

# Wave

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# 4



**tilda**

Staidéar Fadaimseartha na  
hÉireann um Dhul in Aois

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The Irish Longitudinal  
Study on Ageing

**Wellbeing and Health  
in Ireland's over 50s  
2009-2016**



*Towards making Ireland the best  
place in the world to grow old.*

*Le go mbeidh Éire ar an tír is fearr  
ar domhan le dul in aois ann.*

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# Wellbeing and Health in Ireland's over 50s 2009-2016

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On behalf of the TILDA team

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# Key Findings

## Chapter 2 - Methodology

### Key Findings

- A response rate of 84% was achieved with rates largely similar across genders and was highest in those aged 65-74 years.
- Proxy interviews for those unable to take part in an interview was conducted with 64% of participants requiring such an approach.
- A return rate of 86% was achieved for the self-completion questionnaire.

## Chapter 3 – Quality of life and relationships

### Key Findings

- The average quality of life score measured through CASP-12, among TILDA participants was 27.3 out of 30 in Wave 4. This score suggests that, on average, older people in Ireland experience a good quality of life.
- Quality of life doesn't decline linearly with age, but instead increases to a peak at age 68 and then starts to gradually decline, reaching the value observed among 50 year olds at age 80, decreasing steadily from that age onwards.
- The factors which predominantly influence quality of life are social factors, including social networks and social activities, while health-related factors like functional limitations are also important.
- Quality of life decreases with increasing number of chronic health conditions
- Quality of life decreases as the number of activities of daily living (ADL) and instrumental ADL (IADL) limitations increase.
- Increased social integration, through maintenance of a large social network and positive supportive relationships with friends is associated with higher quality of life.

- One third of women (31%) report positive supportive friendships in Wave 4, compared to 16% of men, similar to that reported in Wave 1. Relationship quality within social networks is important, and those who report positive supportive relationships with friends report higher quality of life relative to those with less supportive relationships.
- Over 21% of TILDA respondents reported the highest level of social integration in Wave 4, with 39% moderately integrated, 29% moderately isolated and 11% most isolated, similar to that reported in Wave 1. Men and women reporting highest levels of social integration had higher mean quality of life scores than those reporting lower levels of social integration.

## Chapter 4 – Volunteering and social participation

### Key Findings

- Volunteering and other forms of social participation are important components of successful ageing.
- Overall, 18% of older adults in Ireland volunteer weekly while 56% have volunteered at some time over the previous two years. A similar percentage of men and women volunteer with rates of volunteering highest among the 65 to 74 year old age group.
- Almost three quarters of older adults participate in active and social leisure activities each week, while 52% participate in organised groups such as sports groups, book clubs, or charitable organisations.
- Volunteering and participation in both active and social leisure activities and organized groups are associated with better quality of life and fewer depressive symptoms.
- The percentage of older adults who volunteer at least monthly and who participate in social and organised activities was consistent across the four waves of TILDA.
- By Wave 4, 28% of participants were in paid employment and 51% were retired.
- Among those who retired over the course of TILDA, there is little evidence of an increase in their rates of volunteering or social participation immediately after retirement.
- While rates of social participation are high, efforts to increase volunteering and social participation among older adults should be encouraged as these activities provide benefits not only to the participants themselves but to society more generally.

## Chapter 5 – Living conditions of adults in Ireland

### Key Findings

- Adults living in homes constructed prior to 1971 were twice as likely to have added modifications to their home than those living in newer builds (24-28% vs. 12-13%).
- 19.1% of adults have added modifications to their home, with average costs spent on these modifications higher in Dublin city or county ( 8,574), compared to another town or city ( 5,098) or a rural area ( 5,097).
- 57.8% of adults reported problematic housing conditions. 21.6% of adults who reported three or more problematic housing conditions at Wave 3, reported the same at Wave 4.
- The most prevalent housing condition at Wave 2 was damp, mould or moisture, and this remains the case at Wave 4 (46.3%).
- There was a decrease of 4.6% in adults reporting problems heating their home from Wave 3 to Wave 4 possibly attributable to new policy initiatives.
- Similar to findings from Wave 2, there was a large disparity in problems with heating the home between dwellings in Dublin city or county (50.4%) compared to a rural area (24.4%).
- Location differences were apparent in reporting of neighbourhood social cohesion. 54.3% of participants living in rural areas reported high neighbourhood social cohesion compared to 18.6% of participants living in Dublin city or county.
- Adults who report low neighbourhood social cohesion are more likely to report their health as fair or poor (20%) compared to those who report high neighbourhood social cohesion (14%).
- Lowest quality of life scores were reported by participants experiencing low neighbourhood social cohesion living in another town or city (24.8) compared to those living in Dublin city or county (30.1).

## Chapter 6 – Change in chronic disease prevalence and health behaviours over the first four waves of TILDA

### Key Findings

- From Wave 1 to Wave 4, there was a decrease in the proportion of people aged 50-64 years (21% to 16%) and 65-74 years (23% to 16%) who rated their health as fair or poor. Social engagement had a positive impact on self-rated health.

- In terms of cardiovascular disease, there was an increased prevalence of hypertension (35% to 38%), diabetes (8% to 11%), heart attack (4% to 6%), stroke (1% to 2%), and transient ischaemic attack (2% to 4%) between Waves 1 and 4.
- In terms of non-cardiovascular disease, there was an increased prevalence of arthritis (26% to 39%), osteoporosis (9% to 17%), cataracts (9% to 14%) and lung disease (4% to 5%) from Wave 1 to 4.
- Pain affected 1 in 3 people aged 50 and over, and this was consistent at all waves.
- The number of people who reported recurrent falling in the last year increased from Wave 1 to Wave 4 (7% to 9%).
- The proportion of women aged 50-64 years who reported current smoking decreased between Waves 1 and 4 (24% to 17%).
- Problematic alcohol use was more prevalent in men than women (15% versus 9% at Wave 4).
- A large proportion (45% on average) of adults aged 50 and over walked less than the recommended 150 minutes per week across all four waves. This was particularly evident in those aged 75 and older.

## Chapter 7 – Frailty

### Key Findings

- Frailty is a common condition affecting 12.7% of adults aged 50 years and over and 21.5% of people aged 65 and over in Ireland.
- Frailty is a dynamic process that can change over time and people living with frailty can transition in either direction between the different states of frailty namely robustness, pre-frailty (an intermediate state) and frailty.
- The prevalence of frailty among women is twice that of men at Wave 4 (24.9% versus 12.6%) and increases with age in both sexes. Frailty is also more prevalent among people who are living alone, are widowed, and those with lower levels of educational attainment.
- Frailty is a risk factor for single and recurrent falls, fear of falling and disability among adults aged 50 and over.

- People living with frailty are more likely to experience declines in mental health including lower levels of cognitive function and higher levels of depressive symptoms.
- Frailty is not inevitable and can be avoided, delayed and reversed with timely and appropriate interventions.

## Chapter 8 – Cognitive change over time

### Key Findings

- The majority of older adults continue to perform well on core cognitive tests at an average follow-up of six years, with only minor decreases in task performance.
- There was a slight decline in verbal memory scores observed over time for adults aged 65 years and older. Decline was greatest on the 10-word delayed recall task, and among adults aged 75 and older, who recalled one word less on average at Wave 4 compared to Wave 1.
- Verbal fluency declined across the four waves in adults aged 50 and over. Decline was most pronounced in individuals aged 75 years and older; on average, they named four fewer animals at Wave 4 than at Wave 1.
- There was no decline in prospective memory over time in adults aged 50-64 and 65-74 years. However, the success rate for adults aged 75 and older dropped from 53% at Wave 1 to 40% by Wave 4.
- Older adults who were the most socially integrated at Wave 1 had higher verbal fluency scores initially than adults who were the most isolated, but this difference did not persist over time.
- The proportion of adults aged 50 and older who reported that their memory was 'Fair' or 'Poor' increased from 15% at Wave 1 to almost 20% at Wave 4.
- Seven percent of older adults felt that their memory was continuously declining over the waves. These individuals also had a slightly larger decrease in delayed word recall, verbal fluency, and MMSE scores over the four waves.

## Chapter 9 – Trends in healthcare cover and healthcare use for older adults in Ireland during the austerity years of 2009 to 2016

### Key Findings

Following the financial crash in 2008, Ireland entered a period of austerity. This report examines trends from 2009 to 2016 to explore potential effects of this period in healthcare cover and healthcare utilisation. Key trends are summarised here:

- The proportion with a medical card increased (from 45% to 53%) but, dropped in the over 70s (from 90% to 74%). A means testing system for medical card entitlement for the over 70s was introduced in January 2009 and the threshold decreased during subsequent Budgets.
- The proportion with a GP visit card increased (from 2% to 9%) and, within the over 70s, increased substantially (from 1% to 19%) between Waves 1 and 4. A universal GP visit card for the over 70s was introduced in 2015.
- We did not detect any changes in the rate of purchasing private health insurance among older adults in Ireland.
- We found an increase in the proportion of older adults in Ireland who visited a range of medical care services at least once in the previous year including visits to their General Practitioner (from 87% to 92%), the Emergency Department (15% to 18%) and hospital admissions (12% to 26%). We detected a marginal increase in the average number of nights spent in hospital (1.0 to 2.0 nights).
- For older adults with frailty, the proportion with at least one overnight hospital admission increased (from 23% to 31%) while the average number nights spent in hospital more than doubled (from 2.7 nights to 6.5 nights). The proportion with at least one outpatient clinic visit fell (from 69% to 59%) and the average number of outpatient clinic visits decreased (from 3.1 visits to 2.1 visits).
- Dental care use reduced (from 11% to 9%); though the rate of decline was most notable for those who were classified as frail (from 17% to 11%).<sup>9</sup>
- Community services (e.g. respite, day centre, meals on wheels, occupational therapy or community nursing) are accessed infrequently and we found minimal change in the utilisation of these services across the waves.

- Home help and personal care provision increased marginally (from 3% to 5%) however, the users of the home help service changed – 19% of users had concurrent limitations in activities of daily living (ADL) and instrumental activities of daily living (IADL) in 2010 compared to 41% in 2016. The HSE changed the objective of the home help service in 2012 from provision of ‘domestic help’ to provision of ‘personal care’.
- Informal care (i.e. care from family or friend) use increased (5% to 9%), and particularly among older adults with frailty (27% to 36%) between Wave 1 and Wave 4.





# 1

# Introduction

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The Irish Longitudinal Study on Ageing (TILDA) was designed to provide an evidence-base for addressing current and emerging issues associated with population ageing in Ireland across health, economic and social systems. Before the establishment of this study, only minimal national information was available on the prevalence and incidence of age-related disease, disability, health service utilisation or economic and social data. TILDA has changed this landscape, enabling both cross-sectional and longitudinal evidence-based research. Once the collected data has been thoroughly validated, it is archived for public access at two sites - the Irish Social Science Data Archive (ISSDA) at University College Dublin (<https://www.ucd.ie/issda/data/tilda/>) and the Inter-University Consortium of Political and Social Research at University of Michigan (<https://www.icpsr.umich.edu/icpsrweb/ICPSR/>), thereby maximising analyses in addition to affording opportunities for education and training of Irish and international researchers.

Given its comprehensive multi-domain, longitudinal design, TILDA provides the essential research evidence to inform policy and practice, advancements in technology and innovation, and tailored education and training through an enhanced ageing research infrastructure in Ireland.

## 1.1 TILDA data collection

The sampling frame is based on the Irish Geodirectory, a comprehensive and up-to-date listing and mapping of all residential addresses in the Republic of Ireland. Participants were randomly selected so that each residential address had an equal probability of selection. After 4 years of pilot studies to ensure that TILDA achieved highest quality research standards, baseline interviews with 8,504 participants commenced in 2009. Eligible participants were community-dwelling adults aged 50 years and over and their spouses (of any age) who were non-demented and able to provide informed consent. TILDA represents 1 in 156 people aged 50 and over in Ireland (at Wave 1). Further details about the study design and initial cohort are available elsewhere (1, 2). The initial cohort response rate was 62% and follow-up at consecutive waves (every two years) has maintained a response rate of over 84% (3). Replenishment of the sample aged 50-59 years will commence in 2020 (Wave 6).

There are three components to data collection (i) a computer-assisted personal interview (CAPI) administered by trained social interviewers in the participants' own homes (on average 1.5 hours) which includes detailed questions on socio-demographics, health, wealth, lifestyle and social support; (ii) a self-completion questionnaire (SCQ) completed privately by the participant and designed for the collection of more sensitive information such as alcohol use and relationships and (iii) a comprehensive health assessment carried out every second or third wave to allow an appropriate time interval to detect subtle

physical and cognitive changes. In Wave 4, the CAPI and SCQ were carried out but not the health assessment.

Although TILDA is nationally representative of the older community-dwelling population in Ireland, patterns of response to each component of the study (CAPI, SCQ) vary across certain subgroups of the sample. Participation in later waves of the study is also influenced by levels 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, weights were calculated and applied to different analyses to ensure that subgroups within the sample are represented proportionate to the number of that subgroup present in the population of Ireland.

After each wave, TILDA provides a comprehensive research report (4-6). The Wave 4 report includes current status at Wave 4 and changes that occurred between Wave 1 (conducted in 2009-2011) and Wave 4 (conducted in 2016), in quality of life, social engagement, physical and brain health, living conditions, health care cover and utilisation. A consistent theme for this report is the benefit that social engagement, volunteering and friendships convey on quality of life, mental and physical health and wellbeing.

## **1.2 Larger social networks and positive supportive friendships help to maintain quality of life, even in the presence of increasing disability**

Quality of life reflects the overall wellbeing of an individual. The average quality of life score in TILDA participants is high (27.3/36 in Wave 4) suggesting that they experience a good quality of life. It also did not decline linearly with age, but instead steadily increased to peak at age 68 and then gradually declined, reaching the value observed for 50 year olds at 80 years of age. Adults who have the highest levels of social integration, such as large social networks, and positive supportive friendships, reported highest quality of life, however women are twice as likely to report positive supportive friendships compared to men (31% versus 16% at Wave 4). Unsurprisingly, increases in chronic health conditions and disabilities negatively impact quality of life, however higher social integration and higher supportive friendships moderate the effect of increasing disability on quality of life between Waves 1 and 4, particularly in men. This highlights the importance of the quality of social relationships within social support networks for long-term health and wellbeing. Policies promoting and enabling continued social participation and engagement in older age could significantly improve health outcomes, enhance healthy and active ageing and maintain quality of life in ageing populations.

### **1.3 Volunteering and social participation, which are associated with higher quality of life and lower depressive symptoms, should be promoted for adults aged 75 years and over**

Social participation, and particularly productive activities such as caregiving, volunteering, and informal caring, have huge benefits for the health and wellbeing of older adults (7-9). As previously highlighted by TILDA, volunteering is an important feature of Irish life - older adults in Ireland have the second highest volunteering rate among the 28 European Member States after Austria (10). At Wave 4, 18% of adults volunteer at least once per week while 56% volunteer at least occasionally; volunteering was highest among the 65-74 year olds. There was little change in the proportion of adults who volunteer between Waves 1 and 4. In addition, 74% of older adults participate weekly in active and social activities, although participation levels were lower in those aged 75 and older, while 52% participate in organised groups such as sports groups or book clubs. Both types of social participation are associated with better quality of life and fewer depressive symptoms. Among those who retired between Waves 1 and 4, there were trends for an increase in volunteering and social participation after retirement, but these were not significant suggesting that these patterns were established for most people before retirement. Given the clear benefits accrued from volunteering and social participation, not only to the participants themselves but to society more generally, it is important to identify enablers and barriers to these activities, particularly in those aged 75 and over.

### **1.4 High levels of neighbourhood social cohesion are associated with better mental and physical health, highlighting the need to target social isolation in older adults**

Poor housing conditions, difficulties heating the home and low neighbourhood social cohesion are significant issues for many community-dwelling adults aged 56 and over in Ireland. The most prevalent housing problem was damp, mould or moisture, affecting 46.3% of adults. The reduction in reported heating difficulties (25.6% at Wave 3 to 21% at Wave 4) shows that these problems can be resolved and this can be positively impacted by intervention schemes and initiatives to improve housing conditions and energy efficiency. High levels of neighbourhood social cohesion, reflecting a network of trusting relationships within the area, are most prevalent for adults aged 65-74 years, those living in rural areas and adults who are more socially integrated. High social cohesion is associated with better quality of life, physical health and mental health, highlighting the need for policies and initiatives to combat loneliness and social isolation at a community level.

## **1.5 Prevalence of chronic conditions and outcomes such as falls and fracture increase over time due to advancing age but there are opportunities to improve health through modifying health behaviours**

Self-rated health appears to be improving in those under 75 years, for example, the proportion of 65-74 year olds reporting fair or poor health declined from 23% to 16% between Waves 1 and 4. As expected with an ageing population, the same period saw an increase in the prevalence of many health conditions, including any falls (20% to 52%), arthritis (26% to 39%), osteoporosis (9% to 17%), cataracts (9% to 14%), hypertension (35% to 38%), diabetes (8% to 11%), wrist fractures (12% to 14%), heart attacks (4% to 6%), transient ischaemic attacks (2% to 4%), lung disease (4% to 5%) and strokes (1% to 2%). For some conditions, there was a spike in incidence at Wave 2, possibly due to the effects of feedback after the Wave 1 health assessment, however incidence was consistent thereafter. The number of current smokers declined, mostly driven by the reduction observed in women aged 50-64 years (from 24% at Wave 1 to 17% at Wave 4) while only 52% of adults at Wave 4 achieved the target of 150 minutes of brisk walking per week, down from 62% at Wave 1. Modifying these health behaviours would not only improve physical health but also psychological health, highlighting the importance of recent legislation and policy initiatives which target improvements in these areas.

## **1.6 Frailty, while common and often associated with negative consequences, is not an inevitable condition and early recognition of risk factors can help avoid, delay and reverse frailty.**

The prevalence of frailty in adults aged 50 years and over in Ireland is almost 13% which is equivalent to 160,000 adults. The prevalence of pre-frailty is 31%, equivalent to 370,000 adults. However, frailty is not inevitable; it is a dynamic process in which a person can transition in both directions between the different states of frailty, namely robustness, pre-frailty (an intermediate state) and frailty – almost one third transitioned from frailty at Wave 1 to pre-frailty at Wave 4. In TILDA, adults most at risk of becoming frail are more likely to be older, female, widowed, living alone and with lower educational attainment. Of note, and consistent with the benefits to overall health and wellbeing, forms of social engagement such as emotional support and volunteering have been shown to be protective for the development of pre-frailty and frailty respectively (11, 12). TILDA is currently developing new research strategies for early identification of risk factors, thus allowing timely and appropriate interventions to help avoid, delay and reverse frailty. Since 2017, TILDA has delivered a one-day frailty education programme, run in conjunction with the National Clinical Programme for Older People (NCPOP). The purpose of this education day is to

train healthcare professionals to understand the risk factors for frailty enabling them to implement programmes for early detection, prevention and management.

## **1.7 Cognitive function is relatively consistent across the four waves indicating that participants continue to perform well at Wave 4**

The majority of adults aged 50 and over in Ireland continue to perform well on the core cognitive tests, assessing global cognition, memory and executive function, at an average of six years follow-up. Where a decline did occur, the changes were small and predominantly evident in those aged 75 and older. For example, this age group recalled 1 word less at Wave 4 compared to Wave 1 in the delayed recall task; they named 4 fewer animals at Wave 4 in the verbal fluency test and the success rate in the prospective memory test dropped from 53% at Wave 1 to 40% at Wave 4. This is consistent with international evidence, which suggests acceleration in cognitive decline, at least in some domains, from age 75-80 years onwards (13, 14). Only 7% of adults felt that their memory was continuously declining at each wave and they had a slightly larger decrease in delayed word recall, verbal fluency and global cognitive scores over the four Waves.

## **1.8 Healthcare utilisation changed in line with changes in health policy**

The period during which the first four waves of TILDA took place was a period of substantial change in healthcare spending and policy, the effects of which can be seen in the data. For example, the proportion of those 70 and over with a medical card dropped from 90% at Wave 1 to 74% at Wave 4 after a means testing system for this age group was introduced in January 2009 and the threshold decreased during subsequent Budgets. Similarly, the proportion with a GP visit card increased from 1% to 19%, likely attributable to the introduction of the universal GP visit card for the over 70s in 2015. The proportion of participants accessing dental care decreased at Wave 4 compared to Wave 1 (11% to 9%), most notably in those who were frail (17% to 11%); this followed a number of cuts to dental care entitlements. Overall, there was no change in the rate of purchasing private health insurance among older adults in Ireland (54-57% at each wave) with no difference in cover between age groups at Wave 4.

Medical care utilisation increased between Wave 1 and Wave 4 including GP visits (87% to 92%), Emergency Department visits (15% to 18%), outpatient clinic visits (41% to 44%) and overnight admissions (12% to 16%). The average number of nights spent in hospital also increased from 1 to 2 nights. These changes are mostly driven by changes observed for older adults with frailty (e.g. overnight admissions increased from 23% to 31%; average



number of nights more than doubled 2.7 to 6.5 nights) although the proportion with at least one outpatient visit fell from 69% to 59%).

Overall, the proportion accessing community services (e.g. respite, day centre, meals on wheels, occupational therapy or community nursing) is low at  $\leq 6\%$  and shows minimal change across the waves although home help provision or personal care provision increased marginally (2% to 4%). However, the characteristics of users of the home help service changed – 19% of users had limitations in activities of daily living (ADL) and instrumental activities of daily living (IADL) at Wave 1 compared to 41% at Wave 4. This is most likely attributable to a 2012 policy change, where the HSE changed the criteria from providing ‘domestic help’ to providing ‘personal care’. Conversely, informal care (i.e. care from family or friend) increased substantially from 5% at Wave 1 to 9% at Wave 4. The reasons for this increase require further study but it suggests that the burden of care was transferred from the state to the families during this period.

## 1.9 Conclusion

In summary, Wave 4 underscores the benefits of social engagement, supportive friendships, volunteering and membership of organisations, on health and wellbeing. Quality of life continues to improve with age before gradually declining after age 68. Policies which enhance social engagement should enhance quality of life. Changes in cognitive health are minimal over the average follow-up of six years while timely and appropriate interventions can help delay, avoid or reverse the onset of frailty. Modifying health behaviours such as stopping smoking, reducing alcohol consumption and increasing physical activity can also help to improve both physical and mental health. Recent changes in healthcare policies and provision are reflected in health care access and utilisation.

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# 2 Methodology

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# 2

## Methodology

### Key Findings

- A response rate of 84% was achieved with rates largely similar across genders and was highest in those aged 65-74 years.
- Proxy interviews for those unable to take part in an interview was conducted with 64% of participants requiring such an approach.
- A return rate of 86% was achieved for the self-completion questionnaire.

### 2.1 Introduction

Details of the sampling methods used in Waves 1-3 of TILDA have been reported previously (1,2,3,4). At Wave 4, interviews were sought from 7,462 respondents.

Data collection consisted of two components: a computer-assisted personal interview (CAPI) and a self-completion questionnaire (SCQ). 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 the better knowledge of family and financial circumstances, who were comfortable answering on behalf of the household. In some cases, the family and financial 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. Topics covered in the CAPI and SCQ are listed in Table 2.1.

As per Waves 2 and 3, Wave 4 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 a close relative or friend. Proxy respondents were invited to complete the CAPI but not the SCQ. 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. EOL interviews were sought with a spouse, relative or friend in cases where a respondent had passed away.

*Table 2.1: Questions and measures included in assessments at Wave 4.*

Domain	Measures
<b>Demographics</b>	Marital status; marriage history; education; migration history; childhood.
<b>Social circumstances</b>	Transfers to/from children/parents/others; help with (instrumental) activities of daily living; social connectedness; social networks; volunteering; caring; social participation; religion; relationship quality.
<b>Health and healthcare</b>	Physical (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 (self-rated memory; word-list learning; verbal fluency; prospective memory); psychological (depressive symptoms; anxiety; resilience; life satisfaction; loneliness; worry; quality of life; perceived stress); behavioural (smoking; physical activity; sleep; alcohol; dietary intake); medications; healthcare utilisation; health insurance.
<b>Employment, retirement &amp; assets, lifelong learning</b>	Employment situation; job history; planning for retirement; sources of income; home ownership; other assets; expectations; health literacy.

## 2.2 Computer-assisted personal interview response rates

Of the 7,462 eligible respondents at Wave 4, there were 13 new respondents identified during fieldwork who had not previously taken part. A form of interview (i.e., self, proxy or EOL) was collected from 6,149 respondents. As in previous waves, self-interviews were the most common form of interview (n=5,856), with lower numbers completing proxy (n=121) and EOL (n=172) interviews. The Wave 4 response rate was calculated as the number of self-respondents that completed an interview at Wave 4, relative to the total sample eligible for Wave 4 CAPI (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 4). Table 2.2 presents the Wave 4 CAPI response rates (and counts) by age group and gender. The total CAPI response rate was 84%; response rates were largely similar across genders and were highest in those aged 65-74 years. The proxy interview response rate was calculated as the number of proxy interviews completed relative to the total number of participants identified as eligible for proxy interview throughout fieldwork. The total proxy interview response rate was 64% (age breakdown not shown).

Table 2.2: Wave 4 self-interview response rates (% , n), by age and gender.

	Male % (n)	Female % (n)	Total % (n)
<56	77 (20)	83 (218)	83 (238)
56-64	83 (942)	82 (1174)	82 (2116)
65-74	85 (956)	86 (1141)	86 (2097)
75+	86 (669)	81 (736)	83 (1405)
<b>Total</b>	84 (2587)	83 (3269)	84 (5856)

### 2.3 Reasons for attrition at Wave 4

Table 2.3 summarises the main reasons for non-participation at Wave 4. The most common reasons were refusals (e.g. due to time constraints during the period of Wave 4 data collection) and permanent withdrawal from the study. Importantly, respondents who refused to participate at Wave 4 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 4 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 2.3: Reasons for sample attrition.

