The Irish Longitudinal Study on Ageing

Pseudonymised Microdata File (PMF)

Release Guide

Version 5.5

Wave 1 dataset: v1.12

Wave 2 dataset: v2.7

Wave 3 dataset: v3.6

Wave 4 dataset: v4.4

Wave 5 dataset: v5.5

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Contents

Introduction to The Irish Longitudinal Study on Ageing (TILDA)

The Irish Longitudinal Study on Ageing is a nationally representative study of the population of Ireland aged 50 and above. TILDA aims to understand the health, social and financial circumstances of the older Irish population and how these factors interact to influence the aging process.

The first wave of data collection was conducted between October 2009 and July 2011. In total, 8175 individuals aged 50 and over from 6,279 households participated in the study. In addition, 329 interviews were also conducted with younger spouses or partners of participants, leading to a total sample size of 8,504.

The second wave of TILDA interviews were undertaken between February 2012 and March 2013. Of the 8,504 interviewed in Wave 1, a second interview was obtained for 7,445 respondents. These consisted of the self, proxy and end-of-life interviews types. In addition to the returning respondents, 170 interviews were obtained from eligible household members who had chosen not to take part in Wave 1 or the new spouses/partners of existing respondents.

The third wave of TILDA interviews were undertaken between March 2014 and October 2015. Of the 7,445 interviewed in Wave 2, a third interview was obtained for 6,874 respondents. These consisted of the self, proxy and end-of-life interviews types. In addition to the returning respondents, 28 interviews were obtained from eligible household members who had chosen not to take part in Wave 1 or the new spouses/partners of existing respondents.

The fourth wave of TILDA interviews were undertaken between January 2016 and December 2016, 5,856 participants completed a self interview CAPI, of which 86% returned an SCQ (n=5,064). Additionally, 121 interviews were completed with proxies on behalf of participants who were no longer capable of completing the interview themselves.

The fifth wave of TILDA interviews were undertaken between January 2018 and January 2019, 5,101 participants completed a self interview CAPI, of which 86% returned an SCQ (n=4,410). Additionlly, 124 interviews were completed with proxies on behalf of participants who were no longer capable of completing the interview themselves.

The design of TILDA is described in full elsewhere (see Additional Sources of Information section below) but in brief, each participant underwent a home interview administered by a trained interviewer, was asked to compete and return a paper-based questionnaire including more sensitive questions, and was invited to undertake a health assessment (Wave 1 and Wave 3 only), either at a dedicated centre or in their own home if travel was impracticable.

Target population and Design of TILDA

The sampling framework and design of each component of TILDA is described in detail in the TILDA Design Report[1], and is briefly summarised below. The TILDA target population includes all members of the population of Ireland who are 50 years old or over and who live in the community (that is they

[1] Available from www.tilda.ie

do not live in a long term care institution). At the time of baseline data collection around 1% those between the ages of 65 and 74 lived in long term care, this figure rose to around 6% of those aged between 75 and 84 and 21% of those aged 85 and over.

Initial fieldwork report and response rate

To generate the TILDA sample, all postal addresses in Ireland were assigned to one of 3,155 geographic clusters, and a sample of 640 of these clusters was selected, stratified by socio-economic group and geography to maintain a population representative sample. Clusters were selected with a probability proportional to the number of individuals aged 50 and over in each cluster. Forty households were selected from each cluster (it was estimated that 25,600 addresses in total would be required to achieve the required sample size of 8,000). Each of the selected addresses was visited by an interviewer, who attempted to ascertain the eligibility of the address, to contact a household member and determine whether any individuals aged 50 or over lived at that address. All individuals aged 50 or over in each selected household and their partners (even if aged less than 50 themselves) were invited to be included in the study.

The response rate is the proportion of selected households including an eligible participant from which an interview was successfully obtained. Interviewers were sent to all of the initially allocated 25,600 addresses. Of these, 22,321 were occupied residential addresses. At 11,819 addresses contact was made and it was determined than no person aged 50 or over was at that address. In 9,818 it was determined that there was a person aged 50 or over. At 684 addresses either no contact was made or contact was made but it was impossible to determine whether there was anybody over 50 living at that address. Based on those households in which eligibility was determined, it is estimated that 9818/(9818+11819) x 684 = 310.4 of those households were eligible.

The estimated number of selected eligible households is therefore 9818 + 310.4 = 10128.4. Successful interviews were obtained in 6279 households, leading to a response rate of 62.0%.

Components of the study

The initial respondent (first eligible household member interviewed) in each household provided details of all of household members. Any household members eligible for the study were subsequently invited to take part in the study.

Each individual agreeing to participate in the study underwent a structured Computer Aided Personal Interview (CAPI) in their own home with a trained interviewer, which included questions on many domains of health, wellbeing, family and financial circumstances.

For the first wave of data collection, each participant was invited to undergo a health assessment, either a full health assessment at a specialised centre in Dublin or Cork or a modified partial

assessment in their own home where travel to a centre was not practicable. Whether a respondent completed a health assessment can be identified using the in_ha variable.

Each participant was also left a 'self-completion questionnaire' including potentially sensitive questions for them to fill in and return to TILDA by mail. This included a range of questions on quality of relationships, quality of life, perceptions of ageing, emotional wellbeing and health behaviours. There was also a single blank page for each respondent to make any further comment they chose. Whether a respondent returned a self-completion questionnaire can be identified using the in_scq variable.

The detailed design of each component of the study, including the rationale for the design and the comparability with other European and international studies is, described in the TILDA design report.

Financial Support and Ethical Approval

TILDA is based at Trinity College Dublin and involves many scientific collaborators within Ireland and internationally. TILDA is funded by the Department for Health and Children, Irish Life and The Atlantic Philanthropies.

Ethical approval for each wave of data collection is granted by the Trinity College Research Ethics Committee.

Pseudonymised Public Datasets

This data is supplied without any guarantee of its accuracy. It is possible that errors and inconsistencies exist with the dataset. Future releases of the dataset will address any issues that we are made aware of.

Contact the TILDA team (tilda@tcd.ie) to report errors in the data or for more information.

Changes since last release

Wave 1

Variables added	
RHR	Resting heart rate measured by Omron
Variables removed	
WE138_01	
WE138_02	Over the past 12 months, do you feel that you have been personally subjected to: Age discrimination
WE138_03	Over the past 12 months, do you feel that you have been personally subjected to: Discrimination linked to nationality
WE138_04	Over the past 12 months, do you feel that you have been personally subjected to: Discrimination linked to ethnic background
WE138_05	Over the past 12 months, do you feel that you have been personally subjected to: Discrimination linked to religion
WE138_06	Over the past 12 months, do you feel that you have been personally subjected to: Discrimination linked to disability
WE138_07	Over the past 12 months, do you feel that you have been personally subjected to: Discrimination linked to sexual orientation
WE138_96	Over the past 12 months, do you feel that you have been personally subjected to: None of these
WE138_98	Over the past 12 months, do you feel that you have been personally subjected to: Don't Know
WE138_99	Over the past 12 months, do you feel that you have been personally subjected to: Refused

Wave 2

Variables added	
weight_W1W2_capi	CAPI weight
weight_W1W2_scq	SCQ weight
stratum	Sampling Stratum (tertile of cluster-level social class)
fpc1	Finite population correction for stage 1 - Total number of clusters per stratum
fpc2	Finite population correction for stage 2 - Number of addresses with somebody

Wave 3

Variables added

RHR	Resting heart rate as measured by Omron
fpc1	Finite population correction for stage 1 - Total number of clusters per stratum
fpc2	Finite population correction for stage 2 - Number of addresses with somebody
Variables removed	

Wave 4

Variables added	
fpc1	Finite population correction for stage 1 - Total number of clusters per stratum
fpc2	Finite population correction for stage 2 - Number of addresses with somebody
Variables removed	

Wave 5

Variables added	
fpc1	Finite population correction for stage 1 - Total number of clusters per stratum
fpc2	Finite population correction for stage 2 - Number of addresses with somebody

Wave 1

The version 1.12 pseudonymised microdata file (PMF) dataset includes data from 8,501 TILDA participants interviewed at Wave 1. This includes data from 8,171 individuals aged 50 and over and 330 younger spouses or partners of participants. It includes data from the home interview, the self-completion questionnaire, selected data from the health assessment and certain other variables derived from these data. More information on these derived variables can be found in the 'Wave 1 Derived Variable Codebook'.

The 1.7 version contains a unique identifier which is explained in detail below. This identifier differs from previous dataset versions 1.3 or earlier and can be used to merge data from both waves of data collection.

More information on the Wave 1 data can be obtained in 'Fifty Plus in Ireland 2011', the first findings report, available on the TILDA website (tilda.tcd.ie).

