 Protocol

- The interviewer set up a walking course by placing the tape measure on the floor to measure the full distance.
- The interviewer retrieved the tape measure from the floor and instructed the respondent to place their toes at the start of the course.
- The interviewer said, "Ready, begin" to signal to the respondent to begin walking.
- The interviewer started the stopwatch once the respondent's foot was across the starting line and fully touching the floor.
- The respondent was instructed to walk at their normal pace just past the end of the course.
- The interviewer stopped the stopwatch as soon as the respondent's foot was completely past the masking tape marking the finish line and fully touched the floor.
- The interviewer reset the stopwatch and instructed the respondent to walk back to

the other side.

- The interviewer timed the second walk as well and recorded the information in the booklet.

4.3.4 Lung Function

4.3.4.1 Measurement

- Waves 2 and 4: Three measurements each were taken of forced vital capacity (FVC), forced expiratory volume (FEV) and peak flow (PF) 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.
- Wave 6: The aim was to collect three acceptable blows from each eligible respondent. After each attempt, the program advised the nurse whether the blow was acceptable. If it wasn't, the program instructed the nurse to ask the respondent to try again. At least 3 and up to 8 measurements were taken. As in Waves 2 and 4, measurements taken using a spirometer were of FVC, FEV and PF.

4.3.4.2 Equipment

At Wave 6, due to major technological advances, a different model of spirometer was used to measure lung function. The model differed significantly from the model used at Waves 2 and 4 and so results across waves should be interpreted separately.

4.3.4.3 Protocol

None

4.3.5 Grip Strength

4.3.5.1 Measurement

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.

4.3.5.2 Equipment

Isometric handgrip strength

4.3.5.3 Protocol

Now I would like to assess the strength of your hand in a gripping action. I will count up to three and then ask you to squeeze this handle as hard as you can, just for two or three seconds and then let go.

DEMONSTRATE.

4.3.6 Leg Raise

4.3.6.1 Measurement

Only respondents aged 69 and under who successfully passed the side-by-side stand were eligible and therefore 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.

4.3.6.2 Equipment

None

4.3.6.3 Protocol

LEG RAISE WITH EYES OPEN

Now I will show you the next movement. I want you to try to stand on one leg, whichever one you want and raise the other leg off the ground a few inches. Stand for as long as you can - I will stop you at 30 seconds. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. You may support yourself on a chair, table or wall while getting into position. DEMONSTRATE. Do you feel that would be safe? When I want you to start, I will say: 'Ready, begin'.

LEG RAISE WITH EYES CLOSED

Now I would like you to repeat the procedure one more time, this time with your eyes closed. I want you to close your eyes and try to stand on one leg, whichever one you want, and raise the other leg off the ground a few inches. Stand for as long as

you can - I will stop you at 30 seconds. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. You may support yourself on a chair, table or wall while getting into position. DEMONSTRATE.

4.3.7 Chair Stand

4.3.7.1 Measurement

Chair Rise

4.3.7.2 Equipment

None

4.3.7.3 Protocol

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.

4.3.8 Height

4.3.8.1 Unit of Measurement

Centimeters

4.3.8.2 Equipment

Stadiometer

4.3.9 Weight

4.3.9.1 Unit of Measurement

Kilograms

4.3.9.2 Equipment

4.3.10 Waist Circumference

4.3.10.1 Unit of Measurement

Centimeter

4.3.10.2 Measure Instruction

The waist is defined as the point midway between the iliac crest and the costal margin (lower rib). To locate the levels of the costal margin and the iliac crest use the fingers of the right hand held straight and pointing in front of the participant to slide upward over the iliac crest. Men's waists tend to be above the top of their trousers whereas women's waists are often under the waistband of their trousers or skirts.

4.3.11 Hip Circumference

4.3.11.1 Unit of Measurement

Centimeter

4.3.11.2 Measure Instruction

The hip circumference is defined as being the widest circumference over the buttocks and below the iliac crest. To obtain an accurate measurement you should measure the circumference at several positions and record the widest circumference.

4.3.12 Sitting Height

4.3.12.1 Unit of Measurement

Centimeter

4.3.12.2 Equipment

Stadiometer

4.3.12.3 Measure Instruction

Remove the top 1 or 2 sections of the measuring rod

Find a hard chair with as flat a seat as possible. Place the base of the stadiometer

on the chair with the measuring rod at the back

Ask the respondent to sit on the base plate with his/her back to the rod. Ensure that the respondent is sitting as far back and as upright as possible. Try to ensure that the rod is as vertical as possible. Check that their back is as straight as possible

Position the head in the Frankfort Plane. Bring the head plate down until it gently rests on the highest part of the subject's head. Press down to flatten their hair if necessary.

