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Data sources, methods and pooled results for preliminary estimates of intrinsic capacity and functional ability for adults age 60 and over, in 30 countries[1]

Reported within the Global Status Report – Healthy Ageing, submitted to the 73rd World Health Assembly

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1. Purpose

Pursuant to the World Health Assembly (WHA) resolution 69.3 (2016), a global status report on healthy ageing was submitted to the World Health Organization (WHO)'s 73rd World Health Assembly (2020). This document describes the preliminary data sources, methods and results for estimating healthy ageing specifically (intrinsic capacity and funcation ability), included within the brief global status report. It also notes further work required to revise and test methods, prior to a forthcoming baseline report for the Decade of Healthy Ageing.

2. Background to Healthy Ageing

The 69th World Health Assembly endorsed the Global Strategy on Ageing and Health (2016-2030), with the vision of a world in which all people can live long, healthy lives. The strategy frames WHO's response to population ageing and health by promoting **Healthy Ageing** across the life course. Everybody can experience **Healthy Ageing**, and WHO defines it as "the process of developing and maintaining the functional ability that enables well-being in older age." [2]

It is a continuous process, across the life course. Healthy ageing can be relevant to everyone, not just those who are currently free of disease. Functional ability is determined by the intrinsic capacity of the individual (that is, the combination of all the individual's physical and mental capacities), the environments he or she inhabits (understood in the broadest sense and including physical, social and policy environments), and the interaction between these. There are three components to be measured using common standards and metrics: functional ability, intrinsic capacity and environments.

[1] This document provides further details on the methods used for reporting preliminary analysis on global status – healthy ageing, noted within paragraphs 2-7 in the World Health Assembly information document **The Global strategy and action plan on ageing and health 2016–2020: towards a world in which everyone can live a long and healthy life.**

[2] Global strategy and action plan on ageing and health. Geneva: World Health Organization; 2017, paragraphs 17–20 (https://www.who.int/ageing/WHO-GSAP-2017.pdf?ua=1, accessed 20 February 2020).

WHO's normative language and framework for health,[3] tailored to older adults,[4] was applied to the description of each component to propose person-centred, multiple domain profiles that are relevant to all older adults, as follows:

- Functional ability is defined as "all the health-related attributes that enable people to be and to do what they have reason to value." Five sub-domains are proposed relevant to older adults: meeting basic needs, learning and making decisions; mobility; building and maintaining relationships; and contributing to families, communities or society.

- Intrinsic capacity at any point in time is "determined by many factors, including underlying physiological and psychological changes, health-related behaviours and the presence or absence of disease." Five sub-domains are prioritized among a longer list identified from the International Classification of Functioning, Disability and Health: neuromusculoskeletal, sensory, metabolic, cognitive and psychological.

- Environments "that people inhabit and their interaction with them are also major determinants of what older people with a given level of intrinsic capacity can do. These environments provide a range of resources or barriers that will ultimately decide whether older people can engage or participate in activities that matter to them." Five sub-domains are proposed: products and technology, natural and built environment; support and relationships; attitudes; and services, systems and policies.

3. Objectives

The objectives of the preliminary analysis are to:

- estimate the proportion of older adults, who have high, sufficient, or moderate loss or significant loss of intrinsic capacity and functional ability, by age and sex groups, valid for pooled results across countries included.

This requires that all nationally representative surveys of older adults, age 60 years and over, based on data collected from 2015 onwards, are collated from as many WHO Member States as possible meeting inclusion criteria. It also requires methods that identify and combine items from surveys, for each domain of healthy ageing if possible, in order to estimate the proportion of all older adults at different levels of intrinsic capacity and functional ability.

[3] The International Classification of Functioning, Disability and Health. Geneva: World Health Organization; 2001 (http://www.who.int/classifications/icf/en/, accessed 20 February 2020).
[4] Word Report on Ageing and Health. Geneva: World Health Organization; 2015 (http://apps.who.int/iris/bitstream/10665/186463/1/9789240694811_eng.pdf, accessed 20 February 2020).

4. Data sources

Data from the greatest number of countries meeting the following criteria were collated to measure each component of healthy ageing and as many sub-domains as possible: (a) nationally representative, cross-sectional studies of older adults between 2015 and 2017; (b) comparable questions or performance tests for the same person, for functional ability, intrinsic capacity and his or her environment, and (c) in the public domain, meaning WHO could request and gain access to the data.