Reason	Potential Respondents		Potential proxy Respondents	
	%	n	%	n
<b>Refusal</b>	57	647	49	33
<b>Withdrawn</b>	33	380	16	11
<b>Unable to contact respondent</b>	899 <sup>a</sup>	89	7	5
<b>Moved Outside ROI/NI</b>	2	22	-	-
<b>No permission to seek proxy, proxy not identified, or other</b>	-	-	28	18
<b>Total</b>	100	1138	100	67
<b>Refusal</b>	57	647	49	33

### 2.4 Self-completion questionnaire response rates

Table 2.4 presents SCQ response rates at Wave 4 by age and gender. The overall SCQ response rate was 86%. As with CAPI self-interview response rates, SCQ response rates were generally similar across genders, with highest total response rates observed for those aged 65-74.

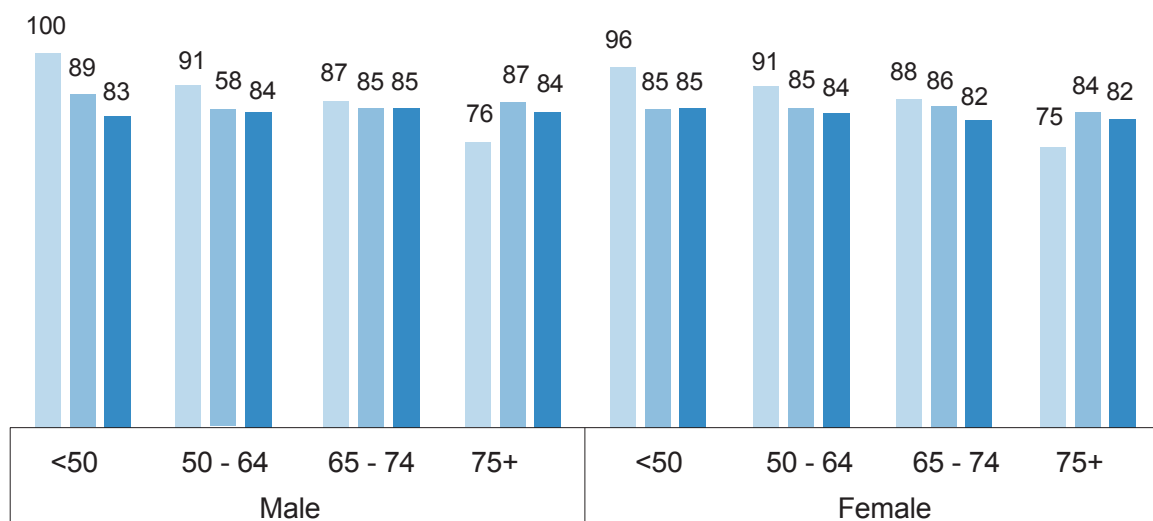
Table 2.4: Wave 4 SCQ response rates (% , n) by age and gender.

	Male % (n)	Female % (n)	Total % (n)
<56	95 (19)	86 (188)	87 (207)
56-64	84 (791)	87 (1017)	85 (1808)
65-74	88 (843)	90 (1024)	89 (1867)
75+	84 (561)	84 (621)	84 (1182)
<b>Total</b>	<b>86 (2214)</b>	<b>87 (2850)</b>	<b>86 (5064)</b>

## 2.5 Computer-assisted personal interview response rates across waves

Figure 2.1 displays CAPI response rates at Wave 2, Wave 3 and Wave 4, by age categories at baseline and gender; response rates are expressed as the percentage of participants who provided a self-interview at a particular wave, relative to the sample eligible for self-interview at that wave. CAPI response rates have remained high across waves since the first follow-up interviews at Wave 2. In particular, patterns of attrition following Wave 2 have largely stabilised, indicating relatively consistent engagement with the study by self-interviewees. The apparent increase in response rate between Waves 2 and 3 for those aged 75+ at Wave 1 may be due to loss to follow-up of some of the oldest members of the sample following Wave 2 (e.g., due to withdrawal or passing away), reducing the total eligible for Wave 3 and the numbers likely to drop out at later waves. Nevertheless, this pattern appears to have stabilised at Wave 4.

Figure 2.1: CAPI response rates (%) across waves, by baseline age category and gender.



## 2.6 Dataset

The results in this report were generated from the following TILDA datasets: CAPI v4.5.0; SCQ v4.3.3; AuditTracker\_W1-W4 v2018.05.06. The CAPI dataset includes observations from 5,977 respondents (5,739 aged 56 years and over) who completed a self or a proxy interview during Wave 4. These respondents form the basis of much of the report, although different sub-samples are used throughout the Chapters. The SCQ dataset includes records for 5,064 respondents (4,857 aged 56 years and over). 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/>).

## 2.7 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.

### 2.7.1 Point estimates and confidence intervals

Throughout this Report, the majority of estimates reflect the percentage of Irish adults aged 50 and older that fall within specific age groups, cohorts, or other analysis criteria. Means or medians of specific continuous quantities are reported where appropriate.

TILDA is a nationally representative study: each member of the study cohort hence corresponds with a given number of individuals in the Irish population aged 50 and older. Due to the random nature of the population sampling process, there is some inherent uncertainty in the derived estimates. To account for this, most estimates in this Report 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.

### 2.7.2 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) vary across certain subgroups of the sample. Participation in later waves of the study is also influenced by levels 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 that subgroup present in the population of Ireland.

In practice, the weights reflect the reciprocal of the probability of a participant being included in the study, based on characteristics such as age, gender, education level, marital status, and the participant's membership of the target population. Separate longitudinal CAPI weights were used for different analyses in each Chapter, depending on the respondents included within each analysis. 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, 3 and 4 (following participation at Wave 1). The probability was calculated using a multivariate logistic regression model, with the following baseline predictors: age, gender, level of education, marital status, urban or rural residence, self-rated physical health, smoking, health insurance, medications, socioeconomic stratum, disability, mental health, employment status, cardiac illness, immediate word recall, verbal fluency, and wrist and hip fractures. Versions of these longitudinal weights that included attrition between Waves 1 and 4 (i.e., participation in all waves except for either Wave 2 or Wave 3) were also calculated. Finally, two sets of these longitudinal weights were also calculated also, separated according to self-interviews only (i.e., proxy interviews were treated as attrition), or as self and proxy interviews (i.e., proxy interviews treated as participation). This accommodated the differing inclusion of proxy respondents in analyses throughout the Report, dependent upon the data analysed.

### **2.7.3. Software**

All analyses in this report were conducted using STATA 12 or 14.

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# 3

# Quality of life and relationships

Christine McGarrigle and Mark Ward

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# 3

## Quality of life and relationships

### Key Findings

- The average quality of life score measured through CASP-12, among TILDA participants is 27.3 in Wave 4. This score suggests that, on average, older people in Ireland experience a good quality of life.
- Quality of life doesn't decline linearly with age, but instead increases to a peak at age 68 and then starts to gradually decline, reaching the value observed among 50 year olds at age 80, decreasing steadily from that age onwards.
- The factors which predominantly influence quality of life are social factors, including social networks and social activities, while health-related factors like functional limitations are also important.
- Quality of life decreases with increasing number of chronic health conditions.
- Quality of life decreases as the number of activities of daily living (ADL) and instrumental ADL (IADL) limitations increase.
- Increased social integration, through maintenance of a larger social network and positive supportive relationships with friends is associated with higher quality of life.
- One third of women (31%) report positive supportive friendships in Wave 4, compared to 16% of men, similar to that reported in Wave 1. Relationship quality within social networks is important, and those who report positive supportive relationships with friends report higher quality of life relative to those with less supportive relationships.
- Over 21% of TILDA respondents reported the highest level of social integration in Wave 4, with 39% moderately integrated, 29% moderately isolated and 11% most isolated, similar to that reported in Wave 1. Men and women reporting highest levels of social integration had higher mean quality of life scores than those reporting lower levels of social integration.

### 3.1 Introduction

Quality of life is recognised as an important measure of wellbeing as people get older. It encompasses not just physical measures of health but the overall wellbeing of an individual. It is a multi-dimensional construct and includes, for example, when individuals stay active and social interactions are maintained with productive activities, thus improving quality of life by improving self-esteem. In previous research, we determined that quality of life peaked at age 68, and declined rapidly past 80 years (1). We found that social networks and integration into family and society were important for higher quality of life (1) and that an increase in ADL and IADL limitations over a two-year period was associated with a decline in quality of life (2).

Disability increases with advancing age and among community-dwelling people in Ireland, 11% of men and 14% of women aged 50 or over have at least one limitation in daily activities (3). Disability in older people has been associated with depression, lower quality of life, social isolation and loneliness (4,5). The influence of poor health on loneliness may be amplified in rural areas (6). This can be due to a number of influences, including physical conditions like pain, or an inability to continue accessing one's social circle and participate in social activities in their wider community (6).

Social integration has been established to have positive health effects (7-9). However, the quality of relationships that people maintain has also been shown to be important and has direct effects on both health and wellbeing (10-13). Ireland is unique in the quantity of social relationships available to individuals due to family size, although this is counter-balanced by large-scale migration of both past and current generations of younger people, thus breaking the continuity of family relations.

In this Chapter, information from those who participated in the first four waves of TILDA are included. Participants are divided into three age groups, based on their age at Wave 1: 50 to 64 years (n=3,284), 65 to 74 years (n=1,409), and 75 years and older (n=605). Education consists of three levels: primary education or less (n=1,309), secondary level education (n=2,196) and third level education (n=1,800). The majority of the information provided in this Chapter was collected during the computer assisted personal interview (CAPI), while the quality of life, and supportive relationship information was collected through the self-completion questionnaire (SCQ).

The aim of the Chapter is to describe changing functional limitations in community-dwelling older adults in Ireland between the first four waves of data collection and to examine how these changes impact on quality of life. To do this we carry out a cross-wave analysis where we compare the cross-sectional distributions of quality of life in Wave 1 and Wave 4,

and examine whether these vary with age, gender, educational attainment, marital status, functional limitations and close relationships. Additionally, we carry out a longitudinal analysis of change in functional limitations within individuals, and compare this to the corresponding change in quality of life. We also identify if social integration and supportive relationships with friends lessen the negative impact of functional limitations on quality of life.

## 3.2 Quality of Life

### 3.2.1 Quality of life and socio-demographics

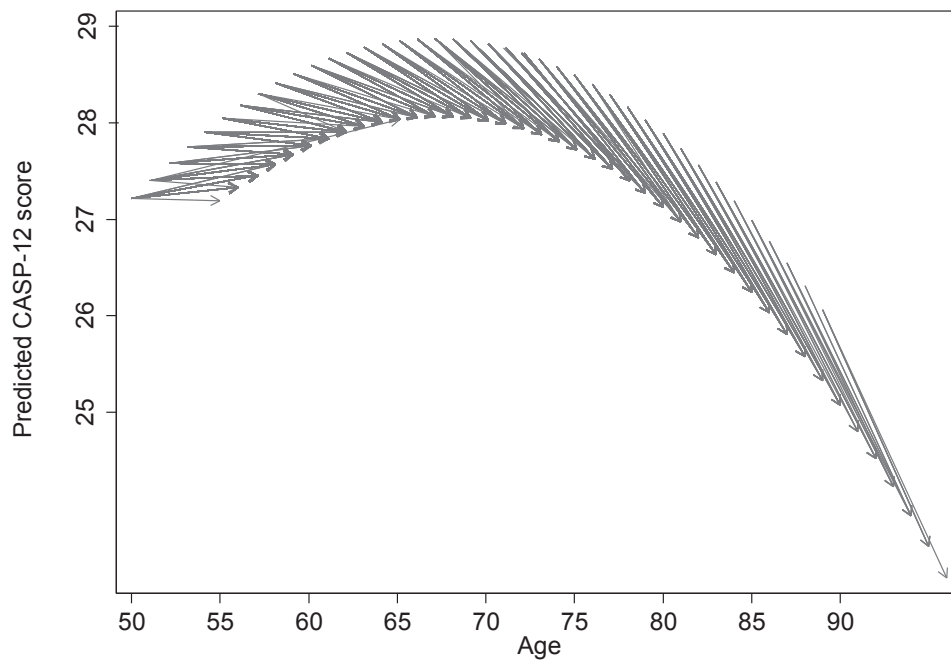
TILDA uses the 12-item self-report measurement, (CASP-12), to assess quality of life in Wave 4 (14). The scale covers the four domains considered to encompass quality of life (Table 3.1). The items included in CASP-12 consist of statements such as: 'I can do the things I want to do', 'I look forward to every day' and 'I feel that life is full of opportunities'. These statements are presented to participants in the SCQ and they are asked to indicate how often (often, sometimes, not often or never), they feel each statement applies to their life. Each item is summed to give an overall score (range 0 to 36) with higher scores denoting better quality of life.

*Table 3.1: Quality of life domains.*

Quality of life domain	
<b>Control</b>	The ability to actively participate in one's environment.
<b>Autonomy</b>	The right of the individual to be free from the unwanted interference of others.
<b>Self-realisation</b>	The fulfilment of one's potential.
<b>Pleasure</b>	The sense of happiness or enjoyment derived from engaging with life.

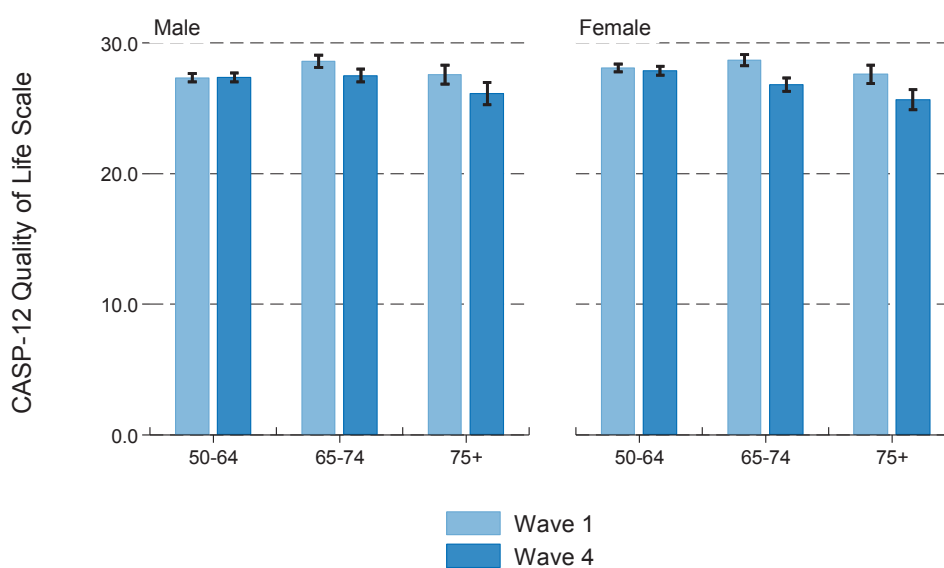
The average quality of life score measured with CASP-12, among TILDA participants is 27.3 (range 4 to 36) in Wave 4. This score suggests that, on average, older people in Ireland experience a good quality of life. Figure 3.1 shows how the average quality of life scores change over time for adults aged 50 years and over.

Figure 3.1: Changing trajectories of quality of life between Waves 1 and 4.



Each arrow in the figure shows the average change in quality of life, based on age at Wave 1, over 6 years of follow-up. Quality of life doesn't decrease linearly with age as might be expected, but instead increases to a peak at age 68 and then starts to gradually decline, reaching the value observed among 50 year olds at age 80 and decreasing steadily from that age onwards. The patterns of change were similar for men and women, as shown in Figure 3.2 where quality of life is highest in the 65-74 year age group and decreases over time in most age groups for both men and women.

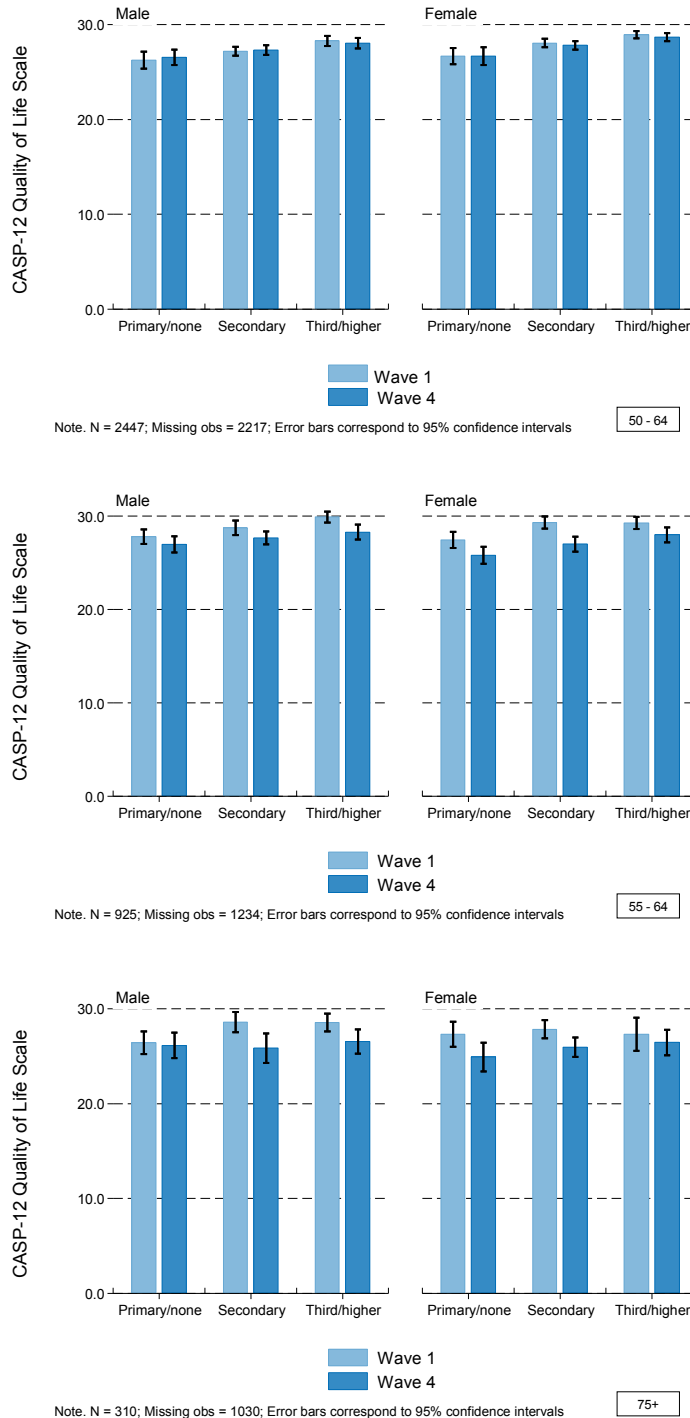
Figure 3.2: Quality of life between Wave 1 and Wave 4 by age group and gender.



Note. N = 3683; Missing obs = 5033; Error bars correspond to 95% confidence intervals

Figure 3.3 shows the association between mean quality of life scores and educational attainment within three age groups and gender. Higher educational attainment was related to higher quality of life scores across all waves of TILDA, although these differences were less pronounced in those aged 75 years and over, where many other ageing-related factors also contribute to lower quality of life. Similar trends are seen for both men and women across age groups, with quality of life decreasing in later waves in older age groups.

Figure 3.3: Quality of life between Wave 1 and Wave 4 by gender, educational attainment and age group.





### 3.2.2 Quality of life and marital status

Many studies, including TILDA, have shown that married people have higher quality of life and life satisfaction than those who have never married or are separated or divorced (1, 5, 15, 16), while depressive symptoms are higher in older people who have never married (17). In Wave 4, quality of life was higher in those who were married, and lowest in those individuals who were separated or divorced, for both men and women. In men who were widowed, quality of life was similar to those who were married, however in widowed women, quality of life was lower and similar to women who were separated or divorced. These differences remained between Wave 1 and Wave 4, although mean quality of life scores were lower in Wave 4 for each group.

Table 3.2: Quality of life by marital status and gender.

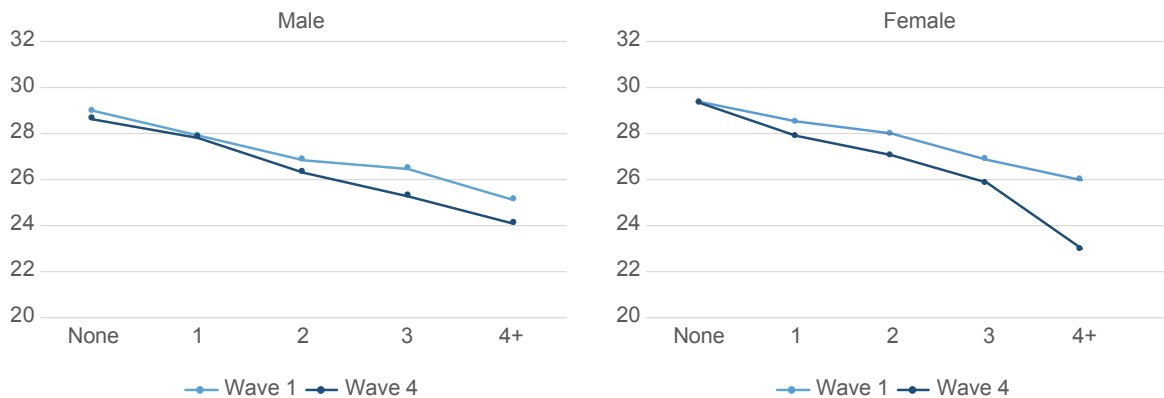
	W1 Mean (95% CI)	W2 Mean (95% CI)	W3 Mean (95% CI)	W4 Mean (95% CI)
<b>Male</b>				
<b>Married</b>	28.09 (27.83,28.35)	27.54 (27.27,27.81)	27.32 (27.04,27.59)	27.65 (27.38,27.92)
<b>Never married</b>	25.78 (24.84,26.71)	24.84 (23.88,25.81)	25.10 (24.22,25.98)	26.02 (25.12,26.93)
<b>Sep/divorced</b>	25.85 (24.52,27.19)	24.29 (22.84,25.74)	24.12 (22.79,25.45)	25.37 (24.04,26.71)
<b>Widowed</b>	28.66 (27.67,29.66)	27.65 (26.89,28.41)	27.57 (26.66,28.47)	27.79 (26.91,28.67)
<b>Female</b>				
<b>Married</b>	28.45 (28.16,28.74)	27.49 (27.19,27.80)	27.26 (26.93,27.60)	27.93 (27.62,28.23)
<b>Never married</b>	28.25 (27.37,29.13)	27.11 (26.21,28.00)	26.17 (25.24,27.09)	27.36 (26.47,28.26)
<b>Sep/divorced</b>	26.55 (25.70,27.40)	25.93 (25.06,26.80)	24.97 (23.98,25.96)	26.02 (25.01,27.03)
<b>Widowed</b>	27.80 (27.17,28.43)	26.69 (26.08,27.29)	25.94 (25.36,26.51)	26.26 (25.71,26.81)
<b>Total</b>				
<b>Married</b>	28.26 (28.05,28.47)	27.52 (27.30,27.74)	27.29 (27.06,27.53)	27.78 (27.56,28.00)
<b>Never married</b>	26.88 (26.20,27.56)	25.86 (25.17,26.55)	25.59 (24.96,26.22)	26.63 (25.98,27.28)
<b>Sep/divorced</b>	26.24 (25.48,27.00)	25.26 (24.47,26.05)	24.59 (23.78,25.41)	25.74 (24.93,26.54)
<b>Widowed</b>	27.99 (27.45,28.52)	26.94 (26.45,27.42)	26.34 (25.86,26.82)	26.62 (26.15,27.09)

### 3.2.3 Quality of life and chronic conditions

As chronic conditions affect health, they can also influence quality of life. In TILDA, we ask participants if a doctor has ever diagnosed one or more of a number of conditions. A count of chronic diseases was generated for participants at each wave based on their self-reported doctor's diagnosis of the following conditions: hypertension, diabetes, angina, heart attack, heart failure, transient ischaemic attack, stroke, arthritis, lung disease and osteoporosis. This was categorised as a count of 0, 1, 2, 3 and 4+ chronic conditions.

Figure 3.4 shows quality of life by number of chronic conditions for men and women. There is a clear gradient seen between an increasing number of chronic conditions, and decreasing quality of life scores and this trend was similar for both men and women and in Waves 1 and 4. Women in Wave 4 reporting four or more chronic conditions had lower mean quality of life scores than women with a similar number of chronic conditions in Wave 1.

Figure 3.4: Changing quality of life by number of chronic conditions Wave 1 and Wave 4, by gender.