Take the height reading indicated by the arrowhead. As with standing height, sitting height must be recorded in centimetres and millimetres, eg 176.5 cms. If a measurement falls between two millimetres, it should be recorded to the nearest even millimetre. For example, if the respondent's height is between 176.4 and 176.5 cms, you should round it down to 176.4. Likewise, if a respondent's height is between 176.5 and 176.6 cms, you should round it up to 176.6 cms.

4.3.13 Knee Height

None

4.3.14 Vision

None

4.3.15 Hearing Exam

None

4.4 SHARE

4.4.1 Blood Pressure and Pulse Rate

Wave 4 (2011) in Germany only.

4.4.1.1 Measurement

Three measurements of Systolic and Diastolic pressure, 1 minute apart, were taken from either arm.

4.4.1.2 Equipment

Electronic blood pressure monitor

4.4.1.3 Protocol

Blood pressure was measured three times in a row with about 1 minute pause between each measurement. The measurement was conducted by using an electronic blood pressure monitor. All interviewers were equipped with exactly the same type of monitor which they had to bring with them to the respondents' homes. Respondents were asked to sit still and relax without talking. Furthermore, interviewers were instructed to assert that respondents did not sit with their legs crossed during the measurement or with a wrong arm position.

4.4.2 Balance

None

4.4.3 Walking Speed

4.4.3.1 Measurement

Respondents were timed as they walked the 2.5 meters course two times.

4.4.3.2 Equipment

None

4.4.3.3 Protocol

Walking speed is assessed by measuring the time (in seconds) it takes for a respondent to walk a distance of 2.5 meters. All respondents aged 76 years or older were eligible for the walking speed test in Wave 1 (2004/05) and all respondents aged 75 years or

older were eligible for the walking speed test in Wave 2 (2006/07).

4.4.4 Lung Function

4.4.4.1 Measurement

2 measurements

4.4.4.2 Equipment

Mini-Wright peak flow meter with a disposable mouthpiece

4.4.4.3 Protocol

The next test that I am going to ask you to perform measures how fast you can expel air from your lungs. It is important that you blow as hard and as fast as you can. I would like you to perform the test two times. When we are ready to begin, I'll ask you to stand up. Take as deep a breath as possible. Open your mouth and close your lips firmly around the outside of the mouthpiece, and then blow as hard and as fast as you can into the mouthpiece. Demonstrate the test.

4.4.5 Grip Strength

4.4.5.1 Measurement

Two measurements were taken for each hand, left hand measure first, then right hand.

4.4.5.2 Equipment

Smedley spring-type hand dynamometer

4.4.5.3 Protocol

Performance measurement that quantifies the respondent's maximum handgrip strength with the aid of a dynamometer.

4.4.6 Leg Raise

None

4.4.7 Chair Stand

4.4.7.1 Measurement

Chair rise

4.4.7.2 Equipment

None

4.4.7.3 Protocol

The chair stand test is measured one time per respondent and is performed only by respondents who are 74 years old or younger in Wave 2 (2006) and by all respondents in Wave 5. The respondents fold their arms across their chest and stand up from a sitting position on a chair and sit down again five times. 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 five rises. The interviewer recorded the time that respondents took to do five rises.

4.4.8 Height

Wave 4 (2011) in Germany only.

4.4.8.1 Unit of Measurement

Centimeter

4.4.8.2 Equipment

A metal tape measure and a rafter square

4.4.9 Weight

None

4.4.10 Waist Circumference

Wave 4 (2011) in Germany only.

4.4.10.1 Unit of Measurement

Centimeter

4.4.10.2 Measure Instruction

Interviewers were instructed to place the tape measure around the body at the height

of the navel. Respondents were asked to breathe in, to breathe out and to hold their breath for a second. The measurement was taken while holding the breath. Respondents were allowed to measure their waist circumference themselves if they wished to do so.

4.4.11 Hip Circumference

None

4.4.12 Sitting Height

None

4.4.13 Knee Height

None

4.4.14 Vision

None

4.4.15 Hearing Exam

None

4.5 KLoSA

4.5.1 Blood Pressure and Pulse Rate

None

4.5.2 Balance

None

4.5.3 Walking Speed

None

4.5.4 Lung Function

None

4.5.5 Grip Strength

4.5.5.1 Measurement

Measurements were taken for each hand, right hand measure first, then left hand.