Wave 2

The version 2.7 PMF dataset includes data from 7,206 TILDA respondents who completed a second self-interview during the Wave 2 fieldwork. Data from any respondents who were new at Wave 2, respondents who had passed away between the waves and data from returning respondents who required a proxy interview have been removed (n=408) to protect anonymity. The dataset includes data from the home interview, the self-completion questionnaire and certain other variables derived from this data. More information on these derived variables can be found in the 'Wave 2 Derived Variable Codebook'.

Version 2.4 differs from previous versions 2.3 or earlier, and can be used to merge data across waves of data collection. Version 2.4 added in 391 more variables and more information on these derived variables can be found in the 'Wave 2 Derived Variable Codebook'.

Wave 3

The version 3.6 PMF dataset includes data from 6,397 TILDA respondents who completed a third interview during the Wave 3 fieldwork. Data from any respondents who were new at Wave 3, respondents who had passed away between the waves and data from returning respondents who required a proxy interview have been removed (n=115) to protect anonymity. The dataset includes data from the home interview, the self-completion questionnaire and certain other variables derived from this data. More information on these derived variables can be found in the 'Wave 3 Derived Variable Codebook'. The new release contains selected data from the health assessment.

Wave 4

The version 4.4 PMF dataset includes data from the 5,713 TILDA respondents who completed a fourth interview during the Wave 4 fieldwork. Data from any respondents who were new at Wave 4, respondents who had passed away between the waves and data from returning respondents who

required a proxy interview have been removed (n=262) to protect anonymity. The dataset includes data from the home interview, the self-completion questionnaire and certain other variables derived from this data. More information on these derived variables can be found in the 'Wave 4 Derived Variable Codebook'.

Wave 5

The version 5.5 PMF dataset includes data from the 4,978 TILDA respondents who completed a fifth interview during the Wave 5 fieldwork. Data from any respondents who were new at Wave 4, respondents who had passed away between the waves and data from returning respondents who required a proxy interview have been removed (n=245) to protect anonymity. The dataset includes data from the home interview, the self-completion questionnaire and certain other variables derived from this data. More information on these derived variables can be found in the 'Wave 5 Derived Variable Codebook'.

Identification Variables

A unique identifier for each participant is provided (id), along with identifiers for the household (household) and geographic cluster (cluster) to which they belong.

All respondents from the same household will have the same household identifier. The individual identifier for each respondent consists of this household ID with an additional digit appended to distinguish individual respondents in the household.

Type of respondents included in dataset

The first respondent interviewed in each household acted as the **'coverscreen respondent'** and provided the demographic data on each person in the household.

Where two participants were married or were living together as if married, a '**financial respondent**' and a '**family respondent**' were identified, providing the detailed responses on family and financial circumstances respectively (Table 2.2). The financial respondent completed the House Ownership and Other Assets modules on behalf of the household and the family respondent completed the Transfers to Children module. The financial and family respondents were not necessarily different individuals and can be identified using the cs017 variable.

For the second wave of data collection, if a respondent was incapable of completing an interview due to cognitive or physical impairments, a proxy was sought to complete the interview on behalf of the respondent. Data collected in these proxy interviews are not included in the publicly released datasets.

Table 2.2: Module allocation based on respondent type

Module Code	Module Name	All respondents	Coverscreen respondent	Financial respondents	Family Respondent
CS	Coverscreen		X		
SC	Self-completion questionnaire	X			
DM	Demographics	X			
TC	Transfers to Children*				X
PH	Physical health & cognitive function	X			
FL	I(ADL) & helpers	X			
HU	Healthcare utilisation	X			
MH	Mental health	X			
WE	Employment situation	X			
GS	Grip strength	X			
TUG	Timed up and go	X			
JH	Job history	X			
LE	Lifelong learning (Wave 1 only)	X			
WR	Planning for retirement	X			
BH	Behavioural health	X			
TP	Transfers to parents	X			
CN	Social Connectedness	X			
SI	Sources of income	X			
HO	House ownership*			X	
AS	Other Assets*			X	
EX	Expectations	X			
DR	Driving and Transport	X			
MD	Medications	X			
CT	Contact Names	X			
HA	Health Assessment	X			
FN	Final Check List	X			

Variable Naming

Variables from the CAPI interview use a standard naming convention: the two letter module code (Table 2.2) followed by a 3 digit question code (e.g. ph121).

For questions where multiple answers are possible or where questions are looped across a number of people or objects the root variable name is followed by an underscore and additional number (e.g. ph201_05). For multiple choice questions the number after the underscore indicates the code of the multiple-choice answer option. For looped questions the number relates to the specific loop increment. For example in the Transfers to Children section all variables relating to the third child in the loop will have the suffix _3 (tc001_3 tc003_3 tc004_3 tc007_3, etc.).

All variables from the self-completion questionnaire are prefixed with 'SCQ'.

Several commonly used scales have been constructed based on the CAPI and SCQ data and these are included along with other derived variables. Derived variables are prefixed with an uppercase code which indicates the research area to which they relate (Table 2.3). Please see the derived variable codebooks for more information on these variables.

Table 2.3: Derived variable coding

Variable Prefix	**Research Area**
ADL	Activities of daily living
BEH	Health behaviours
BLOODS	Results of blood sample analysis
BP	Blood pressure from sphygmomanometer
COG	Scales and questions on cognition
CRT	Choice reaction time (cognitive test)
DIS	Disability, functional impairment and helpers
FR	Frailty, gait, exercise, falls and fractures
G2G	Gateway to Global Aging Data
GRIP	Grip strength
IADL	Instrumental activities of daily living
INC	Income variables
MD	Medication data
MH	Scales and questions on mental health and wellbeing
SCR	Screening tests
SES	Social class and socio
SOC	Social

Standard Response Options

Throughout the dataset there are standard response option codes that are used for variables which are detailed in Table 2.4.

The response code -1 is used to signify that a question was not asked or was not applicable. For example, all male participants will have a -1 label for questions relating to the menopause. Details of routing are included in the questionnaire and can be used to identify which participants skip a question.

Table 2.4: Standard response options

Code	**Value label meaning**
95; _95	Other
96; _96	None; none of the above
98; -98; _98	Don’t know
99; -99; _99	Refused
-1	Not applicable or skipped due to routing patterns

Health Variables

This section outlines the procedures that were followed during the health assessment component of TILDA data collection in Wave 1 and Wave 3 health assessment measures that were included as part of the Wave 2, Wave 4 and Wave 5 interview.

Wave 1 health assessments

As outlined in the TILDA Wave 1 key findings report, the majority of respondents attended a health assessment centre in Dublin or Cork. Respondents who were unable and/or unwilling to attend a health assessment centre were given the option of a shorter, home based assessment. Trained research nurses carried out all of the health assessments and the same procedures were followed in the health centre and the home. Some measurements such as visual acuity were only measured in the health centre. The variables included in release version 1.7 are: height, weight, body mass index (BMI), waist and hip circumference, grip strength, visual acuity, blood pressure, blood lipids, Mini Mental State Examination (MMSE), picture memory test and visual reasoning.

As respondents always completed the Computer Aided Personal Interview (CAPI) first, the time between this and the health assessment is also indicated in this dataset.

Variable – Wave 1	
delay_ha	Delay between CAPI and health assessment (days)

Wave 2 health measures

A full health assessment was not included during the second wave of data collection. As a substitute, a limited number of health measures were included as part of the CAPI. These were carried out by the interviewers who received training from the TILDA Research Team and Research Nurses. The measures included in release version 2.3 are Mini Mental State Examination (MMSE), grip strength and timed up and go (TUG).

Note: The difference in administration methods should be taken into account when comparing health measures across Wave 1 and Wave 2.

Wave 3 health measures

A full health assessment was conducted again as part of Wave 3. The majority of health assessments for this wave took place in the Dublin based assessment centre with some respondents completing a shorter home based assessment. Trained research nurses carried out all of the health assessments and the same procedures were followed in the health centre and the home. The variables include height, weight, waist and hip circumference, grip strength, visual acuity, blood pressure, blood lipids, heel ultrasound, gait and cognition. As respondents always completed the Computer Aided Personal Interview (CAPI) first, the time between this and the health assessment is also indicated in this dataset.

Variable – Wave 3	
delay_ha	Delay between CAPI and health assessment (days)

Wave 4 health measures

A full health assessment was not included during the fourth wave of data collection. As a substitute a limited number of health measures were included as part of the CAPI. These were carried out by the interviewers who received training from the TILDA Research Team and Research Nurses. The measures included in release version 4.0 are Mini Mental State Examination (MMSE), grip strength and timed up and go (TUG).

Note: The difference in administration methods should be taken into account when comparing health measures across Waves.

Wave 5 health measures

A full health assessment was not included during the fifth wave of data collection. As a substitute, a limited number of health measures were included as part of the CAPI. These were carried out by the interviewers who received training from the TILDA Research Team and Research Nurses. The measures included in release version 5.1 are Mini Mental State Examination (MMSE) and timed up and go (TUG).