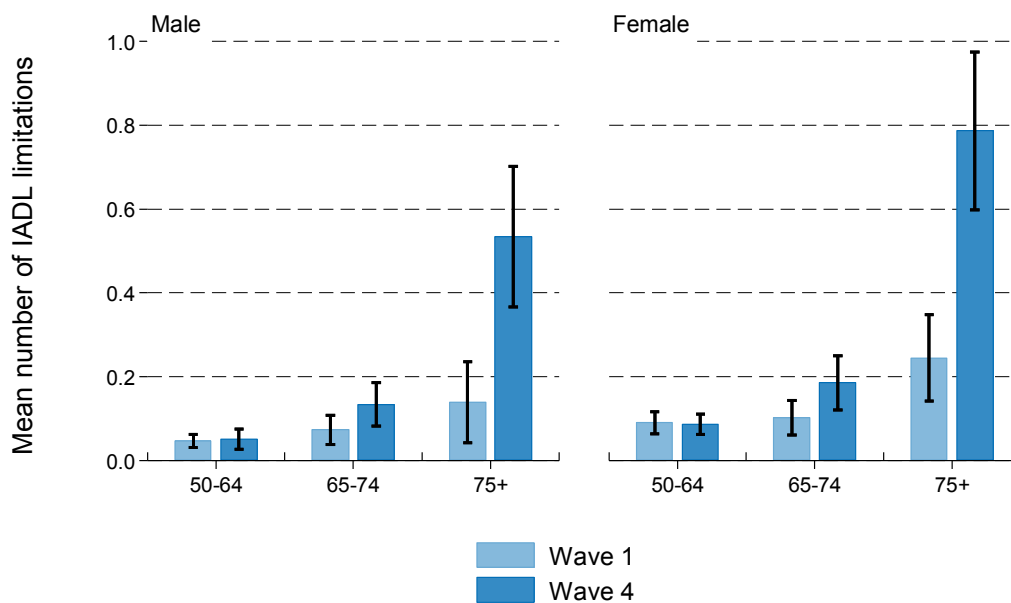


### 3.2.4 Quality of life and functional limitations

It is well established that disability is a determinant of wellbeing and quality of life. Disability status is measured in TILDA as self-reported limitations in the activities of daily living (ADLs; help with walking across a room, dressing, bathing, eating, getting in and out of bed, and using the toilet) and instrumental activities of daily living (IADLs; preparing meals, shopping for groceries, making telephone calls, taking medications and managing money). Health professionals often use these activities as a measure of disability or functional status. The number of ADL limitations and IADL limitations was calculated and categorised as 0, 1, 2 and 3+ limitations.

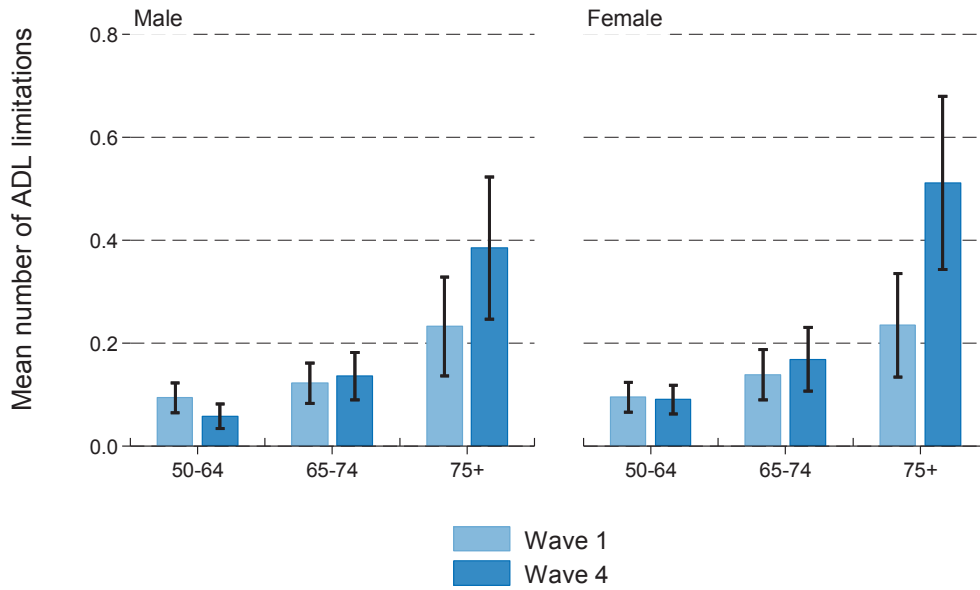
The number of IADL and ADL limitations reported at Wave 1 and Wave 4, by age group and gender are shown in Figures 3.5 and 3.6. In Wave 4, 8% of men and 11% of women reported at least one ADL compared to 8% of men and 7% of women in Wave 1. While 6% of men and 7% of women reported at least one IADL impairment in Wave 4, compared to 4% and 7% in Wave 1 respectively. The highest number of limitations are seen in men and women aged 75 and over, and these increased between Wave 1 and Wave 4.

*Figure 3.5: Mean number of IADL limitations in Wave 1 and Wave 4, by age group and gender.*



Note. N = 5566; Missing obs = 3150; Error bars correspond to 95% confidence intervals

Figure 3.6: Mean number of ADL limitations in Wave 1 and Wave 4 by age group and gender.



Note. N = 5566; Missing obs = 3150; Error bars correspond to 95% confidence intervals

Figures 3.7 and 3.8 show the associations between mean quality of life scores and increasing IADL and ADL limitations for men and women. For both ADLs and IADLs, quality of life decreases with increasing numbers of ADL and IADL limitations overall. This decline in quality of life scores with increasing numbers of limitations is consistent between Wave 1 and Wave 4 in men and women, although the gradient of decline in quality of life is steeper for women than men.

Figure 3.7: Quality of life by IADL limitations Wave 1 and Wave 4 by gender.

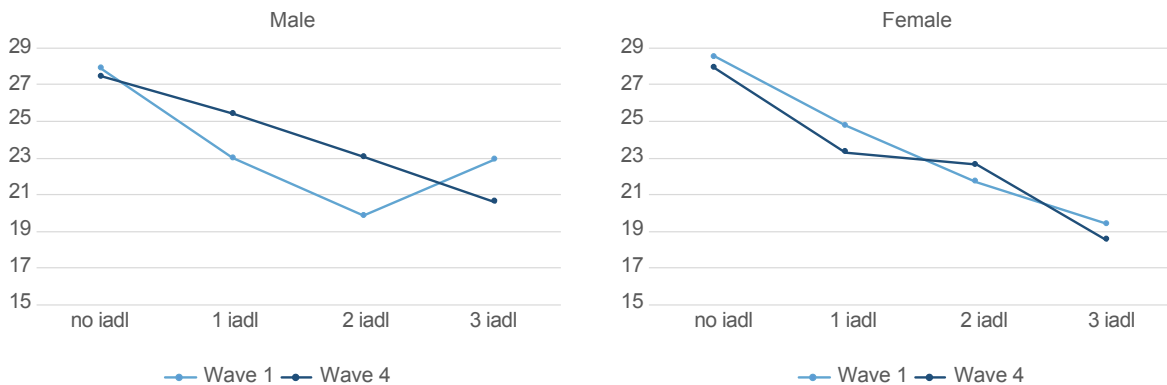
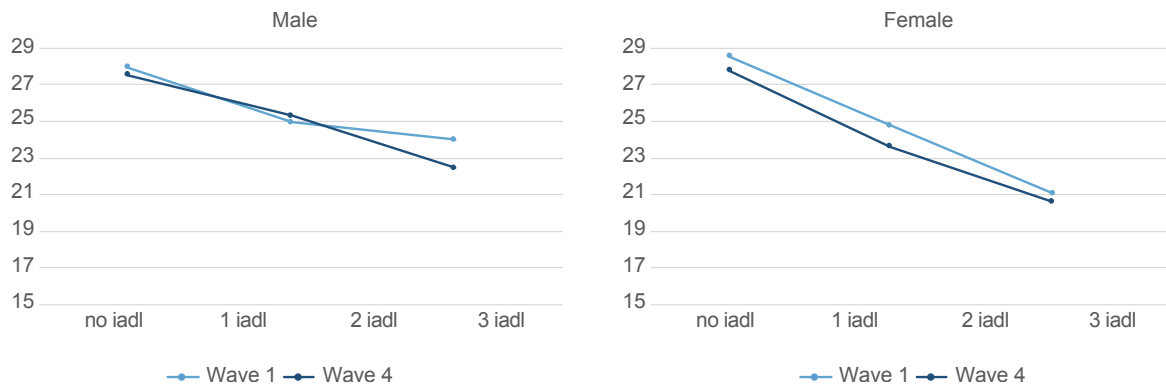


Figure 3.8: Quality of life by increasing ADL limitations Wave 1 and Wave 4 by gender.

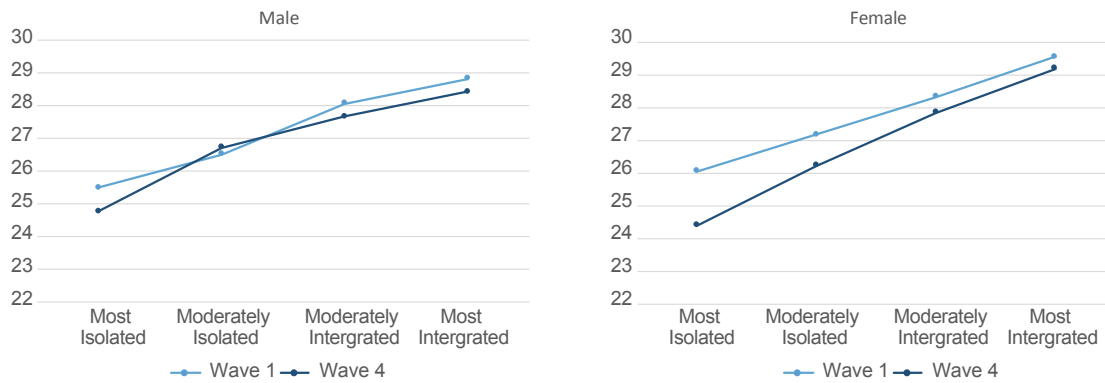


### 3.2.5 Quality of life and social integration

There is consensus that supportive social ties are beneficial for mental health and wellbeing (18, 19). This is thought to work both through promotion of positive emotions and buffering the harmful effects of stress (18). Social support structures and social interaction are recognised as being important for older people with disability and declining functional ability and health (20). Furthermore, previous research has shown that there are socio-economic inequalities in disability, and report a clear wealth gradient in disability among older English adults (21, 22), especially for those with elevated depressive symptoms (21).

Social integration is measured in TILDA using the Berkman-Syme Social Network Index. This is a composite scale scored 0-4 quantifying four types of social connection: married; number of close ties with friends, family and children; member of a church; member of voluntary organisations including clubs. A score of 0-1 indicates a participant who is most isolated, while a score of 4 indicates that they are most integrated.

Figure 3.9: Quality of life by social integration score Wave 1 and Wave 4 by gender.



Over 21% of TILDA respondents reported the highest level of social integration in Wave 4, with 39% moderately integrated, 29% moderately isolated and 11% most isolated. This was similar to figures of 24%, 41%, 27% and 8% reported in Wave 1 respectively. Men and women reporting highest levels of social integration had higher mean quality of life scores than those reporting lower levels of social integration (Figure 3.9). Comparisons between Wave 1 and Wave 4 show that overall, this association did not change over time (Figure 3.9). The strength of the relationship between quality of life and social integration scores remained the same, however, in Wave 4, the most isolated women had lower quality of life relative to women reporting similar levels of isolation in Wave 1.

### 3.2.6 Quality of life by quality of relationships

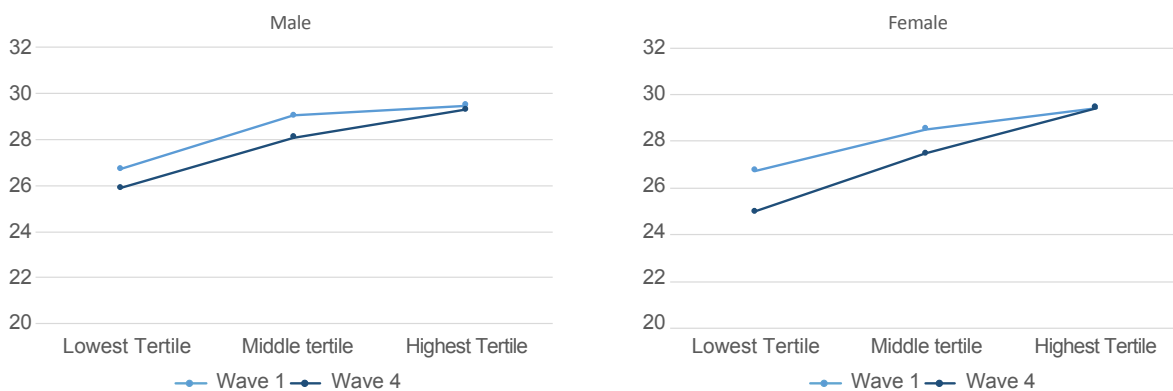
While being integrated into social networks has positive implications for health and wellbeing, it is not only the quantity of social relationships that is important, but also the quality of those relationships. In TILDA, we determine the quality of social support received from friends using questions asked in the SCQ. Positive relationships with friends are assessed through a series of questions, 'Do you feel you can rely on them if you have a serious problem', 'how much do they understand the way you feel about things', and 'how much can you open up to them if you need to talk about your worries'. Answer options varied from 'not at all', to 'a lot' (0-9). These scores are grouped into tertiles, with the highest tertile indicating positive supportive relationships, and the lowest tertile, indicating the least supportive relationships with friends.

One third of women (31%) report positive supportive friendships in Wave 4, compared to 16% of men, similar to that reported in Wave 1. While 27% of women report low supportive friendships, this proportion has decreased (from 38% in Wave 1). A similar decreasing

trend in the proportion who report low supportive friendships is seen for men, from 60% in Wave 1 to 46% in Wave 4, although a higher proportion of men consistently report low supportive friendships than women.

Cross-sectional analysis of Wave 4 data show that people who have positive supportive relationships with their friends have higher quality of life scores than those with less supportive friendships. Comparisons between Wave 1 and Wave 4 show that this association between supportive friendships and quality of life did not change over time for men or women (Figure 3.10).

*Figure 3.10: Quality of life by positive relationship with friends at Wave 1 and Wave 4 by gender.*



### 3.3 Longitudinal change in quality of life with changing functional limitations

#### 3.3.1 Longitudinal change in quality of life and changing functional limitations

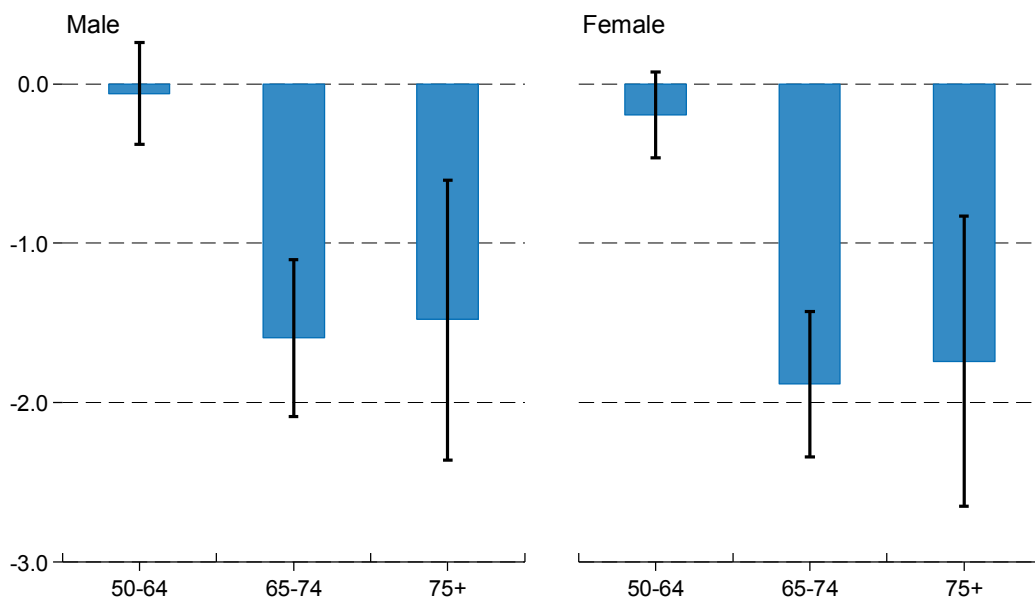
Functional limitations are used in this section as an important determinant of wellbeing that influences both independence and quality of life in older people. We examine longitudinally, change in functional limitations and quality of life scores. We also examine how higher social integration and positive supportive relationships influence these changes in quality of life.

To assess whether quality of life changed within individuals as they developed increased functional limitations, we derive the change in CASP-12 score between Wave 1 and Wave 4 for each participant, and examine this change in relation to change in limitations.

CASP-12 change score is calculated as (CASP-12 Wave 4 – CASP-12 Wave 1), and is a continuous value (with negative and positive values reflecting a decrease or increase in quality of life respectively). Change in functional limitations is derived from the number of ADL and IADL limitations a participant reports in Wave 4 compared to Wave 1. This was categorised as follows: -1 or more, no change, 1, 2 or more additional ADL/IADL limitations with negative and positive values reflecting a decrease or increase in number of limitations respectively.

Figure 3.11 presents the change in quality of life score between Wave 1 and Wave 4 by age group and gender. Quality of life decreased in men and women aged 65 years and over between Wave 1 and Wave 4, but remained stable in those aged 50 to 64 years at Wave 1. Figures 3.12 and 3.13 present the change in IADL and ADL limitations between Waves 1 and 4. An increase in IADL limitations are seen for men aged 75 years and older, and women aged 65 years and older. An increase in ADL limitations are seen in men and women aged 75 years and older.

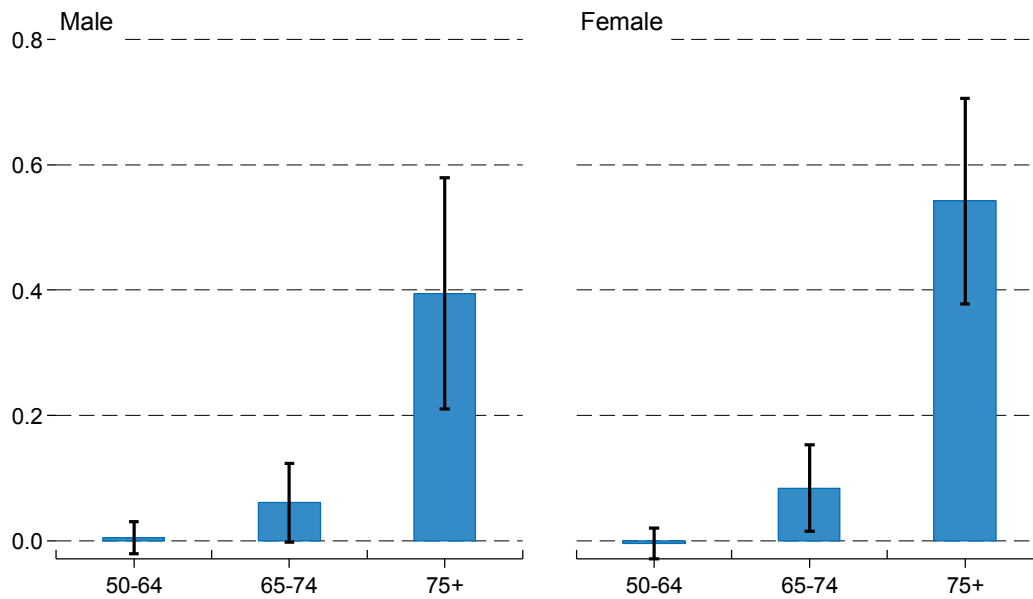
Figure 3.11: Change in quality of life between Wave 1 and Wave 4 by age group and gender.



Note. N = 3586; Missing obs = 1720; Error bars correspond to 95% confidence intervals

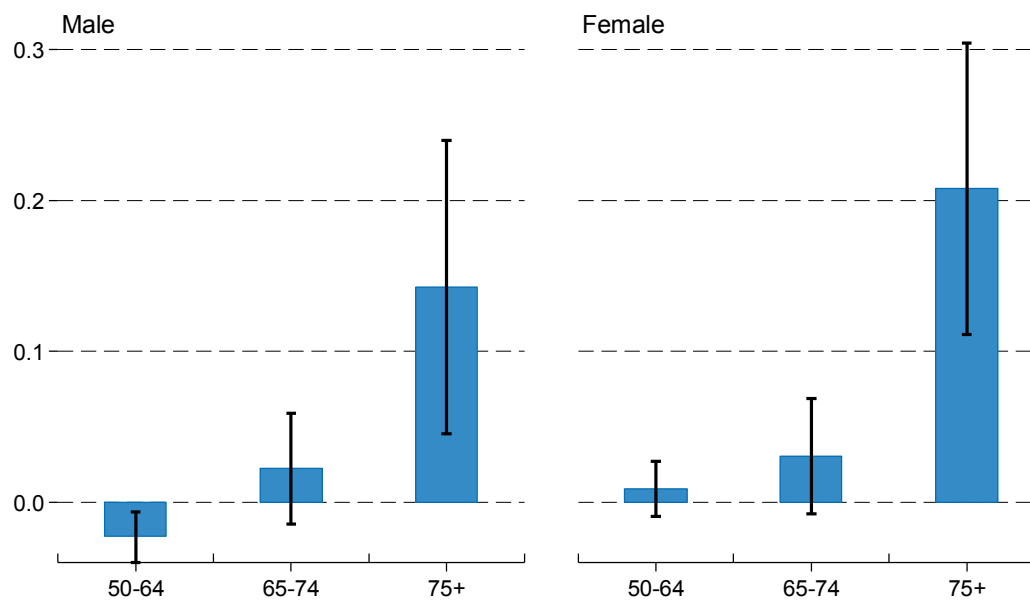


Figure 3.12: Change in IADL limitations between Wave 1 and Wave 4, by age group and gender.



Note. N = 5298; Missing obs = 8; Error bars correspond to 95% confidence intervals

Figure 3.13: Change in ADL limitations between Wave 1 and Wave 4, by age group and gender.



Note. N = 5298; Missing obs = 8; Error bars correspond to 95% confidence intervals

### 3.3.2 Longitudinal change in quality of life by change in functional limitations between Wave 1 and Wave 4

We examine whether quality of life changes in older people as disability increases. Figures 3.14 and 3.15 show that there is a small decline in quality of life for both men and women with no change in functional limitations between Waves 1 and 4. Quality of life decreases in women with an increasing number of ADL and IADL limitations at Wave 4, and although there is a similar trend in men, the change in quality of life is not significant.

Figure 3.14: Change in quality of life by changing IADL limitations between Wave 1 and Wave 4 by gender.

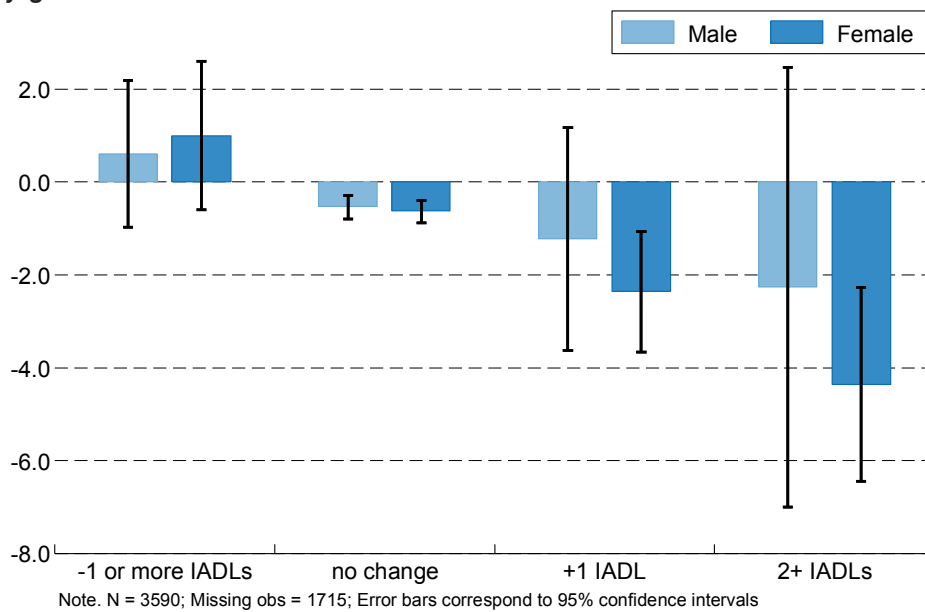
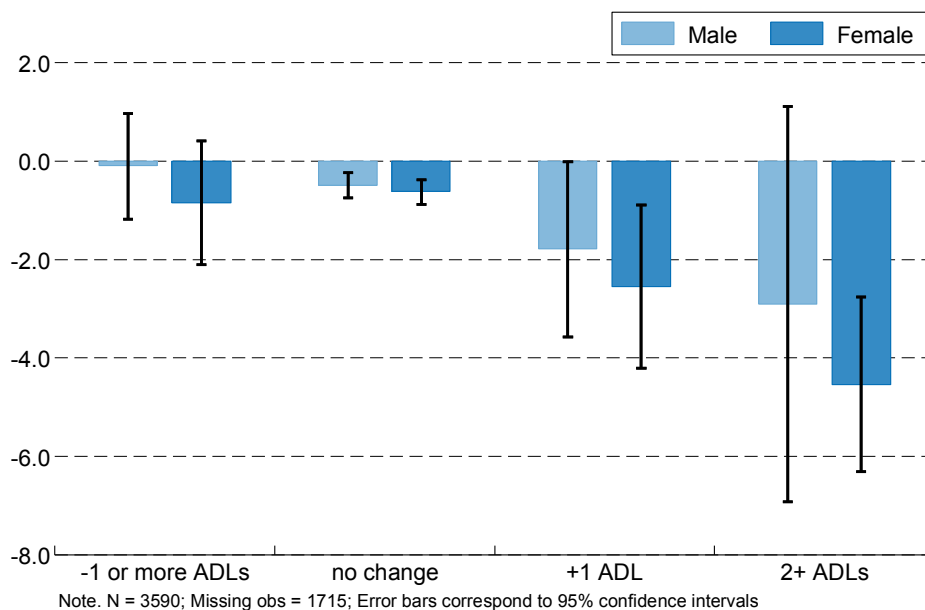


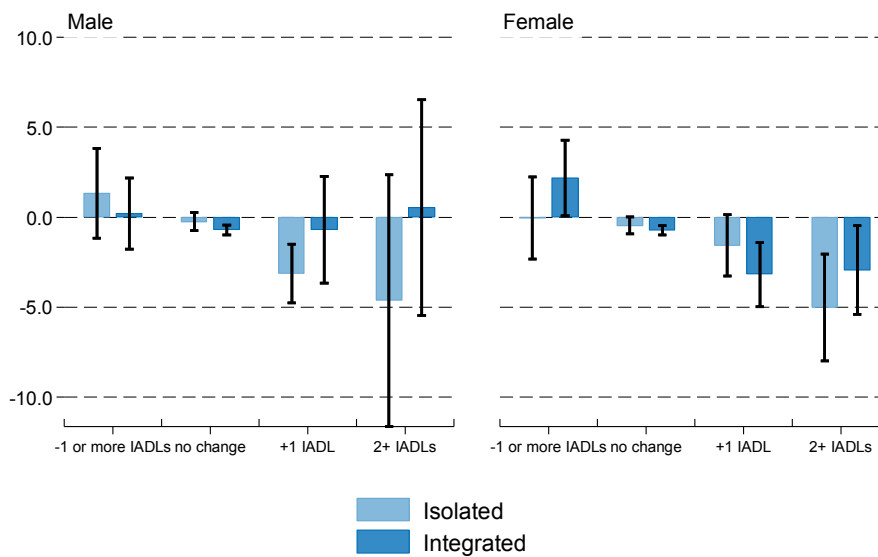
Figure 3.15: Change in Quality of Life by changing ADL limitations between Wave 1 and Wave 4 by gender.



