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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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Report No: 2018-001

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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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April 2018

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Introduction

Identifying comparable measures across global aging surveys is essential for cross-country analysis. This guide provides an overview of harmonization of physical and anthropometric measurements across the surveys within the family of Health Retirement Study (HRS). The surveys included are the Health and Retirement Study (HRS), English Longitudinal Study of Ageing (ELSA), Survey of Health, Ageing, and Retirement in Europe (SHARE), Korean Longitudinal Study of Aging (KLoSA), China Health and Retirement Longitudinal Study (CHARLS), The Irish Longitudinal Study on Aging (TILDA), Mexican Health and Aging Survey (MHAS), and Japanese Study on Aging and Retirement (JSTAR). The measures we have reviewed in this guide include blood pressure, pulse rate, balance, walking speed, lung function, grip strength, leg raise, chair stand, height, weight, waist circumference, hip circumference, vision, hearing, sitting height, and knee height.

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 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 HRS-family surveys.

This guide consists of the following chapters. In the first chapter, we elaborate the methodological issues of each measure across surveys. The second 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 measurement of the Health and Retirement Study (HRS) family studies. This includes HRS [wave 7 (2004) through wave 13 (2016)], ELSA, [wave 2 (2004), wave 4 (2008), and wave 6 (2012)], SHARE [wave 1 (2004) through wave 4 (2010)]¹, KLoSA [wave 1 (2006) through wave 4 (2012)], CHARLS [wave 1 (2011) and wave 2 (2013)], TILDA [wave 1 (2010/2011), wave 2 (2012/2013)], MHAS [wave 3 (2012)], and JSTAR [wave 2 (2009)]. The physical and anthropometric measures we have reviewed include blood pressure, pulse rate, balance, walking speed, lung function, grip strength, leg raise, chair stand, height, weight, waist circumference, hip circumference, vision, hearing, sitting height, and knee height. The following descriptions are the summary of each measure.

Blood Pressure and Pulse Rate

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

Balance

- HRS, ELSA, and CHARLS have three balance positions: semi-tandem, full-tandem, and side-by-side.
- In HRS and CHARLS, conditional on respondents' success of 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 he/she completed side-by-side, and finally full-tandem, if he/she completed semi-tandem.

Walking Speed

- HRS, SHARE, CHARLS, and MHAS measured walking speed of respondents, with length of walking courses varying from 2.5 to 3 meters.

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

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

Lung Function

- HRS and CHARLS took 3 measurements of peak flow rate with 30 seconds interval. SHARE also measured peak flow during waves 2 and 4. But, no detailed information is available.
- 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.

Grip Strength

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

Leg Raise

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

Chair Stand

- Only ELSA and CHARLS ask respondents to stand up and down five times at the fastest pace.

Height

- HRS used inches, and ELSA, SHARE, CHARLS, TILDA, MHAS, and JSTAR used centimeter as unit for height measurement. KLoSA collected self-reported height in centimeters.

Weight

- HRS used pounds, ELSA, SHARE, CHARLS, TILDA, and MHAS used kilogram as unit for weight measurement. KLoSA and JSTAR collected self-reported weights in kilogram.

Waist Circumference

- HRS used inches, ELSA, SHARE, CHARLS, TILDA, MHAS, and JSTAR used centimeters for 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

- ELSA, TILDA, and MHAS used centimeter as unit for hip circumference. ELSA and TILDA measured hip circumference at least twice, while MHAS only measured it once.

Vision

- HRS, ELSA, SHARE, KLoSA, CHARLS, MHAS, and JSTAR have self-reported vision information. TILDA used LogMAR chart to measure visual acuity.

Hearing

- In HRS, self-reported hearing ability questions were asked before 2016. In 2016, hearing was also objectively tested using HearCheck Device, in addition to the self-reported questions. ELSA, SHARE, KLoSA, CHARLS, TILDA, MHAS, and JSTAR have self-reported questions only.

Sitting Height

- Sitting height was measured in centimeter in ELSA (wave 2,4), MHAS, and JSTAR.

Knee Height

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

1. 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 methodological similarities and differences of each physical measure across the surveys. Specifically, this section focuses on a few salient features that could potentially affect measurement results.

1.1 Blood Pressure and Pulse Rate

1.1.1 Measurement

All surveys except for KLoSA [HRS, ELSA, SHARE (Germany Wave 4 only), CHARLS, TILDA, MHAS, and JSTAR] measured systolic and diastolic blood pressure of respondents (Table 1). HRS, ELSA, CHARLS, and JSTAR collected pulse rate of respondents as well.

1.1.2 Equipment

Omron monitors were used to measure blood pressure and pulse rate by many surveys. HRS used Omron HEM-780 Intellisense automated blood pressure monitor with ComFit cuff, CHARLS used Omron HEM-7200 monitor, and TILDA used OMRON Model M10-IT. No detailed model information of Omron monitors is available for ELSA, MHAS, and JSTAR. SHARE does not specify which blood pressure monitor was used.

1.1.3 Number of Measurements, Interval, and Measured Arms

HRS and CHARLS took blood pressure and pulse from respondent's left arm 3 times, with 45 to 60 seconds interval between measurements. ELSA measured 3 times from right arm, but the protocol does not specify time gap between measurements. TILDA measured 2 times with 1-minute gap from whichever arm that was more convenient to a respondent. MHAS measured 2 times from left arm and JSTAR measured 3 times from left arm.

1.1.4 Position

All surveys measure blood pressure and pulse in sitting position if possible. Most surveys (HRS, CHARLS, MHAS, JSTAR) measure blood pressure and pulse on the left arm. ELSA measured blood pressure and pulse on right arm, while TILDA used whichever arm more convenient to respondents.

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

Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
Country	United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Measures	Systolic, Diastolic, Pulse	Systolic, Diastolic, Pulse	(Germany, w4 only) Systolic, Diastolic,	N/A	Systolic, Diastolic, Pulse	Systolic, Diastolic	Systolic, Diastolic	Systolic, Diastolic, Pulse
Equipment	Omron HEM-780 Intellisense automated blood pressure monitor, with ComFit cuff.	Omron monitors	Electronic blood pressure monitor		Omron HEM-7200 monitor,	(wave 1 only) OMRON™ digital automatic blood pressure monitor (Model M10-IT) with arm cuff.	Electronic sphygmomanometer (OMRON)	OMRON machines
Number of Measurement	3	3	-		3	2	2	3
Interval	45 – 60 seconds	-	-		45 - 60 seconds	1 min	-	-
Arms	Left arm	Right arm	-		Left arm	Either arm (more convenient)	Left arm	Left arm
Position	Seated, arm on a flat surface palm facing up so that the center of upper arm is at the same height as heart	Seated	Seated		Seated, arm on a flat surface palm facing up so that the center of upper arm is at the same height as heart	Upright seated position, with arm on a table, asked not to talk or move	Sitting in an armchair or with a table	Position (sitting position /standing position/Other) can vary

1.2 Balance

1.2.1 Measurement

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

1.2.2 Sequence

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

1.2.3 Equipment

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

1.2.4 Age and Duration

All surveys measured semi-tandem and side-by-side for 10 seconds, regardless of respondents' age. For full-tandem, age and duration vary across surveys. In HRS, 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 a 60 seconds full-tandem test. (age cut-off was 65 in 2006, and 70 in the studies after 2006). In ELSA, respondents below age 70 were asked to complete the full-tandem for 30 seconds, whereas respondents with age 70 or above were asked do it for 10 seconds. Finally, CHARLS asked respondents below 70 to complete the test for 60 seconds and respondents 70 or above for 30 seconds (same as HRS).

Table 2. Summary of Balance Measure in Each Survey

Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
Country	United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Measures	up to two of the followings: Full Tandem, Semi-Tandem, Side-by-Side	Side by side, semi-tandem, full tandem,	N/A	N/A	full tandem, side by side, semi-tandem	N/A	N/A	N/A
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))			
Equipment	A diagram showing the foot positions for the different balance stands and a stop watch.	Each position was demonstrated by nurses			stopwatch, show card			
Age and Duration	semi- and side-by-side: 10 seconds; full: 30 seconds (70+) / 60 seconds (under 70)	semi- and side-by-side: 10 seconds; full: 10 seconds (70+) / 30 seconds (under 70)			semi- and side-by-side: 10 seconds; full: 30 seconds (70+) / 60 seconds (under 70)			

1.3 Walking Speed

1.3.1 Measurement

HRS, SHARE, CHARLS, TILDA, MHAS measured walking speed of respondents.

1.3.2 Equipment

HRS and CHARLS used stop watch, tape measure (pre-marked at 98.5 inches), masking tape (to mark the course). MHAS used three meters strip, stopwatch, registration log. No information for SHARE or TILDA.

1.3.3 Course Length and the Number of Measurement

HRS asked respondents to walk 98.5 inches (2.5 meters) course two times, on a clear, preferably non-carpeted area which is approximately 12 feet in length. SHARE measured the time (in seconds) it took for a respondent to walk two and a half meters (approximately 98.5 inches). CHARLS asked respondents to walk 2.5 meters 2 times, on the 4 meters long, non-carpeted area. Respondents in MHAS were asked to walk 3 meters long, 2 times. TILDA did timed up-and-go test (stand up from an arm chair and walk 3 meters and walk back and sit down one time).

Table 3. Summary of Walking Speed Measure in Each Survey

Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
Country	United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Equipment	Stop watch, tape measure, masking tape	N/A	-	N/A	Stop watch, tape measure, masking tape	N/A (timed up-and-go)	Three- meter strip, stopwatch, registration log	N/A
Course Length and the Number of Measurement	98.5 inch (2.5 meters) course two times . A clear, preferably non-carpeted area, approximately 12 feet in length		measuring the time it takes for a respondent to walk 2.5 meters (w1,w2)		2.5 meters twice (setup: 4 meters long in a non-carpeted area)		3 meters twice	

1.4 Lung Function

1.4.1 Measurement

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. HRS and CHARLS took 3 measurements of peak flow with 30 seconds interval. SHARE also measured peak flow during waves 2 and 4. But, no detailed information is available.