Population-based ageing, health and retirement studies that are nationally representative, were the main data source. Thirty countries have comparable data on intrinsic capacity and functional ability for adults aged 60 years and over: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom of Great Britain and Northern Ireland and United States of America.

All 30 surveys are part of a family of international Health and Retirement studies, details are found here: https://hrs.isr.umich.edu/about/international-sister-studies. These are built on the model of the first survey, details found here: https://hrs.isr.umich.edu/about. Nevertheless, each survey included has a unique sampling strategy, using a sample frame and approach to achieve full probability sampling, with most countries drawing on population registers. Sampling weights were used to compensate for the unequal selection probabilities of the various sample units, per survey and country. The survey design and sample strategies are published elsewhere (1-4).

The pooled sample size across the 30 countries is 83,688 adults age 60 years and over. By country, surveys included in the analysis are listed in annex 1. This notes data for 27 out of the 30 countries are from the same, multi-country Survey of Health, Ageing and Retirement in Europe (SHARE). Twenty-nine of the studies are from countries in the European Region, and one from the Pan American region.

5. Methods

- **Items extracted from surveys**

Items administered directly to older people and primary caregivers were reviewed, identified and mapped to each component and sub-domain of healthy ageing. No information on environments was available. The same questions, performance tests and response categories were extracted from all surveys, thus no harmonization was required. Items mapped to specific sub-domains of intrinsic capacity or functional ability were reviewed by WHO technical experts, to ensure consistency with existing measurement standards. For Functional ability, 20 items were retained

on four of the five sub-domains (meeting basic needs, mobility, building and maintaining relationships, and contributing to families, communities or society). For Intrinsic capacity, 11 items were retained from across sub-domains (neuromusculoskeletal, sensory, metabolic, cognitive and psychological), organized in two areas, physical and mental. These items are listed per component and domain in Annex 2. For each study, country, survey weights and information on age and sex were also extracted.

- **Missing data handling**

Across the 30 household survey datasets, 9 items were missing in more than half of the surveys, 1 item missing in just under half of the surveys (e.g. the question was not asked). For the bulk of the items, some data values wer missing for most measures of intrinsic capacity and functional ability, ranging from under 5% to 50%. Missing data imputation was carried-out only for three of the four intrinsic capacity items (gait speed, forced expiratory volumn, verbal fluency) that had higher missing values within the SHARE study covering 27 countries. Verbal fluency missing ranged from 48% to 100% among countries. Gait speed and forced expiratory volumn were not collected within the SHARE study. Multiple imputation chained equations (MICE) were applied to generate 100 complete datasets. For continuous items with missing values of more than 30%, predictive mean matching with the three nearest neighbours was used. Both individual (sex) and country-level characteristics (GDP income) were used as predictors. Individual items of intrinsic capacity were imputed together. Variables were calibrated and centred before imputation. The summary score was not used in the imputation model. No imputation was performed for categorical variables included in the analysis.

- **Estimation of proportions**

To estimate the proportion of older adults with different levels of intrinsic capacity and functional ability across the 30 countries, by age groups and sex, the following steps were taken in this preliminary analysis. First, items extracted for each component were combined into a single summary score, separately for intrinsic capacity and functional ability, through linear transformation. For intrinsic capacity, the measured items were averaged and then transformed. Second, a Box-Cox power exponential (BCPE) was used to transform each summary score into a standard normal distribution (8). Third, for intrinsic capacity and functional ability separately, each transformed score was rescaled into a Z-score (9). Fourth, a preliminary classification of all older adults, based on their Z-score and standard deviation (SD) units[5] in 4 sub-groups, as follow:

- High: older people who are more than 2 SD above the reference median, are considered as experiencing high capacity or ability.

[5] Healthy ageing is defined as a continuous process that is applied to all older adults. To support monitoring of the levels and distribution of healthy ageing, meaningful categories should reflect meaningful segements of the population that can be meaningfully interpreted and be relevant to policy and interventions.

- Sufficient: older people who are between -1 SD and below 2 SD, of the reference median, are considered as having sufficient capacity or ability.
- Moderate loss: older people who are between - 2 SD and -1 SD, the reference median, are considered as experiencing moderate loss of capacity and ability.
- Significant loss: older people who are more than -2 SD below the reference median, are considered as experiencing significant loss of capacity and ability.