4.5.5.2 Equipment

Dynamometer TANATA 6103 Model

4.5.5.3 Protocol

- Now, I'm going to measure your RIGHT HAND. Please put your elbow onto your side and make a right angle around your elbow. Make sure the scale of the dynamometer is set to zero. Ready? Squeeze it now. (unit: Kg)
- Now, I'm going to measure your RIGHT HAND again. Please set the scale of the dynamometer to zero, Squeeze it now. (unit: Kg.)
- Now, I'm going to measure your LEFT HAND, Please put your elbow onto your side and make a right angle around your elbow. Make sure the scale of the dynamometer is set to zero. Ready? Squeeze it now. (unit: Kg.)
- Now, I'm going to measure your LEFT HAND again, Please set the scale of the dynamometer to zero. Squeeze it now. (unit: Kg.)

4.5.6 Leg Raise

None

4.5.7 Chair Stand

None

4.5.8 Height

None

4.5.9 Weight

None

4.5.10 Waist Circumference

None

4.5.11 Hip Circumference

None

4.5.12 Sitting Height

None

4.5.13 Knee Height

None

4.5.14 Vision

None

4.5.15 Hearing Exam

None

4.6 JSTAR

4.6.1 Blood Pressure

4.6.1.1 Measurement

3 measurements of Systolic, Diastolic, and Pulse from left arm

4.6.1.2 Equipment

OMRON machines

4.6.1.3 Protocol

We would like to measure in the following procedure. Here is a sphygmomanometer. Please let us measure three times using this equipment. Wrap the cuff around your left arm. Hold your palm upwards and relax your arm. Relax your stomach during the measurement. When you push the button, the cuff starts to expand and press your arm. Then cuff deflates gradually as the air comes out, and it measures your blood pressure automatically. Since checking the result may affect the blood pressure, I will tell you all the results after measuring three times.

4.6.2 Balance

None

4.6.3 Walking Speed

None

4.6.4 Lung Function

None

4.6.5 Grip Strength

4.6.5.1 Measurement

1 measurement from (preferably) dominant hand

4.6.5.2 Equipment

Smedley-type Hand Grip Meter, No. 6103; TANITA, Tokyo, Japan

4.6.5.3 Protocol

Grasp this handle as strongly as possible for 2-3 seconds with your dominant hand, or if your dominant hand is disabled, with your other hand, and release. I will perform this test only once.

Conduct grip strength test after the following procedure. Adjust the width of the grip by turning a knob of the grip dynamometer. The ideal width is the length where second joint of the forefinger is flexed to a right angle. Set the needle to zero. Instruct the person being tested to grip the dynamometer so that the gauge faces to other side of him or her. The arm should be pulled down and be relaxed at the beginning. It does not matter if the person being tested takes the test while sitting or standing. By keeping the arm at the same position (without moving) ask him or her to grip the dynamometer as much as possible for 2 to 3 seconds and let it relax.

Only when first try did not work out properly, please conduct a second try.

Please make sure if the person being tested understands the procedure of the test. If the person does not understand the procedure, please explain the steps again.

4.6.6 Leg Raise

None

4.6.7 Chair Stand

None

4.6.8 Height

4.6.8.1 Unit of Measurement

Centimeter

4.6.8.2 Equipment

No information

4.6.9 Weight

None

4.6.10 Waist Circumference

4.6.10.1 Unit of Measurement

Centimeter

4.6.10.2 Measure Instruction

Read the following, and encourage to respondent to cooperate in the Waist Circumference. If he/she refuses, please do not coerce. [Instructions for interviewer to read]: Next, could we measure your waist? Waist size reflects the condition of your visceral fat, and is used for diagnosis for metabolic syndrome. This is one of the important measurements to know your health condition. We would like you to measure it by yourself using this tape measure. Could you agree to this?

We would like to measure in the following procedure. First please stand up. If you are wearing thick clothes, take it off or turn it over around your waist. Please indicate where your navel is. Then I will give you this tape measure. Please wrap it around your waist over the clothes at the height of your navel. You are ready if you have it correctly. Breathe normally and freely. I will ask you to stop breathing when you breathe in and out. Then I will read the value of the measure.

4.6.11 Hip Circumference

None

4.6.12 Sitting Height

4.6.12.1 Unit of Measurement

Centimeter

4.6.12.2 Equipment

No information

4.6.12.3 Measure Instruction

First, I would like you to stand with your back against the wall. Then I will measure your height by placing this triangle against your head, and then pasting this post-it

note to the wall to mark your height. Is this okay? We will measure your seated height in the same way. Do you understand?