1.4.2 Equipment

HRS used 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 a peak flow meter manufactured in China. No information was obtainable from SHARE.

Table 4 Summary of Lung Function Measure in Each Survey

Topic	Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
	Country	United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Lung Function	Number of Measurement	Three measurements with 30 seconds apart	Three acceptable measurements from up to 8 attempts	Waves 2 and 4 only (no information)	N/A	Three measurements with 30 seconds interval	N/A	N/A	N/A
	Equipment	Mini-Wright Peak Flow Meter with a disposable mouthpiece.	using a spirometer			Pick flow meter, disposable mouthpiece			

1.5 Grip Strength

1.5.1 Measurement

All surveys measured grip strength of respondents.

1.5.2 Equipment

HRS used Smedley spring-type hand dynamometer; ELSA used the isometric handgrip strength measure; 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. JSTAR used Smedley-type Hand Grip Meter, No. 6103; TANITA, Tokyo, Japan. SHARE, KLOSA, CHARLS, and MHAS didn't provide detailed model name of the dynamometer.

1.5.3 Number of Measurements, Sequence, and Measured hand

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

TILDA changed methods of measurement over waves; in wave 1, two values were recorded for each hand, starting with the non-dominant hand (4 values all together). For wave 2, 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.

1.5.4 Position

In HRS, CHARLS, and MHAS the respondents were asked to stand. TILDA asked respondents to stand, if not then sit in an upright chair. In JSTAR, respondents could either stand or sit as long as the arm was not moving. In KLOSA, no preferred position is specified but respondent's position during grip strength test was recorded (standing; sitting; lying down).

Table 5 Summary of Grip Strength Measure in Each Survey

Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
Country	United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Measures	Grip strength, both hands	Grip strength, both hands	Grip Strength, dominant /measured hand, position	Grip strength, both hands	Grip strength, both hands	Grip strength, both hands in wave 1 and dominant hand only in wave 2	Grip strength, both hands	Grip strength, dominant hand
Equipment	Smedley spring-type hand dynamometer	Isometric handgrip strength measure	-	-	Dynamometer	Baseline (Fabrication Enterprises Inc, White Plains, NY) hydraulic hand dynamometer	Dynamometer	Smedley-type Hand Grip Meter, No. 6103; TANITA, Tokyo, Japan
Number of Measurement	2	3	-	2	2	2 for wave 1 and 1 for wave 2	2	1
Sequence and Measured Hand	Left hand first, then right	both the dominant and non-dominant hand	-	Right hand first, then left	Left hand first, then right	Non-dominant first in wave 1, and dominant hand in wave 2	Left hand first, then right	(preferably) dominant hand
Position	Stand, hold the dynamometer at a right angle and squeeze the handle for a few seconds		-	Questionnaire did not specify whether the preferred position is standing or sitting	Stand, hold the dynamometer at a right angle and squeeze the handle for a few seconds	standing, if not possible sit in an upright chair	a standing position, hold the dynamometer at a 90' angle and squeeze	standing or sitting position does not matter, as long as the arm is not moving

1.6 Leg Raise

1.6.1 Measurement and Sequence

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

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

1.7 Chair Stand

1.7.1 Measurement

ELSA asked all respondents to stand up from a firm chair without using their arms. If 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). Nurse recorded the times taken to complete the task.

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

Table 6. Summary of Leg Raise / Chair Stands Measure in Each Survey

Measure	Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
		United States	England	20+ European	S. Korea	China	Ireland	Mexico	Japan
Leg Raise	Measures	N/A	(Aged 69 years or under and held side-by-side stand for 10 seconds) eyes open for 30 seconds. If complete, with eye closed for 30 seconds	N/A	N/A	N/A	N/A	Stand on one leg for 10 seconds and with other leg for 10 seconds	N/A
Chair Stands	Sequence	N/A	Stand up from a chair. If completed, stand up and down 5 times (if 70 and above)/ 10 times (if below 70)	N/A	N/A	Stand up and down at the fasted pace for five times	N/A	N/A	N/A

1.8 Height

1.8.1 Unit of Measurement

HRS used inches, and ELSA, SHARE, CHARLS, TILDA, MHAS, and JSTAR used centimeter as unit for height measurement. KLoSA collected self-reported height in centimeters.

1.8.2 Equipment

HRS used a tape measure, Rafter’s square, an adhesive note and pencil for this measure. ELSA, CHARLS, and MHAS used stadiometer. TILDA used a Seca 240 wall mounted measuring rod. No information is available for SHARE or JSTAR.

1.9 Weight

1.9.1 Unit of Measurement

HRS used pounds, ELSA, SHARE, CHARLS, TILDA, and MHAS used kilogram as unit for weight measurement. KLoSA and JSTAR collected self-reported weights in kilogram.

1.9.2 Equipment

HRS used Healthometer 830KL digital scale for this measure. CHARLS used a scale by a Chinese manufacturer, without detailed information. TILDA used a SECA electronic floor scales. MHAS used electronic portable scales. No detailed equipment information is available from ELSA or SHARE.

1.10 Waist Circumference

1.10.1 Unit of Measurement

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

1.10.2 Measure Instruction

HRS, SHARE, CHARLS, and JSTAR measured waist circumference at the height of navel. TILDA and MHAS measured at the point midway between the iliac crest and the costal margin (lower rib). ELSA documentations did not provide details on how waist circumference was measured.

1.11 Hip Circumference

1.11.1 Unit of Measurement

ELSA, TILDA, and MHAS used centimeter as unit for hip circumference. Same as waist circumference, ELSA measured hip circumference twice. TILDA also measured hip circumference twice (once for waist circumference) 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 measured hip circumference only once.

1.11.2 Measure Instruction

Both TILDA and MHAS defined the hip circumference as being the widest circumference over the buttocks. No information is available for ELSA.

1.12 Vision

1.12.1 Method

HRS, ELSA, SHARE, KLoSA, CHARLS, MHAS, and JSTAR have self-reported vision information. TILDA used LogMAR chart to measure visual acuity.

1.13 Hearing Exam

1.13.1 Method

In HRS, self-reported hearing ability questions were asked before 2016. In 2016, hearing was also objectively tested using HearCheck Device, in addition to the self-reported questions. ELSA, SHARE, KLOSA, CHARLS, TILDA, MHAS, and JSTAR have self-reported questions only.

1.14 Sitting Height

1.14.1 Unit of Measurement

Sitting height was measured in centimeter in ELSA (wave 2,4), MHAS, and JSTAR

1.14.2 Equipment

MHAS used measuring tape and ruler to measure sitting height, no detailed equipment information for ELSA or JSTAR.

1.14.3 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 for ELSA or JSTAR.

1.15 Knee Height

1.15.1 Unit of Measurement

Knee height was measured in centimeters in CHARLS and MHAS.

1.15.2 Equipment

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

1.15.3 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). CHARLS measured right leg, if possible, while MHAS used left leg.

Table 7. Summary of Anthropometric measurements in Each Survey

Measure	Measures	HRS	ELSA	SHARE	KLoSA	CHARLS	TILDA	MHAS	JSTAR
	Country	United States	England	20+Europe	S. Korea	China	Ireland	Mexico	Japan
Height	Unit	inches	cm	(Germany w4 Only, cm), self-reported	cm (Self-reported)	cm	cm (measured and self-reported)	cm	cm (self-reported)
Weight	Unit	pounds	kg	(kg, self-reported)	kg (Self-report)	kg	(kg) (measured and self-reported)	kg	kg (self-reported)
Waist Circumference	Unit	inches	cm	(Germany w4 Only) cm	N/A	cm	cm	cm	cm (measured)
	Measure Instruction	height of navel	No info	height of navel	N/A	height of navel	midway between the iliac crest and the costal margin	midway between the iliac crest and the costal margin	height of navel
Hip Circumference	Unit	N/A	cm	-	N/A	N/A	cm	cm	N/A
Calf Circumference	Unit	N/A	N/A	-	N/A	N/A	N/A	cm	N/A
Vision	Method	self-reported	self-reported	self-reported	self-reported	self-reported	LogMAR	self-reported	self-reported
Hearing Exam	Method	HearCheck Device (2016)	self-reported	self-reported	self-reported	self-reported	self-reported	self-reported	self-reported
Sitting Height	Unit	N/A	cm	-	N/A	N/A	N/A	Cm	cm
Knee Height	Unit	N/A	N/A	-	N/A	cm (right leg, if possible)	N/A	Cm (left leg, if possible)	N/A

2. Questionnaire

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

Table 8 lists the variable names of each survey.