Note: The difference in administration methods should be taken into account when comparing health measures across Waves.

Height

Height was measured using a Seca 240 wall mounted measuring rod. Footwear (shoes, slippers, sandals, etc), heavy outer clothes (coat, jackets, etc) and head gear (hat, cap, hair accessories, etc) were removed. The respondent was asked to stand with his/her back to the measuring rod facing forward and straight ahead, feet together and knees straight. The head stop was slid along the measurement rod until it lightly touched the respondent's head. The respondent was asked to move away from the rod and measurements were taken to one decimal place.

Respondents were also asked to self-report their height in the computer aided personal interview (CAPI). This was reported in feet and inches or cm and all measurements were converted to cm.

Variables – Wave 1 and Wave 3	
height	Objective height measurement (cm)
SR_Height_Centimetres	Self-reported height – CAPI (cm)
Variables – Wave 2 and Wave 4	
SR_Height_Centimetres	Self-reported height – CAPI (cm)

Weight

Weight was measured using a SECA electronic floor scales. The respondent removed heavy outer garments (jackets, coats, etc) and footwear (shoes, slippers, sandals, etc), stepped onto the scales and stood still, facing forward with arms by the sides. Weight was measured in kg to one decimal place.

Respondents were also asked to self-report their weight in the CAPI. This was reported in stones and pounds or kg and all measurements were converted to kg.

Variables – Wave 1 and Wave 3	
weight	Objective weight measurement (kg)
SR_Weight_Kilogrammes	Self-reported weight – CAPI (kg)
Variables – Wave 2 and Wave 4	
SR_Weight_Kilogrammes	Self-reported weight – CAPI (kg)

Body Mass Index

Body mass index (BMI) was calculated from measured height and weight as: weight / (height^2). This provides a quantitative measure of obesity.

Variables – Wave 1 and Wave 3	
FRbmi	BMI (kg/m^2)

Waist and Hip Circumference / Waist-to-Hip Ratio

There has been increasing interest in the distribution of body fat as an important indicator of increased risk of cardiovascular disease. The waist-to-hip ratio is a measure of distribution of body fat (both subcutaneous and intra-abdominal). Studies suggest that this ratio is a predictor of health risk like BMI.

Waist and hip circumference was measured using a SECA measuring tape unless the respondent was wheelchair bound or had a colostomy or ileostomy. The respondent removed all outer layers of clothing (jackets, heavy or baggy jumpers, cardigans and waistcoats), shoes with heels and tight garments intended to alter the shape of the body. He/she also removed or loosened belts and emptied pockets and bladder. The respondent then stood erect in a relaxed manner, with arms hanging loosely at the sides and breathing normally. Weight was evenly balanced on both feet which were about 25-30 cm apart.

Measuring waist circumference

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

Measuring hip circumference

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.

The order of measurement was waist circumference 1, hip circumference 1, waist circumference 2, hip circumference 2. A third measurement was taken if the difference between two measurements was greater than 3 cm.

Variables – Wave 1 and Wave 3	
FRwaist	Waist circumference (cm)
FRhip	Hip circumference (cm)
FRwhr	Waist:hip ratio

Grip Strength

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. 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.

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

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

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

Variables – Wave 1 and Wave 3	
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)
GRIPtestdominant	Dominant hand
Variables – Wave 2, 4 and 5	
gs001	Was the participant willing to have [his/her] grip strength measured?
gs005 (not in wave 5)	Grip strength for dominant hand (kg)
gs006 (not in wave 5)	Grip strength for non-dominant hand (kg)
gs007	Respondent's position during test

Timed up and go (TUG)

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.

Variables – Wave 1 and Wave 3	
FRtugTimeSec	Timed up and go, in seconds
FRtugSpeed	Speed of time up and go (reciprocal of tugTimeSec)
HOtugchairheight	TUGChairHeight
FRtugchairheight	Chair Height (in cm’s)
Variables – Wave 2, 4 and 5	
tug007	Height of chair from the seat to the ground to nearest cm
tug009min	Time taken to complete walk in minutes, seconds and centiseconds – minutes (m)
tug009sec	Time taken to complete walk in minutes, seconds and centiseconds – seconds (s)
tug009cent	Time taken to complete walk in minutes, seconds and centiseconds – centiseconds (cs)

Repeated chair stands

The chair stand test measures strength and endurance in the legs and lower body as well as speed and coordination. First, the ability to stand up once without the use of arms is assessed. If the respondent can stand without using the arms, a stop watch is then used to measure the time (in seconds) it takes him/her to stand up from a sitting position and sit down again five times, while holding the arms crossed over the chest. Only one timed measure is taken.

Variables – Wave 3	
FRchairStandsTime	Chair stands total time (HAC+Home)

Visual Acuity

Vision or eyesight was assessed by measuring visual acuity (acuteness or clearness of vision). In TILDA, it was assessed using the LogMAR (Minimal Angle of Resolution) charts which are a very accurate method of assessing visual acuity. 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 metres. 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.

Scoring protocol

Tested at 4 metres, the top lines give a score of 1.0. Each line below will give a score 0.1 less than the line above. Owing to the design of the chart, each of the five letters, in each line, count for a score of 0.02 (see scoring sheet below). Therefore, the better the vision, the lower the LogMAR score. For example, if a patient read the 0.4 line in its entirety, they scored 0.4. If they read the 0.4 line plus three letters of the 0.3 line, they scored 0.34. Extra care was taken when calculating values involving a negative score.

SCORING VISUAL ACUITY USING THE LOGMAR CHARTS

ALL 5 CORRECT ON THE 0.9 LINE with	SCORE
none correct on the 0.8 line	0.90
any one correct on the 0.8 line	0.88
any two correct on the 0.8 line	0.86
any three correct on the 0.8 line	0.84
any four correct on the 0.8 line	0.82

ALL 5 CORRECT ON THE 0.8 LINE with	SCORE
none correct on the 0.7 line	0.80
any one correct on the 0.7 line	0.78
any two correct on the 0.7 line	0.76
any three correct on the 0.7 line	0.74
any four correct on the 0.7 line	0.72

ALL 5 CORRECT ON THE 0.9 LINE with	SCORE
none correct on the 0.8 line	0.90
any one correct on the 0.8 line	0.88
any two correct on the 0.8 line	0.86
any three correct on the 0.8 line	0.84
any four correct on the 0.8 line	0.82

ALL 5 CORRECT ON THE 0.8 LINE with	SCORE
none correct on the 0.7 line	0.80
any one correct on the 0.7 line	0.78
any two correct on the 0.7 line	0.76

any three correct on the 0.7 line	0.74
any four correct on the 0.7 line	0.72

ALL 5 CORRECT ON THE 0.7 LINE with	SCORE
none correct on the 0.6 line	0.70
any one correct on the 0.6 line	0.68
any two correct on the 0.6 line	0.66
any three correct on the 0.6 line	0.64
any four correct on the 0.6 line	0.62

ALL 5 CORRECT ON THE 0.6 LINE with	SCORE
none correct on the 0.5 line	0.60
any one correct on the 0.5 line	0.58
any two correct on the 0.5 line	0.56
any three correct on the 0.5 line	0.54
any four correct on the 0.5 line	0.52

ALL 5 CORRECT ON THE 0.5 LINE with	SCORE
none correct on the 0.4 line	0.50
any one correct on the 0.4 line	0.48
any two correct on the 0.4 line	0.46
any three correct on the 0.4 line	0.44
any four correct on the 0.4 line	0.42
ALL 5 CORRECT ON THE 0.4 LINE with	SCORE
none correct on the 0.3 line	0.40
any one correct on the 0.3 line	0.38
any two correct on the 0.3 line	0.36
any three correct on the 0.3 line	0.34
any four correct on the 0.3 line	0.32

ALL 5 CORRECT ON THE 0.3 LINE with	SCORE
none correct on the 0.2 line	0.30
any one correct on the 0.2 line	0.28
any two correct on the 0.2 line	0.26
any three correct on the 0.2 line	0.24
any four correct on the 0.2 line	0.22

ALL 5 CORRECT ON THE 0.2 LINE with	SCORE
none correct on the 0.1 line	0.20
any one correct on the 0.1 line	0.18
any two correct on the 0.1 line	0.16
any three correct on the 0.1 line	0.14
any four correct on the 0.1 line	0.12

ALL 5 CORRECT ON THE 0.1 LINE with	SCORE
none correct on the 0.0 line	0.10
any one correct on the 0.0 line	0.08
any two correct on the 0.0 line	0.06

any three correct on the 0.0 line	0.04
any four correct on the 0.0 line	0.02

ALL 5 CORRECT ON THE 0.0 LINE with	SCORE
none correct on the -0.1 line	0.00
any one correct on the -0.1 line	-0.02
any two correct on the -0.1 line	-0.04
any three correct on the -0.1 line	-0.06
any four correct on the -0.1 line	-0.08