### 3.3.3 Change in quality of life with change in functional limitations between Waves 1 and 4 by social integration and gender

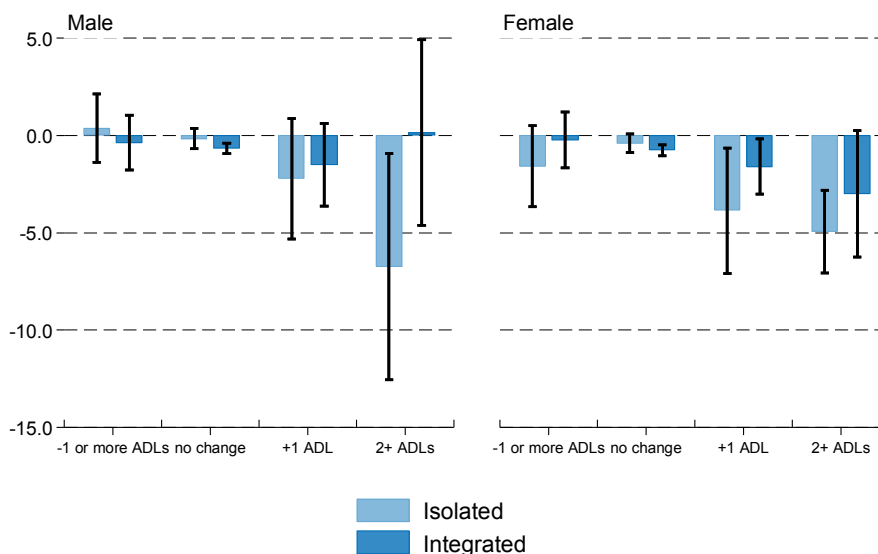
As the quality of relationships are important, we compare quality of life changes with increasing IADL and ADL limitations in people who are socially integrated with older people who are socially isolated. We grouped the social integration score into two groups (most isolated/moderately isolated, and compared to moderately integrated/most integrated).

Figure 3.16: Change in quality of life by changing number of IADL limitations Wave 1 to Wave 4, by level of social integration and gender.



Note. N = 3580; Missing obs = 1725; Error bars correspond to 95% confidence intervals

Figure 3.17: Change in Quality of life by changing number of ADL limitations Wave 1 to Wave 4, by level of social integration and gender.



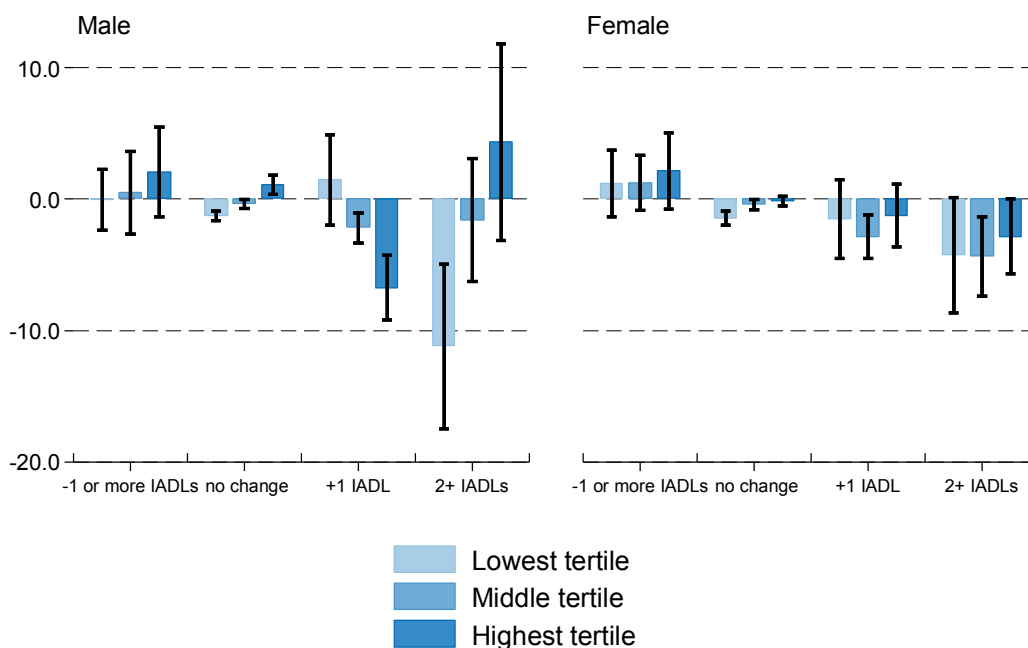
Note. N = 3580; Missing obs = 1725; Error bars correspond to 95% confidence intervals

Level of social integration is related to the change in quality of life in older people as ADL and IADL limitations increase. Figure 3.16 and 3.17 show that quality of life did not decline as number of IADL and ADL limitations increased in men who are more socially integrated. A similar trend, with less decline in more socially integrated women is also seen. However, those who are most isolated and particularly women, had notable declines in quality of life with increasing ADL and IADL limitations.

### 3.3.4 Change in quality of life with increasing disability moderated by positive supportive relationships with friends

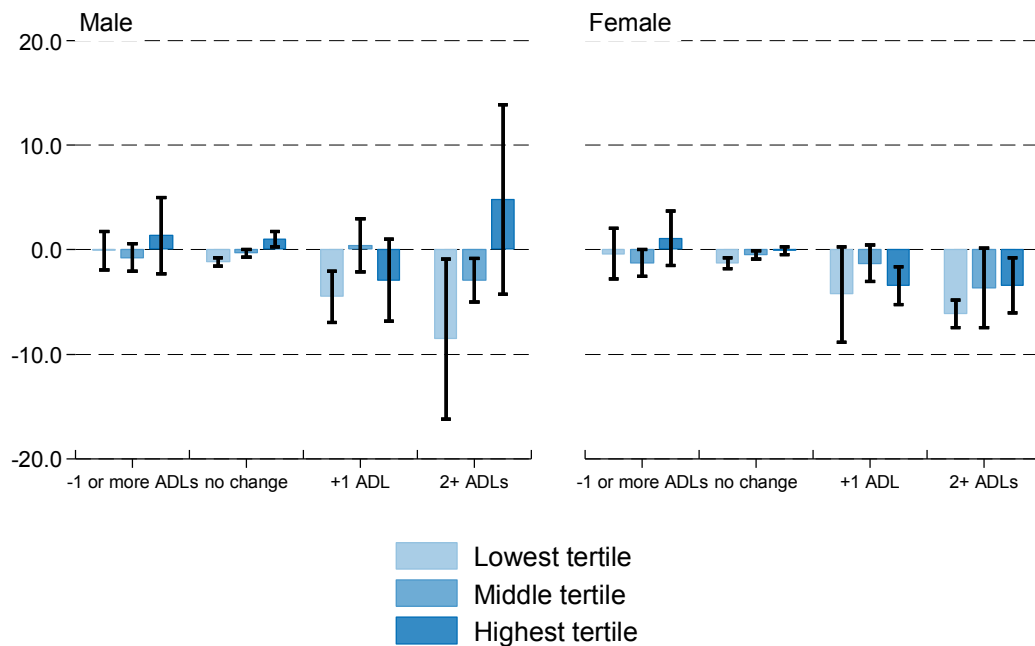
Similarly, supportive relationships with friends moderate the effect of increasing functional limitations on quality of life, particularly in women who report that they feel their friends were able to offer them the support they need. Figure 3.18 shows that quality of life did not decline with increasing number of IADL limitations for women who report the highest supportive relationships with their friends, and there is some evidence of a gradient in decline by decreasing level of positive support. Figure 3.19 shows a similar relationship for ADL limitations.

Figure 3.18: Changing quality of life scores with changing IADL limitations between Wave 1 and Wave 4, the moderating effects of positive supportive relationships with friends.



Note. N = 3479; Missing obs = 1827; Error bars correspond to 95% confidence intervals

Figure 3.19: Changing quality of life scores with changing ADL limitations between Wave 1 and Wave 4, the moderating effects of positive relationships with friends.



Note. N = 3479; Missing obs = 1827; Error bars correspond to 95% confidence intervals

### 3.4 Discussion

Overall, quality of life of middle-aged and older people in Ireland decreased between Wave 1 and Wave 4. However, this decrease is not just a function of ageing, but is associated with gender, marital status, educational attainment, health, disability and social support characteristics.

Quality of life declines with increasing levels of disability, and chronic conditions. An increase in social integration is associated with a corresponding increase in quality of life while social isolation is associated with lower quality of life. We also find that relationship quality within social networks is important, and those who report a positive supportive relationship with friends report a higher quality of life relative to those with less supportive relationships. These findings indicate the importance of having an adequate and active social network to maintain wellbeing, but also emphasise that the quality of relationships, not just the quantity is important.

We find that increases in ADL and IADL limitations over time within individuals, are associated with a corresponding decrease in quality of life in both men and women. These declines in quality of life with increasing functional limitations are not uniform however, and differences are seen between those who are more socially integrated, compared to those who are more isolated. Increased social integration, through maintaining a larger

social network and positive supportive relationships with friends is associated with higher quality of life and moderate the association between increasing functional limitations and lower quality of life. Quality of life remains stable over time for men who have higher social integration and report positive supportive relationships with friends, even as functional limitations increase over the six-year period of the study. This moderating effect of social integration and social relationships is also seen in women, although to a lesser extent.

While social networks may decrease in older people, these findings highlight the importance of the quality of the social relationships within social support networks for long-term health and wellbeing. Therefore, consideration should be given to the promotion of participation in social activities and community groups when treating older adults with chronic physical health conditions. Maintaining social participation and engagement as we age is critical to sustain good physical and mental health.

## Conclusions

Physical disability should be the target of preventive strategies aiming to enhance wellbeing in older ages because of its close association with quality of life. Furthermore, maintaining social relationships and participation is important, but particularly so as people age and have increasing levels of functional limitations. While functional limitations may be associated with lower quality of life, supportive social networks and close relationships can change that association. Policies promoting and enabling continued social participation and engagement in older age could significantly improve health outcomes, and enhance healthy and active ageing and maintain quality of life in the ageing population.

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# 4 Volunteering and social participation

*Mark Ward, Sarah Gibney and Irene Mosca*

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# 4

## Volunteering and social participation

### Key Findings

- Volunteering and other forms of social participation are important components of successful ageing.
- Overall, 18% of older adults in Ireland volunteer weekly while 56% have volunteered at some time over the previous two years. A similar percentage of men and women volunteer with rates of volunteering highest among the 65 to 74 year old age group.
- Almost three quarters of older adults participate in active and social leisure activities each week, while 52% participate in organised groups such as sports groups, book clubs, or charitable organisations.
- Volunteering and participation in both active and social leisure activities and organised groups are associated with better quality of life and fewer depressive symptoms.
- The percentage of older adults who volunteer at least monthly and who participate in social and organised activities was consistent across the four waves of TILDA.
- By Wave 4, 28% of participants were in paid employment and 51% were retired.
- Among those who retired over the course of TILDA, there is little evidence of an increase in their rates of volunteering or social participation immediately after retirement.
- While rates of social participation are high, efforts to increase volunteering and social participation among older adults should be encouraged as these activities provide benefits not only to the participants but to society.

## 4.1 Introduction

Social participation, and particularly productive activities such as caregiving, volunteering, and informal helping, have been shown to greatly benefit the health and wellbeing of older adults (1,2). These benefits are wide ranging and include better quality of life, improved physical and psychological health, and reduced mortality (3–5). As such, social participation is considered an essential component of successful ageing (6,7). At a societal level, these activities also strengthen ties within communities by promoting robust social networks and inter-personal ties which in turn encourage interpersonal trust, and reciprocity (8,9).

Volunteering is also an important feature of Irish life, as evidenced by the fact that adults aged 50 years and older in Ireland have the second highest engagement in unpaid volunteering, after Austria, among the 28 European Member States (6 : p.39). TILDA has previously highlighted the important and sizeable contribution that older adults make to society through volunteering their time and expertise to organisations working to better their communities (7). There is also extensive evidence of the benefits that individuals accrue from volunteering in terms of their physical (10), psychological (11), and social wellbeing (12).

In TILDA, information about three different types of social participation - volunteering; active and social leisure activities; and organised groups - is collected at each wave. As part of the self-completion questionnaire (SCQ), participants are asked whether they ever volunteered during the last year and if so, how often they did so: at least once per week; at least once per month; a few times a year or less; and, never.

There are 14 active and social leisure activities about which information is collected as part of the SCQ, and these activities are then grouped into four domains using a classification scheme defined by House et al. (13). These four domains are: intimate social relationships; formal organisational involvement outside of employment; active and social leisure activities; and passive and social leisure activities. Our analysis of these activities is limited to one of these four domains, participation in active and social leisure activities. Active and social leisure activities include going to films, plays or concerts; attending classes or lectures; playing cards, bingo, games in general; going to the pub; eating out of the house; taking part in sport activities or exercise.

Finally, during the main computer-assisted personal interview (CAPI), participants are asked if they “participate in any groups such as a sports or social group or club, a church connected group, a self-help or charitable body or other community group or a day care

centre?" While this question is distinct from the one asked about volunteering there is some overlap as participation in some of these groups can involve volunteering.

Over the course of their involvement in TILDA, many participants have retired from paid employment. The period post-retirement can signal a change in social participation and volunteering patterns and has been described as an intrusive transition for day-to-day activities and wellbeing (14). In negative circumstances, retirement can lead to a loss of purpose and identity, and increase the risk of social marginalisation and material deprivation. However, retirement may also be associated with increased social participation and improved mental health and wellbeing, as people are freer to spend their time as they choose (15). Whether retirement entails increased social activities or a retreat from social outlets may depend on how prepared individuals are for retirement, the nature of their retirement, and financial security post-retirement. For example, a greater sense of control over the decision to retire, rather than being forced to do so, is associated with more positive outcomes (16).

This Chapter is presented in two sections. In the first section, we describe the rates of participation in volunteering activities, active and social leisure activities, and organised groups in adults aged 56 years and over in Ireland at Wave 4 of TILDA. Furthermore, we show the benefits of each type of activity to older adults' quality of life and mental health (depressive symptoms). We then discuss changes in social participation between Wave 1 (2009-2011) and Wave 4 (2016). In the second section, we describe social participation in among those who retired from paid employment at some point between Wave 1 and Wave 4. Given that more time is available to older adults' post-retirement to pursue personal pursuits outside of work, we hypothesised that participation rates would increase among this cohort.

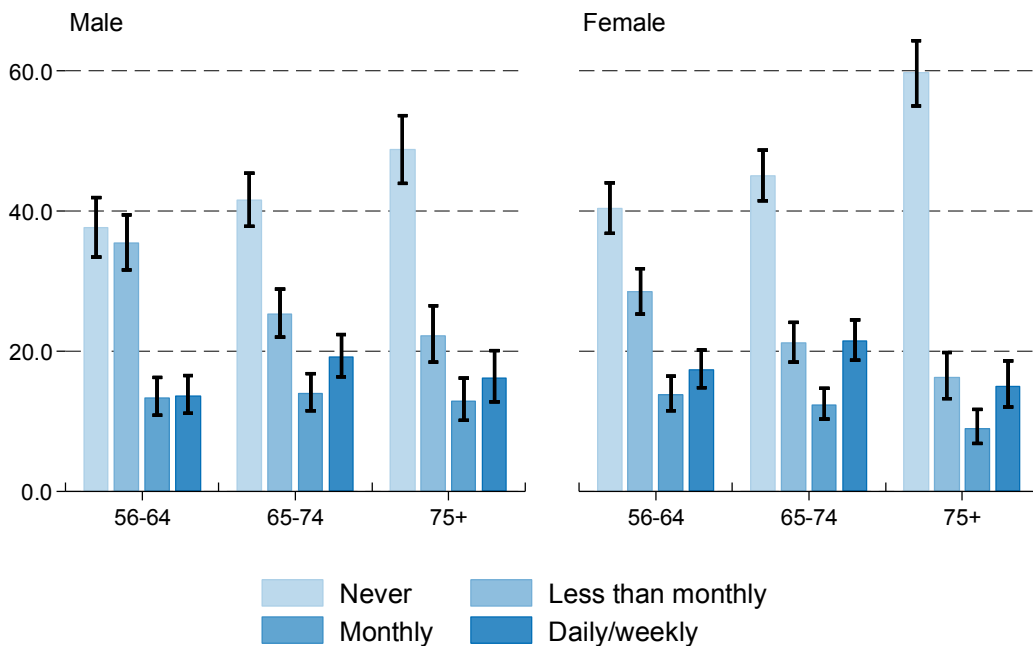
The sample consists of 3,963 community-dwelling older adults in the Republic of Ireland who returned a completed SCQ at each of the four waves. All participants were aged 50 years or older during the first Wave in 2009-2011 and over 56 years by Wave 4. Participants' age at Wave 4 was used to create age categories (56 to 64 years, 65 to 74 years, and 75 years and older) when presenting results.

## **4.2 Volunteering and social participation at Wave 4.**

In this section, we describe the rates of volunteering and social participation among participants at Wave 4. We also examine whether different forms of social participation are associated with differences in quality of life and depressive symptomology. Overall, 18% of older adults in Ireland volunteer at least once per week, 13% volunteer monthly, 25% volunteer less than monthly, while 44% never volunteer. The percentage of men and

women who volunteered weekly were similar at 16% and 18% respectively. As shown in Figure 4.1, men aged 65 to 74 were significantly more likely than their younger peers to volunteer weekly. The possibility that this difference might be explained by men taking up regular volunteering upon leaving paid employment at the statutory retirement age of 65 years, is explored more fully later in this Chapter.

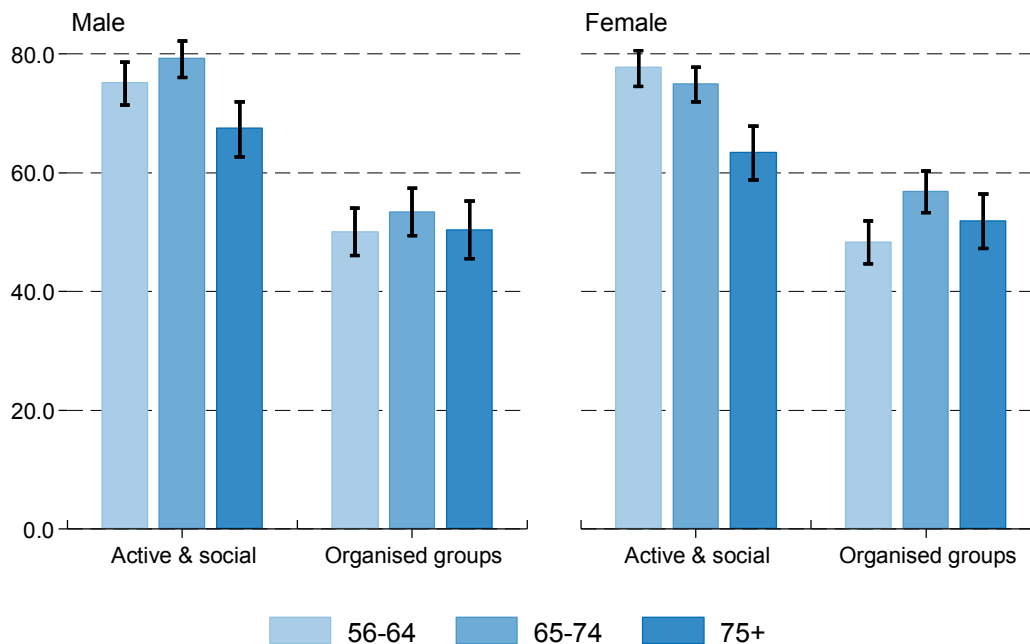
Figure 4.1: Frequency of volunteering, by gender and age group.



Note. N = 3862; Missing obs = 101; Error bars correspond to 95% confidence intervals

Overall, 74% of adults participate in active and social leisure activities each week, while 52% participate in organised groups such as sports groups, book clubs, or charitable organisations. Figure 4.2 shows that social participation rates are similar in men and women. There was a significant decrease in weekly active and social leisure activities among those 75 and over, while in women only, participation in organised groups was higher among the 65 to 74 years age group compared to those aged 50 to 64 years.

Figure 4.2: Proportion (%) of older people who participated in active and social leisure activities and organised groups, by gender and age group.



Note. N = 3961; Missing obs = 2; Error bars correspond to 95% confidence intervals

### 4.3 Benefits of volunteering and social participation at Wave 4

In this section, we examine the associations of social participation with the quality of life and depressive symptomology of older adults. Increased life expectancy has led to an attendant increase in interest in the quality of life of older adults. At the same time, our conceptualisation of quality of life has broadened to encapsulate a more wide-ranging, holistic assessment of wellbeing beyond the previously narrow view which was defined rather exclusively as the absence of ill-health. Quality of life has been measured at each wave of data collection in TILDA using the previously validated Control, Autonomy, Self-realisation and Pleasure Scale (CASP-12) measurement tool (17,18). This scale captures information on four domains of the quality of life of older adults. Control refers to the ability to actively participate in one's environment; Autonomy is the right of the individual to be free from the unwanted interference of others; Self-realisation concerns the fulfilment of one's potential; while Pleasure refers to the sense of happiness or enjoyment derived from engaging with life. CASP-12 consists of 12 statements including: I feel left out of things; I feel satisfied with the way my life has turned out; and I feel free to plan for the future. For each statement, participants are asked to indicate how often (often, sometimes, not often, or never) they feel each statement applies to their life. Each item is scored from 0 to 3 and summed to give an overall score (range 0 to 36) with higher scores denoting better quality of life.

Depressive symptoms were measured using the shorter 8-item version of the Centre for Epidemiological Studies-Depression (CES-D8) scale (19,20). This validated measurement tool captures the frequency that participants have experienced a variety of depressive symptoms within the past week. The total number of positive and negative responses to the eight statements are summed to give a total CES-D8 score (range 0 to 24) with higher scores indicating increased depressive symptomology.

Overall, the average quality of life score was high at 27.7 (maximum 36). Quality of life scores are highest among the 65 to 74 years age group (mean = 28.2) and although lower among the oldest age group (mean = 26.7), the score remains in the upper quartile. The average number of depressive symptoms recorded using the CES-D8 was low at 3.0 (maximum 24). Unlike quality of life, there were no significant age related differences in the number of reported depressive symptoms.

Table 4.1 shows the average CASP-12 and CES-D8 scores by age group and frequency of volunteering. In general, quality of life increases with increasing frequency of volunteering and this pattern is consistent within each age group. Similarly, depressive symptoms were lowest among older adults who volunteer most frequently and highest overall among those who do not volunteer at all.

Table 4.1: Quality of life (CASP-12) and depressive symptoms (CES-D8) by volunteering and age group.

	CASP-12		CES-D8	
	Mean (95% CI)	N	Mean (95% CI)	N
<b>56-64</b>				
<b>Never</b>	26.89 (26.34,27.44)	481	3.33 (2.99,3.67)	516
<b>Less than monthly</b>	28.08 (27.53,28.63)	435	2.85 (2.51,3.19)	445
<b>Monthly</b>	28.23 (27.45,29.02)	191	2.89 (2.40,3.39)	199
<b>Weekly/daily</b>	28.35 (27.59,29.11)	222	2.53 (2.14,2.92)	235
<b>65-74</b>				
<b>Never</b>	27.56 (27.08,28.05)	572	3.28 (2.94,3.62)	623
<b>Less than monthly</b>	28.14 (27.61,28.68)	334	2.74 (2.42,3.07)	365
<b>Monthly</b>	29.04 (28.35,29.74)	198	2.54 (2.06,3.01)	208
<b>Weekly/daily</b>	28.98 (28.37,29.58)	304	2.76 (2.38,3.15)	330
<b>75+</b>				
<b>Never</b>	25.84 (25.26,26.43)	390	3.62 (3.25,3.99)	464
<b>Less than monthly</b>	26.79 (26.06,27.53)	160	2.54 (2.07,3.01)	180
<b>Monthly</b>	28.16 (27.41,28.91)	106	2.86 (2.31,3.41)	120
<b>Weekly/daily</b>	28.52 (27.82,29.22)	135	3.05 (2.43,3.67)	159
<b>Total</b>				
<b>Never</b>	26.89 (26.57,27.21)	1443	3.39 (3.18,3.60)	1603
<b>Less than monthly</b>	27.89 (27.54,28.25)	929	2.76 (2.54,2.97)	990
<b>Monthly</b>	28.56 (28.08,29.03)	495	2.74 (2.43,3.05)	527
<b>Weekly/daily</b>	28.68 (28.27,29.08)	661	2.74 (2.49,3.00)	724

Table 4.2 shows the association between weekly participation in active and social leisure activities, and organised groups, quality of life and depressive symptoms stratified by age group. Quality of life was significantly higher among adults who reported both types of social participation, overall and in each age group. Depressive symptoms were lower in the 65-74 age group who participate in social activities with a similar trend in the 56-64 age group. There was no significant difference in depressive symptomology among the over 75s.