Table 8. Inventory of Physical Measures across Surveys

Topic		HRS			ELSA	SHARE			KLOSA		CHARLS		TILDA		MHAS		JSTAR			
		w7	w8- w12	w 13	w 2,4,6	w 1,2	w 3 (SHARELIFE)	w 4	w1	w2,3,4	w1	w2	w1	w2	w1,w2	w3	w1	w2	w3	
Blood pressure and Pulse Rate	Systolic		1859 1864 1869	1859 1864 1869	sys1 sys2 sys3 sysval						LI857 LI859	QA002 QA002_1	BPseatedsystolic1 BPseatedsystolic2 Bpseatedsystolicmean				1.1, 1.13		09D2-002-3	
	Diastolic	N/A	1860 1865 1870	1860 1865 1870	dias1 dias2 dias3 diaval	N/A	N/A	b4_7_1s b4_7_2s b4_7_3s (Germany Only)	N/A	N/A	LI857 LI860	QA006 QA006_1	BPseateddiastolic1 BPseateddiastolic2 Bpseateddiastolicmean	N/A	N/A		1.1, 1.13	N/A	09D2-002-3	N/A
	Pulse		1861 1866 1871	1861 1866 1871	pulse1 pulse2 pulse3						LI867 LI866 LI871	QA010 QA010_1	-				1.1 1.13		09D2-002-3	
	Arm		1872	1872	N/A						LI872	qa014	-				-		09D2-004 (B)	
Balance	Semi-tandem		1879 1876 1880 1881	1879 1876 1880 1881	mmstre mmstti						LI879 LI880 LI881	qd002 qd003								
	Side-by-side	N/A	1883 1886 1887 1888	1883 1886 1887 1888	mmsstre mmssti	N/A	N/A	N/A	N/A	N/A	LI886 LI887 LI888 LI889	qf002 qf003			N/A	N/A	N/A	N/A	N/A	N/A
	Full-tandem		1893 1896 1897 1898	1893 1896 1897 1898	mmftti mmftre mmftre2						LI896 LI898 LI899	qe002 qe003								
Walking Speed	Help	1828	1828	1828		-					-	-		-			1.19 1.22			
	Walking speed	1820 1823 1824	1820 1823 1824	1820 1823 1824	N/A	ws010_ws011_ws012_ws013_wspe ed wspeed2	N/A	N/A	N/A	N/A	LI823 LI824	qg002 qg003		FRTugSpeed, tug007 tug009m tug009s tug009c (timed up and go)	N/A		1.17, 1.20	N/A	N/A	N/A
Lung Function	Lung Function	1804 1807 1808 1809	1804 1807 1808 1809	1804 1807 1808 1809	fvf1 fev1 fvc2 fev2 fvc3 fec3	pf003 pf004 (w2 only)					LI807 LI808 LI809	qb002 qb003 qb004								
	Effort Level	1810	1810	1810	techni1 techni2 techni3 lfresp	pf005 (w2 only)	N/A				LI810			N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Position	1811	1811	1811	lfstand	pf006 (w2 only)					LI811									

Table 8. Inventory of Physical Measures across Surveys (cont.)

Topic		HRS			ELSA	SHARE			KLOSA		CHARLS		TILDA		MHAS		JSTAR		
		w7	w8- w12	w 13	w 2,4,6	w 1,2	w 3 (SHARELIFE)	w 4	w1	w2,3,4	w1	w2	w1	w2	w1,w2	w3	w1	w2	w3
Grip Strength	Grip Strength:(kg)	I816 I851 I852 I853	I816 I851 I852 I853	I816 I851 I852 I853	mmgsd1 mmgsn1 mmgsd2 mmgsn2 mmgsd3 mmgsn3	gs006_ gs007_ gs008_ gs009_	gs006_ gs007_ gs008_ gs009_	gs006_ gs007_ gs008_ gs009_	ce07 ce08 ce09 ce10	c507 c508 c509 c510	LI816 LI851 LI852 LI853	qc003 qc004 qc005 qc006	GRIPtest1D GRIPtest2D GRIPtest1ND GRIPtest2ND FRgripstrength D FRgripstrength ND	gs001 gs005 gs006	N/A	1.26, 1.27	F002 F-004-3 F-005-3	F002 F-004-3 F-005-3	F002 F-004-3 F-005-3
	Pain	I817	I817	I817	N/A	-	-	-	ce04	c504	K006 K007	K006 K007	-	-	N/A	1.23	-	F-002	-
	Dominant/Measured Hand	I815 I819	I815 I819	I815 I819	N/A	gs004_	gs004_	gs004_	ce01	c501	LI815	pc002 qc002	GRIPtestdominant	-	N/A	1.25	F-003 F-004-2.	F-003 F-004-2.	F-003 F-004-2.
	Position	I818	I818	I818	mmgstp	gs013_	gs013_	gs013_	ce11	c511	-	-	-	gs007	N/A	-	-	-	-
Leg Raise	Eye Open	N/A	N/A	N/A	mmlsre mmloti	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	L9	1.16	N/A	N/A	N/A
	Eye Close	N/A	N/A	N/A	mmlsre mmlsti	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-	-	N/A	N/A	N/A
Chair Stand	Chair Stand	N/A	N/A	N/A	mmcrrr mmrrfti mmrrrr mmrrtti	cs004_ cs008_ (w2 only)	N/A	-	N/A	N/A	LI003 LI004 LI005 LI006 LI007 LI008	QH003 QH004 QH005	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Height	I834	I834	I834	HEIGHT	ph013_ (self-reported)	N/A	b2_5 (Germany only) ph013_ (self-reported)	c095 (self-report)	c107 (self-report)	LI011	qi002	height, SR_Height_Cen timetres	N/A	L4	1.7 1.7.1	D006 (self-report)	09D-006 (self-reported), 09D-015-3 09D-015-4	D006 (self-reported)
	Weight	I841	I841	I841	WEIGHT	ph012_ (self-reported)	N/A	ph012_ (self-reported)	c093 (self-report)	c105 (self-report)	LI841	qi002	weight, SR_Weight_Kilogrammes	N/A	L3	1.8 1.8.1	D005 (self-report)	09D-005 (self-reported)	D005 (self-report)
	Waist Circumference	N/A	I907	I907	waist1 waist2 waist3	N/A	N/A	b3_6 (Germany only)	N/A	N/A	LI907	qm002 qm004	Frwaist, FRwhr	N/A	L6	1.9 1.9.1	N/A	09D2-007-3	N/A
	Hip Circumference	N/A	N/A	N/A	hip1 hip2 hip3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Frhip,FRwhr	N/A	L5	1.10 1.10.1	N/A	N/A	N/A
	Vision	C095 C096 C097 (self-reported)	C095 C096 C097 (self-reported)	C095 C096 C097 (self-reported)	Heeye Hefrnd Hepap (self-reported)	ph041 ph043 ph044 (self-reported)	N/A	ph041 ph043 ph044 (self-reported)	c062 c063 c064 c065 c069 (self-report)	c074 c075 c076 c077 c081 (self-reported)	D032 D033 D034 (self-reported)	D032 D033 D034 (self-reported)	visualAcuityRight VisualAcuityLeft wearGlasses woreGlassesDuingTest	N/A	c44 c45(w1) c41 c42(w2) (self-reported)	c41 c42 (self-reported)	d007 d008 d008-1 d008-2 d008-3 (self-reported)	09D-007 09D-008 09D-008-1 09D-008-2 09D-008-3 (self-reported)	d007 d008 d008-1 d008-2 d008-3 (self-reported)
	Hear Exam	C102 C013 (self-reported)	C102 C013 (self-reported)	I678, I679, I680, I681 C102 C013 (self-reported)	hehear hehra (self-reported and doctor told)	ph045 ph046 ph047 (ph055 ph056) (self-reported)	N/A	ph045 ph046 (self-reported)	c070 c071 c072 (self-report)	c082 c083 c084 (self-reported)	DA038 DA039 (self-reported)	DA038 DA039 (self-reported)	ph107 ph018 ph109 ph110 ph110 ph111 (self-reported)	ph107 ph018 ph109 ph110 ph111 (self-reported)	c46 c47(w1) c43 c44(w2) (self-reported)	c43 c44 (self-reported)	d009 d010-1 d010-2 d010-3 d010-4 (self-reported)	09D-009 09D-010-1 09D-010-2 09D-010-3 09D-010-4 (self-reported)	d009 d010-1 d010-2 d010-3 d010-4 (self-reported)
	Sitting Height	N/A	N/A	N/A	sithgt sithtrsp (w2, w4 ONLY)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	L7 (w2)	1.11 1.11.1	N/A	09D-015-3 09D-015-4	N/A
	Knee Height	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	LI019	QK002	N/A	N/A	L8	1.12 1.12.1	N/A	N/A	N/A

2.1 HRS

In this section, HRS coding information is collected based on 2008 study.

2.1.1 Blood Pressure and Pulse Rate

2.1.1.1 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.

2.1.1.2 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

2.1.1.3 Arm

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:

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

2.1.1.4 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

2.1.2 Balance

2.1.2.1 Semi Tandem

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

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

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)

2.1.2.2 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)

2.1.2.3 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)

2.1.3 Walking Speed

2.1.3.1 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)

2.1.3.2 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: Sec12.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

2.1.4 Lung Function

2.1.4.1 Lung Function

LI804 BREATH COMPLETE AT LEAST ONE TRIAL

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

Ref: Sec12.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: SecI2.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: SecI2.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).

2.1.4.2 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?

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)

2.1.4.3 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?

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

2.1.5 Grip Strength

2.1.5.1 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: Sec12.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 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: Sec12.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 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 the nearest 0.5 kilogram.

Enter 9993 if R was unable to perform this measurement

Enter 9999 if R chose not to do it

2.1.5.2 Pain

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

2.1.5.3 Dominant / Measured Hand

LI815 GRIP DOMINANT HAND

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

Ref: SecI2.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; 3 8. DK (Don't Know); NA (Not Ascertained) ; 9. RF (Refused)

LI819 HAND STRENGTH REST ARM

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

Ref: Sec12.V819_

HAND STRENGTH TEST

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

Answer:

1. YES ; 5. NO

2.1.5.4 Position

LI818 HAND STRENGTH TEST R POSITION

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

Ref: Sec12.V818_Rposition

HAND STRENGTH TEST

What was the r's position for this test?

Answer:

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

2.1.6 Leg Raise

None

2.1.6.1 Eye Open

None

2.1.6.2 Eye Close

None

2.1.7 Chair Stand

None

2.1.8 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.

LI837 HEIGHT WEARING SHOES

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

Ref: SecI2.V837_

HEIGHT

Was R wearing shoes during measurement?

Answer:

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

2.1.9 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: SecI2.V841_Weightpounds

WEIGHT

Enter respondent's weight in pounds as recorded on scale (to the nearest 1/2 pound).

Enter 99993 if R tried but received an error message.

Enter 99999 if R chose not to do it.

LI842 WEIGHT FLOOR SURFACE

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

Ref: SecI2.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 5. NOT SURE; 7. OTHER (SPECIFY); Blank. INAP (Inapplicable); Partial Interview

LI844 WEIGHT WEARING SHOES

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

Ref: SecI2.V844_

WEIGHT

Was R wearing shoes during measurement?