Fifth, for each country, the proportion of older adults in each group was estimated. A meta-analysis was applied to obtain a weighted average of the proportion or percentage of older adults in 3 of the 4 categories, resulting in pooled results from across the 30 countries (10), with confidence intervals noted (95%). The proportion of older adults with sufficient capacity or ability reflects those not classified in the three other categories in this preliminary analysis. Sixth, to estimate the number of people 60 years and over (or further disaggregated) in each of the subgroups, the proportions across the 30 countries were multiplied with the expected number of older people within specific age strata, based on per country, age and sex groups, appling population estimates for the year 2017 (representing the last year of data collected within surveys included).[6]

For compliance with GATHER (Guidelines for Accurate and Transparent Health Estimates Reporting), the stata output files for 30 countries and the statistical script used in the analysis are found here: Methods paper for pooled results across 30 countries

6. Preliminary Results

Preliminary results combine data across 30 countries with a population of 201.1 million older adults, representing 24.1% of the total population in these 30 countries, and 21% of all older adults worldwide, in 2017. These are reported in Table 1 for functional ability and Table 2, for intrinsic capacity. The vast majority of older adults included in this analysis have high or sufficient functional ability and intrinsic capacity, 81.0% and 85.2% respectively. While the estimated percentage of older adults with significant loss of functional ability is 4%, those with significant loss of intrinsic capacity is 0.7%.

[6] United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Online Edition. Rev. 1.

Table 1: Estimated proportion of older adults with high, sufficient, moderate loss, and significant loss of functional ability

Functional ability	Estimated number (million) of older adults, both sexes combined, across 30 countries and corresponding percentage of total population (adults 60 years and over) in each category								
Both sexes, combined									
Age-groups	People, Million	High ability	(95% CI)	Sufficient	(residual)	Moderate loss	(95% CI)	Significant loss	(95% CI)
60 years and over	201.1	8.6%	(0.072 to 0.100)	72.4%		15.0%	(0.12 to 0.19)	4.0%	(0.034 to 0.045)
60-64	51.1	26.5%	(0.219 to 0.311)	66.5%		6.0%	(0.054 to .066)	1.0%	(0.008 to 0.013)
65-69	45.2	6.2%	(0.047 to 0.077)	84.5%		8.0%	(0.073 to 0.087)	1.2%	(0.009-0.015)
70-74	35.7	2.2%	(0.015to 0.030)	83.7%		12.0%	(0.114 to 0.136)	2.1%	(0.017 to 0.025)
75-79	27.6	1.2%	(0.007 to 0.016)	78.3%		16.4%	(0.152 to 0.178)	4.1%	(0.035 to 0.048)
80+	41.2	1.3%	(0.005 to 0.021)	52.6%		32.0%	(0.30 to 0.33)	14.1%	(0.13 to 0.153)
				High and Sufficient	81.0%				
				Moderate and Significant Loss	19.0%				

Table 2: Estimated proportion of older adults with high, sufficient, moderate loss, and significant loss of intrinsic capacity

Intrinsic capacity	Estimated number (million) of older adults, both sexes combined, across 30 countries and corresponding percentage of total population (adults 60 years and over) in each category								
Both sexes, combined									
Age-groups	People, Million	High capacity	(95% CI)	Sufficient		Moderate loss	(95% CI)	Significant loss	(95% CI)
60 years and over	201.1	11.8%	(0.101 to 0.131)	73.4%	(residual)	14.1%	(0.121 to 0.151)	0.7%	(.005 to 0.010)
60-64	51.1	19.1%	(0.159 to 0.224)	67.5%		12.8%	(0.119 to 0. 137)	0.6%	(0.005 to 0.008)
65-69	45.2	15.0%	(0.120 to 0.181)	63.8%		20.4%	(0.193 to 0.211)	0.8%	(0.005 to 0.011)
70-74	35.7	11.2%	(0.088 to 0.137)	63.6%		24.1%	(0.228 to 0.255)	1.1%	(0.009 to 0.015)
75-79	27.6	8.6%	(0.065 to 0.107)	61.6%		28.2%	(0.26 to 0.29)	1.6%	(0.012 to 0.021)
80+	41.2	7.7%	(0.062 to 0.093)	54.6%		34.2%	(0.32 to 0.35)	3.5%	(0.029 to 0.041)
				High and Sufficient	85.2%				
				Moderate and Significant Loss	14.8%				

7. Limitations of data and estimates and further work

WHO has mandate to monitor and report on healthy ageing and its three components (functional ability, intrinsic capacity and environments) across countries as well as provide information to support the leave no one behind agenda within countries.