4.6.13 Knee Height

None

4.6.14 Vision

None

4.6.15 Hearing Exam

None

4.7 TILDA

4.7.1 Blood Pressure and Pulse Rate

4.7.1.1 Measurement

2 measurements with 1 minute interval of Systolic and Diastolic pressure from either arm

4.7.1.2 Equipment

Blood pressure was measured using the OMRON digital automatic blood pressure monitor (Model M10-IT) with arm cuff. The arm cuff measures arm circumferences from 22 to 42 cm.

4.7.1.3 Protocol

Blood pressure was measured using the OMRON TM digital automatic blood pressure monitor (Model M10-IT) with arm cuff. The arm cuff measures arm circumferences from 22 to 42 cm. The respondent removed any tight fitting clothing from their upper arm and any thick clothing (e.g. sweater). Measurements were taken in a quiet place while the respondent was in a relaxed but upright seated position - correct posture during measurement is necessary to get accurate results. The ambient temperature of the room was recorded just prior to the first measurement.

The arm cuff was applied to either arm, whichever was most convenient to the respondent. The blue strip was centered on the middle of the respondent's inner arm, pointing down the inside of the arm. The air tube ran down the inside of the respondent's forearm, in line with their middle finger. The bottom of the cuff was 1-2 cm above the elbow. The cuff was fitted snugly around the respondent's arm with no kinks in the air tubing. The respondent placed their arm on a table so that the cuff was at the same level as their heart and was asked not to talk or move during the measurements.

The machine was pre-programmed to record 2 blood pressure readings, one minute apart. During the first measurement, the cuff inflated and then completely deflated again. After one minute, the 2nd measurement started automatically. The respondent was reminded to remain still until the entire measurement process was complete. The

results for each individual measurement were displayed after all measurements were completed.

4.7.2 Balance

None

4.7.3 Walking Speed (Timed Up and Go)

4.7.3.1 Measurement

1 measurement, Respondents were timed as they stood up from the chair and walked 3 meters (there and back) and then sat down.

4.7.3.2 Equipment

Armed chair, stopwatch, tape measure, masking tape

4.7.3.3 Protocol

The timed "Up & Go" test measures, in seconds, the time taken by an individual to stand up from a standard arm chair (approximate seat height of 46 cm, arm height 65 cm), walk a distance of 3 meters (approximately 10 feet), turn, walk back to the chair, and sit down again. Respondents wore their regular footwear and if assistive devices such as canes or walkers were usually used by the respondents, they were asked to use them during the test.

4.7.4 Lung Function

None

4.7.5 Grip Strength

4.7.5.1 Measurement

2 measurements from non-dominant hand first and then dominant hand in Wave 1 (2010) and Wave 3 (2014).

1 measurement from dominant hand (preferably) in Wave 2 (2012) and Wave 4 (2016).

4.7.5.2 Equipment

Grip strength was measured with a Baseline (Fabrication Enterprises Inc, White Plains, NY) hydraulic hand dynamometer which consists of a gripping handle with a strain-gauge and an analogue reading scale.

4.7.5.3 Protocol

Hand-grip strength affects everyday function and declines with age. It is an indicator of frailty in older persons and lower grip strength is associated with higher morbidity and mortality.

Respondents with swelling, inflammation, severe pain or recent injury to their hand/wrist, and those with surgery to their hand/wrist in the last 6 months were excluded. If there was a problem with one hand, measurements were taken with the other hand. The grip strength test was explained and demonstrated before the test was carried out. Each respondent was asked to indicate their dominant hand.

Large rings were removed before the test and the handle was set to a comfortable grip ensuring that the metal bar (grip) rested on the middle piece of the four fingers. The upper arm was kept tight against their trunk and the forearm was kept at a right angle to the upper arm. If the respondent found the dynamometer too heavy to hold in this position, either they or the nurse were allowed use their free hand to rest the dynamometer on. The test was carried out standing; if this was not possible, the respondent was allowed to sit in an upright chair. If necessary, the table could be used for arm support ensuring the forearm was still at a right angle to the upper arm. The respondent was asked to squeeze the handle with maximum force for a few seconds. The value to the nearest whole number in kg was recorded by viewing the scale when held at nose level.

In Wave 1 and Wave 3, two values were recorded for each hand alternating between hands, starting with the non-dominant hand (4 values all together). In Wave 2 and Wave 4, only one measurement was attempted by the interviewer using the respondent's dominant hand. If the respondent was unable to use their dominant hand, for example due to pain or recent surgery, a measurement was taken using the non-dominant hand.