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

2.1.10 Waist Circumference

LI904 WAIST COMPLETE

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

Ref: SecI2.V904_WaistComplete

WAIST CIRCUMFERENCE

Were you able to measure R's 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 Circumferencement 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.

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

2.1.11 Hip Circumference

None

2.1.12 Vision

LC095 RATE EYESIGHT

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

Ref: SecC.Eyesight.C095_

Is your eyesight excellent, very good, good, fair, or poor using glasses or corrective lenses as usual?

Answer: 1. EXCELLENT; 2. VERY GOOD ; 3. GOOD ; 4. FAIR ; 5. POOR 6. [VOL] LEGALLY BLIND;
8. DK (Don't Know); NA (Not Ascertained); 9. RF (Refused); Blank. INAP (Inapplicable)

LC096 RATE DISTAL VISION

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

Ref: SecC.Eyesight.C096_

How good is your eyesight for seeing things at a distance, like recognizing a friend across the street, using glasses or corrective lenses as usual? (Is it excellent, very good, good, fair, or poor?)

Answer:

1. EXCELLENT; 2. VERY GOOD; 3. GOOD; 4. FAIR; 5. POOR; 8. DK (Don't Know); NA (Not Ascertained); 9. RF (Refused); Blank. INAP (Inapplicable); Partial Interview

LC097 RATE NEAR VISION

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

Ref: SecC.Eyesight.C097_

How good is your eyesight for seeing things up close, like reading ordinary newspaper print, using glasses or corrective lenses as usual? (Is it excellent, very good, good, fair, or poor?)

Answer:

1. EXCELLENT; 2. VERY GOOD; 3. GOOD; 4. FAIR; 5. POOR; 8. DK (Don't Know); NA (Not Ascertained); 9. RF (Refused); Blank. INAP (Inapplicable); Partial Interview

2.1.13 Hearing Exam

(2016 only)

Secl.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

Secl.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

Secl.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

Secl.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

(all waves)

LC102 WEAR HEARING AID

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

Ref: SecC.Hearingaid.C102_

Do you ever wear a hearing aid?

Answer:

1. YES ; 5. NO; 8. DK (Don't Know); NA (Not Ascertained); 9. RF (Refused); Blank. INAP (Inapplicable); Partial Interview

LC103 RATE HEARING

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

Ref: SecC.Hearingaid.C103_

Is your hearing excellent, very good, good, fair, or poor [(using a hearing aid as usual)]?

Answer: 1. EXCELLENT; 2. VERY GOOD; 3. GOOD; 4. FAIR; 5. POOR; 8. DK (Don't Know); NA (Not Ascertained); 9. RF (Refused); Blank. INAP (Inapplicable); Partial Interview

2.1.14 Sitting Height

None

2.1.15 Knee Height

None

2.2 ELSA

In this section, ELSA coding information is collected based on Wave 4 study.

2.2.1 Blood Pressure and Pulse Rate

2.2.1.1 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]

2.2.1.2 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]

2.2.1.3 Arm

None

2.2.1.4 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]

2.2.2 Balance

2.2.2.1 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.

2.2.2.2 Side by Side

MMSSINT @

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.

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

2.2.2.3 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]

2.2.3 Walking Speed

2.2.3.1 Help

None

2.2.3.2 Walking Speed

None

2.2.4 Lung Function

2.2.4.1 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 NoRead]

IF FVC reading (litres) < 9.95 [FVC < 9.95]

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]

2.2.4.2 Effort Level

TECHNIQUE

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.

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

2.2.4.2 Position

LFSTAND

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

Answer: 1 Standing; 2 Sitting

2.2.5 Grip Strength

2.2.5.1 Grip Strength

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

2.2.5.2 Pain

None

2.2.5.3 Dominant / Measured Hand

None

2.2.5.4 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

2.2.6 Leg Raise

2.2.6.1 Eye Open

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]

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.

2.2.6.2 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.

2.2.7 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.

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.

2.2.8 Height

HEIGHT

NURSE: Record standing height (in centimetres).

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

[Don't know and refusal are not allowed]

2.2.9 Weight

WEIGHT

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]

2.2.10 Waist Circumference

WAIST

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

Enter the [**^first / second / third**] Waist Circumferencement in centimetres.

(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]

2.2.11 Hip Circumference

HIP

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

Enter the [**^first / second / third**] measurement of hip circumference in centimetres. (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]

2.2.12 Vision

HEEYE

Is eyesight (using glasses or corrective lenses if use them)...

Answer:

1 ...excellent; 2 very good; 3 good; 4 fair; 5 or, poor?; 6 SPONTANEOUS: Registered or legally blind

HEFRND

How good is your eyesight for seeing things at a distance, like recognizing a friend across the street (using glasses or corrective lenses if use them)?

Answer:

1 ...excellent; 2 very good; 3 good; 4 fair; 5 or, poor

HEPAP

How good is your eyesight for seeing things up close, like reading ordinary newspaper print (using glasses or corrective lenses if use them)?

Answer:

1 ...excellent; 2 very good; 3 good; 4 fair; 5 or, poor

2.2.13 Hearing Exam

HEHEAR

Is hearing (using a hearing aid if use one)...

Answer:

1 ...excellent; 2 very good; 3 good; 4 fair; 5 or, poor

HEHRA

Do you find it difficult to follow a conversation if there is background noise, such as TV, radio or children playing (using a hearing aid as usual)?

Answer:

1 Yes; 2 No

2.2.14 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 height attempted, not obtained; 4 Sitting height 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 centimetres).

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

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

2.2.15 Knee Height

None

2.3 SHARE

In this section, SHARE coding information is collected based on Wave 4 study. Note that information of measures collected in only in Germany (blood pressure, measured height, waist circumference in Wave 4) is not collected

2.3.1 Blood Pressure and Pulse Rate

Blood pressure is taken only in Wave 4 in Germany

2.3.1.1 Systolic

None

2.3.1.2 Diastolic

None

2.3.1.3 Arm

None

2.3.1.4 Pulse

None

2.3.2 Balance

2.3.2.1 Semi Tandem

None

2.3.2.2 Side by Side

None

2.3.2.3 Full Tandem

None

2.3.3 Walking Speed

In Wave 1 and Wave 2 only

2.3.3.1 Help

None

2.3.3.2 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)

2.3.4 Lung Function

2.3.4.1 Lung Function

(Wave 2, Wave 4 only)

PF003_ValFirstMeas

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.)

PF004_ValSecMeas

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.)

2.3.4.2 Effort Level

PF005_EffortR

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

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

2.3.4.3 Position

PF006_PositionR

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

Answer:

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

2.3.5 Grip Strength

2.3.5.1 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

2.3.5.2 Pain

None

2.3.5.3 Dominant / Measured Hand

GS004_DominantHand

Which is your dominant hand?

Answer:

1. Right hand 2. Left hand

2.3.5.4 Position

GS013_Position

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

Answer:

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

2.3.6 Leg Raise

2.3.6.1 Eye Open

None

2.3.6.2 Eye Close

None

2.3.7 Chair Stand

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)

2.3.8 Height

Measured height is taken only in Wave 4 in Germany

BI003_Completed IWER: Which measurements were completed? Tick all that apply

Answer:

1. Height 2. Waist circumference 3. Blood pressure 4. Blood Spots 96. None of these

PH013_HowTall

How tall are you?

IWER: Length in centimetres (in UK: feet-dot-inches)

0.00..230.00

2.3.9 Weight

PH012_Weight

Approximately how much do you weigh?

IWER: Weight in kilos (in UK stone-dot-pounds)

0.00..250.00

2.3.10 Waist Circumference

Waist Circumference is taken only in Wave 4 in Germany

BI003_Completed IWER: Which measurements were completed? Tick all that apply

Answer:

1. Height 2. Waist circumference 3. Blood pressure 4. Blood Spots 96. None of these

2.3.11 Hip Circumference

None

2.3.12 Vision

PH041_UseGlasses

Do you usually wear glasses or contact lenses?

Answer: 1. Yes; 5. No

PH043_EyeSightDist

How good is your eyesight for seeing things at a distance, like recognising a friend across the street [using glasses or contact lenses as usual]? Would you say it is...

Answer: 1. Excellent; 2. Very good; 3. Good; 4. Fair; 5. Poor

PH044_EyeSightPap

How good is your eyesight for seeing things up close, like reading ordinary newspaper print [using glasses or contact lenses as usual]? Would you say it is...

Answer: 1. Excellent; 2. Very good; 3. Good; 4. Fair; 5. Poor

2.3.13 Hearing Exam

PH045_UseHearingAid

Are you usually wearing a hearing aid?

Answer: 1. Yes; 5. No

PH046_Hearing

Is your hearing [using a hearing aid as usual]...

Answer: 1. Excellent; 2. Very good; 3. Good; 4. Fair; 5. Poor

2.3.14 Sitting Height

None

2.3.15 Knee Height

None

2.4 KLoSA

In this section, KLoSA coding information is collected based on wave 4.

2.4.1 Blood Pressure and Pulse Rate

2.4.1.1 Systolic

None

2.4.1.2 Diastolic

None

2.4.1.3 Arm

None

2.4.1.4 Pulse

None

2.4.2 Balance

2.4.2.1 Semi Tandem

None

2.4.2.2 Side by Side

None

2.4.2.3 Full Tandem

None

2.4.3 Walking Speed

2.4.3.1 Help

None

2.4.3.2 Walking Speed

None

2.4.4 Lung Function

2.4.4.1 Lung Function

None

2.4.4.2 Effort Level

None

2.4.4.3 Position

None

2.4.5 Grip Strength

2.4.5.1 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]

2.4.5.2 Pain

C504. Which hand hurts?

Answer: 1. R is unable to use both hands →Go to C505 ; 3. R is unable to use right hand →Go to C509; 5.