ALL 5 CORRECT ON THE -0.1 LINE with	SCORE
none correct on the -0.2 line	-0.10
any one correct on the -0.2 line	-0.12
any two correct on the -0.2 line	-0.14
any three correct on the -0.2 line	-0.16
any four correct on the -0.2 line	-0.18

ALL 5 CORRECT ON THE -0.2 LINE with	SCORE
none correct on the -0.3 line	-0.20
any one correct on the -0.3 line	-0.22
any two correct on the -0.3 line	-0.24
any three correct on the -0.3 line	-0.26
any four correct on the -0.3 line	-0.28

ALL 5 CORRECT ON THE -0.3 LINE	-0.30

Variables – Wave 1 and Wave 3	
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)

Note: Differences in visual acuity between those participants who (1) reported not usually wearing glasses/corrective lenses, (2) reported usually wearing glasses/corrective lenses and wore glasses/corrective lens during assessment, and (3) reported usually wearing glasses/corrective lenses and did not wear glasses/corrective lenses during assessment should be taken into account

Heart Rate

Heart rate was taken as the average of two measurements of seated Systolic Blood pressure (SBP), Diastolic Blood pressure (DBP) and Resting Heart Rate (RHR) were obtained separated by a 1-minute interval using an automatic digital oscillometric blood pressure monitor (OMRONTM, M10-IT).

Variables – Wave 1 and Wave 3	
RHR	Resting heart rate as measured by Omron

Blood Pressure

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

Variables – Wave 1 and Wave 3	
TEMperature	Ambient temperature
BPseatedsystolic1	Seated systolic blood pressure measurement 1 (mm Hg)
BPseatedsystolic2	Seated systolic blood pressure measurement 2 (mm Hg)
BPseateddiastolic1	Seated diastolic blood pressure measurement 1 (mm Hg)
BPseateddiastolic2	Seated diastolic blood pressure measurement 2 (mm Hg)
BPseatedsystolicmean	Mean seated systolic blood pressure (mm Hg)
BPseateddiastolicmean	Mean seated diastolic blood pressure (mm Hg)
BPhypertension	Objective measure of hypertension (0 = not hypertensive, 1 = hypertensive). Defined as hypertensive if BPseatedsystolicmean > =140 mm Hg or BPseateddiastolicmean > =90 mm Hg

Bloods Data

All respondents were eligible to give blood except:

1. People with clotting or bleeding disorders - haemophilia and low platelets, i.e. thrombocytopenia. There are many different types of bleeding/clotting disorders but they are all quite rare. With these problems, blood samples were not attempted, even if the disorder was controlled.

NOTE: People who have a past history of thrombophlebitis, a deep venous thrombosis, a stroke caused by a clot, a myocardial infarction or an embolus are NOT considered to have clotting disorders and were not excluded.

2. People who were not willing to give their consent in writing

3. People with HIV or Hepatitis

Respondents were not asked to fast before the health assessment. As the majority of respondents would not have fasted, blood was drawn at the end of the assessment. If a respondent did fast, consent and blood samples were obtained at the beginning of the assessment so that he/she could eat before completing the rest of the measurements. This was important as otherwise performance on all tests may have been adversely affected. In all cases (fasting and non-fasting), the time the respondent last ate was recorded.

The blood was analysed for a complete lipid profile. This includes Total cholesterol, HDL (High Density Lipoprotein), LDL (Low Density Lipoprotein) and TG (Triglyceride). These lipids are types of fat present in the blood and are related to diet.

As blood-taking is an invasive procedure, both written and verbal consent was required. The procedure was explained to the respondent in full and any problems with taking blood were identified. The respondent was seated comfortably or lying down on a couch if preferred. Venepuncture was performed with a butterfly and a green 21 gauge Vacutainer needle, following standard clinical guidelines.

For all bloods collected in the centre, one of the filled EDTA tubes was immediately covered in tinfoil to protect the sample from the light as carotenoids are light sensitive. Labelled blood tubes were then placed inside the specialised 3 layer blood boxes which maintained the temperature of the blood samples between 2-8°C for up to 48 hours until they were delivered to the central laboratory for processing.

Buffy coat samples were then isolated in 1ml aliquots and placed in long term storage at -80°C. Buffy coat refers to aliquots of white blood cells, taken from the plasma/red cell interface in centrifuged whole blood, which also inevitably contain some plasma and red cells [Youngman et al.]. HbA_{1c} concentration was subsequently analysed in these stored samples by reversed-phase action exchange chromatography using an ADAMS A_{1c} HA-8180V analyser.

HbA_{1c} reflects an individual's average glycaemic control over the previous 8-12 weeks and is an accepted method for the identification of diabetes and pre-diabetes [American Diabetes Association]. C-reactive protein (CRP) is a protein that is elevated in infection or inflammation.

References

Youngman LD, Clark S, Manely S, Peto R, Collins R (2002) Reliable Measurement of Glycated Hemoglobin in Frozen Blood Samples: Implications for Epidemiological Studies. Clin Chem 48: 1627-1629

American Diabetes Association (2015) 2. Classification and Diagnosis of Diabetes. Diabetes Care 38: S8-S16

Raw variables– Wave 1 and Wave 3	
Bloods_CHOL	Cholesterol (mmol/l -millimoles per litre)
Bloods_HDL	HDL (mmol/l -millimoles per litre)
Bloods_LDL	LDL (mmol/l -millimoles per litre)
Bloods_TRIG	Triglycerides (mmol/l -millimoles per litre)
Bloods_TimebetweenLastMealandAss	Time between last meal and assessment

Raw variables– Wave 1	
VISLutein_W1	VISLutein_W1
VISZeaxanthin_W1	VISZeaxanthin_W1
CRP_W1	CRP_W1
CREA_W1	CREA_W1
CYSC_W1	CYSC_W1
HbA1c_W1	HbA1c_W1

Cognition

General points to consider for cognition tests

Respondents were encouraged to wear eye glasses if needed for the cognitive tests. Time was also allowed to adjust a hearing aid if the respondent had poor hearing. Instructions were provided very clearly and more slowly that a normal conversation. In general, simple vocabulary, short sentences or questions that contained a single idea were used. The research nurse then paused to allow for a reply or response.

The cognitive battery was administered in private to ensure confidentiality and to prevent an individual feeling uncomfortable and/or distracted due to answering questions in front of other people. All mobile phones were turned off during testing.

As questions may be difficult for some individuals, questions were not described as "silly" or "easy". Research nurses were instructed not to say "These are routine questions that I have to ask everybody" as this may make an individual feel anxious or embarrassed if he/she is unable to answer some of the questions correctly. Furthermore, if the respondent answered any question incorrectly, nurses/interviewers did not correct the response or convey any concern (e.g. by facial expression). If the individual asked whether an answer was correct, they replied with something like "That was pretty close". They were asked to be supportive and encouraging without being condescending but not to prompt or provide any clues or hints to the correct answer. If the individual was anxious, they would periodically say "You are doing fine". EXACT instructions were given as indicated in this document in blue text.

Mini Mental State Examination (MMSE)

The MMSE is used as a global measure of cognition and takes approximately 5 minutes to administer. It assesses different cognitive domains: attention and concentration, memory, language, visuo-constructional skills, calculations and orientation. The individual's response was recorded for each item.

Orientation to time: The first 5 questions assessed the individual's orientation to time.

"What is the year?"

"What is the season?"

"What is the month of the year?"

"What is the day of the week?"

"What is the date?"

One point was awarded for each item answered correctly (maximum 5 points).

Scoring the season can be difficult as it can be somewhat arbitrary. The Irish calendar does not observe the typical astronomical seasons (beginning, in the Northern Hemisphere, on the equinoxes and solstices), or the meteorological seasons (beginning on March 1, June 1, September 1 and December 1). Rather, it centres the seasons around the solstices and equinoxes, beginning the seasons at the approximate halfway points between solstice and equinox. For example, in Ireland, the autumn months according to the national meteorological service, Met Éireann, are September, October and November. However, according to the Irish Calendar, the autumn months are August, September and October.

To score this question correctly, either season if the season is within one month of changing (see table below) was accepted. So for example, if the month is August, either summer or autumn was accepted.

Month	*Accept Season*
January	Winter
February	Winter / Spring
March	Spring
April	Spring
May	Spring / Summer
June	Summer
July	Summer
August	Summer / Autumn
September	Autumn
October	Autumn
November	Autumn / Winter
December	Winter

Orientation to place: The next 5 questions assessed the individual's orientation to place. In TILDA, these questions are slightly different to those on the MMSE sheet.

"What is the name of this country?"