Table 4.2: Mean quality of life (CASP-12) and CES-D8 depression scores by active and social leisure activities, and organised groups, by age group.

Active and social leisure activities				
	CASP-12		CES-D	
	Mean (95% CI)	N	Mean (95% CI)	N
<b>56-64</b>				
<b>No</b>	26.50 (25.79,27.22)	293	3.49 (3.03,3.95)	317
<b>Yes</b>	28.03 (27.68,28.38)	1055	2.86 (2.64,3.07)	1100
<b>65-74</b>				
<b>No</b>	26.59 (25.91,27.27)	308	3.50 (3.06,3.94)	346
<b>Yes</b>	28.63 (28.32,28.93)	1134	2.80 (2.58,3.02)	1223
<b>75+</b>				
<b>No</b>	25.63 (24.89,26.36)	258	3.44 (3.01,3.87)	310
<b>Yes</b>	27.27 (26.84,27.71)	556	3.11 (2.80,3.42)	649
<b>Total</b>				
<b>No</b>	26.28 (25.87,26.69)	859	3.48 (3.21,3.74)	973
<b>Yes</b>	28.14 (27.93,28.35)	2745	2.89 (2.74,3.03)	2972
Organised groups				
<b>56-64</b>				
<b>No</b>	27.07 (26.60,27.54)	649	3.27 (2.97,3.58)	688
<b>Yes</b>	28.30 (27.88,28.72)	699	2.73 (2.49,2.98)	729
<b>65-74</b>				
<b>No</b>	27.27 (26.81,27.74)	602	3.31 (3.00,3.61)	662
<b>Yes</b>	28.91 (28.56,29.26)	839	2.67 (2.43,2.91)	906
<b>75+</b>				
<b>No</b>	25.70 (25.13,26.27)	359	3.53 (3.12,3.94)	436
<b>Yes</b>	27.64 (27.18,28.11)	454	2.94 (2.64,3.23)	522
<b>Total</b>				
<b>No</b>	26.85 (26.56,27.15)	1610	3.35 (3.14,3.55)	1786
<b>Yes</b>	28.42 (28.18,28.66)	1992	2.75 (2.60,2.90)	2157

### 4.4 Weekly volunteering across Waves 1 to 4

In this section, we describe volunteering and social participation at each of the four Waves. Figure 4.3 shows the percentage of men and women who volunteered weekly at each wave, further broken down by age group. While we see some fluctuation in rates of volunteering among each age group over time, there were no significant changes in the percentage of either men or women who volunteered weekly.

Figure 4.3: Proportion (%) of older people who volunteered weekly at each Wave by gender and age group.



## 4.5 Social participation across Waves 1 to 4

Figure 4.4 shows the percentage of men and women who participated in active and social leisure activities at each wave. Similar to the pattern observed for volunteering, there was no change in the percentage of men and women participating in active and social leisure activities across the waves. Again, this pattern was consistent within each of the three age groups.

Figure 4.4: Proportion (%) of older people who engaged in active and social leisure activities at each wave by gender and age group.

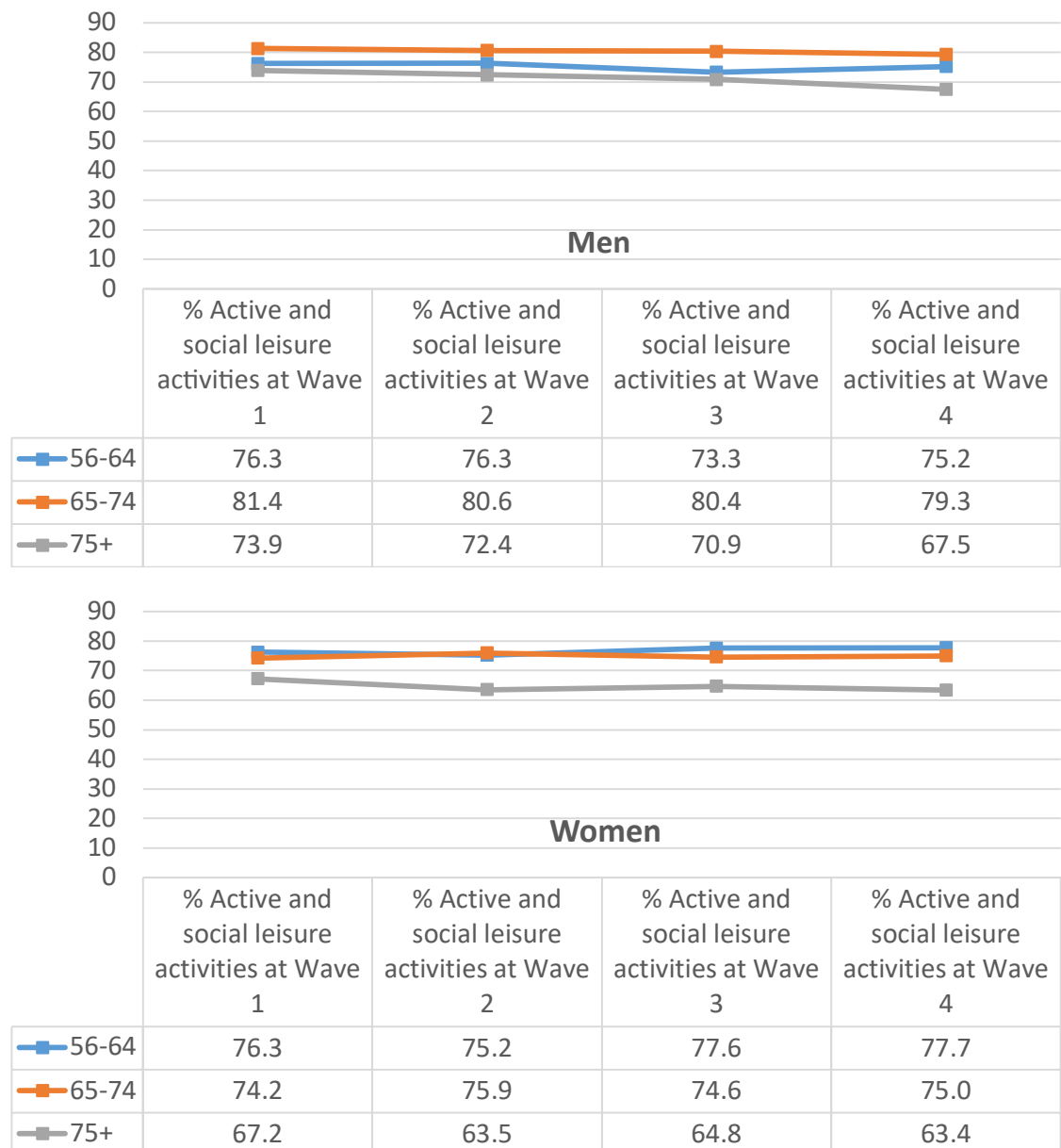
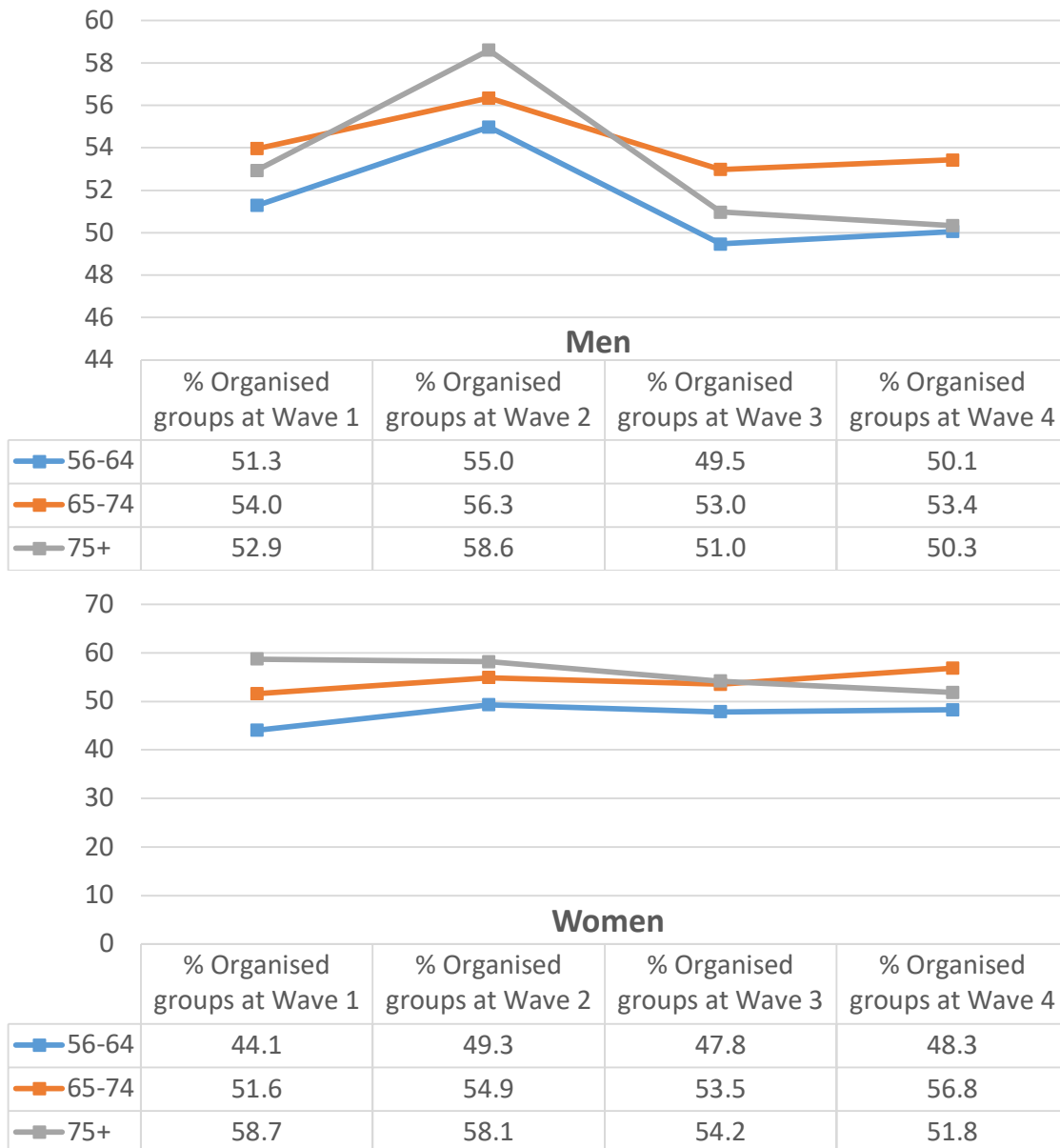


Figure 4.5 shows that there was some fluctuation between waves in the percentage of older adults who participated weekly in organised groups. Among men, there was some evidence of an increase in this form of participation among the oldest age groups between Waves 1 and 2, however, this change was not significant. The trend after Wave 2, was for a decrease in participation in organized groups although again, the decline was not significant.

Figure 4.5: Proportion (%) of older people who participated in organised groups at each wave by gender and age group.



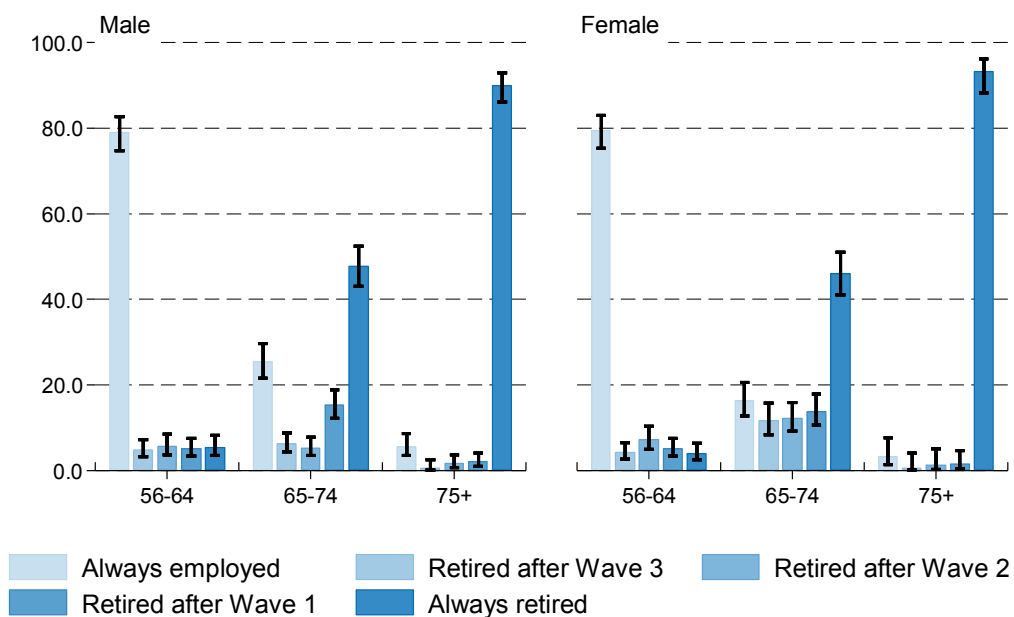
## 4.6 Retirement patterns

Retirement from paid employment leads to many challenges and opportunities for older adults, among them increased availability of time in which to pursue personal pursuits outside of the economic domain. Given the comparatively high rates of volunteering in Ireland (6), it is realistic to hypothesise that individuals may be more likely to participate in voluntary activities upon their retirement. To test whether this hypothesis is true, we describe the retirement patterns observed among TILDA participants before testing whether those participants who did retire, took up volunteering or other forms of social participation that they may have previously been precluded from doing due to the time constraints inherent in paid employment.

This analysis is limited to participants for whom data on employment status is available at all four waves of data collection. Furthermore, only those who reported that they were employed or retired at some point over the four waves were included. This means that those participants who reported that they were in ‘full-time education’; ‘permanent sick or disabled’; or ‘looking after home or family’, were not included in the analysis. Of the 2,372 participants included in the analysis, 41.1% were in paid employment at Wave 1 while 32.6% were retired. By Wave 4, 28.3% of participants were in paid employment and 51.2% were retired.

Figure 4.6 shows the transition to retirement for men and women at each wave in each age group. Given that the usual retirement age in Ireland is 65 years, it is unsurprising that we see the greatest number of retirements among the 65 to 74 year old age group.

Figure 4.6: Proportion (%) of older adults moving from employment to retirement between Waves 1 and 4 by gender and age group.



Note. N = 2372; Missing obs = 1591; Error bars correspond to 95% confidence intervals

## 4.7 Volunteering and social participation post retirement

Table 4.3 shows the different types of social participation at each wave of data collection by employment / retirement status at each wave. The wave at which participants transitioned from paid employment to retirement is highlighted in bold. If it is the case that older adults are more likely to take up these pursuits once retired from paid employment, we should see an increase in social participation at these waves.

Looking at volunteering first, we do observe a trend of higher rates of volunteering post-retirement among those who retired after Waves 1 and 2. However, the differences are not large enough to reach statistical significance. For participation in active and social leisure activities and organized groups, there were similar trends for increased participation after retirement, but again these are not significant.

*Table 4.3: The percentage of older adults who volunteer, participate in active and social leisure activities, and participate in organised groups, pre- and post-retirement.*

	Volunteering at Wave 1 % (95% CI)	Volunteering at Wave 2 % (95% CI)	Volunteering at Wave 3 % (95% CI)	Volunteering at Wave 4 % (95% CI)
Employed all 4 Waves	63.2 (59.7,66.7)	65.3 (61.6,68.8)	61.9 (58.0,65.6)	63.7 (60.0,67.3)
Retired after Wave 1	60.0 (52.2,67.4)	<b>65.5 (57.1,73.0)</b>	63.1 (55.4,70.1)	65.0 (57.1,72.1)
Retired after Wave 2	55.9 (46.9,64.5)	58.1 (49.1,66.7)	<b>64.7 (55.5,72.9)</b>	68.4 (60.1,75.8)
Retired after Wave 3	67.7 (57.1,76.7)	67.2 (57.3,75.8)	61.9 (51.9,71.0)	<b>60.5 (50.9,69.4)</b>
Retired all 4 Waves	59.7 (56.1,63.3)	64.0 (60.5,67.4)	60.1 (56.4,63.6)	56.7 (53.1,60.3)
	Active and social leisure activities at Wave 1	Active and social leisure activities at Wave 2	Active and social leisure activities at Wave 3	Active and social leisure activities at Wave 4
Employed all 4 Waves	76.1 (72.9,79.0)	76.7 (73.5,79.7)	75.4 (71.9,78.5)	75.5 (72.0,78.6)
Retired after Wave 1	78.1 (71.0,83.9)	<b>85.5 (78.8,90.3)</b>	83.5 (76.9,88.5)	82.3 (75.9,87.3)
Retired after Wave 2	80.0 (71.9,86.2)	77.4 (68.9,84.2)	<b>87.0 (80.0,91.8)</b>	86.3 (79.2,91.3)
Retired after Wave 3	84.6 (76.7,90.2)	80.3 (71.3,87.0)	71.5 (62.5,79.1)	<b>76.4 (67.8,83.3)</b>
Retired all 4 Waves	80.0 (77.1,82.6)	77.7 (74.8,80.4)	77.2 (74.4,79.7)	75.6 (72.6,78.4)

	Organised groups at Wave 1	Organised groups at Wave 2	Organised groups at Wave 3	Organised groups at Wave 4
Employed all 4 Waves	53.6 (50.0,57.2)	57.1 (53.6,60.6)	51.1 (47.3,54.8)	51.7 (47.9,55.4)
Retired after Wave 1	48.7 (41.3,56.2)	<b>56.5 (48.6,64.0)</b>	60.2 (52.6,67.4)	62.2 (54.5,69.3)
Retired after Wave 2	57.7 (49.3,65.6)	60.3 (51.9,68.1)	<b>68.5 (59.9,76.1)</b>	65.0 (56.5,72.6)
Retired after Wave 3	55.2 (45.6,64.3)	50.3 (41.0,59.5)	51.6 (42.1,61.0)	<b>53.2 (43.9,62.4)</b>
Retired all 4 Waves	60.2 (57.0,63.4)	62.5 (59.0,65.8)	55.7 (52.1,59.2)	57.2 (53.7,60.6)

Finally, we show the percentage of adults who participate in any of the three types of activities (volunteering; participation in active and social leisure activities; and participation in organised groups) at each wave by employment/retirement status. Encouragingly, more than 90% of adults participate in at least one of these activities, with many participating in more than one. Table 4.4 shows the percentage doing so at each wave, again broken into groups according to the timing of their transition from employment to retirement. Similar to above, the largest increase in participation was observed among those who first report being retired after Wave 2.

*Table 4.4: The percentage of older adults who volunteer or participate in active and social leisure activities or participate in organised groups, pre- and post-retirement.*

	Any participation at Wave 1	Any participation at Wave 2	Any participation at Wave 3	Any participation at Wave 4
Employed all 4 Waves	92.1 (89.9,93.9)	93.8 (91.8,95.3)	90.5 (88.0,92.5)	92.4 (90.2,94.2)
Retired after Wave 1	92.2 (86.6,95.6)	<b>92.1 (86.8,95.4)</b>	94.4 (89.5,97.1)	95.2 (90.5,97.6)
Retired after Wave 2	91.7 (85.3,95.4)	90.5 (83.7,94.6)	<b>97.3 (92.7,99.1)</b>	96.5 (90.6,98.7)
Retired after Wave 3	94.6 (87.6,97.8)	92.0 (84.5,96.1)	88.4 (80.7,93.3)	<b>90.4 (83.0,94.8)</b>
Retired all 4 Waves	93.0 (91.0,94.6)	92.4 (90.4,94.1)	91.0 (88.7,92.8)	91.4 (89.3,93.2)

## 4.8 Conclusions

There are high rates of volunteering and participation in both active and social leisure activities and organised groups among older adults in Ireland. Taking part in these activities is associated with better quality of life and fewer depressive symptoms. While this clearly demonstrates that volunteering and social participation are important features of successful ageing, the fact that more than half (56%) of older adults volunteered their time and expertise at some stage, and almost one-in-five do so on a weekly basis, highlights the important contribution that older adults make to the economic, social, cultural, and

community wellbeing of the population. Similarly, the high rates of participation in active and social leisure activities suggests that a large majority of older adults maintain active friendships and kinship into middle and older age. This benefits all participants in terms of reciprocity which is an essential feature of these relationships as well as being essential to social cohesion.

There was little or no change in participation rates across the four waves among this cohort. This suggests that these behaviours may be established in earlier adulthood meaning that individuals who volunteer or are socially active continue these activities into older age rather than withdrawing from or taking them up for the first time at this stage of their lives. This is somewhat unsurprising when viewed within the context of the high overall participation rates. For example, the fact that three quarters of participants are engaged weekly in active and social leisure activities means that there is limited scope to detect an increase in participation rates over the short, six year period between the first and last Wave of data collection. Furthermore, the comparatively small number of participants who do not take part in these activities may have any number of reasons for not doing so, ranging from personal preference to disabilities. Future research can potentially identify some of these inhibitors to greater participation.

Retirement from paid employment is clearly an important transitional period in people's lives and is a time when one might expect to see change in their involvement in social activities. While we found some evidence of a general trend of increased volunteering immediately after retirement, in the main, the observed increases were not significant. Again, there are a number of potential reasons for this. On the one hand, many participants may prefer not to replace paid employment with other activities. On the other hand, there may be structural reasons such as a lack of opportunities for social participation, or indeed, an absence of information on the types of activities available to people.

Despite the fact that large numbers of older adults are socially active, a sizeable proportion are not, and it appears that this is not solely due to constraints on available time due to employment commitments. From a research perspective, it is therefore important to identify enablers and barriers to social participation among older adults in Ireland. In terms of policy, current efforts to promote and support participation should be further extended to include even more people. This is especially important in light of the benefits accrued from social participation, not only to the participants themselves but to society more generally.



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# 5 Living conditions of adults in Ireland

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# 5

## Living conditions of adults in Ireland

### Key Findings

- Adults living in homes constructed prior to 1971 were twice as likely to have added modifications to their home than those living in newer builds (24-28% vs. 12-13%).
- 19.1% of adults have added modifications to their home, with average costs spent on these modifications higher in Dublin city or county (€8,574), compared to another town or city (€5,098) or a rural area (€5,097).
- 57.8% of adults reported problematic housing conditions. 21.6% of adults who reported three or more problematic housing conditions at Wave 3, reported the same at Wave 4.
- The most prevalent housing condition at Wave 2 was damp, mould or moisture, and this remains the case at Wave 4 (46.3%).
- There was a decrease of 4.6% in adults reporting problems heating their home from Wave 3 to Wave 4 possibly attributable to new policy initiatives.
- Similar to findings from Wave 2, there was a large disparity in problems with heating the home between dwellings in Dublin city or county (50.4%) compared to a rural area (24.4%).
- Location differences were apparent in reporting of neighbourhood social cohesion. 54.3% of participants living in rural areas reported high neighbourhood social cohesion compared to 18.6% of participants living in Dublin city or county.
- Adults who reported low neighbourhood social cohesion are more likely to report their health as fair or poor (20%) compared to those who report high neighbourhood social cohesion (14%).
- Lowest quality of life scores were reported by participants experiencing low neighbourhood social cohesion living in another town or city (24.8) compared to those living in Dublin city or county (30.1).

## Introduction

A suitable living environment is important to maintain the ability to live independently (1). Life satisfaction of older people has been shown to be impacted by the conditions of their home (2). As people age, they may experience lower functional abilities and poorer health which can lead to the home becoming unsuitable for their needs (3). It has been shown that the majority of older persons want to age in place, therefore modifications to homes become increasingly necessary to ensure suitability as care needs increase.

A TILDA report on the housing conditions of Ireland's older population was published in 2012 (4). The report highlighted that the majority of older adults (59%) experienced a problem with the condition of their home such as damp/mould, structural, pests or noise problems, while around a quarter reported difficulties in heating their home (4). Adults aged 50 years and over who reported heating difficulties were more likely to have poorer self-rated health and depressive symptoms (4). Recommendations within the report suggest that policies targeting housing quality and heating could potentially improve physical and mental health.

The Sustainable Energy Authority of Ireland (SEAI) provides a number of grants targeting energy performance, efficiency and warmth in homes. The *Better Energy Homes* scheme (5) is available to all homeowners in dwellings constructed prior to 2006 (for insulation and heating control system grants), or 2011 (for heat pump and solar thermal grants). The *Better Energy Warmer Homes* scheme (6) is available to homeowners in dwellings built prior to 2006 and who are in receipt of certain welfare payments including the fuel allowance. The *Warmth and Wellbeing* scheme (7) launched in 2016 and aimed to supplement the *Better Energy Homes* scheme. *Warmth and Wellbeing* is available for children aged 0-12 and adults aged 55 years and over who live with a chronic respiratory disease. The scheme was initially only available to residents in Dublin 12 and 24. In 2017, it was announced that the *Warmth and Wellbeing* scheme would receive additional funding and be extended to Dublin 8, 10 and 22. The impact of the *Warmth and Wellbeing* scheme will be seen in coming years. Additional schemes targeting the needs of the older population and administered through local authorities are also available. The *Mobility Aids Grant* scheme (8) provides funding for older adults, or adults with a disability who require works to address mobility issues in their home (e.g. grab rails, ramps, stair lift). The *Housing Aid for Older Persons* scheme (9) is available for adults aged 66 years and older, providing funding to improve the condition of older peoples' homes.