R is unable to use left hand →Go to C507

2.4.5.3 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

2.4.5.4 Position

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

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

2.4.6 Leg Raise

None

2.4.6.1 Eye Open

None

2.4.6.2 Eye Close

None

2.4.7 Chair Stand

None

2.4.8 Height

C107. How tall are you? (unit: Centimeter)

[range:70~210]

2.4.9 Weight

C105. How much do you weigh? (unit: Kilogram)

[range:30~200]

2.4.10 Waist Circumference

None

2.4.11 Hip Circumference

None

2.4.12 Vision

C074. Now I have some questions about your eyesight. Do you usually wear glasses or corrective lens?

Answer: 1. Yes ; 3. Visually disabled (blind)→Go to C082; 5. No

C075. How good is your eyesight (including corrected vision)?

Answer: 1. Very good; 2. Good; 3. Fair; 4. Poor; 5. Very poor

C076. How good is your eyesight (including corrected vision) for seeing things at a distance, like recognizing a friend across a street?

Answer: 1. Very good; 2. Good; 3. Fair; 4. Poor; 5. Very poor

C077. How good is your eyesight (including corrected vision) for seeing things up close, like reading a newspaper?

Answer: 1. Very good; 2. Good; 3. Fair; 4. Poor; 5. Very poor

2.4.13 Hearing Exam

C082. Now I have some questions about your hearing. Do you wear a hearing aid?

Answer: 1. Yes; 5. No

C083. How good is your hearing? If you use a hearing aid, answer about your hearing when you wear it.

Answer: 1. Very good; 2. Good; 3. Fair; 4. Poor; 5. Very poor

C084. Does your hearing limit your daily activities?

Answer: 1. Yes; 5. No

2.4.14 Sitting Height

None

2.4.15 Knee Height

None

2.5 CHARLS

In this section, CHARLS coding information is collected based on wave 1.

2.5.1 Blood Pressure and Pulse Rate

LI857-LI875: 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.)

2.5.1.1 Systolic

LI857 (Measure 1) Time of Reading

LI859 (Measure 1) Systolic Reading

LI857 (Measure 2) Time of Reading

LI864 (Measure 2) Systolic Reading

LI857 (Measure 3) Time of Reading

LI869 (Measure 3) Systolic Reading

2.5.1.2 Diastolic

LI857 (Measure 1) Time of Reading

LI860 (Measure 1) Systolic Reading

LI857 (Measure 2) Time of Reading

LI865 (Measure 2) Systolic Reading

LI857 (Measure 3) Time of Reading

LI870 (Measure 3) Systolic Reading

2.5.1.3 Arm

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

Answer:

1 Left arm; 2 Right arm

2.5.1.4 Pulse

LI857 (Measure 1) Time of Reading

LI861 (Measure 1) Systolic Reading

LI857 (Measure 2) Time of Reading

LI866 (Measure 2) Systolic Reading

LI857 (Measure 3) Time of Reading

LI871 (Measure 3) Systolic Reading

2.5.2 Balance

2.5.2.1 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

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)

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

2.5.2.2 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

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

LI889 Record the type of floor surface that the balance measures were conducted on. (Circle one) .

Answer: (Circle one)

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

(Specify): _____

2.5.2.3 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 it993 R tried but was

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

Answer: (Circle one)

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

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): _____

2.5.3 Walking Speed

2.5.3.1 Help

None

2.5.3.2 Walking Speed

LI823 (Measure 1) Waling Speed Time (second)

LI824 (Measure 2) Waling Speed Time (second)

2.5.4 Lung Function

2.5.4.1 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.)

2.5.4.2 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

2.5.4.3 Position

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

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

2.5.5 Grip Strength

2.5.5.1 Grip Strength

LI816 (Measure 1) Left Hand

LI851 (Measure 1) Right Hand

LI852 (Measure 2) Left Hand

LI853 (Measure 2) Right Hand

2.5.5.2 Pain

K006 “Before we begin, I’d like to make sure it is safe for you to do this measurement. Have you had surgery or experienced any swelling, inflammation, severe pain, or injury in one or both hands within the last 6 months?”

Answer: (Circle one)

1 YES → continue with the next question

5 NO → skip the next question

K007 “In which hand (have you had surgery or experienced any swelling, inflammation, severe pain, or injury in the last 6 months)?”

Answer: (Circle one)

1 BOTH HANDS → do not complete this measure and answer question in box below

2 LEFT HAND ONLY → continue but do not perform measurement on left hand

3 RIGHT HAND ONLY → continue but do not perform measurement on right hand

2.5.5.3 Dominant / Measured Hand

LI815 “Which is your dominant hand?”

Answer: (Circle one)

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

2.5.5.4 Position

None

2.5.6 Leg Raise

2.5.6.1 Eye Open

None

2.5.6.2 Eye Close

None

2.5.7 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

2.5.8 Height

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

2.5.9 Weight

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

2.5.10 Waist Circumference

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

2.5.11 Hip Circumference

None

2.5.12 Vision

DA032. Now I have some questions about your eyesight. Do you usually wear glasses or corrective lenses?

Answer:

(1) Yes ; (2) Legally blind; (3) No

DA033. How good is your eyesight for seeing things at a distance, like recognizing a friend from across the street (with glasses or corrective lenses if you wear them)? Would you say your eyesight for seeing things at a distance is excellent, very good, good, fair, or poor?

Answer:

(1)Excellent; (2) Very good; (3) Good; (4) Fair; (5) Poor

DA034. How good is your eyesight for seeing things up close, like reading ordinary newspaper print (with glasses or corrective lenses if you wear them)? Would you say your eyesight for seeing things up close is excellent, very good, good, fair, or poor?

Answer:

(1) Excellent; (2) Very good; (3) Good; (4) Fair; (5) Poor

2.5.13 Hearing Exam

DA038. Now I have some questions about your hearing. Do you ever wear a hearing aid?

Answer:

1. YES; 5. NO ;

DA039. Is your hearing very good, good, fair, poor, or very poor (with a hearing aid if you normally use it

and

without if you normally don't)? Would you say your hearing is excellent, very good, good, fair, or poor?

Answer:

(1) Excellent; (2) Very good; (3) Good; (4) Fair; (5) Poor

2.5.14 Sitting Height

None

2.5.15 Knee Height

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

2.6 TILDA

In this section, THILDA coding information is collected based on wave 1,2.

2.6.1 Blood Pressure and Pulse Rate

(Wave 1 only)

2.6.1.1 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)

2.6.1.2 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)

2.6.1.3 Arm

None

2.6.1.4 Pulse

None

2.6.2 Balance

2.6.2.1 Semi Tandem

None

2.6.2.2 Side by Side

None

2.6.2.3 Full Tandem

None

2.6.3 Walking Speed

(Wave 2 only)

2.6.3.1 Help

None

2.6.3.2 Walking Speed

tug007

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

tug009m

Time taken to complete walk in minutes, seconds and centiseconds – minutes (m)

tug009s

Time taken to complete walk in minutes, seconds and centiseconds – seconds (s)

tug009c

Time taken to complete walk in minutes, seconds and centiseconds – centiseconds (cs)

2.6.4 Lung Function

2.6.4.1 Lung Function

None

2.6.4.2 Effort Level

None

2.6.4.3 Position

None

2.6.5 Grip Strength

2.6.5.1 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)

gs005

Grip strength for dominant hand (kg)

gs006

Grip strength for non-dominant hand (kg)

2.6.5.2 Pain

None

2.6.5.3 Dominant / Measured Hand

GRIPtestdominant

Dominant hand

2.6.5.4 Position

gs007

Respondent's position during test

2.6.6 Leg Raise

2.6.6.1 Eye Open

None

2.6.6.2 Eye Close

None

2.6.7 Chair Stand

None

2.6.8 Height

(Wave 1 only)

height

Objective height measurement (cm)

SR_Height_Centimetres

Self-reported height – CAPI (cm)

2.6.9 Weight

(Wave 1 only)

weight

Objective weight measurement (kg)

SR_Weight_Kilogrammes

Self-reported weight – CAPI (kg)

2.6.10 Waist Circumference

(Wave 1 only)

FRwaist

Waist circumference (cm)

2.6.11 HipCircumference

(Wave 1 only)

FRhip

Hip circumference (cm)

FRwhr

Waist:hip ratio

2.6.12 Vision

(Wave 1 only)

visualAcuityRight

Visual acuity score for right eye

visualAcuityLeft

Visual acuity score for left eye

wearGlasses

If respondent wears glasses/corrective lens (yes/no)

woreGlassesDuringTest

If respondent wore glasses/corrective lens during test (yes/no)

2.6.13 Hearing Exam

PH107:

[Do/Does] [you/he/she] use any of the following aids or appliances to help [you/him/her] with [your/his/her] hearing?

Answer:

1. Hearing aid (all the time) [ph107_01] ; 2. Hearing aid (some of the time) [ph107_02] ; 3. Amplifier [ph107_03]; 96. None of the above [ph107_96]; 98. DK [ph107_98]; 99. RF [ph107_99]

PH145:

Do you feel [you/he/she] [have/has] a hearing loss?

Answer:

1. Yes; 5. No; 98. DK; 99. RF

PH108:

Is your hearing (with or without a hearing aid)

Answer:

1. excellent;; 2. very good ; 3. Good ; 4. Fair ; 5. or, poor; 98. DK; 99. RF

PH109:

Can you follow a conversation with one person (with or without a hearing aid)?

Answer:

1. with no difficulty; 2. with some difficulty; 3. with much difficulty ; 4. no I cannot; 98. DK; 99. RF

PH110:

Can you follow a conversation with four people (with or without a hearing aid)?

Answer:

1. with no difficulty; 2 .with some difficulty; 3. with much difficulty; 4. no I cannot; 98. DK; 99. RF

2.6.14 Sitting Height

None

2.6.15 Knee Height

None

2.7 MHAS

In this section, MHAS coding information is collected based on wave 3.