This requires nationally representative information from as many countries as possible, with data that can be disaggregated by age groups and sex, and other socio-demographic characteristics within countries. In 2018, of the 109 Member States reporting on whether they had cross-sectional, nationally representative household surveys including adults age 60 and over, 54 countries reported having surveys with data collected since 2010[7]. Some additional countries and national institutions have data but have not yet released these in the public domain or for inclusion in this preliminary analysis.

Moreover, most household surveys do not sample adults residing in long term care facilities. Therefore, for countries included within these preliminary results in the European Region and the United States of America, older adults who reside in long term care facilities, and who may be care dependent, and are not counted. This may lead to an under-estimation of older adults with significant loss of intrinsic capacity (estimated in these pooled results across 30 countries as 0.7% of the population 60 years and older).

WHO is working with scientific partners to develop and test standardized and agreed on methods and metrics to measure healthy ageing. These draw on existing population-based studies that use a variety of measures (self-reported, tests, observation) to understand the physiological, psychological and social changes experienced by older adults. The estimates based on the data and methods included in the preliminary analysis were produced using existing items not originally intended to measure components of healthy ageing (intrinsic capacity or functional ability).

Although in these 30 surveys, items are identically worded, that does not guarantee that these are being interpreted and responded similarly by people within or across countries. The use of existing survey items, has relied on self-reported questions for body mass index, hearing and vision conditions. These measures may affect the precision of the estimates, as reporting biases are well documented (11, 12).

[7] Global Strategy on Ageing and Health, mid term progress reporting, indicator 9: https://www.who.int/ageing/commit-action/measuring-progress/indicators-9.pdf?ua=1

8. Next steps

For the main baseline report, additional surveys from 20 countries covering other WHO regions will be included, complementing the 30 included in this preliminary analysis. However, there are several challenges in adding population surveys and producing estimates of each component of healthy ageing. First, most additional surveys do not use comparable questions, performance tests or response scales. Second, heterogeneity between surveys in the design, recruitment methods and selection criteria, data collection time frame, and measures collected, can limit comparability and easy integration of data. Third, surveys from a wider range of regions might also change the scale and interpretation of levels and distribution of each component.

A post-harmonization exercise is currently underway examining data collected from all 50 countries using a standard protocol. To improve comparability, the response scales of the original measures will be altered and harmonised.

In consultation with experts, including the WHO Consortium on Metrics and Evidence for Healthy Ageing, the preliminary methods described above will be revisited to simplify and enhance comparability, and ensure a wider range of results, including disaggregation by age groups and sex. This includes improving and testing approaches to classify sub-groups of the population relevant to health policy and population based interventions, that are comparable across countries and produce a set of comprehensive estimates; and testing of model, and validity and comparability of estimates across countries, to enable reporting and visulatization by age, sex and country.

Finally, an analysis of the third component of healthy ageing, enabling environments is being pursued separately. Methods are being tested to extract information from satellite and internet based mapping services in the public domain.

9 References

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10 Annexes

Annex 1 . List of surveys included in preliminary, pooled analysis

S.no	Surveys	Country	WHO region	Year	Mean Age (SD)	Sample aged 60 years and over	Percentage of women
1	SHARE (Survey of Health, Ageing and Retirement in Europe)	Austria	EURO	2017	72.6 (8.0)	2736	58.9%
2	SHARE (Survey of Health, Ageing and Retirement in Europe)	Belgium	EURO	2017	71.7 (8.5)	3635	54.2%
3	SHARE (Survey of Health, Ageing and Retirement in Europe)	Bulgaria	EURO	2017	70.8 (7.2)	1409	57.9%
4	SHARE (Survey of Health, Ageing and Retirement in Europe)	Croatia	EURO	2017	69.9 (7.4)	1736	53.3%
5	SHARE (Survey of Health, Ageing and Retirement in Europe)	Cyprus	EURO	2017	72.9 (8.2)	946	58.3%
6	SHARE (Survey of Health, Ageing and Retirement in Europe)	Czech Republic	EURO	2017	71.4 (7.5)	3737	59.0%
7	SHARE (Survey of Health, Ageing and Retirement in Europe)	Denmark	EURO	2017	70.5 (7.5)	2344	53.2%
8	SHARE (Survey of Health, Ageing and Retirement in Europe)	Estonia	EURO	2017	72.8 (8.2)	4043	62.1%
9	SHARE (Survey of Health, Ageing and Retirement in Europe)	Finland	EURO	2017	70.5 (7.5)	1389	52.9%
10	SHARE (Survey of Health, Ageing and Retirement in Europe)	France	EURO	2017	72.1 (8.9)	2685	57.4%
11	SHARE (Survey of Health, Ageing and Retirement in Europe)	Germany	EURO	2004-2017	71.3 (7.6)	2919	51.0%
12	SHARE (Survey of Health, Ageing and Retirement in Europe)	Greece	EURO	2004-2017	71.8 (7.8)	2575	53.8%
13	SHARE (Survey of Health, Ageing and Retirement in Europe)	Hungary	EURO	2011-2017	70.2 (7.2)	1351	59.5%
14	TILDA (Irish Longitudinal Study on Ageing)	Ireland	EURO	2010-2016	69.9 (7.7)	1858	54.4%
15	SHARE (Survey of Health, Ageing and Retirement in Europe)	Israel	EURO	2006-2017	72.4 (8.3)	1858	56.2%
16	SHARE (Survey of Health, Ageing and Retirement in Europe)	Italy	EURO	2004-2017	71.9 (8.1)	3592	53.1%
17	SHARE (Survey of Health, Ageing and Retirement in Europe)	Latvia	EURO	2015-2017	71.9 (8.1)	1196	66.1%