4.7.6 Leg Raise

None

4.7.7 Chair Stand

None

4.7.8 Height

4.7.8.1 Unit of Measurement

Centimeter

4.7.8.2 Equipment

Seca 240 wall mounted measuring rod

4.7.9 Weight

4.7.9.1 Unit of Measurement

Kilograms

4.7.9.2 Equipment

SECA electronic floor scale

4.7.10 Waist Circumference

4.7.10.1 Unit of Measurement

Centimeter

4.7.10.2 Measure Instruction

The waist was defined as the point midway between the iliac crest and the costal margin (lower rib). Men's waists tend to be above the top of their trousers whereas women's waists are often under the waistband of their trousers or skirts. If the

respondent had a waistband at the correct level of the waist (midway between the lower rib margin and the iliac crest), waist circumference was measured over the waistband. The respondent was asked to breathe out gently and to look straight ahead (to prevent them contracting their muscles or holding their breath). The tape was kept horizontal and the measurement to the nearest mm was taken at the end of a normal expiration.

Caution was taken with female respondents where the waistband of jeans was on the waist at the back but dipped down at the front. In such instances, the Waist Circumference was taken on the waist band at the back and off the waist band at the front.

4.7.11 Hip Circumference

4.7.11.1 Unit of Measurement

Centimeter

4.7.11.2 Measure Instruction

The hip circumference was defined as being the widest circumference over the buttocks and below the iliac crest. The tape was pulled so that it was horizontal and kept in position but not causing indentation. The respondent was asked to relax their gluteal muscles during measurement. Two measurements were taken, and the largest value was recorded.

4.7.12 Sitting Height

None

4.7.13 Knee Height

None

4.7.14 Vision

4.7.14.1 Method

Vision or eyesight was assessed in Wave 1 (2010) and Wave 3 (2014) only.

4.7.14.2 Equipment

LogMAR (Minimal Angle of Resolution) charts

4.7.14.3 Measure Instruction

As respondents were allowed wear corrective glasses/lenses for this test, the measurements reflect corrected visual acuity. The charts are designed to be used at 4 meters. A different chart was used to test each eye starting with the right eye.

The respondent was asked to stand behind the marked line on the floor, 4 m from the chart. He/She covered the left eye and read Chart 1 slowly letter by letter starting at the top left hand corner of the chart and reading across, then moving onto the line beneath and repeating this step. Only one reading of a given letter was allowed. When the respondent had difficulty, he or she was encouraged to guess. It was deemed reasonable to point to the letter and say “Try reading this one”. The score for the right eye was calculated using the scoring protocol below and recorded to two decimal places. For the left eye, the respondent was asked to stand behind the line, cover the right eye and read Chart 2 slowly letter by letter as before. If a respondent was unable to read any letters, they were moved closer to the chart (1 m away) and 0.6 was added to the LogMAR score for each line.

4.7.15 Hearing Exam

None

4.8 CHARLS

4.8.1 Blood Pressure

4.8.1.1 Measurement

3 measurements of Systolic, Diastolic pressure and Pulse from left arm with 45 second intervals

4.8.1.2 Equipment

Omron HEM-7200 Monitor, Batteries, Stopwatch

4.8.1.3 Protocol

“Now let’s talk about the first activity. I’d like to measure your blood pressure using this monitor and cuff which I will secure around your left arm. I would like to take three blood pressure measures. I will ask you to relax and remain seated and quiet during the measurements. First, I will place the cuff on your left arm. Once the cuff is placed appropriately on your arm and we are ready to begin, I’ll ask you to lay your arm on a flat surface palm facing up so that the center of your upper arm is at the same height as your heart. I will then press the Start button. The cuff will inflate and deflate automatically. After we have completed all three measures, I will give you your results.”

Insert arm cuff plug into jack on the side of the monitor, place the cuff on the left arm approximately ½ above the elbow. Position the arrows over the brachial artery on the inside of the arm. Press the START/STOP button to show how the cuff will inflate automatically.

4.8.2 Balance

4.8.2.1 Measurement

Up to two of the following measures of balance were conducted: Full Tandem, Semi-Tandem, Side-by-Side.

4.8.2.2 Equipment

A show card showing the foot positions for the different balance stands and a stopwatch.

4.8.2.3 Protocol: Semi-Tandem

“For the first one, I want you to try to stand with the side of the heel of one foot touching the big toe of the other foot for about 10 seconds. You may put either foot in front, whichever is more comfortable for you. Like this...”

4.8.2.4 Protocol: Full-Tandem

If the respondent completed the semi-tandem stand they were asked to complete the full-tandem stand.

“Now I want you to try to stand with the heel of one foot in front of and touching the toes of the other foot for about [30/60] seconds. You may put either foot in front, whichever is more comfortable for you. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. Like this...”