"What is the name of this county?"

"What is the name of this city?"

"What is this building?" (either type or name of building)

"What floor are we on?"

One point was scored for each item answered correctly (maximum 5 points).

Registration: This tests a person's ability to learn and retain three unrelated words, as well as his/her level of alertness and attentiveness. Three words (apple, penny, table) were read out slowly to the participant and they were asked to repeat them and then keep them in mind as they would be asked them again in a few minutes.

Each correct answer received 1 point (maximum 3 points). The order of the words did not matter. If the respondent did not successfully repeat all three words on the first trial, they were repeated until he/she was able to say all three words back (in any order). This is important as the person needs to "make" the memory if they are to "retrieve" it later. A maximum of five trials was allowed to repeat all three words. Respondents were scored on the first trial only.

Attention and Calculation: The serial 7s and WORLD tasks both assess the respondent's attention and mental calculation abilities. The respondent was asked both components of the test but only the best score was used to calculate the MMSE score.

For the serial 7s, the respondent was asked to subtract 7 from 100 then keep subtracting 7 from each answer until told to stop. A total of five answers was required and all answers given by the respondent were recorded. One point was scored for each correct answer (maximum 5 points). An answer was considered correct if it was exactly 7 less than the previous answer, regardless of whether that previous answer was correct.

In the WORLD task, the respondent was asked to spell WORLD forwards then backwards. Only the backward spelling was scored, giving one point for each letter that appeared in the correct order with the highest number of consecutive letters being scored (e.g. DLROW = 5, DLORW = 2) (maximum 5 points).

Recall: The next task assessed the individual's ability to recall the three words he/she learned during the registration task (apple, penny, table) without prompts or clues. One point was given for each correct answer (maximum 3 points) regardless of the order they were provided in.

Naming: The next task assessed the individuals' ability to recognise and name two common objects. The respondent was shown a pencil/pen, watch or other common object (e.g. eyeglasses, chair or keys). One point was given for each object correctly identified (maximum 2 points)

Repetition: This single-item task assessed the respondent's ability to precisely repeat a series of unrelated word that are not frequently said together. The respondent was asked to repeat "NO IFS, ANDS OR BUTS". The research nurse spoke slowly and articulated clearly so that all the "s" endings were audible. One point was given if the respondent repeated the entire phrase correctly; otherwise he/she received 0. If the respondent did not hear the phrase the first time, the sentence was repeated a second time. If the sentence needed to be repeated a third time, the respondent scored 0.

Comprehension: This task assessed the respondent's ability to attend to, comprehend and carry out a complex three-stage command "Take this paper in your right hand, fold it in half and put it on the floor". If a respondent was disabled or physically positioned in such a way that he/she could not place the paper on the floor, he/she could place the paper on a table. The scoring sheet or any blank sheet of paper was used. Care was taken so that the paper was not handed to the respondent until after the entire 3 stage command was given and that it was handed to the space in between their hands and not preferentially towards their right or left hand.

One point was given for each of the following: respondent took the paper in his/her right hand, he/she folded the paper in half (the fold did not need to be perfect), he/she put the paper on the floor (or table, if appropriate) (maximum 3 points). If the respondent asked if they could use both hands to fold the sheet, it was clarified that they could. If necessary, the instructions were repeated but this was done in their entirety (i.e. all 3 stages together).

Reading: The next section assessed the respondent's ability to read and understand a simple sentence. They were shown a paper with CLOSE YOUR EYES written on it. The respondent could read it aloud if preferred and they received one point if they closed their eyes. This instruction was given only once.

Writing: The next task tested the respondent's ability to write a sentence. A sentence is the largest independent unit of grammar: it begins with a capital letter and ends with a period, question mark, or exclamation point. The sentence is traditionally defined as a word or group of words that expresses a complete idea and must include a subject and a verb. One point was given for a comprehensible sentence; minor grammar or spelling errors were ignored. Respondents were prompted to write a longer sentence if their initial sentence was incomplete in which case they could still score on this task.

Drawing: The drawing task assessed the individual's visuo-spatial ability. Respondents were asked to copy a design comprising two 5-sided figures that intersect to form a 4-sided figure. One point was given if the respondent copied the design accurately. The two figures did not have to be perfect pentagons, equivalent in size or have perfectly straight lines, but they both needed to be 5-sided and their intersection needed to form a 4 sided shape.

The total MMSE score was calculated by summing the item scores across all 11 tasks, taking the higher score of either the WORLD or Serial 7's (maximum 30 points).

Variables – Wave 1	
COGmmse_ha	Mini-mental state examination (Health Assessment)
Variables – Wave 2	
COGmmse	Mini-mental state examination (CAPI)
Variables – Wave 3	
COGmmse	Mini-mental state examination (CAPI)
Variables – Wave 4	
COGmmse	Mini-mental state examination (CAPI)
Variables – Wave 5	
COGmmse	Mini-mental state examination (CAPI)

Picture Memory Test – Naming, Free Recall and Recognition

This is a test of visual memory where respondents were asked to name some objects shown to them in pictures. The respondent was allowed 2 seconds to see each picture. Acceptable answers depended on local usage as some items may have more than one correct name. Errors included description of function (e.g. 'used for telling the time' for watch) and approximate answers (e.g. 'weighing machine' for scales; 'bag' or 'carrier' for suitcase; 'light' for lamp). In the case of an approximate answer, respondents were prompted for 'another word for it'.

The respondent received 1 point for each object named correctly (maximum 6 points) (picture naming). They were not forewarned that they needed to remember these objects for later.

At a later time during the assessment, the respondent was asked to recall the objects in the pictures. Either descriptions or names were acceptable here. The respondent received 1 point for each item correctly recalled (maximum 6 points) (free recall).

Respondents were then shown 6 sets of pictures in the assessment booklet and asked to identify which pictures they were shown previously. Each set of pictures contained three similar objects, only one of which appeared earlier. One point was given for each item correctly recognised (maximum 6 points) (recognition).

Variables – Wave 1	
PICmemScore	Picture Memory Test score (naming)
PICrecallScore	Picture Memory Test Recall score
PICrecogScore	Picture Memory Test Recognition score

Immediate and delayed recall

The 10 word list learning task used in TILDA has TWO learning trials (coded as Immediaterecall1 and Immediaterecall2); most other studies use just ONE learning trial. This provides a better

opportunity for more words to be acquired at the learning stage which could enhance the later delayed recall. Stress / anxiety can often disrupt the first trial learning with improved performance on subsequent learning trials. This means that the FIRST learning trial is fully compatible with immediate recall in other studies, which use only one learning trial. The delayed free recall measure is exactly the same as these other studies, however it is possible that TILDA participants could have a higher delayed free recall score as they had two learning trials.

Visual Reasoning

The Visual Reasoning Test in the CAMDEX booklet was used for this test . This consists of 6 cards with four boxes on each. Three of the boxes have an object inside while one box is empty. Respondents were asked which object from a choice of 6 options should go in the box. If the respondent made an error on the first card, the correct response was indicated and the reason why was explained. This was repeated for the second card. After this point, the respondent was shown cards 3 to 6 but no further corrections were made. Respondents were given sufficient time to indicate the correct object for each card. Further clarification and explanation of cards 1 and 2 was provided if requested.

The total number of correct answers was recorded (maximum 6 points). If a respondent required cards 1 or 2 explained, they scored 0 for that card.

Variables – Wave 1	
VISreasoning	Visual reasoning score

Sustained Attention to Response Task (SART)

This is a computer based test to measure sustained attention**.** Sustained attention is "the ability to direct and focus cognitive activity on specific stimuli."

Respondents were presented with the digits 1-9 appearing one at a time on screen and in consecutive order. Each digit appeared for 300ms, with an interval of 800ms between digits. The cycle of digits 1–9 was repeated 23 times, giving a total of 207 trials. Respondents were instructed to press the spacebar in response to every digit, *except for the number '3'.* The task lasted approximately 4 minutes and the following measures were recorded. Mean response time, that is, the mean time (milliseconds) taken for each key press in response to digits 1, 2, and 4–9 across the entire task and the standard deviation of response time that is, a simple measure of the overall variability of response time (milliseconds) across the task. The number of commission errors (pressing in response to the number 3) and omission errors (failing to press in response to any of the other digits) was also recorded.

Variables – Wave 1 and Wave 3	
COGsartCoeff	The coefficient of variation in response times (mean/standard deviation)
COGsartCookedMean	Mean SART response time(ms) with intra-individual (single trial) outliers removed
COGsartCookedStdev	Standard deviation of SART response time (ms) with intra-individual outliers removed
COGsartErrors3	The number of errors of commission
COGsartOmissions	The number of errors of omission
COGsartRawMean	Mean SART response time (in milliseconds) without intra-individual outliers removed
COGsartRawStdev	Standard deviation of SART response time without intra-individual outliers removed

Choice reaction time (cognitive test CRT)

The Choice Reaction Time test is a computerised test which measures attention and speed of processing information in the brain. Participants pressed a button on the keyboard until an on-screen stimulus prompted them to press another pre-specified button. Average reaction time from presentation of the stimulus to pressing the button, was measured over multiple trials.