2.7.1 Blood Pressure and Pulse Rate

2.7.1.1 Systolic

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. [____][____][____] 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

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

2.7.1.2 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

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

2.7.1.3 Arm

None

2.7.1.4 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

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

2.7.2 Balance

2.7.2.1 Semi Tandem

None

2.7.2.2 Side by Side

None

2.7.2.3 Full Tandem

None

2.7.3 Walking Speed

2.7.3.1 Help

1.19 Aids used during first test

Answer:

1 None; 2 Cane; 7 Other

1.22 Aids used during second test

Answer:

1 None; 2 Cane; 7 Other

2.7.3.2 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

1.20 Time for the second test Time to walk 4 meters [__|__] . [__|__] Min. Sec.

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

1.21 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

2.7.4 Lung Function

2.7.4.1 Lung Function

None

2.7.4.2 Effort Level

None

2.7.4.3 Position

None

2.7.5 Grip Strength

2.7.5.1 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.

FIRST MEASUREMENT SECOND MEASUREMENT

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

2.7.5.2 Pain

1.23 Do you feel it is safe for you to do this measurement? Please consider whether in the past six months you had surgery or experienced some swelling, inflammation, pain or serious injury to one or both hands.

Answer:

1 Yes, with both hands; 2 Yes, only with the right hand; 3 Yes, only with the left hand; 4 It is not possible to do the test with any hand

2.7.5.3 Dominant / Measured Hand

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

Answer:

1 Right; 2 Left; 3 Both hands

2.7.5.4 Position

None

2.7.6 Leg Raise

2.7.6.1 Eye Open

1.16 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.

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 [____][____]

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 [____][____]

2.7.6.2 Eye Close

None

2.7.7 Chair Stand

None

2.7.8 Height

FIRST MEASURE SECOND MEASURE

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 [__|__|__].[__]

2.7.9 Weight

FIRST MEASURE SECOND MEASURE

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 [__|__|__].[__|__|__]

2.7.10 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 [__|__|__].[__|__|__]

2.7.11 HipCircumference

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)

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 [__|__|__].[__|__|__]

2.7.12 Vision

C.41 Do you usually wear glasses?

Answer:

1 YES; 2 NO; 8 RF; 9 DK

C.42 How is your vision (with glasses)?

Answer

1 Excellent ; 2 Very Good ; 3 Good; 4 Fair; 5 Poor; 6 [Vol] LEGALLY BLIND; 8 RF; 9 DK

2.7.13 Hearing Exam

C.43 Do you usually use a hearing aid or auditory device?

Answer:

1 YES; 2 NO; 8 RF; 9 DK

C.44 How is your hearing/auditory range (using hearing aid or auditory device)?

Answer

1 Excellent ; 2 Very Good ; 3 Good; 4 Fair; 5 Poor; 6 [Vol] LEGALLY DEAF; 8 RF; 9 DK

2.7.14 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 [__|__|__]. [__]

2.7.15 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 [__|__|__]. [__]

2.8 JSTAR

In this section, JSTAR coding information is collected based on wave 2.

2.8.1 Blood Pressure and Pulse Rate

2.8.1.1 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 77

09D2-004

Measurement condition 1 [Interviewer: Do not read aloud the following, and check the condition when you measure the blood pressure.]

A: Measurement place

Answer:

1. Indoors
2. Entrance
3. Outdoors

B: Measurement arm

1. Right
2. Left

C: Measurement posture

1. sitting position
2. standing position
3. Other (specify ____)

09D2-004-1 :

Measurement condition 2 Does he/she usually take medicine for blood pressure?

1. Yes 2. No 3. Don't know 4. Refused to answer

09D2-004-2 :

Measurement condition 3 Did he/she take the medicine for blood pressure today? When did he/she take it?

1. Yes [About () o'clock] 2. No 3. Don't know 4. Refused to answer

2.8.1.2 Diastolic

Refer to 3.8.1.1 Systolic

2.8.1.3 Arm

None

2.8.1.4 Pulse

Refer to 3.8.1.1 Systolic

2.8.2 Balance

2.8.2.1 Semi Tandem

None

2.8.2.2 Side by Side

None

2.8.2.3 Full Tandem

None

2.8.3 Walking Speed

2.8.3.1 Help

None

2.8.3.2 Walking Speed

None

2.8.4 Lung Function

2.8.4.1 Lung Function

None

2.8.4.2 Effort Level

None

2.8.4.3 Position

None

2.8.5 Grip Strength

2.8.5.1 Grip Strength

09F-004-3 :

[Interviewer: Enter score, rounding off to closest kg.]

1. ___kg
2. Not possible to measure, or measurement failed

09F-005-3 :

[Interviewer: Enter score, rounding off to closest kg.]

1. ___kg
2. Not possible to measure, or measurement failed

2.8.5.2 Pain

09F-002 :

[Interviewer: Assess the condition of the respondent. Do not read the following choices out loud.]

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

2.8.5.3 Dominant / Measured Hand

09F-004-2 :

[Interviewer: Indicate which hand was measured.]

Answer:

1. Right ; 2. Left

09F-003 :

Which is your dominant hand?

Answer:

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

2.8.5.4 Position

None

2.8.6 Leg Raise

2.8.6.1 Eye Open

None

2.8.6.2 Eye Close

None

2.8.7 Chair Stand

None

2.8.8 Height

09D-006 :

What is your current height?

[Interviewer] If 09D-006 is 3, read the following and prompt once more.

[Read] Answers to the other dietary questions will be analyzed so that you will be given the results. If you give me the answer to this question, the result will be more accurate. Could you please answer?

1. ___ cm ; 2. Don't know ; 3. Refused to answer

2.8.9 Weight

09D-005 :

What is your current weight?

[Interviewer] If 09D-005 is 3, read the following and prompt once more.

[Read] Answers to the other dietary questions will be analyzed so that you will be given the results. If you give me the answer to this question, the result will be more accurate. Could you please answer?

1. ___ kg ; 2. Don't know ; 3. Refused to answer

2.8.10 Waist Circumference

09D2-007-3 :

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

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."

09D2-008 :

Reason for disagreement/interruption [Interviewer: Read the following, and mark the reasons. (Multiple answers are acceptable)] [Instructions for interviewer to read:] Excuse me. We will stop the measurement.

Answer:

1. A family member could not attend ;
2. The subject could not keep standing/sitting during the measurement
3. The subject felt uneasy/unpleasant during the measurement
4. The subject could not hold breathing during the measurement
5. Could not have the measure around the waist because of his/her health condition
6. The subject could not understand the procedure
7. The subject could not indicate where his/her navel was
8. The subject felt uneasy/unpleasant during the measurement
9. Something is wrong with the instrument
10. Other (specify)

09D2-009 :

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

2.8.11 HipCircumference

None

2.8.12 Vision

09D-007 :

Do you normally use glasses, contact lenses, or other corrective lenses?

Answer:

1. Yes / 2. No

09D-008-1 :

How clear is your sight, with ophthalmic devices if you use them?

Indicate one of the following.

Answer:

1. Can see very well ; 2. Can see well ; 3. Can see at an average level ; 4. Can see only so-so ; 5. Can't see well ; 6. Can't see at all, or am visually impaired

09D-008-2 :

ophthalmic devices if you use them?

Answer:

1. Can see very well ; 2. Can see well ; 3. Can see at an average level ; 4. Can see only so-so ; 5. Can't see well ; 6. Can't see at all, or am visually impaired

09D-008-3 :

How clearly do you see near objects, such as the newspaper?

Answer:

1. Can see very well ; 2. Can see well ; 3. Can see at an average level ; 4. Can see only so-so ; 5. Can't see well ; 6. Can't see at all,

2.8.13 Hearing Exam

09D-009 :

Do you normally use a hearing aid(s)?

Answer:

1. Yes / 2. No

09D-010-1 :

How clear is your hearing, with hearing aid(s) if you use one/them?

Indicate one of the following.

Answer:

1. Can hear very well ; 2. Can hear well ; 3. Can hear at an average level ; 4. Can hear only so-so ; 5. Can't hear well ; 6. Cannot hear at all, or am hearing-impaired.

09D-010-2 :

How clearly do you understand conversation in a noisy environment, for example, around a TV or radio, with hearing aid(s) if you use one/them?

Answer:

1. Can hear very well ; 2. Can hear well ; 3. Can hear at an average level ; 4. Can hear only so-so ; 5. Can't hear well ; 6. Cannot hear at all, or am hearing-impaired.

09D-010-3 :

How clearly do you understand conversation between several people, with hearing aids if you use one/them?

Answer:

1. Can hear very well ; 2. Can hear well ; 3. Can hear at an average level ; 4. Can hear only so-so ; 5. Can't hear well ; 6. Cannot hear at all, or am hearing-impaired.

09D-010-4 :

How clearly do you understand one-to-one conversation, with hearing aids if you use one/them?

Answer:

- 1. Can hear very well ; 2. Can hear well ; 3. Can hear at an average level ; 4. Can hear only so-so ; 5. Can't hear well ; 6. Cannot hear at all,

2.8.14 Sitting Height

09D-015-2 :

[Interviewer:] Please comment in the following table below without speaking aloud.

	Yes	No
1: The subject could stand and sit without swaying during the height measurement		
2: The subject could understand the gist of how the standing and seated height measurements were to be performed		
3: A safe place to measure the standing and sitting heights could be secured		
4: Permission was received to paste the post-it note to the wall		

If answers from 09D-015-2-1 to 09D-015-2-4 are "yes", go to 09D-015-3. Otherwise go to 09D-015-5.

09D-015-3 :

[Interviewer:] Please perform the measurements following the outline in the enclosed paper.

- 1. Measurement result (_____) centimeters
- 2. Stop measurement

Measurement in 3 digits or error message (please correctly enter the result in centimeters)

09D-015-4 :

[To the Interviewer:] Please perform the measurements following the outline in the enclosed paper.