18	SHARE (Survey of Health, Ageing and Retirement in Europe)	Lithuania	EURO	2015-2017	71.7 (8.1)	1332	65.0%
19	SHARE (Survey of Health, Ageing and Retirement in Europe)	Luxembourg	EURO	2013-2017	69.9 (7.7)	909	51.9%
20	SHARE (Survey of Health, Ageing and Retirement in Europe)	Malta	EURO	2015-2017	70.3 (7.3)	933	54.4%
21	SHARE (Survey of Health, Ageing and Retirement in Europe)	Poland	EURO	2007-2017	70.2 (8.1)	3264	54.3%
22	SHARE (Survey of Health, Ageing and Retirement in Europe)	Portugal	EURO	2011-2017	70.3 (8.1)	421	53.4%
23	SHARE (Survey of Health, Ageing and Retirement in Europe)	Romania	EURO	2015-2017	69.7 (7.7)	1435	55.3%
24	SHARE (Survey of Health, Ageing and Retirement in Europe)	Slovakia	EURO	2015-2017	67.5 (6.2)	1124	51.4%
25	SHARE (Survey of Health, Ageing and Retirement in Europe)	Slovenia	EURO	2011-2017	71.4 (8.1)	3043	56.5%
26	SHARE (Survey of Health, Ageing and Retirement in Europe)	Spain	EURO	2004-2017	73.5 (9.0)	3993	54.4%
27	SHARE (Survey of Health, Ageing and Retirement in Europe)	Sweden	EURO	2004-2017	72.9 (7.8)	2933	53.3%
28	SHARE (Survey of Health, Ageing and Retirement in Europe)	Switzerland	EURO	2004-2017	71.9 (8.3)	2032	53.1%
29	ELSA (English Longitudinal Study on Ageing)	United Kingdom	EURO	2002-2018	70.7 (8.2)	13014	54.3%
30	HRS (Health and Retirement Study) USA	United States of America	AMRO	2002-2018	69.9(8.4)	9246	54.8%
Total pooled sample size across 30 surveys						**83,688**	

Annex 2. Items extracted from surveys

Table 1 Description of survey measures of functional ability

S.no	Components	Item	Scaling	Recoded
1.	**Basic needs**			
1	Eating	Do you have any difficulty with eating, such as cutting up your food?	Yes - 0 No -1	Retained as coded in the original dataset
2	Bathing	Do you have any difficulty with bathing or showering?	Yes - 0 No -1	Retained as coded in the original dataset
3	Dressing	Do you have any difficulty with dressing, including putting on shoes and socks?	Yes - 0 No -1	Retained as coded in the original dataset
4	Toilet	Do you have any difficulty with using the toilet, including getting up and down?	Yes - 0 No -1	Retained as coded in the original dataset
5	Medication	Do you have any difficulty with taking medications?	Yes - 0 No -1	Retained as coded in the original dataset
6	In/out of bed	Do you have any difficulty with getting in or out of bed?	Yes - 0 No -1	Retained as coded in the original dataset
7	Household task	Do you have any difficulty with carrying out household work?	Yes - 0 No -1	Retained as coded in the original dataset
8	Meal preparation	Do you have any difficulty preparing a hot meal?	Yes - 0 No -1	Retained as coded in the original dataset
9	Money	Do you have any difficulty with managing money?	Yes - 0 No -1	Retained as coded in the original dataset
10	Shopping	Do you have any difficulty with shopping for groceries?	Yes - 0 No -1	Retained as coded in the original dataset