Respondents aged 70 or older were asked to complete a 30 second full-tandem balance test while those younger than 70 were asked to complete a 60 second full-tandem balance test.

4.8.2.5 Protocol: Side-by-side

If the respondent failed to complete the semi-tandem stand they were asked to complete the side-by-side stand.

“Now I will show you the next movement. I want you to try to stand with your feet together, side-by-side for about 10 seconds. You may use your arms, bend your knees, or move your body to maintain your balance, but try not to move your feet. Try to hold this position until I tell you to stop. Like this...”

4.8.3 Walking Speed

4.8.3.1 Measure

Respondents were timed as they walked the 2.5 meters course two times.

4.8.3.2 Equipment

Tape measure, Stopwatch, Masking Tape

4.8.3.3 Protocol

- Measured only for respondents aged 60 or older
- “I am going to time you as you walk the course at your normal pace. I will be asking you to walk the course at your usual pace a total of two times. I’ll walk along side you the whole time during the measurement. I’d like you to stand here with your feet lined up. Start walking when I say ‘Begin’. Walk all the way past the other end of the tape before you stop. Are you ready to go now? Begin.”
- “Now I want you to repeat the walk. Remember to walk at your usual pace and go all the way past the other end of the course. I’d like you to stand here with your feet lined up. Start walking when I say ‘Begin’. Are you ready to go now? Begin.”

4.8.4 Lung Function

4.8.4.1 Measurement

3 measurements with 30 seconds interval

4.8.4.2 Equipment

Everpure peak flow meter with a disposable mouthpiece

4.8.4.3 Protocol

“Next I’m going to ask you to perform a simple measurement that will measure how fast you can expel air from your lungs. It is important that you blow as hard and as fast as you can. I would like you to perform the measurement three times. When we are ready to begin, I’ll ask you to stand up. Take as deep a breath as possible. Open your mouth and close your lips firmly around the outside of the mouthpiece, and then blow as hard and as fast as you can into the mouthpiece. Like this...”

Stand up, take a deep breath and then place lips around the outside of the mouthpiece. Blow as hard and as fast as you can.

4.8.5 Grip Strength

4.8.5.1 Measurement

2 measurements were taken for each hand, left hand measure first, then right hand.

4.8.5.2 Equipment

Yuejian WL-1000 dynamometer

4.8.5.3 Protocol

“Now I would like to assess the strength of your hand in a gripping action. I will ask you to squeeze this handle as hard as you can, just for a couple of seconds and then let go. I will take alternately two measurements from your right and your left hands.”

Stand, hold the dynamometer at a right angle and squeeze the handle for a few seconds.

4.8.6 Leg Raise

None

4.8.7 Chair Stand

4.8.7.1 Measurement

Repeated chair stand 5 times

4.8.7.2 Equipment

Stopwatch

4.8.7.3 Protocol

“Now, I will show you the next movement. Please keep your arms folded across your chest. When I say ‘ready? stand’, please stand up straight and then sit down again at your fastest pace five times without stopping in between and without using your arms to push off. Do you think you can do that for me?”

4.8.8 Height

4.8.8.1 Unit of Measurement

Centimeter

4.8.8.2 Equipment

Stadiometer

4.8.9 Weight

4.8.9.1 Unit of Measurement

Kilograms

4.8.9.2 Equipment

Scale

4.8.10 Waist Circumference

4.8.10.1 Unit of Measurement

Centimeter

4.8.10.2 Measure Instruction

“Next I’m going to perform a simple measurement of your waist circumference. For this measurement it is important for you to be standing. I will ask you to identify where on your body your navel (belly button) is located. I will then place this soft measuring tape around your waist, over your clothing, holding it securely at the level of your navel. Once the tape measure is placed appropriately around your waist then we are ready to begin. I will ask you to take a normal breath and exhale, holding your breath at the end of the exhale. I will then record the measurement.

The waist is defined as the point midway between the iliac crest and the costal margin (lower rib). Stand and locate navel. Place measuring tape over the clothing around the waist at the level of the navel. Take a normal breath and exhale, holding breath at end of exhale and letting the tape out slightly.

4.8.11 Hip Circumference

None

4.8.12 Sitting Height

None

4.8.13 Knee Height

4.8.13.1 Unit of Measurement

Centimeter

4.8.13.2 Equipment

MA DING Rule

4.8.13.3 Measure Instruction

"Next I will measure your knee height. Please sit on a chair with barefoot."

4.8.14 Vision

None

4.8.15 Hearing Exam

None

4.9 LASI

4.9.1 Blood Pressure and Pulse Rate

4.9.1.1 Measurement

Three measurements of Systolic pressure, Diastolic pressure and Pulse were taken with 1 minute intervals. It also provides the average of the last 2 readings.

