8 Methodology

Daniel Carey, Margaret Foley
and Orna Donoghue

Contents

tilda

Staidéar Fadaimseartha na
hÉireann um Dhul in Aois

The Irish Longitudinal
Study on Ageing

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Key Findings

- At Wave 1 (2009-2011), TILDA recruited a nationally representative stratified, clustered random sample of 8,504 community-dwelling adults aged 50 years and over (and their spouses/partners of any age), living in Ireland.

- At Wave 3 (2014-2015), 6,566 respondents completed the Computer Assisted Personal Interview (CAPI), while 85% completed a self-completion questionnaire (SCQ) and 82% completed a comprehensive health assessment. Respondents who completed the SCQ and health assessment at Wave 3 were more likely to have completed these components of data collection at Wave 1.

- In addition, 121 proxy interviews were completed by family or friends of respondents who were unable to complete the interview themselves due to physical or cognitive impairment while 215 End-of-Life interviews were completed for respondents who had passed away.

8.1   Wave 3 survey methodology

Details of the sampling methods used in Waves 1 and 2 of TILDA have been reported previously (1, 2, 3). At Wave 3, interviews were sought from 8,210 eligible respondents, i.e. respondents who took part in any previous wave and who agreed to be contacted again at Wave 3.

Data collection consisted of three components: a computer-assisted personal interview (CAPI), a self-completion questionnaire (SCQ) and a health assessment. The CAPI included questions on health, economic, social and family circumstances and was administered by a trained social interviewer in the respondent's own home. In households with more than one respondent, respondents were asked to nominate a 'family' and a 'financial' respondent. Typically, these were the individuals in the household with better knowledge of family and financial circumstances and who were comfortable answering on behalf of the household. In some cases, the financial and family respondents were the same person.

Following completion of the interview, respondents were provided with the SCQ, to be completed and returned to TILDA in the pre-paid envelope provided. The SCQ included questions on more sensitive matters such as quality of life, interpersonal relationships, and alcohol consumption. Details of the topics covered in the CAPI and SCQ are provided in Table 8.1.

At Wave 3, respondents were invited to attend a comprehensive health assessment in the TILDA Health Assessment Centre at Trinity College Dublin, similar to the initial health assessment conducted at Wave 1 (but not Wave 2). If respondents were unable or unwilling to travel to the health centre, they were offered a modified home-based health assessment. All assessments were conducted by trained research nurses. The health assessment tests are listed in Table 8.1.

As per Wave 2, Wave 3 also included proxy and End-of-Life (EOL) interviews. Where respondents were unable to complete an interview themselves due to physical or cognitive impairment, a proxy interview was sought from the spouse or a close relative/friend of the respondent. Proxy respondents were invited to complete the CAPI but not the SCQ, however TILDA respondents requiring a proxy interview were invited to attend a health assessment if they had completed a health assessment at Wave 1. EOL interviews were sought with a spouse, relative or friend in cases where a respondent had passed away. If a respondent moved into residential care ahead of Wave 3, the appropriate type of interview (i.e. with the respondent or with a proxy) was completed.

Table 8.1: Measures and tests included in the CAPI, SCQ and health assessment at Wave 3