Variables – Wave 1 and Wave 3	
CRTfaulty	no. of trials with data errors
CRTmeancog	Mean cognitive response time
CRTmeancogyes	Mean cognitive response time if target was yes
CRTmeancogno	Mean cognitive response time if target was no
CRTmeancogfirst	Mean cognitive response time in first 50 responses
CRTmeancogsecond	Mean cognitive response time in second 50 responses
CRTmeanmot	Mean motor response time
CRTmeanmotyes	Mean motor response time if target was yes
CRTmeanmotno	Mean motor response time if target was no
CRTmeanmotfirst	Mean motor response time in first 50 responses
CRTmeanmotsecond	Mean motor response time in second 50 responses
CRTmeantot	(mean) totresponse
CRTmeantotyes	(mean) totresponseyes
CRTmeantotno	(mean) totresponseno
CRTmeantotfirst	(mean) totresponsefirst
CRTmeantotsecond	(mean) totresponsesecond
CRTsdcog	s.d. of cognitive response time
CRTsdcogyes	s.d. of cognitive response time if target was yes
CRTsdcogno	s.d. of cognitive response time if target was no
CRTsdcogfirst	s.d. of cognitive response time in first 50 responses
CRTsdcogsecond	s.d. of cognitive response time in second 50 responses
CRTsdmot	s.d. of motor response time

CRTsdmotyes	s.d. of motor response time if target was yes
CRTsdmotno	s.d. of motor response time if target was no
CRTsdmotfirst	s.d. of motor response time in first 50 responses
CRTsdmotsecond	s.d. of motor response time in second 50 responses
CRTsdtot	(sd) totresponse
CRTsdtotyes	(sd) totresponseyes
CRTsdtotno	(sd) totresponseno
CRTsdtotfirst	(sd) totresponsefirst
CRTsdtotsecond	(sd) totresponsesecond
CRTcorrect	Number of correct choices (out of number of valid trials, max 100)
CRTcogoutliers	(sum) cogoutlier
CRTmotoutliers	(sum) motoutlier
CRTtrials	Number of valid trials (out of 100)

Colour Trails Tests 1 & 2

These are timed pen and paper test of visual scanning and executive function.

For the Colour Trails 1 test, the respondent is instructed to draw a line connecting the circles numbered 1 through 25 in consecutive order, using a pencil. The incidental fact that colour alternates with each succeeding number is not mentioned. The respondent is told to perform the task as quickly as possible without making errors. If an error is made, the examiner points it out and instructs the respondent to correct the error and proceed with the task. Up to 10 seconds are allowed for the respondent to make a connection between one circle and the next. After the 10 second period has elapsed, the examiner provides a non-verbal prompt (i.e. by pointing) indicating the position of the next correct circle. If the respondent initiates a movement towards a circle that is not in the correct sequence, but corrects his/herself spontaneously, this is considered to be a near miss. The examiner records the length of time (in seconds) required by the respondent to complete the Colour Trails 1 trial. The examiner also records the number of near-misses, errors and prompts.

For the Colour Trails 2 trial, the examiner instructs the respondent to draw a line between numbered circles, maintaining the sequence of numbers, but this time alternating between pink and yellow colours. The examiner records the length of time required to complete the test trial along with the number of near-misses, prompts, colour sequence errors and number sequence errors made by the respondent.

Variables – Wave 1 and Wave 3	
COGtrail1time	Time taken to complete Trail 1 (seconds)
COGtrail2time	Time taken to complete Trail 2 (seconds)
COGtraildeltatime	The increase in time taken to complete Trail 2 (COGtrail2time – COGtrail1time)
COGtrail1nearmisses	Number of near misses on Colour Trails 1
COGtrail2nearmisses	Number of near misses on Colour Trails 2

COGtrail1prompts	Number of prompts on Colour Trails 1
COGtrail2prompts	Number of prompts on Colour Trails 2
COGtrail1errors	Number of errors on Trial 1
COGtrail2errors	Number sequence errors on Trial 2
COGtrail2colourerrors	Colour sequence errors on Trial 2

National Adult Reading Test (NART)

The National Adult Reading Test (NART; Nelson, 1982) is a vocabulary-based measure of pre-morbid intelligence.

Respondents were asked to read aloud 50 irregular spelled words, that is words that are not pronounced as they are written (e.g. aisle, drachm). Words were written on cards and were presented one at a time in order of increased difficulty. Respondents were encouraged to guess the pronunciation of the words when they did not recognize them.

One point was attributed to each correctly pronounced word, with a maximum accuracy score of 50 points. If the respondent scores more than five words incorrect within the first 25 words, the test can be discontinued after 25 words. The number of words accurately pronounced is then used to predict IQ.

The NART was administered by a nurse during the health assessment and was introduced at Wave 3. Respondents who were illiterate or blind did not take part in the test.

Reference:

Nelson HE. National adult reading test (NART): test manual. Windsor, Berks: NFER-Nelson; 1982.

Variables – Wave 3	
COGnartRawScore	HO + HAC: NART Raw Test Score
COGnartTestSize	HO + HAC: NART Test Size

State Trait Anxiety Inventory (STAI)

The State-Trait Anxiety Inventory (STAI) measures participant's present level of anxiety/calmness.

Respondents were asked to indicate the extent to which they were currently experiencing anxiety-related emotions, using a 4-point scale (1 = Not at all, 4 = Very much). Higher scores reflect greater anxiety.

The 6-item short version form of the STAI was used in TILDA protocol. The test was introduced at Wave 3.

Reference:

Marteau, T. M., & Bekker, H. (1992). The development of a six-item short-form of the state scale of the Spielberger State-Trait Anxiety Inventory (STAI). British Journal of Clinical Psychology, 31, 301–306

Variables – Wave 3	
COGstateanxietyraw	State Anxiety 6 Score HAC+Home (raw 6-item scoring)

Centre for Epidemiological Studies-Depression (CESD)

The CES-D is a short self-report scale completed in the CAPI that is designed to measure the current level of depressive symptoms in the general population. It was validated in the general population and primary care settings and has been shown to have acceptable screening accuracy in these populations. The scale contains 20 items about symptoms that occurred in the previous week with response options from 0 to 3 that refer to frequency of symptoms. The scale ranges from 0 (best) to 60 (worst) with a higher number indicative of increasing depressive symptoms. Depressive symptoms were assessed using the CES-D as a continuous outcome variable with a range from 0-60.

In the health assessment at Wave 3 depressive symptoms were assessed using the short 8-item version of the Centre for Epidemiological Studies-Depression (CES-D) scale. This scale measures the frequency that respondents have experienced a variety of depressive symptoms within the past week. It consists of 8 items and the total number of positive and negative responses are summed to give a total score ranging from 0 to 24 with higher scores indicating increased depressive symptomology

Reference:

Karim J, Weisz R, Bibi Z, ur Rehman S. Validation of the Eight-Item Center for Epidemiologic Studies Depression Scale (CES-D) Among Older Adults. Curr Psychol. 2015;34(4):681–92

Variables – Wave 1	
MHcesd_capi	CES-D From CAPI
Variables – Wave 2	
MHcesd_capi	CES-D From CAPI
Variables – Wave 3	
MHcesd_capi_sf	CES-D (short form) from CAPI
MHcesd_ha	CESD-8 Scale: Home + HAC
Variables – Wave 4	
MHcesd_capi_sf	CES-D (short form) from CAPI
Variables – Wave 5	
MHcesd_capi_sf	CES-D (short form) from CAPI

Montreal Cognitive Assessment (MOCA)

The Montreal Cognitive Assessment (MoCA) was designed as a rapid screening instrument for mild cognitive dysfunction. It assesses different cognitive domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation. The time to administer the MoCA is approximately 5-10 minutes and the maximum score is 30 points. The number of years formal education that the respondent has had is also recorded as <12 years or >12 years.

Variables – Wave 1 and Wave 3	
COGmoca	MoCA score

Heel Ultrasound

The gold standard for measuring bone mineral density is a DEXA machine. By the WHO criteria, a T-score of -2.5 or higher on a DEXA indicates osteoporosis. However, DEXA machines are expensive, large and involve ionising radiation. As it was not feasible to use a DEXA in TILDA, a heel ultrasound machine which measures the speed of sound through the heel was used as a surrogate marker for osteoporosis. It is important to realise that the T-score generated from a heel ultrasound is not the same as that generated by a DEXA machine and cannot be used to diagnose osteoporosis. However, having a low score on a heel ultrasound was an independent risk factor for hip fracture in a large prospective study with >5000 female participants (Hans et al., 1996).

