11 Methodology

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Contents

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Staidéar Fadaimseartha na
hÉireann um Dhul in Aois

The Irish Longitudinal
Study on Ageing

11 Methodology

Summary

- TILDA recruited a stratified clustered sample of 8178 individuals representative of the community living Irish population aged 50 years and over. Younger spouses and partners were also invited to participate, primarily to provide information regarding family and financial circumstances.
- Each participant underwent an extensive face-to-face interview, was left a questionnaire to complete and return and was invited to a health assessment either at a dedicated centre or in the home.
- The overall response rate to the study was 62.0%. The subsequent participation in the health assessment and the proportion returning the self-completion questionnaire is high, and collection of both is ongoing.

This chapter describes the sample selection and analytical methods that were chosen to ensure an efficient design and that valid population based inferences were made based upon the TILDA sample. The sample is described with respect to its representativeness of the target population of all community living adults aged 50 years and over in Ireland.

11.1 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 target population, that is the population on which inferences presented in this report can be applied, includes all members of the population of Ireland who are 50 years old or over, and who live in the community (that is do not live in a long-term care institution). While only around 1% those between the ages of 65 and 74 currently live in long-term care, this figure rises to around 6% of those aged between 75 and 84 and 21% of those aged 85 and over (2).

To generate the TILDA sample, all postal addresses in Ireland were assigned to one of 3155 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 25600 addresses in total would be

required to achieve the required sample size of 8000). 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.

11.1.1 Fieldwork report and response rate

A total of 8178 interviews were conducted with respondents aged 50 and over belonging to 6282 households. An additional 329 interviews were conducted with younger partners of eligible individuals. The first interview took place on 18 October 2009, with a steady accrual until the last interview was conducted on 22 February 2011.

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 25600 addresses. Of these, 22321 were occupied residential addresses. At 11819 addresses contact was made and it was determined than no person aged 50 or over was at that address. In 9818 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 6282 households, leading to a response rate of 62.0%.

11.1.2 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 'CAPI' interview in their own home with a trained interviewer, which included questions on many domains of health, well-being, family and financial circumstances.

Where two respondents 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. The financial and family respondents were not necessarily different individuals.

Each participant was invited to undergo a health assessment, either a full health assessment at a centre in Dublin or Cork or a partial assessment in their own home where travel to either centre was not practicable.

Each participant was also left a 'self-completion questionnaire' (SCQ) 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 well-being and health behaviours. There was also a single blank page for each respondent to make any further comment they chose.

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 (1).

11.1.3 Classification of the population

Throughout this report subgroups of the population are defined by socio-economic and health related factors including age, sex, living arrangement, disability level etc. These factors and the their levels were chosen to reflect the diversity in circumstances among the older Irish population while ensuring that each groups was sufficiently well represented within the study sample. Classifications are described in relevant chapters of this report but in brief, those commonly used include:

Age and sex: Age groups are determined as appropriate throughout this report, but in the majority of cases the population is divided into three groups, those aged 50-64, those aged 65-74 and those aged 75 and over. Other age groups are employed where needed to reflect for example changes in entitlement to a medical card.

Education: Education is an indicator of socio-economic status as well as directly influencing health behaviours, lifetime environmental exposures and mental activity. The educational attainment of each TILDA respondent is measured in one of seven categories, and these are assigned to one of three groups. Those who did not complete primary education and those with only primary education are classified as 'primary'. Those who completed a junior certificate, or leaving certificate or equivalent are classified as 'secondary', and those who completed a diploma, first degree or higher degree are classified as 'tertiary or higher'.

Location: The population is divided by location of their residence as living in 'Dublin City or County', 'Another town or city in the Republic of Ireland' or 'Another rural area in the Republic of Ireland'.

Labour market status: Labour market status classifications are described in Chapter 8, but in brief each participant is classified by their own description of their status as being either 'employed' (including self-employed), 'retired', or 'other', where other includes all those describing themselves as primarily looking after a home or family, out of work through illness or unemployed.

Gross asset wealth: TILDA financial respondents are asked to describe their household's financial and non-financial assets. This total value is assigned to each member of the household and quartiles based on this measure are used to classify the sample into four groups (see chapter 9 for details).