	Domain	Measures
CAPI/SCQ	Demographics	Marital status, marriage history; education; migration history; childhood; address history.
	Social circumstances	Transfers to/from children/parents/others; help with (instrumental) activities of daily living; social connectedness; social networks; volunteering; caring; social participation; religion; relationship quality.
	Health and healthcare	Physical health (self-rated health; limiting long-standing illness; sensory function; cardiovascular and non-cardiovascular disease; falls; fear of falling; fractures; pain; oral health); health screening; cognitive function (self-rated memory; word list learning; verbal fluency; prospective memory); psychological health (depressive symptoms; anxiety; resilience; life satisfaction; loneliness; worry; quality of life; ageing perceptions; perceived stress; personality); behavioural health (smoking; physical activity; sleep; alcohol; dietary intake); medications; healthcare utilisation; health insurance.
	Employment, retirement & assets, lifelong learning	Employment situation; job history; planning for retirement; sources of income; home ownership; other assets; life-long learning; expectations; financial literacy.
Health Assessment	Neuropsychological	Montreal Cognitive Assessment (MoCA); Sustained Attention to Response Task (SART); Choice Reaction Time; Color trails test; National Adult Reading Test (NART); depressive symptoms; state anxiety.
	Cardiovascular	Blood pressure; pulse wave velocity; phasic blood pressure; heart rate variability; near infra-red spectroscopy (NIRS).
	Gait and physical function	Timed Up-and-Go; repeated chair stands; gait (normal pace, maximum pace, normal pace with cognitive task); grip strength.
	Bone health	Heel bone ultrasound.
	Sensory function	Visual acuity; contrast sensitivity; retinal photography; multisensory integration.
	Anthropometry/Other	Height; weight; waist circumference; hip circumference; dental assessment; accelerometry; brain magnetic resonance imaging (MRI).
	Biological samples	Blood samples; hair samples.

8.2   CAPI response rates

Of the 8,210 eligible respondents identified prior to Wave 3, a form of interview (i.e. an interview with the TILDA respondent, a proxy interview or an EOL interview) was collected for 6,874 respondents. A further 28 respondents (e.g. spouses of existing respondents) who had not taken part in previous waves were also recruited during fieldwork (24 were aged ≥50 years at Wave 1) bringing the total number of interviews to 6,902. The vast majority of CAPI respondents completed an interview themselves (n=6,566), with lower numbers completing proxy (n=121) and EOL (n=215) interviews. The Wave 3 response rate was calculated as the percentage of self-respondents that completed an interview at Wave 3, relative to the total eligible Wave 3 CAPI sample (i.e. excluding those requiring a proxy interview, or who were known to have withdrawn, passed away, or moved outside the target area, before Wave 3). Table 8.2 presents the Wave 3 CAPI total respondent counts (self-respondents), and response rates by age group and sex. The total CAPI response rate was 85%; response rates were largely similar in men and women and increased slightly with age. The overall response rate for proxy interviews was 66%.

Table 8.2: Eligible Wave 3 CAPI self-respondents (total counts) and response rates, by age at Wave 3 and sex

	Male (%)	Female (%)	Total (%)	Total count
<54	87.5	83.3	83.7	313
54-64	83.2	83.0	83.1	3417
65-74	86.4	87.8	87.1	2401
75+	86.8	85.5	86.1	1595
Total	85.0	84.9	85.0	7726

8.2.1 Reasons for attrition at Wave 3

Table 8.3 summarises the main reasons for non-participation at Wave 3. The most common reasons were refusals (e.g. due to time constraints during the period of Wave 3 data collection) and permanent withdrawal from the study. Importantly, respondents who refused to participate at Wave 3 agreed to further contact, and are eligible for follow-up at future waves. A smaller number of respondents could not be contacted or had moved abroad before Wave 3 making them ineligible for follow-up. Potential proxy respondents had similar reasons for non-participation although proxy interviews could only be sought if respondents gave permission for this in a previous wave.

Table 8.3: Reasons for sample attrition

Reason	Potential respondents		Potential proxy respondents	
	n	%	n	%
Refusal	587	50.6	42	56.8
Withdrawn	448	38.6	12	16.2
Unable to contact respondent	85	7.3	13	17.6
Moved outside ROI/NI	37	3.2	-	-
Other	3	0.3	-	-
No permission to seek proxy, proxy not identified, or other	-	-	7	9.5
Total	1160	100	74	100

8.3 SCQ and health assessment completion rates

Of respondents who completed the CAPI at Wave 3, 85% returned an SCQ (n=5,569) while 82% took part in a health assessment (n=5,364). Most respondents completed a centre-based health assessment (80%, n=4,307), with the remainder taking place in respondents' homes (20%, n=1,057).