4.9.1.2 Equipment

OMRON HEM-780 N monitor, Soft measuring Tape (Gulick Tape), and stopwatch.

4.9.1.3 Protocol

- Respondents were instructed to sit down with both feet on the floor and their left arm comfortably supported (on a table for example) with the palm facing up. Respondents were asked to roll their sleeve up unless they had on a short sleeve shirt or a thin shirt.
- The cuff was adjusted to the respondent's arm ensuring that it made direct contact with the skin, the bottom of the cuff was approximately half an inch above the elbow and the air tube ran down the middle of the respondent's arm.
- The interviewer pressed the start button.
- The cuff inflated automatically and then deflated while displaying the systolic and diastolic blood pressure and pulse.
- The interviewer recorded the systolic and diastolic blood pressure and pulse.
- The interviewer used a stopwatch and waited 1 minute before beginning the next measurement.
- Three readings were taken.
- Interviewers were instructed to remain quiet and not to respond to a respondent's inquiry regarding the reading while the three measurements were being taken.

4.9.2 Balance

4.9.2.1 Measurement

Up to two of the following measures of balance were conducted: Full Tandem, Semi-Tandem, Side-by-Side.

4.9.2.2 Equipment

A diagram showing the foot positions for the different balance stands and a stopwatch.

4.9.2.3 Protocol: Semi-Tandem

- Stand with the side of the heel of one foot touching the big toe of the other foot for 10 seconds.
- The respondent could put either foot in front and use their arms, bend their knees or move their body to maintain balance, but was instructed to try not to move their feet.
- If necessary, the interviewer was instructed to gently support the respondent's arm to help them get into the semi-tandem position. The interviewer stood to the side of the respondent to be in position to assist if a respondent lost his/her balance.
- The respondent was instructed to try to hold this position until told to stop.
- If R was able to complete the semi-tandem for the full 10 seconds without stepping out of place or grabbing a hold of anything go to Full-Tandem.
- If R was not able complete the semi-tandem for the full 10 seconds without stepping out of place or grabbing a hold of anything go to Side-by-Side.

4.9.2.4 Protocol: Full-Tandem

- If they were able to hold Semi-Tandem for 10 seconds, they were then asked to do the Full Tandem stand.
- Same protocol as for semi-tandem, except that the respondent was asked to stand with the heel of one foot in front of and touching the toes of the other foot for about [30/60] seconds.
- Respondents aged 70 or older were asked to complete a 30 second full-tandem balance test while those younger than 70 were asked to complete a 60 second full-tandem balance test.
- The interviewer stopped the stopwatch after [30/60] seconds or when the respondent stepped out of position or grabbed the interviewer's arm.

4.9.2.5 Protocol: Side-by-side

- If they were unable to hold the Semi-Tandem for 10 seconds, they were asked to perform the Side-by-Side Tandem stand.

- Same protocol as for semi-tandem, except that the respondent was asked to stand with both feet together, side-by-side, for about 10 seconds.
- The interviewer stopped the stopwatch after 10 seconds or when the respondent stepped out of position or grabbed the interviewer's arm.

4.9.3 Walking Speed

4.9.3.1 Measure

Respondents were timed as they walked the 4-meter course two times (there and back).

4.9.3.2 Equipment

Stopwatch, Steel measuring tape, Masking Tape (to mark the course)

4.9.3.3 Protocol

- The interviewer set up a walking course by placing the tape measure on the floor to measure the full distance.
- The interviewer retrieved the tape measure from the floor and instructed the respondent to place their toes at the start of the course.
- The interviewer said, "Ready, begin" to signal to the respondent to begin walking.
- The interviewer started the stopwatch once the respondent's foot was across the starting line and fully touching the floor.
- The respondent was instructed to walk at their normal pace just past the end of the course.
- The interviewer stopped the stopwatch as soon as the respondent's foot was completely past the masking tape marking the finish line and fully touched the floor.
- The interviewer reset the stopwatch and instructed the respondent to walk back to the other side.
- The interviewer timed the second walk as well and recorded the information in the booklet.

4.9.4 Lung Function

4.9.4.1 Measurement

Three measurements each were taken of forced vital capacity (FVC) and forced expiratory volume (FEV) using a spirometer. The aim was to collect three acceptable blows from each eligible respondent. After each attempt, the program advised the nurse whether the blow was acceptable. If it wasn't, the program instructed the nurse to ask the respondent to try again. At least 3 and up to 8 measurements were taken.