Household characteristics also incorporate who is living in the household. The proportion of older adults living alone increases with advancing age in most countries in Western Europe. Living alone can allow older adults to maintain independence and build self-esteem (10, 11). However, social isolation and loneliness can be exacerbated by living alone and can lead to poor psychological well-being (12). In 2012, it was reported that a quarter of older adults in Ireland live alone (4). The *National Positive Ageing Strategy* (13) seeks to enable people to age with confidence, security and dignity in their own homes and communities for as long as possible. Additionally, it sets out to remove barriers to participation and provide more opportunities for continued involvement of people as they age in cultural, economic and social life. The *Seniors Alert* scheme (14) launched in 2017, provides adults aged 65 years and over with a free personal monitored alarm worn on the wrist. The scheme intends to provide older people with a sense of security and peace of mind in their own homes, connecting them with a local volunteer or emergency services when the alarm is activated.

In this Chapter, we describe the living environment of adults aged 56 and over living in Ireland. We examine housing characteristics and modifications, housing conditions, heating and neighbourhood social cohesion. Analysis of housing characteristics and modifications are based on the 5,977 participants aged 56 and over who took part in the wave 4 computer-assisted personal interview (CAPI), while analysis on housing conditions, heating and neighbourhood cohesion are based on participants who returned the self-completion questionnaire (SCQ) (n=5,064).

## 5.1 Housing characteristics

### 5.1.1 Location of home

26.0% of adults aged 56 years and over in Ireland resided in Dublin city or county, 30.4% resided in another town or city, while 43.7% resided in a rural area.

### 5.1.2 Construction dates

The majority of homes were constructed after 1970 (1971-2000: 45.7%; 2001 or later: 8.0%). Adults aged 75 years and over were more likely to live in homes constructed prior to 1971 (66.5%), whilst only 35.0% of adults aged 56-64 years lived in homes constructed during the same period.

### 5.1.3 Ownership details

The majority of adults aged 56 and over in Ireland owned their home (81.5% outright, 10.8% with a mortgage). 4.8% of adults were in local authority rented property while 2.8% rented privately. Older adults aged 75 years and over were more likely to own their home (93.0%) compared to adults aged 56-64 years (89.2%).

### 5.1.4 Living situation

In Wave 4, 28.5% of adults aged 56 and over in Ireland lived alone. The prevalence of those living alone was slightly higher for women (31.8%) than men (25.0%). The proportion living alone increased with advancing age, with 20.5% of adults aged 56-64 years living alone, compared to 45.2% of adults aged 75 and over. More adults over the age of 56 reported living alone in another town or city (33.4%), than Dublin city or county (26.6%) or a rural area (26.3%).

## 5.2 Housing modifications

TILDA participants were asked if they had ever modified their home to make it easier or safer for an older person to live there. Examples of modifications included grab bars, railings, ramps, or remodelling of existing buildings. 19.1% of adults had added modifications to their home. Table 5.1 shows a breakdown of prevalence of modifications added and participant characteristics.

Modifications were more likely to have been added in households based in Dublin city or county (26.7%). Over a quarter of adults residing in Dublin city or county reporting added modifications. In comparison, 15.7% of adults living in a rural area reported added modifications and 17.7% of those living in another town or city.

Adults aged 75 years and over were over twice as likely to have modified their home compared to those aged 65-74 years (38.6% vs 16.4%). Just 8.8% of adults aged 56-64 years added modifications to their homes.

Construction date played a role in the likelihood of dwellings being modified. 27.7% of adults living in homes built between 1941-1970 reported modifications. The prevalence decreased in homes constructed more recently, with 13.2% of those living in homes constructed in 1971-2000 reporting modifications and 11.9% of those in homes constructed in 2001 or later.

Participants were asked if they had any difficulties with activities of daily living (ADLs) (e.g. walking, bathing, dressing and eating) or instrumental activities of daily living (IADLs) (e.g.

meal preparation, grocery shopping and medication management) which were expected to last longer than three months. In Dublin city or county, adults who reported an ADL or IADL were 3.5 times more likely to have modified their homes compared to those who reported no disability (73.0% versus 21%) while adults in rural areas were over five times more likely to modify their homes (66.7% versus 12.6%). Self-rated health was similarly related to home modifications. 29.9% of those who reported 'fair' health and 46.3% who reported 'poor' health added modifications compared with 11.2% of those who reported 'excellent' health.

*Table 5.1: Modifications to home stratified by age, construction date, disability and self-rated health.*

Variable	Dublin city or county % (95% CI)	Another town or city % (95% CI)	A rural area % (95% CI)	Total % (95% CI)
<b>Age</b>				
56-64 years	12.4 (9.1-16.6)	6.7 (4.3-10.2)	8.3 (6.1-11.0)	8.8 (7.3-10.6)
65-74 years	22.4 (18.3-27.1)	16.3 (12.3-21.2)	13.0 (10.5-16.0)	16.4 (14.3-18.6)
75+ years	52.9 (43.8-61.8)	37.5 (30.5-45.1)	30.5 (25.1-36.5)	38.6 (34.5-43.0)
<b>Construction Date</b>				
Pre-1919	29.2 (17.9-43.8)	18.3 (9.7-32.1)	24.6 (18.5-32.1)	24.1 (19.2-29.7)
1919-1940	37.8 (26.7-50.2)	20.9 (12.1-33.8)	19.4 (12.9-28.2)	26.3 (20.6-32.9)
1941-1970	33.6 (27.2-40.6)	28.3 (22.7-34.6)	20.1 (14.6-27.0)	27.7 (24.2-31.6)
1971-2000	19.2 (15.1-24.2)	10.7 (8.1-14.1)	11.6 (9.0-14.8)	13.2 (11.4-15.3)
2001 or later	16.5 (4.1-47.6)	17.3 (10.1-27.9)	7.9 (4.2-14.4)	11.9 (8.0-17.3)
<b>Disability</b>				
Not disabled	21.0 (17.8-24.5)	13.5 (11.2-16.2)	12.6 (10.8-14.7)	15.0 (13.6-16.5)
IADL Disability only	55.7 (37.0-72.8)	54.8 (38.0-70.6)	62.0 (43.3-77.6)	57.1 (46.7-67.0)
ADL Disability only	68.1 (53.7-79.7)	23.2 (11.2-41.8)	24.1 (13.9-38.5)	40.5 (31.5-50.3)
IADL or ADL Disability	73.0 (49.4-88.2)	65.4 (46.7-80.3)	66.7 (47.1-81.8)	67.8 (56.3-77.4)
<b>Self-Rated Health</b>				
Excellent	19.1 (13.2-27.0)	9.1 (5.4-15.0)	6.7 (4.1-10.9)	11.2 (8.5-14.5)
Very Good	19.4 (15.1-24.5)	12.0 (8.7-16.2)	9.8 (7.4-12.8)	13.0 (11.0-15.2)
Good	28.5 (23.2-34.4)	19.4 (15.3-24.2)	18.4 (15.2-22.3)	21.1 (18.7-23.7)
Fair	39.8 (30.9-49.5)	25.3 (18.2-34.0)	27.8 (21.6-35.0)	29.9 (25.5-34.7)
Poor	66.3 (47.5-81.1)	53.2 (31.8-73.5)	22.2 (10.3-41.7)	46.3 (34.6-58.4)
<b>Total</b>	<b>26.7 (23.2-30.5)</b>	<b>17.7 (14.9-20.9)</b>	<b>15.7 (13.6-18.0)</b>	<b>19.1 (17.5-20.9)</b>



### 5.2.1 Cost of modifications by age group

The mean overall cost of modifications for adults in Ireland was €6,367. Participants who reported that they had added modifications to their homes were asked what the total cost of these modifications were. Adults aged 56-64 years reported a mean cost of €11,936, with lower reported costs in the older age groups (65-74 years: €6,495, ≥75 years: €3,987).

### 5.2.2 Cost of modifications by location

For adults residing in Dublin city or county, the mean cost of modifications was €8,574. Adults living in another town or city reported average costs of €5,098. Adults living in a rural area reported similar average costs of €5,097 for modifications to their home.

## 5.3 Housing conditions

Housing conditions were assessed in the SCQ where participants were asked to record whether they have problems with the condition of the home. For the purposes of this Chapter, the categories of problematic housing conditions are defined in Table 5.2.

Table 5.2: Classification of problematic housing condition categories.

Housing conditions	Category
<ul style="list-style-type: none"> <li>• A leaking roof</li> <li>• Leaking or moisture getting in through walls</li> <li>• Leaking or moisture getting in at doors or windows</li> <li>• Leaks from water pipes</li> <li>• Rising damp</li> <li>• Condensation dampness</li> <li>• General dampness from unknown sources</li> <li>• Mould on walls/ceilings, etc</li> </ul>	Damp, mould or moisture
<ul style="list-style-type: none"> <li>• Corrosion or rot around any external door(s)</li> <li>• Badly fitting doors</li> <li>• Corrosion or rot around any window(s)</li> <li>• Leaky or draughty windows</li> <li>• Windows that don't open/close properly</li> <li>• Rot in timbers other than windows/doors, such as rot in joists, floor boards, etc</li> <li>• Structural cracks in internal or external support walls</li> <li>• Subsidence in floors</li> </ul>	Structural
<ul style="list-style-type: none"> <li>• Pests – rats, mice, cockroaches</li> </ul>	Pest
<ul style="list-style-type: none"> <li>• Noise from neighbouring houses</li> </ul>	Noise
<ul style="list-style-type: none"> <li>• Difficulty in heating accommodation</li> </ul>	Heating

The previously published report showed that 59% of participants reported problematic housing conditions in Wave 2 (4). For those who completed an SCQ at Wave 3 and Wave 4 (n=4,459), the change in number of reported problematic housing conditions between waves is shown in Table 5.3. 56.7% of the population reported having a problem in their home at Wave 4, compared to 60.0% in Wave 3.

21.6% of participants who reported three or more problematic housing conditions at Wave 3 reported a similar number of problems at Wave 4. 14.1% of adults who reported problems at Wave 3, reported no problematic housing conditions at Wave 4. 11.4% who reported no problematic housing conditions in Wave 3 reported a problem at Wave 4. Overall, the proportion of participants who reported problematic housing conditions was similar across Waves.

*Table 5.3: Change in number of reported problematic housing conditions between Wave 3 and Wave 4.*

	No problem (W4)		One or two problems (W4)		Three or more problems (W4)		Total (W4)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
<b>No problem (W3)</b>	29.1	(27.3-31.0)	8	(7.0-9.1)	3.4	(38.6-42.6)	40.6	(38.6-42.6)
<b>One or two problems (W3)</b>	9.6	(8.6-10.7)	10.5	(9.4-11.7)	6.7	(5.8-7.8)	24.9	(23.4-26.6)
<b>Three or more problems (W3)</b>	4.5	(3.7-5.5)	6.5	(5.6-7.7)	21.6	(20.0-23.4)	32.8	(31.0-34.6)
<b>Total (W3)</b>	40	(38.1-42.0)	25.9	(24.4-27.6)	34.1	(32.2-36.0)	100	

### 5.3.1 Distribution of reported housing problems

At Wave 2, damp, mould or moisture was the most commonly reported problematic housing condition of adults in Ireland with 46% reporting this problem (4). Table 5.4 shows the breakdown of housing problems in Wave 4. Adults aged 56-64 reported more problematic housing conditions than their older counterparts. Those living in rural areas were less likely to report problematic housing conditions (53.8%) compared to other locations (Dublin city or county: 59.9%, Another town or city: 61.1%). Modern building regulations should ensure better insulation and structural quality (15, 16). This is reflected in these findings with adults in older dwellings built pre-1940 more likely to report problems (64.9% compared to 51.4% of homes constructed in 2001 or later).

Damp, mould or moisture was the most commonly reported problematic housing condition (46.3%) followed by structural issues (31.9%) (Table 5.3). Noise issues were more prevalent in Dublin city and county compared to rural areas (18.4% vs. 5.1%). 65.2% of participants with a reported IADL disability reported housing problems, compared to 57.1% of participants with no disability (Table 5.3).

Damp, mould or moisture, structural problems and pest problems were higher in homes constructed pre-1940. 57.9% reported damp, mould or moisture and 38.5% reported structural problems in homes constructed pre-1940, compared to 32.1% and 26.9% respectively in homes constructed in 2001 or later. A similar trend was seen with pest problems, as 22.4% of participants living in homes constructed pre-1940 reported this issue, compared to 9.6% in homes constructed in 2001 or later.

Table 5.4: Problematic housing condition by age group, location and construction date.

	Any problem		Damp, mould or moisture		Structural		Pest		Noise		Heating	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
<b>Age</b>												
56-64 years	65.2	(62.1-68.1)	52.3	(49.3-55.4)	36.3	(33.5-39.3)	17	(14.9-19.4)	16.4	(14.0-19.1)	24.3	(21.7-27.0)
65-74 years	51.8	(48.8-54.8)	42.1	(39.2-45.0)	28.2	(25.5-31.0)	14.9	(13.0-17.1)	10.9	(9.1-13.0)	19	(16.9-21.3)
75+ years	54.2	(50.1-58.3)	43.5	(39.5-47.5)	29.9	(26.6-33.4)	13	(10.6-15.8)	7.5	(5.4-10.5)	18.8	(15.9-22.1)
<b>Location</b>												
Dublin city or county	59.9	(56.3-63.6)	43.8	(40.0-47.8)	30.8	(27.5-34.3)	17.8	(15.3-20.9)	18.4	(15.6-21.7)	21.3	(18.5-24.5)
Another city or town	61.1	(57.6-64.5)	49.6	(45.9-53.2)	36	(32.6-39.5)	13.1	(10.8-15.9)	17.2	(14.5-20.2)	22.4	(19.4-25.6)
A rural area	53.8	(50.8-56.8)	45.7	(42.9-48.5)	29.4	(27.0-31.8)	15.2	(13.3-17.2)	5.1	(3.8-6.7)	19.9	(17.9-22.1)
<b>Construction Date</b>												
Pre 1940	64.9	(60.4-69.2)	57.9	(53.5-62.1)	38.5	(34.6-42.5)	22.4	(19.2-26.0)	12	(9.2-15.5)	27.1	(23.5-31.1)
1941-1970	58.7	(54.4-62.8)	49.5	(45.4-53.5)	31.1	(27.5-35.0)	16	(13.1-19.3)	12.9	(10.4-15.9)	20.2	(17.3-23.5)
1971-2000	54.5	(51.6-57.3)	41.2	(38.5-44.0)	29.1	(26.7-31.7)	12.9	(11.0-14.9)	11.9	(10.0-14.1)	18	(15.9-20.2)
2001+	51.4	(44.9-57.8)	32.1	(26.2-38.7)	26.9	(21.1-33.7)	9.6	(6.1-14.2)	12.4	(8.4-18.0)	21.6	(16.6-27.5)
<b>Disability</b>												
No disability	57.1	(55.1-59.1)	45.5	(43.6-47.5)	31.3	(29.6-33.1)	15.4	(14.0-16.8)	11.5	(10.1-13.0)	20.2	(18.7-21.8)
ADL disability only	60.8	(48.4-71.9)	53.6	(42.6-64.3)	39.7	(29.5-50.8)	11.5	(6.3-20.0)	21.7	(13.4-33.2)	24.3	(15.7-35.7)
IADL disability only	65.2	(55.2-74.1)	55.3	(45.5-64.7)	28.7	(20.8-38.2)	18.3	(12.0-26.8)	14.9	(9.5-22.7)	31.1	(23.5-34.0)
ADL and IADL disability	61.2	(48.3-72.8)	50.9	(38.6-63.2)	38.5	(27.9-50.4)	13.3	(6.9-23.9)	20.3	(12.1-32.2)	27.9	(18.4-40.0)
<b>Overall</b>	<b>57.6</b>	<b>(55.7-59.6)</b>	<b>46.3</b>	<b>(45.0-48.3)</b>	<b>31.9</b>	<b>(30.1-33.0)</b>	<b>15.3</b>	<b>(13.9-16.7)</b>	<b>12.2</b>	<b>(11.0-13.2)</b>	<b>21</b>	<b>(19.9-22.2)</b>

### 5.3.2 Changes in problematic housing conditions between Wave 3 and Wave 4

Of those who participated in both Wave 3 and Wave 4 of TILDA (n=5,475), there was little change in reported housing problems between waves except for difficulty in heating the home, decreasing from 25.6% to 21.0%, potentially a reflection of access to the fuel allowance in the older ages (Table 5.5).

Table 5.5: Changes in problematic housing conditions in the population between Wave 3 and Wave 4.

Housing condition	Wave 3		Wave 4	
	%	(95% CI)	%	(95% CI)
Damp, mould or moisture	46.8	(44.9-48.7)	46.4	(44.4-48.3)
Structural	31.4	(29.6-33.2)	31.7	(30.0-33.5)
Pest	15.7	(14.3-17.2)	15.3	(13.9-16.7)
Noise	12.5	(11.1-14.0)	12.2	(10.8-13.7)
Heating	25.6	(23.9-27.3)	21.0	(19.5-22.6)

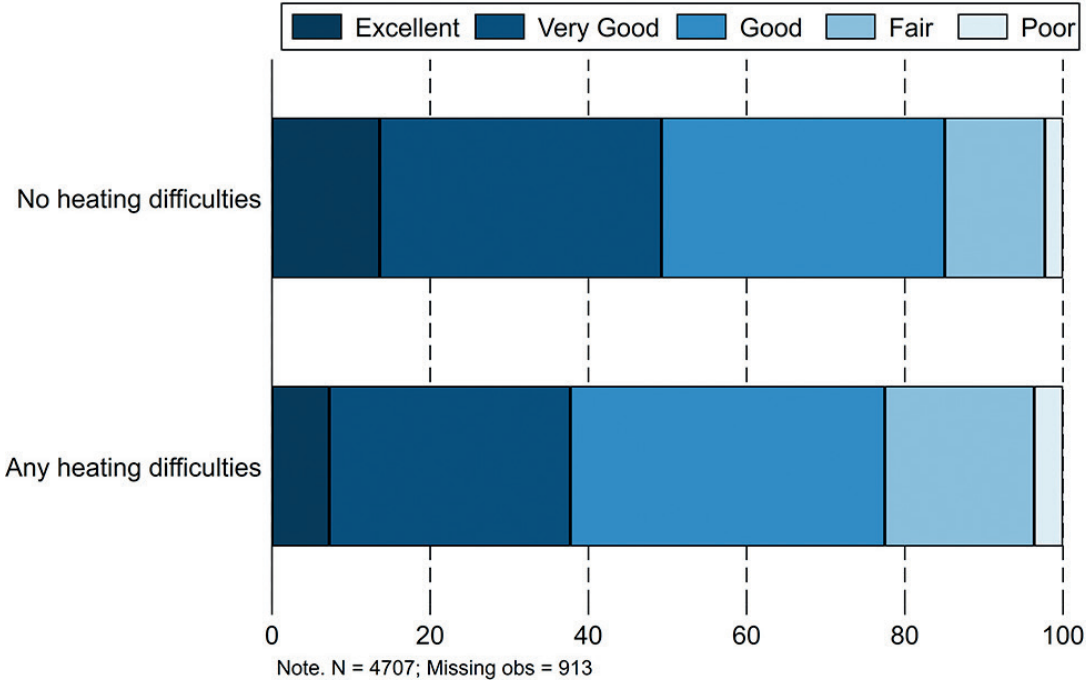
## 5.4 Heating

In the SCQ, TILDA participants were asked to record the ways in which they heat their homes during the winter. Options include central heating, open fire, portable heaters and closed solid fuel appliances. Participants could choose more than one heating method. The most common method of heating the home was through central heating; 83.9% of adults reported using this method. Section 5.4.1 assesses the relationship between central heating and heating difficulties. Heating difficulties are captured by asking if participants have any problem in heating their accommodation.

### 5.4.1 Central heating and heating difficulties

At Wave 4, 30% of TILDA participants who did not have central heating reported having heating difficulties, compared to 19% of those with central heating. There was a location effect as 50.4% of those with no central heating living in Dublin city or county reported heating difficulties, compared to 24.4% of those residing in a rural area (Figure 5.1). These are consistent with findings from the Wave 2 report (4).

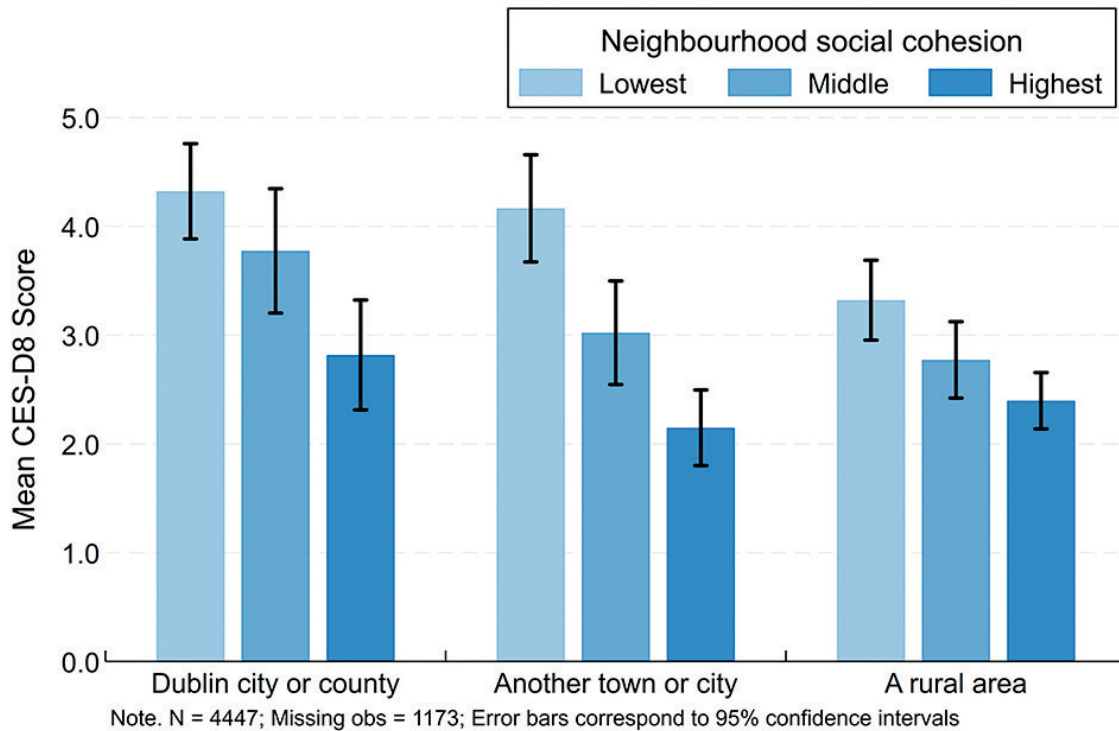
Figure 5.1: Percentage of heating difficulties by central heating and location.



### 5.4.2 Heating difficulties and self-rated health

Participants who reported difficulties in heating their home were more likely to report fair or poor health (22.5%) compared to those with no heating difficulties (15.0%) (Figure 5.2). This is marginally less compared to Wave 2, where 24.0% of adults with heating difficulties reported their health as fair/poor (4).

Figure 5.2: Percentage of heating difficulties by self-rated health.



## 5.5 Neighbourhood social cohesion

Neighbourhood social cohesion was measured in the SCQ through a number of statements (see Table 5.6). Participants are shown a positive statement which is anchored by an opposing negative statement and were asked to what degree they agree with each on a scale of one to seven. These scores were grouped into tertiles, with the highest tertile indicating highest neighbourhood social cohesion, and the lowest tertile indicating the lowest neighbourhood social cohesion.

Table 5.6: Statements used for measuring neighbourhood social cohesion.

Neighbourhood social cohesion	
Positive statement	Negative statement
I really feel part of this area	I feel that I don't belong in this area
Most people in this area will always treat you fairly	People in this area will take advantage of you
Most people in this area are friendly	Most people in this area are unfriendly
If you were in trouble, there are lots of people in this area who would help you	If you were in trouble, there is nobody in this area who would help you
Most people in this area can be trusted	Most people in this area can't be trusted

Neighbourhood social cohesion was measured at Wave 2 and Wave 4, and rates of reported neighbourhood social cohesion did not change across waves, potentially reflecting a low number of participants moving neighbourhoods and the stability of social cohesion within the communities that participants reside. Of those who completed an SCQ at Wave 2 and Wave 4 (n=4,468), little change was seen between neighbourhood social cohesion between waves. Consequently, the following section only describes the findings from Wave 4.

### 5.5.1 Demographic characteristics of neighbourhood social cohesion

Table 5.7 reports neighbourhood social cohesion by sample characteristics. Neighbourhood social cohesion varied by sex, as more women reported high neighbourhood social cohesion than men (53.8% vs 46.2%). 54.3% of participants living in rural areas reported high social cohesion compared to 18.6% of participants living in Dublin city or county.



Table 5.7: Demographic characteristics of neighbourhood social cohesion tertiles.