Response rates for the SCQ and health assessment varied across age groups, and depended on the level of participation at previous waves (Table 8.4). SCQ completion rates were lower at Wave 3 especially in respondents aged 75 years and over. With increasing age, respondents were less likely to complete a centre-based health assessment and more likely to complete a home-based health assessment. This pattern was especially evident at Wave 3 and may reflect reduced ability to travel to the TILDA health centre as respondents age, as previously reported (4,5).

Table 8.4: SCQ and health assessment completion rates (with total eligible counts) at Wave 1 and Wave 3, by age at Wave 1

	SCQ W1 (%)	SCQ W3 (%)	HC W1 (%)	HO W1 (%)	No HA W1 (%)	HC W3 (%)	HO W3 (%)	No HA W3 (%)	Total Count
<50	87.9	84.2	79.9	4.8	15.4	76.6	6.2	17.2	273
50-64	88.6	85.9	76.1	5.7	18.2	72.5	10.7	16.8	3738
65-74	91.2	86.5	70.9	9.5	19.5	62.0	19.7	18.3	1627
75+	89.3	78.0	48.2	21.2	30.6	36.6	38.9	24.5	764
Total	89.3	85.0	71.6	8.5	19.9	65.7	16.2	18.1	6402

HC - health centre; HO - home assessment; No HA - no health assessment; W1/W3 - Wave 1/Wave 3.

Note: These figures reflect completion rates for respondents who completed a CAPI at both Wave 1 and Wave 3.

Table 8.5 presents Wave 1 SCQ and health assessment completion rates for respondents who attrited before or during Wave 3 (including refusals, withdrawals, deaths, no contacts and respondents who became ineligible due to moving abroad). In contrast to those who completed Wave 3, those who attrited were less likely to return the SCQ at Wave 1 compared to those who completed Waves 1 and 3. They were also less likely to have completed a health assessment at Wave 1 compared to those who participated in Waves 1 and 3. Similar age patterns were observed where older respondents were less likely to complete the SCQ and centre-based assessment but more likely to complete the home-based health assessment.

Table 8.5: SCQ and health assessment completion rates at Wave 1 for Wave 3 attriters, across Wave 1 age

	SCQ W1 (%)	HC W1 (%)	HO W1 (%)	No HA W1 (%)	Total Count
<50	73.2	39.3	3.6	57.1	56
50-64	70.0	39.7	8.8	51.5	891
65-74	68.5	31.7	12.5	55.8	441
75+	64.1	17.4	25.8	56.8	384
Total	68.5	32.9	13.2	53.9	1772

HC - health centre; HO - home assessment; No HA - no health assessment; W1/W3 - Wave 1/Wave 3.

8.4   Dataset

The results in this report were generated from the following TILDA datasets: CAPI v3.4.1; centre health: v3.0.6; home health: v3.0.3; AuditTracker v2016.09.21. The CAPI dataset includes observations from 6,687 respondents (6,425 aged 54 years and over) who completed a self or a proxy interview during Wave 3. These respondents form the basis of much of the report, although different sub-samples are used throughout the chapters (e.g. Chapter 5 uses data from respondents who completed both Waves 1 and 3). The CAPI dataset also includes SCQ records for 5,569 respondents (5,351 aged 54 years and over).

The health datasets contain observations for the 4,309 and 1,082 centre and home health assessments respectively (including both self and proxy respondents). Health assessment analyses in this report are restricted to participants aged 54 years and over (centre n=4,118; home assessment n=1,063).

The AuditTracker is an internal dataset that tracks participation of all respondents in each component of the study at each wave, in addition to reasons for non-response and attrition.

An anonymised dataset will shortly be archived at the Irish Social Science Data Archive (ISSDA) at University College Dublin (https://www.ucd.ie/issda/data/tilda/).

8.5   Analytical methods employed in this report

Statistical methods used to calculate the estimates presented in this report are described below. These methods aim to correct for potential biases in survey data estimates, in addition to determining correctly the uncertainty surrounding those estimates.