Disability: Respondents are asked whether they have a health-related impairment in carrying out certain activities. Based on this, the sample is divided into those who have 'no impairment' an 'impairment in instrumental activities of daily living (IADL)', 'impairment in activities of daily living (ADL)', or 'impairment in both ADL and IADL.' (see Chapter 7 for details).

Self-rated health: Respondents are asked to rate their physical health as 'excellent', 'very good', 'good', 'fair', or 'poor' (Chapter 5). These are collapsed into two or three groups as appropriate throughout the report.

Depression: Depressive symptomatology is measured using the Centre for Epidemiological Studies Depression (CES-D) scale (see Chapter 6). Based on this individuals are classified as being 'not depressed' (score of 0-7), having 'sub-threshold depression' (score of 8-15) or 'clinically relevant depressive symptoms' (score of 16 or higher).

11.1.4 Dataset

All of the results in this report are based on the TILDA dataset version 1.0.1. This dataset includes CAPI data from all 8507 TILDA respondents (from 6282 households), of whom 8178 were aged 50 and over. This 8178 forms the sample for this report. Data from the 329 younger respondents are incorporated where measures are taken at the level of the household or the couple.

At the time of writing TILDA health assessments are ongoing, with an anticipated completion date of June 2011. Up until 27 Feb 2011, 3907 health centre assessments of those aged 50 and over had been completed and data from these are included in this report. Home assessments are also ongoing, and this report incorporates the 477 home assessments conducted to date. By 16 Feb 2011 a total of 6262 SCQs had been returned to TILDA by respondents aged 50 and over and these are included in the current dataset. Table 11.1 shows a breakdown of the response to date to the components of the study.

Table 11.1: Number of respondents aged 50 and over whose self-completion questionnaires and health assessments have been included in this report

| SCQ received to date | Health assessment to date | | | |
	None to date	Health centre assessment	Home assessment	Total (%)
No	1419	404	93	1916 (23.4)
Yes	2375	3503	384	6262 (76.6)
Total (%)	3794 (46.4)	3907 (47.8)	477 (5.8)	8178

11.2 Analytical methods employed in this report

For estimates to be unbiased and for their uncertainty to be correctly determined, analyses used to generate the findings in this report incorporate the design of the study and the pattern of non-response (missing data). Statistical methods used to calculate the estimates presented in this report are described below.

11.2.1 Confidence intervals and statistical significance

The majority of the estimates presented in this report are the percentages of older people falling into various groups or averages of quantities. Mean or median averages are used as appropriate for each quantity of interest.

Each estimate based on the TILDA sample corresponds to a true value in the population. TILDA represents a random sample of the population, and so some uncertainty or imprecision arises due to fluctuations associated with the sampling process. Many of the estimates are provided with a 95% confidence interval reflecting this uncertainty which should be interpreted as the plausible range for the true value in the target population. More precise estimates have smaller confidence intervals.

The formal interpretation of the 95% confidence interval is that there is a 95% chance of the sampled confidence interval encompassing the true population parameter. In other words, 95% of confidence intervals include the true population value.

Unless otherwise stated, the results we present in this report are 'statistically significant' at the 5% level, that is for each of the differences or trends we report there is a smaller than 5% chance that the difference is not present in the population. In most cases the chance of such a false positive results is much smaller than this.

11.2.2 Stratified clustered analysis

Stratified sampling was used to select the clusters used for TILDA. Stratification ensures an efficient and population representative sample. A further benefit of stratification occurs when strata indicators are incorporated into estimation procedures, by explaining variability among individuals and improving the precision of estimators.

Geographic clustering increases the efficiency of the data collection process, resulting in a lower fieldwork cost per interview. However, clustering also reduces the effective contribution of each individual taking part, since there is likely to be some correlation in the responses of individuals from the same cluster. The effect of this is to reduce the precision of estimates, reflected by wider confidence intervals. The confidence intervals included in this report incorporate the effects of stratification and clustering on precision.

11.2.3 Differential non-response and weighting

As described above, the response rate to the study was 62.0%. Differential non-response, where response rates vary among subgroups of the population, may lead to biased estimates. To eliminate this source of bias, weights were applied in calculations with the weight corresponding to the number of members of the population that was represented by each participant. Those respondents arising from subgroups of the population less likely to respond were assigned higher weights than those coming from subgroups more likely to respond.

Formally, the weight applied to each participant was the reciprocal of the probability of that participant's inclusion in the final study sample, given their characteristics and that they were a member of the target population.