Social cohesion						
	Lowest		Middle		Highest	
	%	95% CI	%	95% CI	%	95% CI
<b>Sex</b>						
Men	55.1	(52.3-57.9)	46	(43.1-49.0)	46.2	(43.4-48.9)
Women	44.9	(42.1-47.7)	54	(43.1-49.0)	53.8	(51.1-56.6)
<b>Age</b>						
56-64	49.3	(46.1-52.6)	38.1	(35.0-41.0)	29.4	(26.5-32.5)
65-74	33	(30.2-36.0)	37.9	(34.9-41.0)	39.4	(36.2-42.8)
75+	17.7	(15.3-20.3)	24	(21.1-27.2)	31.2	(28.1-34.3)
<b>Location</b>						
Dublin city or town	32.3	(27.4-37.2)	27.4	(23.2-32.0)	18.6	(15.3-22.4)
Other city or town	32.6	(28.0-37.6)	31.2	(26.8-35.9)	27.2	(23.1-31.7)
A rural area	35.2	(31.0-39.7)	41.4	(36.9-46.1)	54.3	(49.5-58.9)
<b>Disability</b>						
Not disabled	88.5	(86.2-90.5)	89.4	(86.9-91.4)	91.8	(89.7-93.5)
IADL Disability only	4	(2.7-5.9)	4.1	(2.9-5.7)	2.2	(1.4-3.4)
ADL Disability only	4.4	(3.3-5.8)	3.3	(2.3-4.8)	3.5	(2.5-4.7)
IADL and ADL Disability	3.1	(2.1-4.5)	3.2	(2.1-4.8)	2.6	(1.6-4.0)
<b>Living Situation</b>						
Living alone	25.3	(22.4-28.4)	30.8	(27.7-34.2)	27.2	(24.3-30.3)
Living with others	74.7	(71.6-77.6)	69.2	(65.8-72.3)	72.8	(70.4-74.0)
<b>Total</b>	<b>34.4</b>	<b>(32.5-36.4)</b>	<b>34.1</b>	<b>(32.4-35.8)</b>	<b>31.6</b>	<b>(29.8-33.4)</b>

### 5.5.2 Neighbourhood social cohesion and social integration

Strength of participants' social network is measured in TILDA using the Berkman-Syme Social Network Index (17). This is a composite scale scored 0-4 quantifying four types of social connection: (i) married, (ii) number of close ties with friends, family and children, (iii) member of a church, (iv) member of voluntary organisations including clubs. Participants were scored one point if they answered positively to any of the above. A score of 1 indicated most isolated, and a score of 4 indicated most integrated. The average social network index score for adults in Ireland in 2016 was 2.7, which is considered moderately to most socially integrated.

Table 5.8 shows the prevalence of self-reported social integration categories by tertiles of neighbourhood social cohesion. A larger proportion of those who were categorised as being moderately/most integrated reported the highest neighbourhood social cohesion (68.1%), compared to those who reported the lowest neighbourhood social cohesion (56.4%). Conversely, those who reported the lowest neighbourhood social cohesion are more likely to report being moderately/most isolated (43.7%) compared to those who report the highest neighbourhood social cohesion (31.9%).

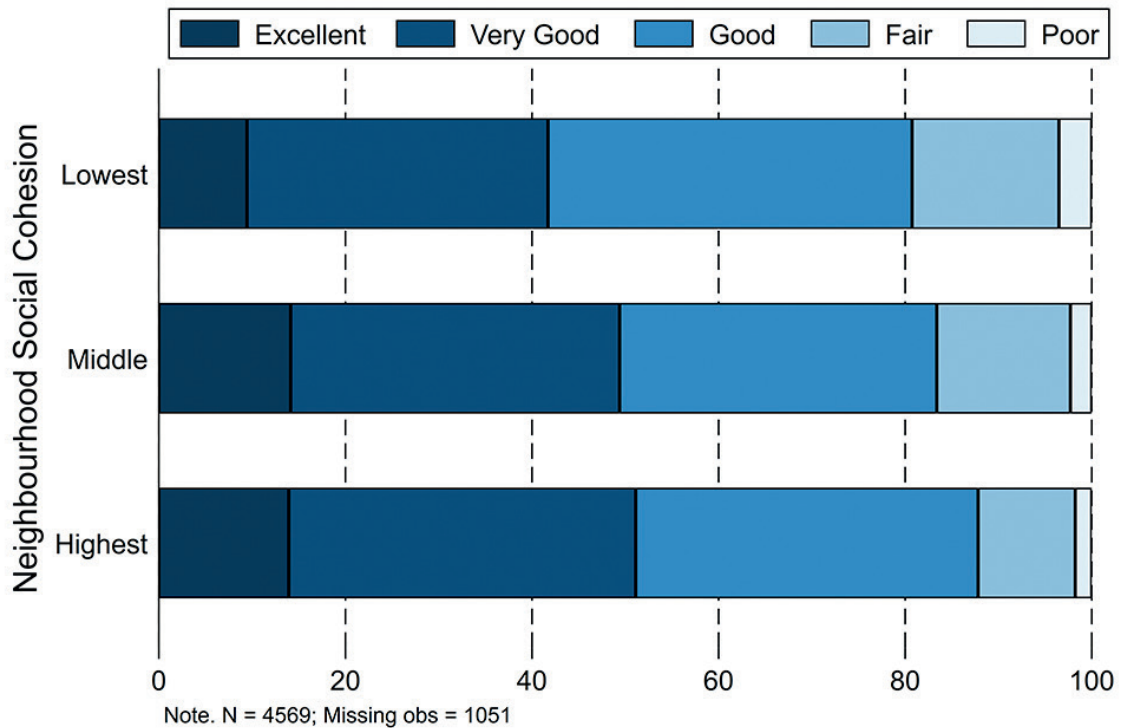
*Table 5.8: Proportion of social integration by neighbourhood social cohesion tertiles.*

	<i>Lowest</i>		<i>Middle</i>		<i>Highest</i>	
	<i>%</i>	<i>95% CI</i>	<i>%</i>	<i>95% CI</i>	<i>%</i>	<i>95% CI</i>
<b>Most isolated</b>	11.3	(9.1-13.8)	8.9	(7.0-11.2)	7.6	(5.8-9.9)
<b>Moderately isolated</b>	32.4	(29.4-35.5)	28.6	(35.7-31.2)	24.3	(21.7-27.2)
<b>Moderately integrated</b>	37.2	(34.4-40.2)	39.4	(36.4-42.5)	42.8	(39.8-45.9)
<b>Most integrated</b>	19.2	(16.9-21.7)	23.1	(20.6-25.7)	25.3	(22.6-28.1)

### 5.5.3 Neighbourhood social cohesion and self-rated health

Adults who perceived high neighbourhood social cohesion tended to express their self-rated health as better than those with low neighbourhood social cohesion (Figure 5.2). 9% of adults with low neighbourhood social cohesion reported excellent self-rated health, compared to 14% of those with higher neighbourhood social cohesion. 20% of participants with low neighbourhood social cohesion reported fair/poor health, proportionately higher than in the highest neighbourhood social cohesion group (14%).

Figure 5.3: Self-rated health, by tertiles of neighbourhood social cohesion.

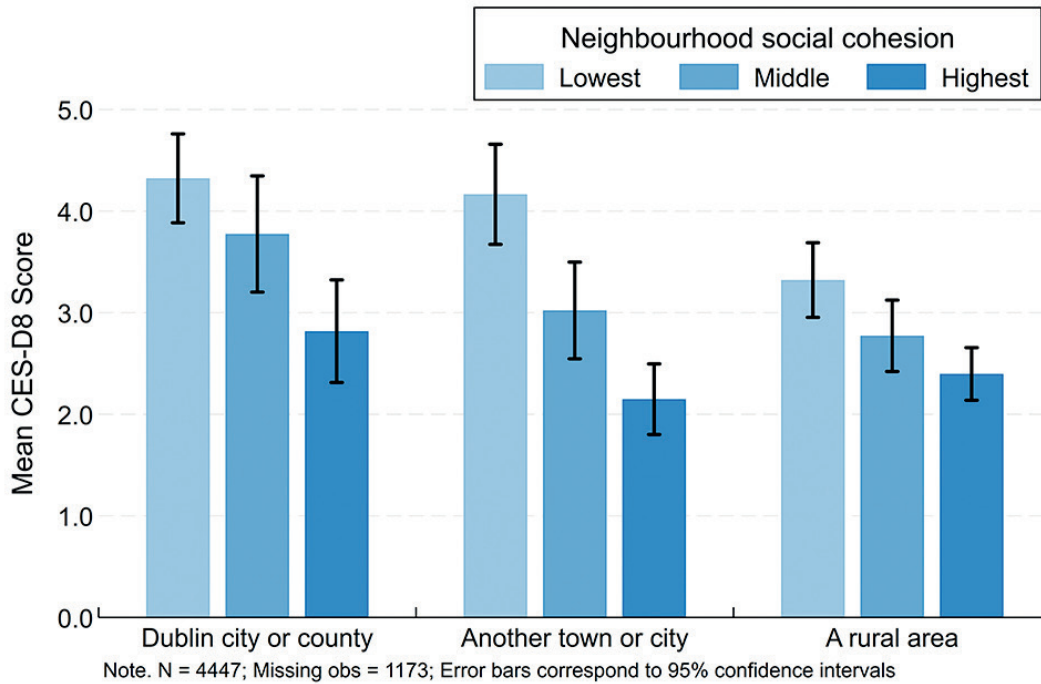


#### 5.5.4 Neighbourhood social cohesion and depressive symptoms

Depressive symptoms were measured with the 8-item short form Centre for Epidemiologic Studies Depression (CES-D8) scale (18). The data were scored and summed to create a scale of 0-24, with a higher score indicating more depressive symptoms experienced within the week prior to the participant's interview. The average CES-D8 score for adults in Ireland at Wave 4 was 3.2.

Average CES-D8 scores varied by location, and tended to be higher in city locations than rural areas (Figure 5.4). Scores were highest in areas of low neighbourhood social cohesion within Dublin city or county (3.9) and lowest in areas of high neighbourhood social cohesion in another town or city (2.4) (Figure 5.3).

Figure 5.4: Mean depressive symptoms score (CES-D8) by neighbourhood social cohesion tertiles and location.

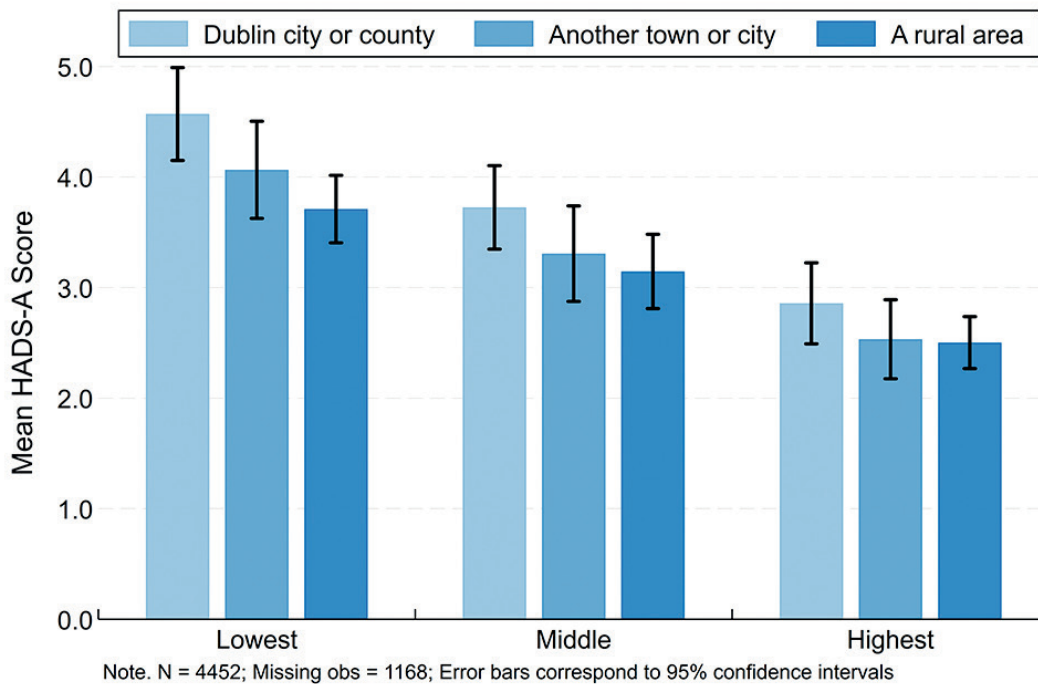


### 5.5.5 Neighbourhood social cohesion and anxiety

Symptoms of anxiety were assessed with the 8-item anxiety subscale of the Hospital Anxiety and Depression Scale: Anxiety Subscale (HADS-A) (20). Results of each statement were scored and summed to create a scale of 0-21. The average score for adults in Ireland at Wave 4 was 3.4.

A similar trend can be seen with HADS-A scores as CES-D8 scores, with scores varying by location. Adults residing in Dublin city or county experiencing the lowest social cohesion had the highest average scores on the HADS-A at 4.6 (Figure 5.4).

Figure 5.5: Mean anxiety symptoms (HADS-A) by neighbourhood social cohesion tertiles and location.



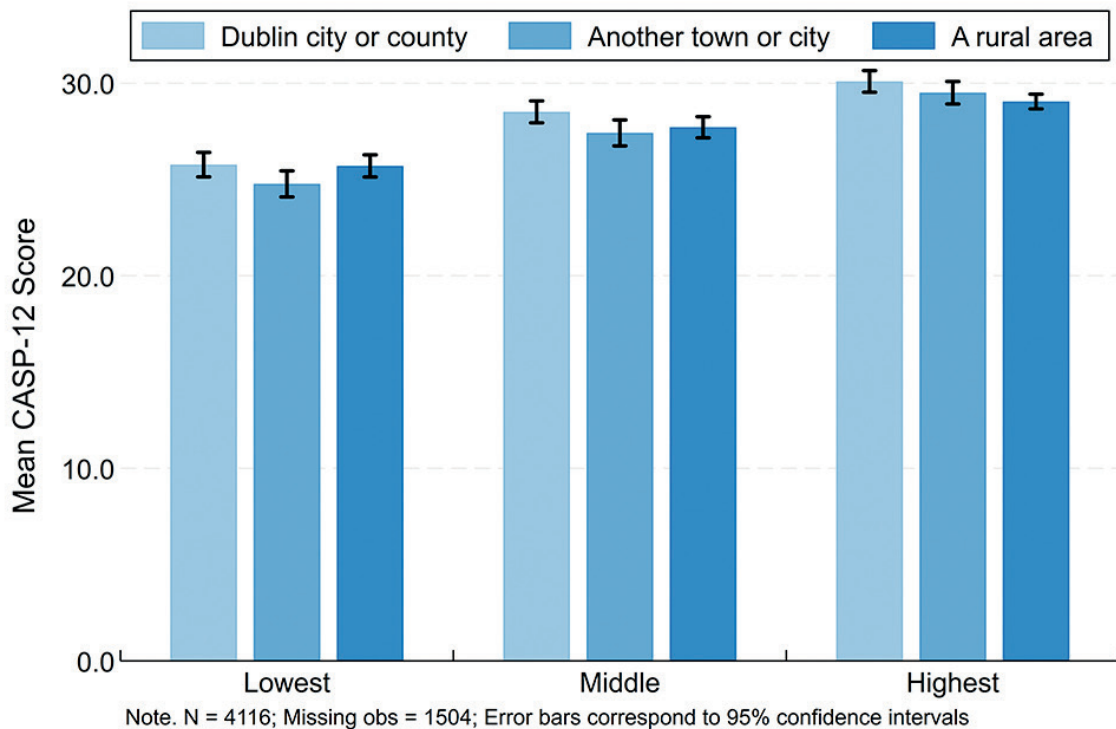
### 5.5.6 Neighbourhood social cohesion and quality of life

Quality of life is assessed in TILDA using the 12-item self-report Control, Autonomy, Self-realisation and Pleasure Scale (CASP-12) scale (21, 22). This scale assesses four different domains of life quality; Control (the ability to participate in one's environment), Autonomy (freedom from the unwanted interference of others), Self-realisation (the fulfilment of one's potential) and Pleasure (happiness or enjoyment derived from engaging with life). Each item is scored from 0-3 and summed to give an overall score from 0-36, with higher scores indicating better quality of life. The average CASP-12 score for adults in Ireland at Wave 4 was 27.4.

Average CASP-12 scores increased in line with level of neighbourhood social cohesion. Participants reporting low neighbourhood social cohesion had an average quality of life score of 25.2, rising to 27.9 for those in the middle tertile of neighbourhood social cohesion, to 29.3 in the highest tertile of neighbourhood social cohesion.

Participants living in another town or city experiencing low neighbourhood social cohesion reported the lowest quality of life scores (24.8). Highest quality of life scores was reported by participants experiencing high neighbourhood social cohesion living in Dublin city or county (30.1) (Figure 5.5).

Figure 5.6: Mean quality of life score (CASP-12) by neighbourhood social cohesion tertiles and location.



## 5.6 Conclusions

This Chapter analysed the living conditions of community-dwelling adults aged 56 years and over in Ireland in 2016. The current characteristics of homes in Ireland were explored in order to learn more about the effect that physical changes in the home have on the mental and physical health of our older population. The results have highlighted that problematic housing conditions remain an issue. Additionally, variation in neighbourhood social cohesion was found amongst TILDA participants with a potential impact on social integration, self-rated and mental health, reinforcing the issue that housing and living conditions need to be a key policy area to provide a healthy and happy ageing experience in Ireland.

Reported difficulties with heating have decreased compared to previous waves of TILDA, possibly a reflection of increased uptake and spending on schemes targeting energy and heating or increased uptake of the government fuel allowance scheme as the sample ages. Almost half of adults aged 56 and over reported problems with damp, mould or moisture (46.4%) (Table 5.5). The *Warmth and Wellbeing* scheme seeks to address these problematic housing conditions, with a view to improving overall health, ease the symptoms of respiratory diseases and reduce the reliance on medications and health services (7). Ireland reports mortality rates 40.3% higher than the EU28 average for respiratory diseases (23), a condition further exacerbated by damp conditions.

The results show that homes constructed prior to 1971 and those which belonged to adults who reported poorer self-rated health and disability are more likely to have been modified to make them more suitable for living in, reflecting the increased needs of these groups. The *Better Energy Homes* scheme targets homes constructed prior to a certain date with a view to improving energy usage in homes, while the *Mobility Aids Grant* scheme and the *Housing Aid for Older People* scheme provide financial assistance for older adults requiring home improvements. As our population experiences a shift in the ageing demographic and care needs increase, the demand for suitable housing grows. It is important for individuals to reside somewhere suitable for their requirements. Delayed hospital discharges can be experienced where suitable accommodation is not available for the patient.

The report on housing conditions using TILDA data in 2012 recommended policy initiatives to target improvements in heating and housing quality (4). In Wave 4, a lower proportion of people reported difficulty in heating the home.

Adults aged 56 or more who report lower neighbourhood social cohesion report worse self-rated health, higher levels of depressive and anxiety symptoms, and lower quality of life. However, social integration is shown to have a positive impact on perceptions of neighbourhood social cohesion, suggesting that the goals set out by the *National Positive Ageing Strategy* to improve social participation in older people should have a positive impact on their physical and mental well-being. In 2011, participants of the study *Loneliness and Social Isolation Among Older Irish People* reported that one coping mechanism for feelings of isolation was to have a security system such as a personal alarm (11). Therefore, the *Seniors Alert* scheme may have a positive impact in reducing feelings of isolation and enhancing perceptions of safety by providing alarms to older adults.

Independent living is important for the quality of life of our older population but can only be possible where homes are suitable for the changing needs of the ageing population. It has been found that problematic housing conditions, and low neighbourhood social cohesion are significant issues for many community-dwelling adults aged 56 and over in Ireland. The reduction in reported heating difficulties shows that these problems can be resolved and this can be positively impacted by intervention schemes and initiatives to improve housing conditions and energy efficiency. Future waves of TILDA will allow reported problems to be monitored over the coming years, in addition to tracking the impact of new schemes and the expansion of already established schemes.

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# 6

## Change in chronic disease prevalence and health behaviours over the first four waves of TILDA

*Triona McNicholas and Eamon Laird*

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# 6

## Change in chronic disease prevalence and health behaviours over the first four waves of TILDA

### Key findings

- From Wave 1 to Wave 4, there was a decrease in the proportion of people aged 50-64 years (21% to 16%) and 65-74 years (23% to 16%) who rated their health as fair or poor. Social engagement had a positive impact on self-rated health.
- In terms of cardiovascular disease, there was an increased prevalence of hypertension (35% to 38%), diabetes (8% to 11%), heart attack (4% to 6%), stroke (1% to 2%), and transient ischaemic attack (2% to 4%) between Waves 1 and 4.
- In terms of non-cardiovascular disease, there was an increased prevalence of arthritis (26% to 39%), osteoporosis (9% to 17%), cataracts (9% to 14%) and lung disease (4% to 5%) from Wave 1 to 4.
- Pain affected 1 in 3 people aged 50 and over, and this was consistent at all waves.
- The number of people who reported recurrent falling in the last year increased from Wave 1 to Wave 4 (7% to 9%).
- The proportion of women aged 50-64 years who reported current smoking decreased between Waves 1 and 4 (24% to 17%).
- Problematic alcohol use was more prevalent in men than women (15% versus 9% at Wave 4).
- A large proportion (45%) of adults aged 50 and over walked less than the recommended 150 minutes per week across all four waves. This was particularly evident in those aged 75 and older compared to those aged 50-64 years (63% versus 42% at Wave 4).

## 6.1 Introduction

With increasing age, there is an increasing burden of chronic disease, and a subsequent demand on our health services. This has been demonstrated in many studies worldwide (1). The opportunities and challenges associated with population ageing have been addressed in Ireland's health reform policy "*Healthy Ireland – A Framework for Improved Health and Well-being 2013-2025*" (2) and in "*The National Positive Ageing Strategy*"(3), which aims to increase the proportion of people who are healthy at all stages of life; to improve or manage their physical health, mental health and well-being; and to use an evidence-based approach to better inform policy responses to population ageing. Data collected by The Irish Longitudinal Study on Ageing (TILDA), including information on chronic health conditions and health behaviours can help to inform policy and achieve these Government objectives.

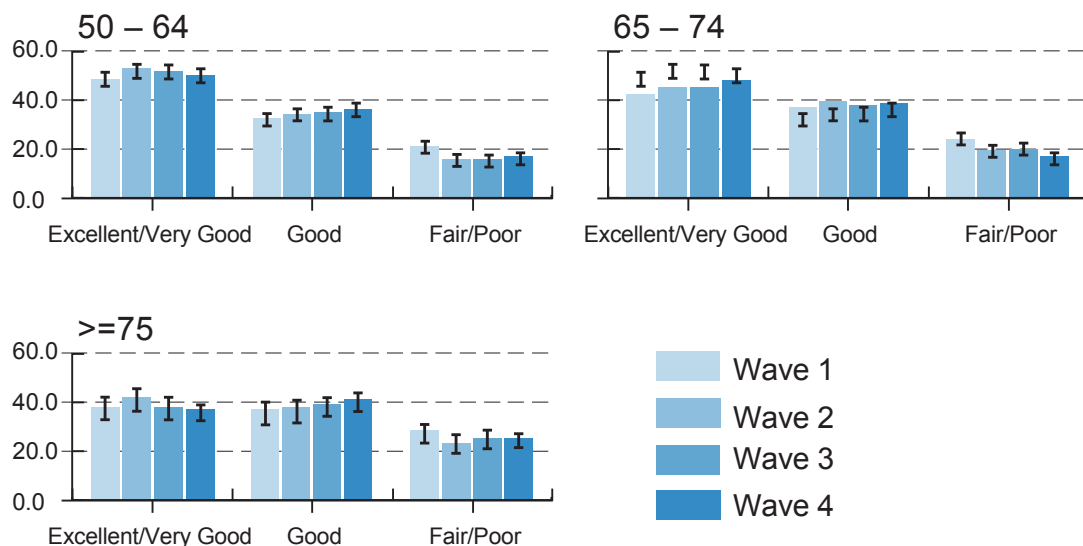
In this Chapter, we present self-rated health, the prevalence and incidence of chronic health conditions (cardiovascular and non-cardiovascular), falls and fractures as well as indicators of behavioural health (smoking, alcohol intake and walking) across four waves of data collection. Prevalence refers to the cumulative proportion of people who report ever having a condition at each wave. Incidence refers to the proportion of new cases at each wave, which had not been reported by the participants in previous waves. For example, incident cases at Wave 3 refers to the proportion of new cases reported by participants at Wave 3, not already self-reported at Waves 1 and 2.

As part of the TILDA data collection, participants completed a computer-assisted personal interview (CAPI) at each wave. This is carried out by trained interviewers in the participant's home. They were also invited to complete a self-completion questionnaire (SCQ), in their own time, which they then returned by post to the TILDA centre. Data obtained during the CAPI and SCQ at each of the first four waves of TILDA are presented in this Chapter. To facilitate an accurate comparison between Waves 1 to 4, only adults who completed a self-interview at all four waves are included in the analysis (n=5,200). The majority of measures presented in this Chapter were obtained in the CAPI, with the exception of alcohol intake which was obtained from the SCQ. 4,557 of the participants included in this analysis completed an SCQ at Wave 4, while 3,961 participants completed the SCQ at all four waves. Where participants are separated into age groups, it is age at the reported wave that is used to categorise participants. All reported data are weighted to account for probability of selection, survey non-response and attrition.