- 1. Measurement result (_____) centimeters
- 2. Stop measurement

2.8.15 Knee Height

None

3. Biomarker Measurement Protocols

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

3.1 HRS

3.1.1 Blood Pressure and Pulse Rate

3.1.1.1 Measurement

Three measurements, 45 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.

3.1.1.2 Equipment

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

3.1.1.3 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 stop watch 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.

3.1.2 Balance

3.1.2.1 Measurement

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

3.1.2.2 Equipment

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

3.1.2.3 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 his/her 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.

3.1.2.4 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 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.

3.1.2.5 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.

3.1.3 Walking Speed

3.1.3.1 Measure

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

3.1.3.2 Equipment

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

3.1.3.3 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 stop watch 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 stop watch 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 stop watch 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.

3.1.4 Lung Function

3.1.4.1 Measurement

Three measurements, 30 seconds apart, were conducted.

3.1.4.2 Equipment

Mini-Wright Peak Flow Meter with a disposable mouthpiece.

3.1.4.3 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 stop watch 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.

3.1.5 Grip Strength

3.1.5.1 Measurement

Two measurements were taken for each hand, alternating hands.

3.1.5.2 Equipment

Smedley spring-type hand dynamometer.

3.1.5.3 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 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.

3.1.6 Leg Raise

3.1.6.1 Measurement

None

3.1.6.2 Equipment

None

3.1.6.3 Protocol

None

3.1.7 Chair Stand

3.1.7.1 Measurement

None

3.1.7.2 Equipment

None

3.1.7.3 Protocol

None

3.1.8 Height

3.1.8.1 Unit of Measurement

Inches

3.1.8.2 Equipment

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

3.1.9 Weight

3.1.9.1 Unit of Measurement

Pounds

3.1.9.2 Equipment

Healthometer 830KL digital scale

3.1.10 Waist Circumference

3.1.10.1 Unit of Measurement

Inches

3.1.10.2 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.

3.1.11 Hip Circumference

3.1.11.1 Unit of Measurement

None

3.1.11.2 Measure Instruction

None

3.1.12 Vision

3.1.12.1 Method

Self-Reported

3.1.13 Hearing Exam

3.1.12.1 Method

In HRS, self-Reported hearing ability questions were asked before 2016. In 2016, hearing test was taken in addition to the self-reported questions.

3.1.13.2 Equipment

HearCheck Device, Disposable Ear Cup

3.1.13.3 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

3.1.14 Sitting Height

3.1.14.1 Unit of Measurement

None

3.1.14.2 Equipment

None

3.1.14.3 Measuring Instruction

None

3.1.15 Knee Height

3.1.15.1 Unit of Measurement

None

3.1.15.2 Equipment

None

3.1.15.3 Measuring Instruction

None

3.2 ELSA

3.2.1 Blood Pressure and Pulse Rate

3.2.1.1 Measurement

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

3.2.1.2 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 waves 2, 4 and 6 nurse visits.

3.2.1.3 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.

3.2.2 Balance

3.2.2.1 Measurement

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

3.2.2.2 Equipment

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

3.2.2.3 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

3.2.2.4 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

3.2.2.5 Protocol: Side-by-side

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

3.2.3 Walking Speed

3.2.3.1 Measure

None

3.2.3.2 Equipment

None

3.2.3.3 Protocol

None

3.2.4 Lung Function

3.2.4.1 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.

3.2.4.2 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.

3.2.4.3 Protocol

None

3.2.5 Grip Strength

3.2.5.1 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.

3.2.5.2 Equipment

None

3.2.5.3 Protocol

None

3.2.6 Leg Raise

3.2.6.1 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.

3.2.6.2 Equipment

None

3.2.6.3 Protocol

None

3.2.7 Chair Stand

3.2.7.1 Measurement

Chair Rise

3.2.7.2 Equipment

None

3.2.7.3 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.

3.2.8 Height

3.2.8.1 Unit of Measurement

cm

3.2.8.2 Equipment

No information

3.2.9 Weight

3.2.9.1 Unit of Measurement

Kg

3.2.9.2 Equipment

No information

3.2.10 Waist Circumference

3.2.10.1 Unit of Measurement

Centimeter

3.2.10.2 Measure Instruction

No information

3.2.11 Hip Circumference

3.2.11.1 Unit of Measurement

Centimeter

3.2.11.2 Measure Instruction

No information

3.2.12 Vision

3.2.12.1 Method

Self-Reported

3.2.13 Hearing Exam

3.2.13.1 Method

Self-Reported

3.2.14 Sitting Height

3.2.14.1 Unit of Measurement

Centimeter (wave 2,4 not wave 6)

3.2.14.2 Equipment

No information

3.2.14.3 Measure Instruction

No information

3.2.15 Knee Height

3.2.15.1 Unit of Measurement

None

3.2.15.2 Equipment

None

3.2.15.3 Measure Instruction

None

3.3 SHARE

3.3.1 Blood Pressure and Pulse Rate

3.3.1.1 Measurement

Wave 4 (2010/2011)

3.3.1.2 Equipment

None

3.3.1.3 Protocol

None

3.3.2 Balance

3.3.2.1 Measurement

None

3.3.2.2 Equipment

None

3.3.2.3 Protocol: Semi-Tandem

None

3.3.2.4 Protocol: Full-Tandem

None

3.3.2.5 Protocol: Side-by-side

None

3.3.3 Walking Speed

3.3.3.1 Measure

Wave1 (2004/05), Wave 2 (2006/07)

3.3.3.2 Equipment

None

3.3.3.3 Protocol

Walking speed is assessed by measuring the time (in seconds) it takes for a respondent to walk a distance of two and a half meters.

3.3.4 Lung Function

3.3.4.1 Measurement

Wave 2 (2006/07)

3.3.4.2 Equipment

None

3.3.4.3 Protocol

None

3.3.5 Grip Strength

3.3.5.1 Measurement

Wave1 (2004/05), Wave 2 (2006/07), Wave 3 (2008/09), Wave 4 (2010/11)

3.3.5.2 Equipment

Hand dynamometer.

3.3.5.3 Protocol

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

3.3.6 Leg Raise

3.3.6.1 Measurement

None

3.3.6.2 Equipment

None

3.3.6.3 Protocol

None

3.3.7 Chair Stand

3.3.7.1 Measurement

Wave 2 (2006/07)

3.3.7.2 Equipment

None

3.3.7.3 Protocol

The chair stand test is measured one time per respondent and is performed only by respondents who are 74 years old or younger. The respondents fold their arms across their chest and stand up from a sitting position on a chair and sit down again for five times.

3.3.8 Height

3.3.8.1 Unit of Measurement

Centimeter (Wave 4 (2010/11)), both self-reported and measured

3.3.8.2 Equipment

No information

3.3.9 Weight

3.3.9.1 Unit of Measurement

Kg (Wave 4 (2010/11))

3.3.9.2 Equipment

No information

3.3.10 Waist Circumference

3.3.10.1 Unit of Measurement

Centimeter (Wave 4 (2010/11))

3.3.10.2 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.

3.3.11 Hip Circumference

3.3.11.1 Unit of Measurement

None

3.3.11.2 Measure Instruction

None

3.3.12 Vision

3.3.12.1 Method

None

3.3.13 Hearing Exam

3.3.13.1 Method

None

3.3.14 Sitting Height

3.3.14.1 Unit of Measurement

None

3.3.14.2 Equipment

None

3.3.14.3 Measure Instruction

None

3.3.15 Knee Height

3.3.15.1 Unit of Measurement

None

3.3.15.2 Equipment

None

3.3.15.3 Measure Instruction

None

3.4 KLoSA

3.4.1 Blood Pressure and Pulse Rate

3.4.1.1 Measurement

None

3.4.1.2 Equipment

None

3.4.1.3 Protocol

None

3.4.2 Balance

3.4.2.1 Measurement

None

3.4.2.2 Equipment

None

3.4.2.3 Protocol: Semi-Tandem

None

3.4.2.4 Protocol: Full-Tandem

None

3.4.2.5 Protocol: Side-by-side

None

3.4.3 Walking Speed

3.4.3.1 Measure

None

3.4.3.2 Equipment

None

3.4.3.3 Protocol

None

3.4.4 Lung Function

3.4.4.1 Measurement

None

3.4.4.2 Equipment

None

3.4.4.3 Protocol

None

3.4.5 Grip Strength

3.4.5.1 Measurement

Grip strength, Pain, Dominant hand, Measured hand, Position

3.4.5.2 Equipment

Hand dynamometer.

3.4.5.3 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.)

3.4.6 Leg Raise

3.4.6.1 Measurement

None

3.4.6.2 Equipment

None

3.4.6.3 Protocol

None

3.4.7 Chair Stand

3.3.6.1 Measurement

None

3.3.6.2 Equipment

None

3.3.6.3 Protocol

None

3.4.8 Height

3.4.8.1 Unit of Measurement

Centimeter (Self-reported)

3.4.8.2 Equipment

None

3.4.9 Weight

3.4.9.1 Unit of Measurement

Kg (Self-reported)

3.4.9.2 Equipment

None

3.4.10 Waist Circumference

3.4.10.1 Unit of Measurement

None

3.4.10.2 Measure Instruction

None

3.4.11 Hip Circumference

3.4.11.1 Unit of Measurement

None

3.4.11.2 Measure Instruction

None

3.4.12 Vision

3.4.12.1 Method

Self-reported

3.4.13 Hearing Exam

3.4.13.1 Method

Self-reported

3.4.14 Sitting Height

3.4.14.1 Unit of Measurement

None

3.4.14.2 Equipment

None

3.4.14.3 Measure Instruction

None

3.4.15 Knee Height

3.4.15.1 Unit of Measurement

None

3.4.15.2 Equipment

None

3.4.15.3 Measure Instruction

None

3.5 CHARLS

3.5.1 Blood Pressure

3.5.1.1 Measurement

2 measurements of Systolic, Diastolic, and pulse from left arm

3.5.1.2 Equipment

Omron HEM-7200 Monitor, Batteries, Stopwatch

3.5.1.3 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 your 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

3.5.2 Balance

3.5.2.1 Measurement

Semi-Tandem, Full-Tandem, Side-by-side

3.5.2.2 Equipment

Stopwatch, Show Card

3.5.2.3 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...”