Non-response varied by study component, and so different weights were applied in each analysis depending on the component of the study being used. The calculation of each set of weights is described below.

11.2.4 Estimating CAPI weights

Before an interview is conducted it is not possible to know the characteristics of respondents and non-responders, making direct calculation of the probability of participation impossible. Weights applied to the main (CAPI) sample were estimated by comparing the numbers of individuals in the sample with a given combination of characteristics with the same number in the population, estimated using the Quarterly National Household Survey (QNHS 2010). The characteristics compared were age, sex and educational attainment. Table 11.2 illustrates the calculation of weights assigned to each sub-group of the population when estimates are based

on the whole CAPI sample. The key determinant of the participation of the study is education. Each participant with third level education represents around 70-100 members of the population depending on their age and sex, while those with primary education represent around 150-250 individuals.

Table 11.2: The distribution of age, sex and educational attainment in the population compared to the sample, and the consequent weight applied to each participant in estimation

Age at interview		Educational attainment and sex					
		Primary		**Secondary**		**Third level**	
		Male	Female	Male	Female	Male	Female
50-64	N (sample)	471	486	967	1152	643	949
	N (pop'n)	95600	80800	176300	187000	79100	82000
	Weight	203.0	166.3	182.3	162.3	123.0	86.4
65-74	N (sample)	457	408	337	391	275	294
	N (pop'n)	72800	65900	44400	56600	20000	21200
	Weight	159.3	161.5	131.8	144.8	72.7	72.1
>=75	N (sample)	323	361	151	266	124	119
	N (pop'n)	57300	86800	20600	33800	9600	10600
	Weight	177.4	240.4	136.4	127.1	77.4	89.1

11.2.5 Estimating health assessment and SCQ weights

Table 11.3 shows the probability of attending a health centre or completing a home assessment in subgroups of the sample. Those with more education, people in better health and those in the youngest age groups were more likely to complete health assessment.

Most objective measures of health included in this report were taken during both the health centre assessment and the home assessment. A 'health assessment' weight was created so that results based on these measures can be applied to the population.

The health assessment weight for each respondent is calculated by dividing the CAPI weight shown above by the respondents' subsequent probability of having completed a health assessment. This probability is estimated using multivariate logistic regression and is based on the characteristics shown to significantly affect participation in the health assessment.

Only one measure reported here (osteoporosis as measured by heel ultrasound) is recorded in the health centre but not the home assessment. In this case a separate health centre assessment weight was applied using the same principle as the health assessment weight. Age, disability and location were the main determinants of choosing a home assessment over a health centre assessment, although the health centre assessment was well attended by all subgroups of respondents.

Table 11.3 also includes the proportion of those respondents who had returned a self-completion questionnaire. Older people, those with less education, less wealthy, more depressed respondents and those who reported their own health as poorer were less likely to return questionnaires. A new weight was therefore applied to each participant when estimates were based on the self-completion questionnaire subgroup.

11.2.6 Item non-response

As well as refusal at the individual level, respondents may have refused to answer or been unable to answer certain questions or perform certain tests. This 'item-level' non-response has the potential to bias individual estimates if certain groups of the population are less likely to respond than others.

In the majority of cases the number of individuals not responding to specific items is very small. Where this is the case the missing data is considered to be missing at random, and a complete-case analysis is conducted. We have conducted several analyses to test the sensitivity of our findings to this assumption, with no substantive difference in results.

Approximately half of the sample did not respond fully to questions concerning their financial assets, and these respondents are not included when the population is classified by asset wealth. In order to adjust for any potential bias caused by this non-response, the populations who did and did report their asset wealth were compared. Table 11.3 shows that the oldest old, women and those living outside Dublin were less likely to fully report their asset wealth. Based on these differences, a weight was constructed so that population based inference regarding asset wealth and association with health and social circumstances can be made.

11.2.7 Software

All analysis was conducted using Stata 10.0.