Heel ultrasound was measured using the Achilles Insight Heel Ultrasound machine. Measurement was taken barefoot using the non-dominant foot (same side as non-dominant hand in grip strength). This provides a T-score (range -7 to 4) and an ultrasound stiffness index (range 10 to 200). The T-score and stiffness index were used to classify respondents as having normal bone density, osteopenia or osteoporosis based on data provided in the Achilles Insight Operators Manual (GE Medical Systems).

Variables – Wave 1 and Wave 3	
FRtscore	T-score
FRstiffness	Ultrasound stiffness index
FRosteoporosis	Based on T-score: osteoporosis (-100 to -2.5), osteopenia (>-2.5 to -1), normal bone stiffness (>-1 to 100)
FRosteoporosis2	Based on stiffness index: osteoporosis (-1000 to <65), osteopenia (65 to <87), normal bone stiffness (87 to 1000)

Multisensory Integration (Sound-Induced Flash Illusion)

As we get older the way in which we integrate information across our senses is known to change. The Sound-Induced Flash Illusion (SIFI) is a measure of the temporal efficiency of multisensory integration, and was included in the Wave 3 health assessment of TILDA.
In the Sound Induced Flash Illusion task (Shams et al., 2000; Hirst et al, 2020), participants are presented with a number of visual "flashes" which are sometimes accompanied by auditory "beeps". Typically, when one flash is paired close in time with two beeps, participants report perceiving two flashes (even though only one occurred). When the second beep is offset further in time from the flash-beep pair (i.e. with a longer Stimulus Onset Asynchrony, SOA) susceptibility to the illusion should decrease, providing a measure of the time window in auditory information influences visual perception. Less illusion susceptibility at longer SOAs is typically considered a "healthy" pattern of integration.
Testing took place in a dimly lit testing room with the nurse who conducted the healthcare assessment. Participants were seated in front of a computer (Dell Latitude E6400 with Intel Core 2

Duo CPU, 2Gb RAM, using Windows 7 Professional OS, 60 Hz refresh rate) and instructed to look at the fixation cross at the centre of the screen. If the participant usually wore glasses or hearing aids they also wore them during the assessment. A fixation cross lasting 1000 ms marked the start of each trial. The visual and/or auditory stimuli were then presented. The visual stimulus was a white disc (1.5° visual angle, 32fl luminance approximately) positioned 5 cm below the central fixation (4.77° visual angle) cross for 16 ms, on a black background. Viewing distance was approximately 60 cm. Auditory beeps were brief bursts of 3500 Hz sounds (10 ms, 1 ms ramp), presented aloud at approximately 80 dB via the inbuilt speakers in the laptop.

On each trial, the number of flashes and/or beeps presented and the temporal offset between multiple stimuli (SOA) varied. These factors are indicated in the variable names of the data. For example "2B1F_230" indicates 2 Beeps presented with 1 Flash, where the second beep occurred 230 ms after the flash beep pair.

The main testing block contained multisensory illusory trials (2B1F), multisensory non- illusory trials (2B2F, 1B1F) and unisensory visual trials (0B2F, 0B1F). Illusory trials (2B1F) were presented at one of six SOAs, −230 ms, −150 ms, −70 ms, 70 ms, 150 ms, 230 ms, where negative values indicate an auditory lead. Congruent 2B2F trials were presented at three SOAs, 70 ms, 150 ms, 230 ms. Unisensory 0B2F trials were presented at one SOA, 70 ms. Each trial type was presented twice within a block and in random order across participants. Before the main testing block, a practice phase was presented comprising one trial from each of the following conditions: illusory 2B1F (SOAs of 70, 150, and 230), non-illusory 2B2F and 1B1F, and unisensory visual 0B2F 70 ms. Participants were asked to report the number of visual flashes perceived. Once a response was provided, the nurse, who sat near the participant, recorded the participant's vocal responses by pressing the corresponding number key on a laptop. The nurse then pressed the space bar to continue to the next trial. A separate block of unisensory auditory trials was then presented. In this block, either 1 beep or 2 beeps were presented in the absence of any flash (1B0F, 2B0F). In the unisensory 2B0F condition, the two beeps were presented at three SOAs, 70 ms, 150 ms, and 230 ms. Participants were asked to identify the number of beeps they heard. As in the main block, the nurse pressed the corresponding key once a verbal response was given. Two trials per condition were presented in this block, therefore proportion scores are 0, 0.5 or 1 – indicating 0, 1 or 2 correct responses for that condition.

References

Shams, L., Kamitani, Y. & Shimojo, S. What you see is what you hear. *Nature* **408**, 788 (2000). https://doi.org/10.1038/35048669

Hirst RJ, McGovern DP, Setti A, Shams L, Newell FN. What you see is what you hear: Twenty years of research using the Sound-Induced Flash Illusion. Neurosci Biobehav Rev. 2020 Nov;118:759-774. doi: 10.1016/j.neubiorev.2020.09.006. Epub 2020 Sep 13. PMID: 32937116.

Variables – Wave 3	
Shams_2B1F_m230	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of -230ms.
Shams_2B1F_m150	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of -150ms.
Shams_2B1F_m70	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of -70ms.
Shams_2B1F_70	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of 70ms.
Shams_2B1F_150	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of 150ms.
Shams_2B1F_230	Proportion correct for judging 1 flash when paired with 2 beeps with an SOA of 230ms.
Shams_2B2F_70	Proportion correct for judging 2 flashes when paired with 2 beeps with an SOA of 70ms.
Shams_2B2F_150	Proportion correct for judging 2 flashes when paired with 2 beeps with an SOA of 150ms.
Shams_2B2F_230	Proportion correct for judging 2 flashes when paired with 2 beeps with an SOA of 230ms.
Shams_1B1F	Proportion correct for judging 1 flash when paired with 1 beep.
Shams_2B0F_70	Proportion correct for judging 2 beeps at 70ms SOA.
Shams_2B0F_150	Proportion correct for judging 2 beeps at 150ms SOA.
Shams_2B0F_230	Proportion correct for judging 2 beeps at 230ms SOA.
Shams_1B0F	Proportion correct for judging 1 beep.
Shams_0B2F	Proportion correct for judging 2 flashes at 70ms SOA.
Shams_0B1F	Proportion correct for judging 1 flash.

Applying Complex Survey Analysis Methods

Weights

For inferences based on the TILDA dataset to be applicable to the Irish population, weights must be applied to correct for selection bias. Weights are only supplied in the Wave 1 dataset for the 8,175 participants aged 50 or over. Those aged less than 50 should not be directly included in analyses aimed at yielding estimates applicable to the general population. These weights are supplied with the Wave 1 dataset; a description of how they are calculated follows:

The weight for each participant is equal to the number of individuals in the population represented in the study by that participant. Those individuals who come from groups less likely to participate in the study therefore have a higher weight. A 'weighted' estimate based on the sample is an unbiased estimate of the respective parameter in the population.

There are four sets of weights supplied in the dataset. The first is the 'CAPI' weight, to be applied when the whole TILDA sample is included in an analysis. This is equal to the number of individuals in the population (based on the numbers in the 2010 Quarterly National Household Survey) represented by each individual among the 8,175 individuals that underwent the home 'CAPI' interview. The additional weights are the self-completion questionnaire (SCQ) weight and the health assessment weight, to be applied when only those who returned the SCQ or only those who completed a health assessment are included respectively. These take into account the CAPI weight as described above, but also the fact that some subgroups of the sample were more likely to return their SCQ than others and some more likely to participate in the health assessment than others.

Computer Aided Personal Interview Weight - Wave 1

The CAPI weight is calculated by comparing the distributions of individual characteristics in the sample to those derived from data from the Quarterly National Household Survey (QNHS).

The distribution across age categories (50-64/65-74/75+), sex and educational attainment (primary/secondary/tertiary+) from the 2010 QNHS was used to calculate a weight for each individual.

Therefore estimates from the CAPI sample will reflect the number of people in TILDA but the distribution of age, sex and educational attainment match those from the 2010 target population of Irish adults over 50 (N=1,259,100) as determined by the QNHS.

Self-Completed Questionnaire Weight - Wave 1

In total, 6,915 (85%) of participants returned the SCQ. The SCQ weight incorporates a CAPI respondent's subsequent probability of returning the SCQ. A probability for each respondent is estimated using multivariable logistic regression including age, sex, educational attainment, marital status, employment status, region, whether the participant agreed to a health assessment, and the participants prospective memory test results, immediate recall score, disability, and depression.

The SCQ weight for each participant over 50 is then generated by dividing the CAPI weight by this predicted probability. A further rescaling ensures that the total size of the weighted population remains the same as the target population.