4.9.4.2 Equipment

Spirometer, CAPI, Mouthpiece with filter, Barcode scanner, Barcode sticker/ label, Nose clip, Micropore tape, Thermo hygrometer.

4.9.4.3 Protocol

- Ask the Respondent to sit straight and upright throughout the test.
- Tell the respondent to perform the complete maneuver while you deliver instructions. Use micro pore tape and nose clip if respondent is inhaling from nose. Ask not to obstruct the mouthpiece with tongue if required. If respondent performance is incorrect, explain the instructions and demonstrate the procedure. If respondent performance is correct, fix the respondent mouthpiece on spirometer and proceed for the test by clicking on —FVC measurement in CAPI. Health investigator should close both ends of spirometer while calibration process to avoid any airflow in the device. The interviewer instructed the respondent to take a deep and complete breath, blow hard (Peak must be obtained), Continuing blowing (Minimum 6 seconds or until 1 second plateau is achieved), Take a deep and complete breath.
- Perform 3 acceptable tests out of which 2 should be repeatable and finish the test. Let respondent relax between two tests (min 30 sec). Do not perform more than 8 tests (include complete maneuver only). Dispose the mouthpiece and micro pore tape in Bio-hazard waste bag. Stop the test if the respondent coughs continuously or feels giddiness and is unable to perform test.
- Please note that this data has not been released at this time.

4.9.5 Grip Strength

4.9.5.1 Measurement

Two measurements were taken for each hand, left hand measure first, then right hand.

4.9.5.2 Equipment

Smedley spring-type hand dynamometer and Stopwatch.

4.9.5.3 Protocol

- The dynamometer was fit to the respondent's hand and the respondent practiced once with their dominant hand in a standing position with their arm at their side at a 90-degree angle.
- The respondent was instructed to squeeze the meter as hard as they were able for a couple of seconds and to then let go.
- After the practice measurement, the respondent was instructed to switch to their nondominant hand
- Two measurements were taken with each hand, alternating hands.
- After each measurement, the interviewer recorded the result and handed the dynamometer back to the respondent.
- If the respondent was unable to stand, the measurement was completed with the respondent seated. If the respondent had difficulty holding the dynamometer, the respondent was allowed to perform the measurement was conducted with their upper arm resting on a table or other object for support. If the measurement was only performed with one hand, the interviewer instructed the respondent to wait 30 seconds between each measurement.

4.9.6 Leg Raise

None

4.9.7 Chair Stand

None

4.9.8 Height

4.9.8.1 Unit of Measurement

Centimeter

4.9.8.2 Equipment

Pocket Stadiometer with Spirit Level Bubble

4.9.9 Weight

4.9.9.1 Unit of Measurement

Kilogram

4.9.9.2 Equipment

Seca 803 Digital Weight measuring scale

4.9.10 Waist Circumference

4.9.10.1 Unit of Measurement

Centimeter

4.9.10.2 Measure Instruction

Waist circumference was measured at the height of the navel. Make sure the tape is parallel to the floor all the way round the body when preparing to make the measurement. Minimize touching the respondent. If the respondent was unable to place the measure around their waist, the interviewer could help them to do so. The measure was conducted over a thin layer of clothing.

4.9.11 Hip Circumference

4.9.11.1 Unit of Measurement

Centimeter

4.9.11.2 Measure Instruction

Make sure the person has minimal clothing on the hips between the tape and skin. Ask respondents to remain standing with their feet together, arms at their side with palms facing inwards. Move the Gulick's tape from the waist, to the maximum

circumference of the hips. Take the soft Gulick tape around the maximum circumference of the respondent's buttocks, being careful to make sure the tape is parallel to the floor all the way around. Fit the tape snugly, but not so tightly as to compress the soft tissue. Ask the respondent to breathe normally and pause at the end of the expiration of a breath when you will take the reading.

4.9.12 Sitting Height

None

4.9.13 Knee Height

None

4.9.14 Vision

4.9.14.1 Method

Visual acuity is measured in both eyes using distance and near vision tests on programmed CAPI.

4.9.14.2 Equipment

Mini Laptop (CAPI Device), Steel measuring tape, soft measuring tape, and Masking tape

4.9.14.3 Measure Instruction

- Tell respondent to sit at starting point whichever s/he finds comfortable so that the respondent's eyes will be 3 meters from the mini laptop screen/display.
- Explain the Show Card/ log mark image to the Respondent.
- Make sure the person does not lean in closer to the mini laptop during the test.
- Respondents indicate if the “E” shown on CAPI screen is facing Up, Down, Left or Right.
- Only record that whether his/her response is correct or incorrect using radio buttons provided for the same.

4.9.15 Hearing Exam

None