8.5.1   Confidence intervals and statistical significance

Throughout this report, the majority of estimates reflect the percentage of adults within specific age groups, cohorts, or other analysis criteria. Means or medians of specific measured quantities are reported where appropriate. As TILDA is a nationally representative study, each respondent corresponds with a given number of individuals in the Irish population. However, due to the random nature of the population sampling process, there is some inherent uncertainty in the derived estimates. To account for this, estimates are presented with 95% confidence intervals (CI). Formally, the 95% CI indicates that with repeated sampling, 95% of the CIs calculated would contain the true population

parameter. The 95% CI can therefore be interpreted as the range within which there is a 95% chance that the true population parameter will lie.

8.5.2 Weighting

Although TILDA is nationally representative of the older community-dwelling population in Ireland, patterns of response to each component of the study (CAPI, SCQ, health assessment) vary across different subgroups of the population. Participation in later waves of the study is also influenced by level of participation at earlier waves, and by sample attrition.

To account for these systematic differences in responses and to ensure that the estimates derived from the sample remain representative of the target population, a number of weights were calculated and applied to different analyses. Weighting ensures that, for the estimates calculated, subgroups within the sample are represented proportionate to the number of individuals within that subgroup present in the population of Ireland.

Weights calculated with respect to Wave 3 only are referred to as cross-sectional weights. A cross-sectional Wave 3 CAPI weight was calculated by comparing the proportion of individuals within the CAPI sample across age, sex, highest level of education attained and urban/rural residence, to the corresponding proportions in the population, using estimates from the 2011 Census. In practice, the weight reflects the reciprocal of the probability of a respondent being included in the study, based on the characteristics described above, and the respondent's membership of the target population.

A cross-sectional SCQ weight was calculated by multiplying the base cross-sectional CAPI weight by the reciprocal of the probability that a participant returned a completed SCQ at Wave 3. This probability was calculated using multivariate logistic regression; factors shown to affect the likelihood of SCQ return included age, sex, educational attainment, marital status, cognitive test performance, and health-related factors. This weight was used in analyses that relied mainly on data obtained from the SCQ e.g. Chapter 4.

Longitudinal CAPI and SCQ weights were calculated and applied to any analysis that used data from more than one wave (e.g. Chapter 3). The longitudinal weights (for CAPI or SCQ) were calculated by multiplying the base CAPI weight by the reciprocal of the probability that a participant completed Waves 2 and 3 (following response at Wave 1). The probability was calculated using a multivariate logistic regression model, with the following predictors: age, sex, educational attainment, marital status, self-rated physical

health, cognitive test performance, depressive symptoms, chronic health conditions, and urban/ rural residence. Versions of these longitudinal weights that included attrition between Waves 1 and 3 (i.e. participation in Wave 2 was not specified in the model) were also calculated.

Finally, a longitudinal health assessment weight (e.g. Chapter 5) was calculated by multiplying the Wave 1 health assessment weight by the reciprocal of the probability that a respondent completed a health assessment at Wave 3. The probability of completing a Wave 3 health assessment was calculated using a multivariate logistic regression with the following factors: age, sex, educational attainment, marital status, cognitive test performance, health-related factors, employment status and depressive symptoms.

8.5.3 Software

All analyses in this report were conducted using Stata v12.0 or v14.0.

References

1. 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; 2010.

2. 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; 2012.

3. Nolan A, O'Regan C, Dooley C, Wallace D, Hever A, Cronin H, Hudson E, Kenny RA. The Over 50s in a Changing Ireland: Economic Circumstances, Health and Well-Being. Dublin: The Irish Longitudinal Study on Ageing; 2014.

4. Kearney PM, Cronin H, O'Regan C, Kamiya Y, Savva GM, Whelan B, Kenny RA (2011). Cohort Profile: the Irish Longitudinal Study on Ageing. Int J of Epidemiol. 2014;40(4):877-84.

5. Cronin H, O'Regan C, Kearney P, Finucane C, Kenny RA. Health and Ageing: Development of the TILDA health assessment. J Am Geriatr Soc. 2013; 61(Suppl2): S269-278.