3.5.2.4 Protocol: Full-Tandem

“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...”

[Procedure: If R’s age ≥ 70 , then do this measurement for 30 seconds; if R’s age < 70 , then do this measurement for 60 seconds.

3.5.2.5 Protocol: Side-by-side

“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...”

3.5.3 Walking Speed

3.5.3.1 Measure

2 measurements, walking speed time

3.5.3.2 Equipment

Tape measure, Stopwatch, Masking Tape

3.5.3.3 Protocol

- Measured only for age > 60
- “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.”

3.5.4 Lung Function

3.5.4.1 Measurement

3 measurements

3.5.4.2 Equipment

Peak flow meter, Disposable mouthpiece(s) packaged in plastic bag

3.5.4.3 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.

3.5.5 Grip Strength

3.5.5.1 Measurement

2 measurements from both dominant and non-dominant hands

3.5.5.2 Equipment

Hand dynamometer.

3.5.5.3 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

3.5.6 Leg Raise

3.5.6.1 Measurement

None

3.5.6.2 Equipment

None

3.5.6.3 Protocol

None

3.5.7 Chair Stand

3.5.7.1 Measurement

Repeated chair stand

3.5.7.2 Equipment

Stadiometer

3.5.7.3 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?"

3.5.8 Height

3.5.8.1 Unit of Measurement

Centimeter

3.5.8.2 Equipment

Stadiometer

3.5.9 Weight

3.5.9.1 Unit of Measurement

Kg

3.5.9.2 Equipment

Scale (no detailed information)

3.5.10 Waist Circumference

3.5.10.1 Unit of Measurement

Centimeter

3.5.10.2 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.”

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.

3.5.11 Hip Circumference

3.5.11.1 Unit of Measurement

None

3.5.11.2 Measure Instruction

None

3.5.12 Vision

3.5.12.1 Method

Self-reported

3.5.13 Hearing Exam

3.5.13.1 Method

Self-reported

3.5.14 Sitting Height

3.5.14.1 Unit of Measurement

None

3.5.14.2 Equipment

None

3.5.14.3 Measure Instruction

None

3.5.15 Knee Height

3.5.15.1 Unit of Measurement

Centimeter

3.5.14.2 Equipment

MA DING Rule

3.5.14.3 Measure Instruction

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

3.6 TILDA

3.6.1 Blood Pressure and Pulse Rate

3.6.1.1 Measurement

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

3.6.1.2 Equipment

Blood pressure was measured (in wave 1 only) 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

3.6.1.3 Protocol

Blood pressure was measured (in wave 1 only) 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. 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.

3.6.2 Balance

3.6.2.1 Measurement

None

3.6.2.2 Equipment

None

3.6.2.3 Protocol: Semi-Tandem

None

3.6.2.4 Protocol: Full-Tandem

None

3.6.2.5 Protocol: Side-by-side

None

3.6.3 Walking Speed

3.6.3.1 Measure

2 measurements, walking speed time, help

3.6.3.2 Equipment

None

3.6.3.3 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.

3.6.4 Lung Function

3.6.4.1 Measurement

None

3.6.4.2 Equipment

None

3.6.4.3 Protocol

None

3.6.5 Grip Strength

3.6.5.1 Measurement

2 measurements from both dominant and non-dominant hands

3.6.5.2 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.

3.6.5.3 Protocol

Hand-grip strength affects every day 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, two values were recorded for each hand alternating between hands, starting with the non-dominant hand (4 values all together). For wave 2, 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.

3.6.6 Leg Raise

6.6.6.1 Measurement

None

3.6.6.2 Equipment

None

3.6.6.3 Protocol

None

3.6.7 Chair Stand

3.6.7.1 Measurement

None

3.6.7.2 Equipment

None

3.6.7.3 Protocol

None

3.6.8 Height

3.6.8.1 Unit of Measurement

Centimeter (in Wave 1 only)

3.6.8.2 Equipment

Seca 240 wall mounted measuring rod

3.6.9 Weight

3.6.9.1 Unit of Measurement

Kg

3.6.9.2 Equipment

SECA electronic floor scale

3.6.10 Waist Circumference

3.6.10.1 Unit of Measurement

Centimeter

3.6.10.2 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 Circumferencement was taken on the waist band at the back and off the waist band at the front.

3.6.11 Hip Circumference

3.6.11.1 Unit of Measurement

Centimeter

3.6.11.2 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.

3.6.12 Vision

3.6.12.1 Method

Vision or eyesight was assessed

3.6.12.2 Equipment

LogMAR (Minimal Angle of Resolution) charts

3.6.12.3 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.

3.6.13 Hearing Exam

3.6.13.1 Method

Self-reported

3.6.14 Sitting Height

3.6.14.1 Unit of Measurement

None

3.6.14.2 Equipment

None

3.6.14.3 Measure Instruction

None

3.6.15 Knee Height

3.6.15.1 Unit of Measurement

None

3.6.15.2 Equipment

None

3.6.15.3 Measure Instruction

None

3.7 MHAS

3.7.1 Blood Pressure

3.7.1.1 Measurement

2 measurements with 5 minutes interval, of Systolic, Diastolic, from either arm

3.7.1.2 Equipment

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

3.7.1.3 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

3.7.2 Balance

3.7.2.1 Measurement

None

3.7.2.2 Equipment

None

3.7.2.3 Protocol: Semi-Tandem

None

3.7.2.4 Protocol: Full-Tandem

None

3.7.2.5 Protocol: Side-by-side

None

3.7.3 Walking Speed

3.7.3.1 Measure

2 measurements, help

3.7.3.2 Equipment

Three meter strip, stopwatch

3.7.3.3 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 talking 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

3.7.4 Lung Function

3.7.4.1 Measurement

None

3.7.4.2 Equipment

None

3.7.4.3 Protocol

None

3.7.5 Grip Strength

3.7.5.1 Measurement

2 measurements from both dominant and non-dominant hands

3.7.5.2 Equipment

Dynamometer

3.7.5.3 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.

3.7.6 Leg Raise

3.7.6.1 Measurement

None

3.7.6.2 Equipment

None

3.7.6.3 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.

3.7.7 Chair Stand

3.7.7.1 Measurement

None

3.7.7.2 Equipment

None

3.7.7.3 Protocol

None

3.7.8 Height

3.7.8.1 Unit of Measurement

Centimeter

3.7.8.2 Equipment

Stadiometer

3.7.9 Weight

3.7.9.1 Unit of Measurement

Kg

3.7.9.2 Equipment

Electronic portable scales

3.7.10 Waist Circumference

3.7.10.1 Unit of Measurement

Centimeter

3.7.10.2 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 "0" 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

3.7.11 Hip Circumference

3.7.11.1 Unit of Measurement

Centimeter

3.7.11.2 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

3.7.12 Vision

3.7.12.1 Method

Measured

3.7.13 Hearing Exam

3.7.13.1 Method

Self-reported

3.7.14 Sitting Height

3.7.14.1 Unit of Measurement

Centimeter

3.7.14.2 Equipment

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

3.7.14.3 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 oriented in the Frankfort Plane Position, have them stand 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 to as a confirmation.

3.7.15 Knee Height

3.7.15.1 Unit of Measurement

Centimeter

3.7.15.2 Equipment

Fiberglass measuring tape, pen, registration log, measurement log

3.7.15.3 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 form 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 the 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.

3.8 JSTAR

3.8.1 Blood Pressure

3.8.1.1 Measurement

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

3.8.1.2 Equipment

OMRON

3.8.1.3 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. Did you understand the procedure?

3.8.2 Balance

3.8.2.1 Measurement

None

3.8.2.2 Equipment

None

3.8.2.3 Protocol: Semi-Tandem

None

3.8.2.4 Protocol: Full-Tandem

None

3.8.2.5 Protocol: Side-by-side

None

3.8.3 Walking Speed

3.8.3.1 Measure

None

3.8.3.2 Equipment

None

3.8.3.3 Protocol

None

3.8.4 Lung Function

3.8.4.1 Measurement

None

3.8.4.2 Equipment

None

3.8.4.3 Protocol

None

3.8.5 Grip Strength

3.8.5.1 Measurement

1 measurements from (preferably) dominant hand

3.8.5.2 Equipment

Dynamometer

3.8.5.3 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 his 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 as follows: 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 his 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.]

3.8.6 Leg Raise

3.8.6.1 Measurement

None

3.8.6.2 Equipment

None

3.8.6.3 Protocol

None

3.8.7 Chair Stand

3.8.7.1 Measurement

None

3.8.7.2 Equipment

None

3.8.7.3 Protocol

None

3.8.8 Height

3.8.8.1 Unit of Measurement

Centimeter

3.8.8.2 Equipment

No information

3.8.9 Weight

3.8.9.1 Unit of Measurement

Kg (self-reported)

3.8.9.2 Equipment

None

3.8.10 Waist Circumference

3.8.10.1 Unit of Measurement

Centimeter

3.8.10.2 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. Did you understand the procedure?

3.8.11 Hip Circumference

3.8.11.1 Unit of Measurement

None

3.8.11.2 Measure Instruction

None

3.8.12 Vision

3.8.12.1 Method

Self-reported

3.8.13 Hearing Exam

3.8.13.1 Method

Self-reported

3.8.14 Sitting Height

3.8.14.1 Unit of Measurement

Centimeter

3.8.14.2 Equipment

No information

3.8.14.3 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?

3.8.15 Knee Height

3.8.15.1 Unit of Measurement

None

3.8.15.2 Equipment

None

3.8.15.3 Equipment

None