2.	**Mobility**			
11	Indoor	Do you have difficulty in walking across a room?	Yes - 0 No -1	Retained as coded in the original dataset
12	Walking	Do you have difficulty with walking 100 meter?	Yes - 0 No -1	Retained as coded in the original dataset
13	Sitting	Do you have difficulty with sitting for about two hours ?	Yes - 0 No -1	Retained as coded in the original dataset
14	Getting up from chair	Do you have difficulty in getting up from a chair after sitting for long periods?	Yes - 0 No -1	Retained as coded in the original dataset
15	Leaving house	Do you have difficulty in leaving the house independently and accessing transportation services?	Yes - 0 No -1	Retained as coded in the original dataset
3.	**Social contacts**			
16	Child /children	How often did you have contact with child/children ?	1. Daily 2. Several times a week About once a week 3. About every two weeks 4. About once a month Less than once a month **5.** Never	Two options: a) Recode as 1= Once a month or more frequent and 0= never. b) Retain as recorded in the original scale
17	Other family members	How often did you have contact with your mother/father/ siblings?	1. Daily 2. Several times a week About once a week 3. About every two weeks	Two options: a) Recode as 1= Once a month or more frequent and 0= never. b) Retain as recorded in the original scale

			4. About once a month Less than once a month **5.** Never	
4.	**Contribution**			
18	Caring for grandchildren	Have you regularly or occasionally looked after grandchild/grandchildren without the presence of the parents?	0 -No 1- Yes	Retained as coded in the original dataset
19	Caring for sick	Is there someone living in this household whom you have helped regularly during the last twelve months with personal care, such as washing, getting out of bed, or dressing?	0 -No 1- Yes	Retained as coded in the original dataset
20	Working	Current work situation	1. Retired 2. Employed or self-employed 3. Unemployed 4. Homemaker	1 (Yes) – Employed or self-employed (including working for family business) 0 (No)- all other category

Table 2 Description of survey measures of intrinsic capacity

	Components	Tests/questions	Scaling	Recoded	Remarks
	Mental capacity				
1	Memory	Ten words immediate recall	0 to 10	Retained as coded in the original dataset	
2	Memory	Ten words delayed recall	0 to 10	Retained as coded in the original dataset	
3	Verbal fluency	Animal naming	0 to n	Retained as coded in the original dataset	
4	Orientation	1) Day of the month 2) Month 3) Year 4) Day of week	0 to 4	Retained as coded in the original dataset	
5	Mood and sleep	During the past month they experienced any of the following symptoms: Depressed mood, pessimism, suicidality, sleep interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness.	0 to 12	Retained as coded in the original dataset	Twenty eight countries changed depression scale in the recent wave of data collection.
6	Mood and sleep	During the past week: have you experienced the following symptoms ("was depressed," "everything was an effort," "sleep was restless," "was happy," "felt lonely," "enjoyed life," "felt sad," and "could not get going")	0 to 8	Retained as coded in the original dataset	UK and USA retained the original items in the recent wave of data collections

	Physical capacity				
7	Vision and hearing	1) How good is your eyesight for seeing things at a distance 2) How good is your eyesight for seeing things up close 3) Is your hearing Poor, fair Good, Very good, Good and Excellent.	0 – 15	Retained as coded in the original dataset	
8	Body mass index	Height and weight metrics	20 to n	Recoded as 1-5 (higher score indicates normal BMI) 1. Underweight: Below 18.5/ Obesity class III: above 40 2. Obesity class II: 35.0–39.9 3. Obesity class I: 30.0–34.9 4. Pre-obesity: 25.0–29.9 5. Normal weight: 18.5–24.9	Both underweight and overweight is associated with low intrinsic capacity. Therefore, BMI was recoded.
9	Gait speed	Timed walking test	0 to n	Retained as coded in the original dataset	
10	Grip strength	Maximum Hand grip strength test (handheld device)	0 to n	Retained as coded in the original dataset	
11	Forced expiratory volume	Peak flow (spirometry test)	0 to n	Retained as coded in the original dataset	