Table 11.3: Classification of respondents by socio-economic and health status and their subsequent participation in the health assessment, whether an SCQ was received and whether sufficient information was obtained during the CAPI to calculate asset wealth

	Number in sample	Health assessment (up to 27 Feb 2011)		SCQ returned (up to 16 Feb 2011)	Complete asset wealth data
		Health centre	Home assessment		
Age					
50-64	4,668	2491 (53%)	135 (3%)	3593 (77%)	2377 (51%)
65-74	2,163	1061 (49%)	131 (6%)	1694 (78%)	1031 (48%)
>=75	1,347	355 (26%)	211 (16%)	975 (72%)	541 (40%)
Sex					
Male	3,749	1803 (48%)	239 (6%)	2858 (76%)	1940 (52%)
Female	4,429	2104 (48%)	238 (5%)	3404 (77%)	2009 (45%)
Education					
Primary/none	2,506	860 (34%)	251 (10%)	1723 (69%)	1181 (47%)
Secondary	3,264	1630 (50%)	173 (5%)	2568 (79%)	1550 (47%)
Tertiary or higher	2,404	1416 (59%)	53 (2%)	1969 (82%)	1216 (51%)
Location					
Dublin	1,936	1113 (57%)	45 (2%)	1489 (77%)	1175 (61%)
Other town or city	2,312	1103 (48%)	144 (6%)	1780 (77%)	1101 (48%)
Rural area	3,918	1686 (43%)	288 (7%)	2984 (76%)	1667 (43%)
Labour Market Status					
Employed	2,934	1612 (55%)	74 (3%)	2276 (78%)	1400 (48%)
Retired	3,048	1390 (46%)	268 (9%)	2386 (78%)	1434 (47%)
Other	2,196	905 (41%)	135 (6%)	1600 (73%)	1115 (51%)
Asset wealth					
Lowest	988	337 (34%)	77 (8%)	707 (72%)	-
2nd	999	461 (46%)	75 (8%)	786 (79%)	-
3rd	975	573 (59%)	41 (4%)	824 (85%)	-
Highest	987	634 (64%)	14 (1%)	829 (84%)	-
Disability					
Not disabled	7,192	3551 (49%)	333 (5%)	5535 (77%)	3457 (48%)
IADL limitation only	287	90 (31%)	38 (13%)	205 (71%)	141 (49%)
ADL limitation only	387	174 (45%)	40 (10%)	308 (80%)	198 (51%)
Both IADL and ADL	312	92 (29%)	66 (21%)	214 (69%)	153 (49%)
Self-rated health					
Excellent	1,715	1007 (59%)	60 (3%)	1398 (82%)	840 (49%)
Very good	2,745	1319 (48%)	113 (4%)	2129 (78%)	1378 (50%)
Good	2,442	1136 (47%)	149 (6%)	1836 (75%)	1088 (45%)
Fair	994	355 (36%)	114 (11%)	707 (71%)	499 (50%)
Poor	268	86 (32%)	38 (14%)	183 (68%)	141 (53%)
Depression					
Not depressed	5,853	2880 (49%)	312 (5%)	4559 (78%)	2772 (47%)
Sub-threshold	1,417	660 (47%)	86 (6%)	1071 (76%)	713 (50%)
Depressed	777	319 (41%)	69 (9%)	541 (70%)	418 (54%)

11.3   Limitations of this report and future analyses

While this report provides an overview of the circumstances of older people and identifies many factors that are associated with successful ageing in Ireland, future analyses will provide in depth explorations that are outside the scope of the current report. Although future waves will capture the transition to long-term care, the current baseline sample only includes those living in the community.

A further limitation of the current analyses is that so far only the first wave of data collection has been undertaken. This means that while we are able to describe the current circumstances of the older population of Ireland and report many differences across sub-groups of the population we are unable to directly explore the causal relationships between factors. For example, while differences between age groups with respect to church attendance is reported in Chapter 4 – it is not possible to say whether older people attend church more frequently as they age (an age effect) or whether that cohort of people, who are in the oldest age group now, have always attended church more regularly than those who were born later and so are younger now (a cohort effect). Similarly, we cannot say whether people have better social networks because they are in better health, or vice versa.

The longitudinal aspect of TILDA is crucial to address these questions. TILDA will return to the field later this year and by 2013 will be able to provide the first direct analysis of the trajectories of ageing within the Irish population and, therefore, an analysis of the determinants as opposed to the correlates of successful ageing. As subsequent waves of data collection are undertaken, a complete picture of the factors that shape the ageing process in Ireland will emerge.

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2   Wren, M-A; Long-term health and social care. In Layte,R , editor. Projecting the impact of demographic change on the demand for and delivery of health care in Ireland. The Economic and Social Research Institute, Dublin; 2009.