Health Assessment Weights - Wave 1

In total, 5,897 (72%) of participants completed a health assessment (at home or by attending the health centre). The health assessment weight incorporates a CAPI respondent's subsequent probability of completing a health assessment. A probability for each respondent is estimated using multivariable logistic regression including age and educational attainment.

A similar health centre assessment weight was also computed for those 5036 (62%) participants who completed a health assessment at the health centre.

The health assessment and health centre assessment weights for each participant over 50 were each generated by dividing their CAPI weight by these predicted probabilities. A further rescaling ensures that the total size of the weighted population remains the same as the target population.

Weight Variables –Wave 1

Applying these weights to analyses yields estimates that are applicable to the Irish population in 2010. Weights are only supplied for the 8,175 participants aged 50 or over. Those aged less than 50 should not be directly included in analyses aimed at yielding estimates applicable to the general population.

Variables	
capiweight	CAPI weight based on age/sex/education crosstabulation from 2010 QNHS
scq_weight	Weight to apply to SCQ only sample, incorporates CAPI weight
ha_weight	Weight for health centre/home assessment, incorporates CAPI weight
hc_weight	Weight for health centre assessment, incorporates CAPI weight

Weights for Wave 2

Variables	
weight_W1W2_capi	Weight for CAPI W1-W2 non-proxy response (survivors only)
weight_W1W2_scq	Weight for W1-W2 SCQ completion (survivors only)

Weights for Wave 3

Variables	
weight_W1W2W3_capi	Weight for CAPI W1-W2-W3 non-proxy response (survivors only)
weight_W1W2W3_scq	Weight for W1-W2-W3 SCQ completion (survivors only)
weight_W1W3_ha	Weight for W1+W3 Health Assessment (survivors only)
weight_W1W3_hc	Weight for W1+W3 Health Centre Assessment (survivors only)

Weights for Wave 4

Variables	
weight_W1W2W3W4_capi	Weight for CAPI W1-W2-W3-W4 non-proxy response (survivors only)
weight_W1W2W3W4_scq	Weight for W1-W2-W3-W4 SCQ completion (survivors only)

Weights for Wave 5

Variables	
weight_W1W2W3W4W5_capi	Weight for CAPI W1-W2-W3-W4-W5 non-proxy response (survivors only)
weight_W1W2W3W4W5_scq	Weight for W1-W2-W3-W4-W5 SCQ completion (survivors only)

Clusters

The TILDA sample was recruited from households selected in geographic clusters, and when a household was selected every eligible member of that household was invited to participate. Failing to take into account the correlation between participants introduced by this sampling design will lead to biased estimates of the precision of estimates.

The two variables supplied in the dataset that indicate the cluster and household to which participants belong are '**cluster**' and `**household**'.

Stratification

The selection of geographic clusters was stratified, so that equal numbers of clusters were selected from each of three socio-economic groups. The socio-economic status of a cluster was defined by the

proportion of individuals in that cluster. The variable '**stratum**' indicates to which of the three strata the cluster from which each participant was recruited belonged.

Pseudonymisation Techniques

The TILDA public release dataset was pseudonymised in collaboration with the Central Statistics Office. Data that is highly sensitive or that is potentially identifiable is not included in the public release dataset. In addition, some variables are recoded in order to avoid possible identification of individuals.

The criteria for pseudonymisation included the following rules:

- No data that could directly identify an individual (e.g., name, address, etc.) was to be released
- Any potentially identifiable data, that is data based on which an individual could be identified, on its own or in combination with other publicly available data sources was to be either top-coded, grouped or dropped completely
- It would not be possible to eliminate self-identification. The process to do this would be to eliminate a large amount of the data, and as such would greatly diminish the quality of the data released.

Grouping/Global recoding: This was performed on variables where very specific answers occurred at different stages in the variable. As such, results were banded together, so as to eliminate identification.

Top-coding and bottom-coding: This was performed on variables where extreme results occurred at either end of a scale. As such, all respondents who answered over or below a given threshold were grouped together to form a new category, so as to eliminate identification using extreme values or outliers.

Spreadsheets detailing the variables that were deleted, top-coded or grouped prior to this release are available with the download of the dataset, or on the TILDA website (https://tilda.tcd.ie/data/documentation/) E.g. - Variables Pseudonymisation Actions_v1.10 & Variable Pseudonymisation Actions_v2.4 for Wave 1 and Wave 2 respectively).

Citation and Acknowledgement

When using the TILDA datasets, please cite the relevant publications from the following list:

- Kearney PM, Cronin H, O'Regan C, Kamiya Y, Savva GM, Whelan B, Kenny RA. Cohort Profile: the Irish Longitudinal Study on Ageing. *International Journal of Epidemiology*. 2011; 40(4): 877-84.
    - Describes the cohort recruited at Wave 1 in detail
- Whelan BJ, Savva GM. Design and Methodology of the TILDA Study. *Journal of the American Geriatrics Society. 2013;* 61(s2): S265-68.
    - Describes the Wave 1 study design in detail, particularly the Wave 1 fieldwork process, response rates and weighting
    - Cronin H, O'Regan C, Kearney P, Finucane C, Kenny RA. 2013. Health and Ageing: Development of the TILDA health assessment. *Journal of the American Geriatrics Society. 2013;* 61(s2): S269-278.Describes the Wave 1 health assessment in detail
- Donoghue, OA, McGarrigle CA, Foley, M, Fagan, A, Meaney, J, Kenny, RA. Cohort Profile Update: The Irish Longitudinal Study on Ageing (TILDA). *International Journal of Epidemiology*. 2018; 47(5):1398-1398l.
    - Describes the cohort at Wave 1 and at follow-up Waves 2, 3 and 4; also describes the additional Wave 3 health assessment tests in detail

Any publications using this TILDA data should include following information in acknowledgements:

> Researchers interested in using TILDA data may access the data for free from the following sites: Irish Social Science Data Archive (ISSDA) at University College Dublin http://www.ucd.ie/issda/data/tilda/; Interuniversity Consortium for Political and Social Research (ICPSR) at the University of Michigan http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34315

Publications and presentations should include a reference to TILDA in the title. The recommended format is:

> "[INSERT publication/presentation title]: results from The Irish Longitudinal Study on Ageing."

Additional Sources of Information

More information on the TILDA study and the methods described in this release guide can be found on the TILDA website (www.tilda.tcd.ie). The following reports and documents may be particularly useful.

- **Design Report (describes the design of TILDA and the motivation for selection of each of the assessments undertaken in the study):** Kenny R, Whelan B, Cronin H, Kamiya Y, Kearney P, O'Regan C, et al. The Design of the Irish Longitudinal Study on Ageing. Dublin: Trinity College Dublin; 2009.
- **Wave 1 Key Findings Report (based on a preliminary version of Wave 1 data):** Barrett A, Savva G, Timonen V, Kenny R. Fifty Plus in Ireland 2011: First results from the Irish Longitudinal Study on Ageing (TILDA). Dublin: The Irish Longitudinal Study on Ageing; 2011.

- **Wave 2 Key Findings Report (based on Wave 1 and 2 data):** Nolan A, O'Regan C, Dooley C, Wallace D, Hever A, Cronin H, Hudson E, Kenny R. The Over 50s in a Changing Ireland: Economic Circumstances, Health and Well-Being. Dublin: The Irish Longitudinal Study on Ageing; 2014.

- **Wave 3 Key Findings Report (based on Waves 1, 2 and 3 data):** McGarrigle C, Donoghue O, Scarlett S, Kenny R. Health and Wellbeing: Active Ageing for Older Adults in Ireland. Dublin: The Irish Longitudinal Study on Ageing; 2017.

- **Wave 4 Key Findings Report (based on Waves 1, 2, 3 and 4 data):** Turner N, Donoghue O, Kenny R. Wellbeing and Health in Ireland's over 50s 2009-2016. Dublin: The Irish Longitudinal Study on Ageing; 2018.

- **Wave 5 Key Findings Report (based on Wave 5 data):** Kenny R, Scarlett S, O'Mahoney P. THE OLDER POPULATION OF IRELAND ON THE EVE OF THE COVID-19 PANDEMIC. Dublin: The Irish Longitudinal Study on Ageing; 2020

- **Wave 1, Wave 2, Wave 3, Wave 4 and Wave 5 Derived Variables Codebooks**: Codebooks with notes on each of the derived variables and how each was created are available on the ISSDA website (https://tilda.tcd.ie/data/documentation/)

- **Questionnaires:** The TILDA CAPI questionnaires and the SCQs are available on the TILDA website (https://tilda.tcd.ie/data/documentation/)

- **Details of the pseudonymisation process:** a list of the variables that were removed from public datasets, those that were modified and how such modification was conducted is also available on the ISSDA website (https://tilda.tcd.ie/data/documentation/) in the 'Variable Pseudonymisation Actions' Excel files.