## 6.2 Self-rated health

Poor self-rated health has consistently been associated with increased morbidity and mortality (4). Over the last decade, older adults in Ireland have had higher levels of self-rated health compared to their EU counterparts (5). In TILDA, self-rated health is measured in the CAPI, by asking participants to rate their health as Excellent, Very Good, Good, Fair, or Poor. Figure 6.1 illustrates responses to this at each of the four waves. Despite the burden of increasing age and chronic disease, over 40% of participants under 75 years rated their health as Excellent or Very Good at all four waves, while just under 40% of those aged 75 and over rated their health as Excellent or Very Good. This was coupled with a decline in those who rated their health as Fair or Poor (Appendix Table 6.1).

Figure 6.1: Self-rated health across waves by age group.



Note. N = 5200; Error bars correspond to 95% confidence in intervals

Next we examined the impact of social engagement on self-rated health. In the CAPI, participants were asked “Do you participate in any groups such as a sports or social group or club, a church connected group, a self-help or charitable body or other community group or a day care centre?” At Wave 4, 53% of people participated in such groups and these people had better self-rated health than those who didn’t participate (Figure 6.2). Similarly, the 23% of people who reported that they volunteered (Figure 6.3) and the six percent of people who reported that they cared for others (Figure 6.4) also had better self-rated health.

Figure 6.2: Self-rated health by participation in social clubs, church groups, charitable bodies or other community groups at Wave 4.

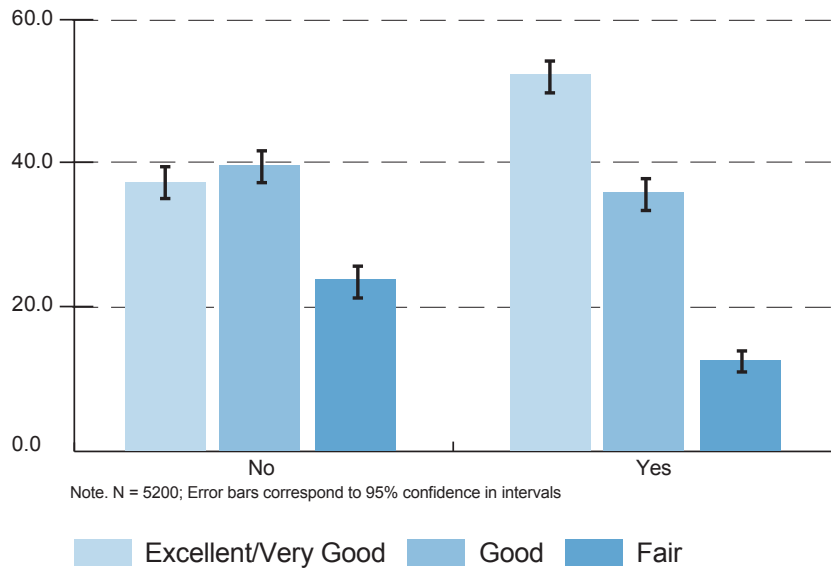


Figure 6.3: Self-rated health by volunteering status at Wave 4.

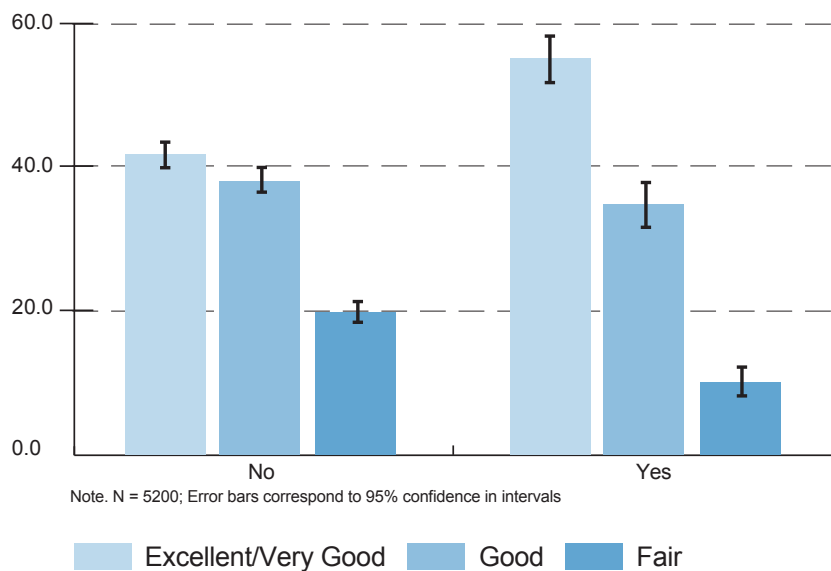
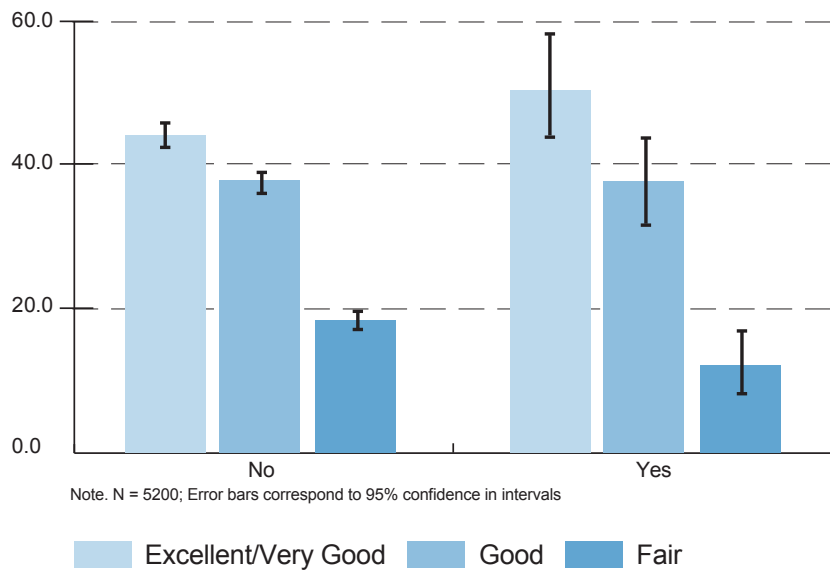


Figure 6.4: Self-rated health by caring status at Wave 4.



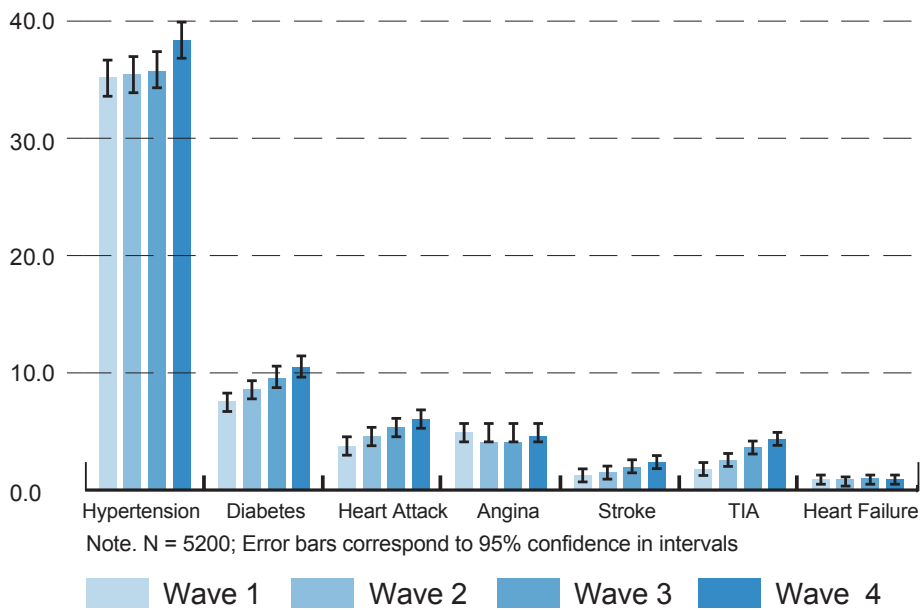
## 6.3 Chronic Disease

### 6.3.1 Prevalence of cardiovascular conditions at Waves 1 to 4

Despite substantial progress in the reduction of age-standardised death rates (weighted averages of the age-specific rates) from cardiovascular disease (3), it remains the most common cause of death in Ireland. Many modifiable risk factors (e.g. smoking, obesity and physical inactivity) play a role in increasing cardiovascular risk, therefore a concerted effort is required to improve health behaviours and reduce the occurrence of cardiovascular disease. As part of the CAPI, participants were asked to self-report a doctor's diagnosis of hypertension, diabetes, heart attack, angina, stroke, transient ischaemic attack (TIA) and heart failure. The results are displayed in Figure 6.5. There was an overall increase in the prevalence of hypertension (35% to 38%), diabetes (8% to 11%), heart attacks (4% to 6%), strokes (1% to 2%) and TIAs (2% to 4%) between Waves 1 and Wave 4. The increase in diabetes and heart attack in particular, was most evident in men (Appendix Table 6.2). As reported previously, the older age group ( $\geq 75$  years) reported a higher prevalence of cardiovascular conditions than the youngest age group (50-64 years) throughout the waves (Appendix Table 6.3).



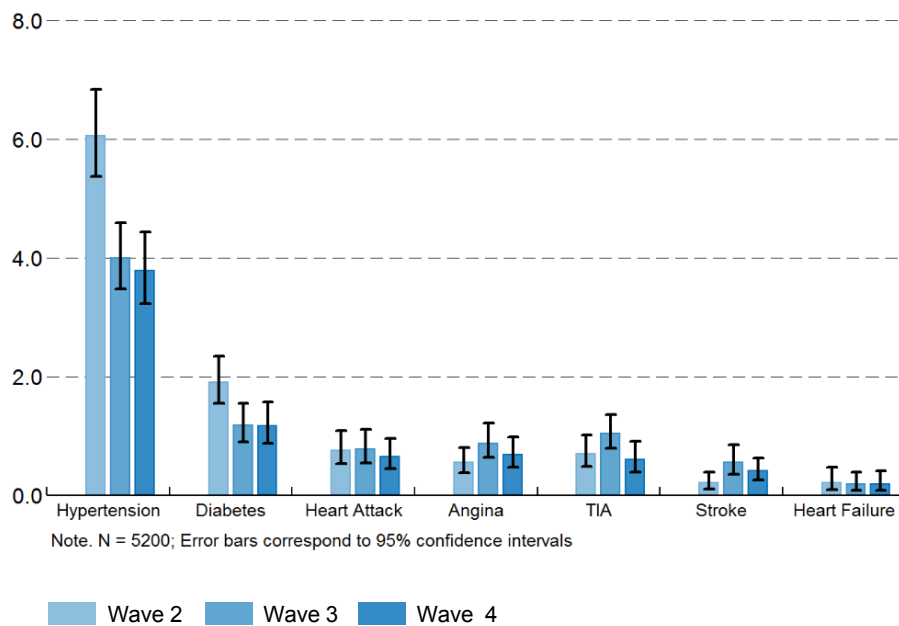
Figure 6.5: Prevalence of cardiovascular conditions from Waves 1 to 4.



### 6.3.2 Incident cardiovascular conditions at Waves 2, 3 and 4

Incident cases of cardiovascular disease, i.e. a condition reported by the participant at the current wave, but not in any of the previous waves, is presented in Figure 6.6. While prevalence increased, there was a decline in incident cases of hypertension (6% to 4%) and diabetes (2% to 1%) after Wave 2. Higher incident cases of hypertension at Wave 2 may have been due to feedback received after the Wave 1 health centre assessment, which prompted participants to seek advice from their GP. The proportion of new cases at Waves 3 and 4 were stable.

Figure 6.6: Incidence of newly reported cardiovascular conditions at Waves 2, 3 and 4.

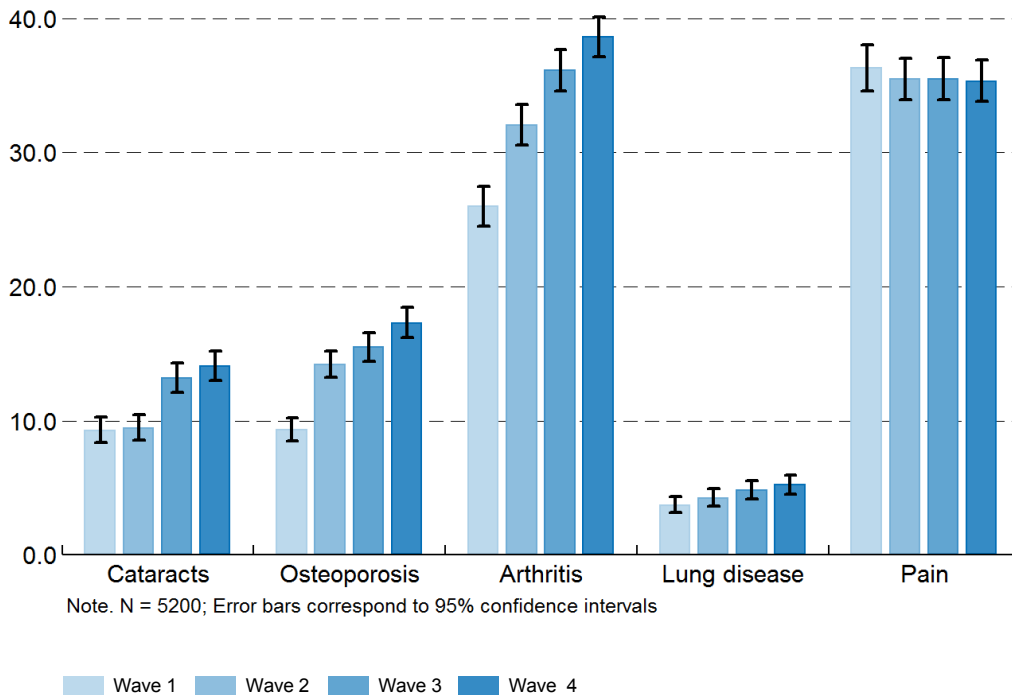


### 6.3.3 Prevalence of non-cardiovascular conditions at Waves 1 to 4

Non-cardiovascular conditions such as osteoporosis and cataracts are associated with increased morbidity, decreased quality of life, and increased mortality (6). Osteoporosis is an increasingly common, chronic condition estimated to affect over 200 million individuals worldwide (7) and has been estimated to cause over 8.9 million fractures annually. Osteoporotic fractures account for 0.8% of the global burden of non-communicable disease and the annual loss of over 5.8 million disability-adjusted life years (DALYs) (8). Cataracts are one of the most common causes of vision loss in people over age 40 and are the principal cause of blindness in the world. The global prevalence of cataract in adults >50 years is estimated at 47.8% while it is 19.3% within Europe (9). According to a recent survey by the Association of Optometrists, the average wait for cataract surgery in Ireland is 28 months but up to five years in some areas (Association of Optometrists Ireland, 2018 Children's Eye-Care & Cataract Services Report).

During the CAPI, participants were asked if they had ever received a doctor's diagnosis of cataracts, osteoporosis, arthritis or lung disease and whether they were often troubled by pain. From Wave 1 to Wave 4, there was an increased prevalence of cataracts (9% to 14%), osteoporosis (9% to 17%), arthritis (26% to 39%) and lung disease (4% to 5%) (Figure 6.7).

Figure 6.7: Prevalence of non-cardiovascular conditions across the four waves.

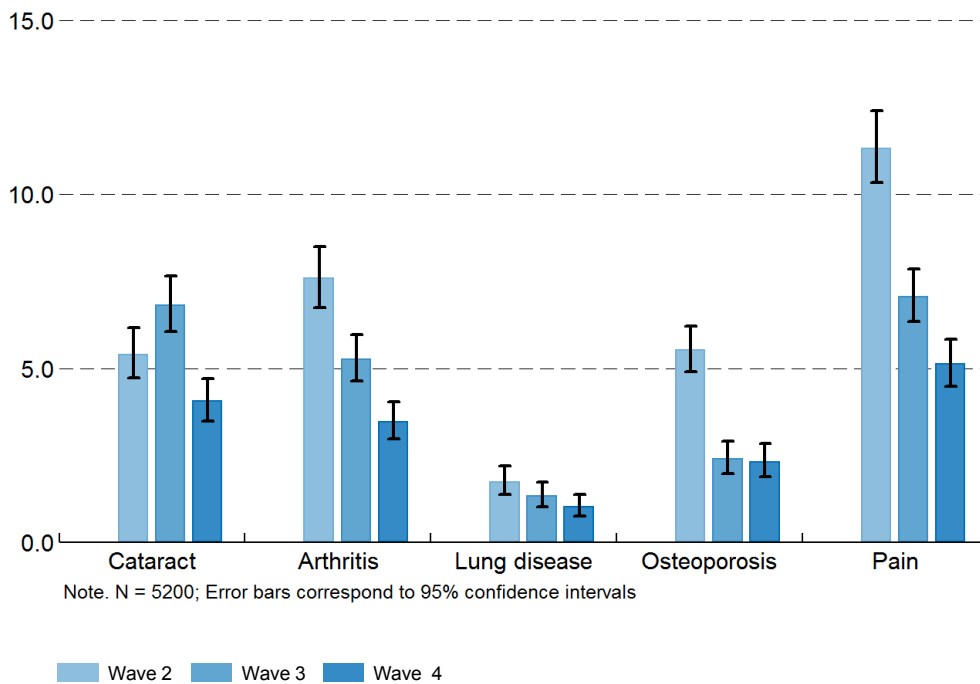


Older women (age  $\geq 75$ ) reported the highest burden of both osteoporosis and arthritis, with an increased level across all four waves (Appendix Tables 6.4, 6.5, and 6.6). This could potentially increase the risk of disability and reduced physical activity in older women in Ireland. Cataracts were common, particularly in the older age group (age  $\geq 75$ ), however it was within women aged 50-64 years that there was an increased prevalence of the condition between Waves 1 and 4 (Appendix Tables 6.4 and 6.6). At Wave 1, 38% of participants reported that they were often troubled by pain and this was consistent across all subsequent waves (Figure 6.7). Again, this could potentially increase the risk of disability and reduced physical activity in this group.

#### 6.3.4 Incidence of non-cardiovascular conditions at Waves 2, 3 and 4

Incident new non-cardiovascular disease cases at Waves 2 to 4 are presented in Figure 6.8. Despite an increased prevalence across the waves, the proportion of incident cataracts, arthritis, osteoporosis and pain decreased from Wave 2 to Wave 4. In the case of osteoporosis, this may have been due to feedback on bone density (from the heel ultrasound test) provided to the participants after the Wave 1 health centre assessment.

Figure 6.8: Incident non-cardiovascular conditions at Waves 2, 3 and 4.

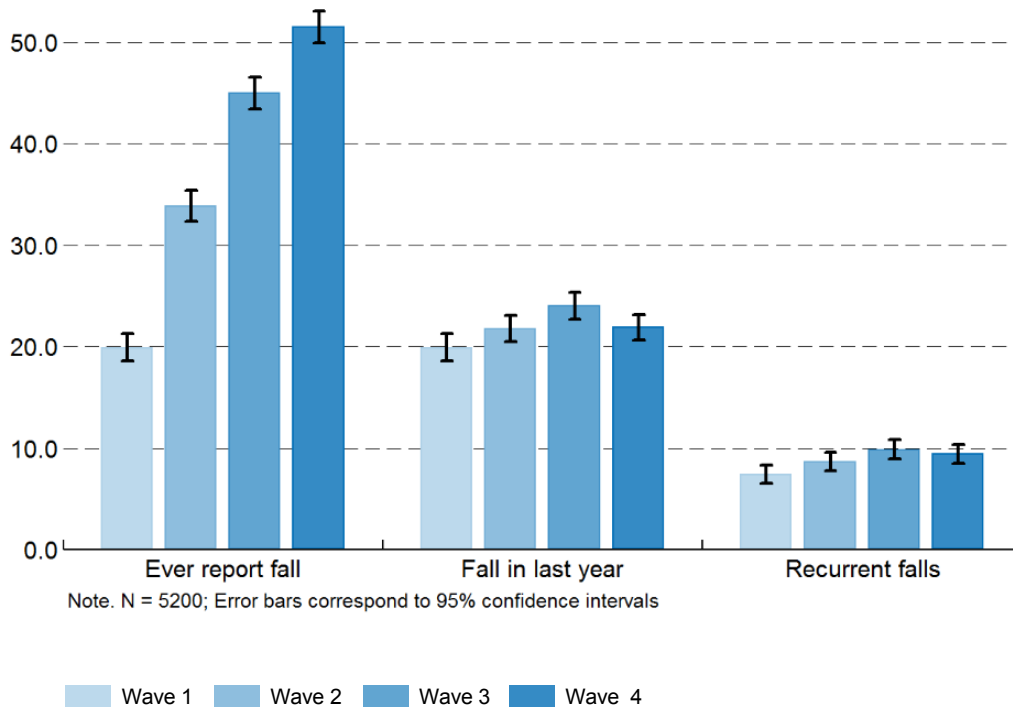


## 6.4. Falls and fractures

Falls are the dominant cause of injuries among older adults, and are linked to poorer overall function and early admission to institutional care facilities (10). One in three adults over the age of 65 falls each year (11), with a single fall significantly increasing the risk of subsequent falls (12). An Economic Burden of Illness Study estimated that fall-related injuries in older people cost €402 million to the Irish economy in 2006 and would increase to €922-1077 by 2020 in the absence of a National Fall and Fracture Prevention Strategy being implemented (13). Hip fracture is the most common disabling injury in older adults, and can cause accidental death. Research has shown a 5-10% mortality rate after one month, rising to 30% after one year (14), with only 40-60% of surviving patients regaining their pre-fracture level of mobility (15).

Participants were asked a number of questions pertaining to falls history in the CAPI at each wave the proportion of people who ever reported falling, that is they reported falling at any of the waves up to Wave 4; the proportion of those who reported a fall in the last year prior to interview; and the proportion of those who reported recurrent falls in the last year at each wave. The prevalence of those who ever reported a fall cumulatively up to the reported wave increased from 20% to 52% between Waves 1 and 4. The number of people who reported recurrent falling also increased from 7% to 9%. The proportion of people who reported falling in the year prior to interview, rose from Wave 1 to Wave 3, however we did not see an increase at Wave 4.

Figure 6.9: Proportion of sample who reported a fall – ever, in the last year or recurrent - from Wave 1 to Wave 4.



## 6.5 Behavioural health

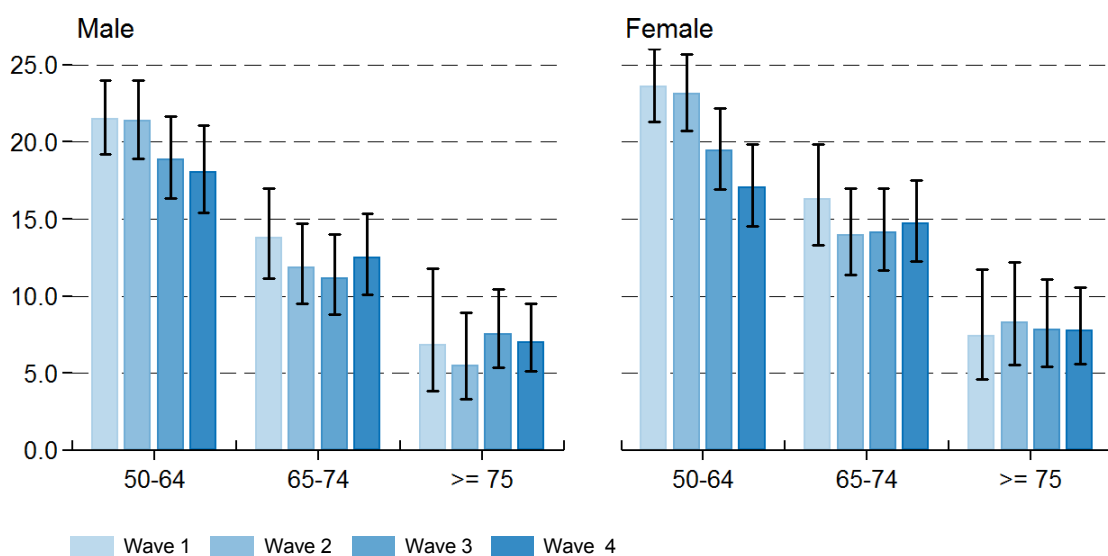
The prevalence of chronic disease, including cardiovascular disease, has increased in older adults in Ireland since Wave 1 data collection in 2009-2011. Behavioural health refers to the modifiable risk factors, such as smoking, alcohol and physical inactivity that can negatively influence health and contribute to chronic disease. In this section, smoking habits, alcohol intake, problem drinking, and time spent walking are examined in order to identify any change in behavioural health patterns across the four waves.

### 6.5.1 Smoking

Smoking is a well-known risk factor for a variety of conditions, in particular, cardiovascular and lung disease. It also plays a role in other non-life-threatening chronic conditions such as cataracts and osteoporosis (16). The “*Tobacco Free Ireland*” policy (17) introduced in 2013, aims to reduce the prevalence and initiation of smoking. It included a piece on developing legislation for the introduction of standardised/plain packaging, which was implemented in the *Public Health (Standardised Packaging of Tobacco) Act 2015* and the EU Tobacco Products Directive.

Smoking status was assessed at each wave using questions in the CAPI. Participants were categorised as non-smokers, past smokers, or current smokers. There was an overall decrease in the proportion of current smokers across all four waves (19% to 13%), which is described in Appendix Table 6.7. This decrease was primarily driven by younger women (age 50-64 years), with a decrease from 24% at Wave 1 to 17% at Wave 4 (Figure 6.10). The lowest proportion of current smokers was in the oldest age group (7% of  $\geq 75$  vs 21% of 50-64 year olds). There was a very low number of new smokers, with only 12 people who were non-smokers at Wave 1 having commenced smoking during the subsequent three waves.

Figure 6.10: Proportion of current smokers from Waves 1 to 4, by sex and age group.



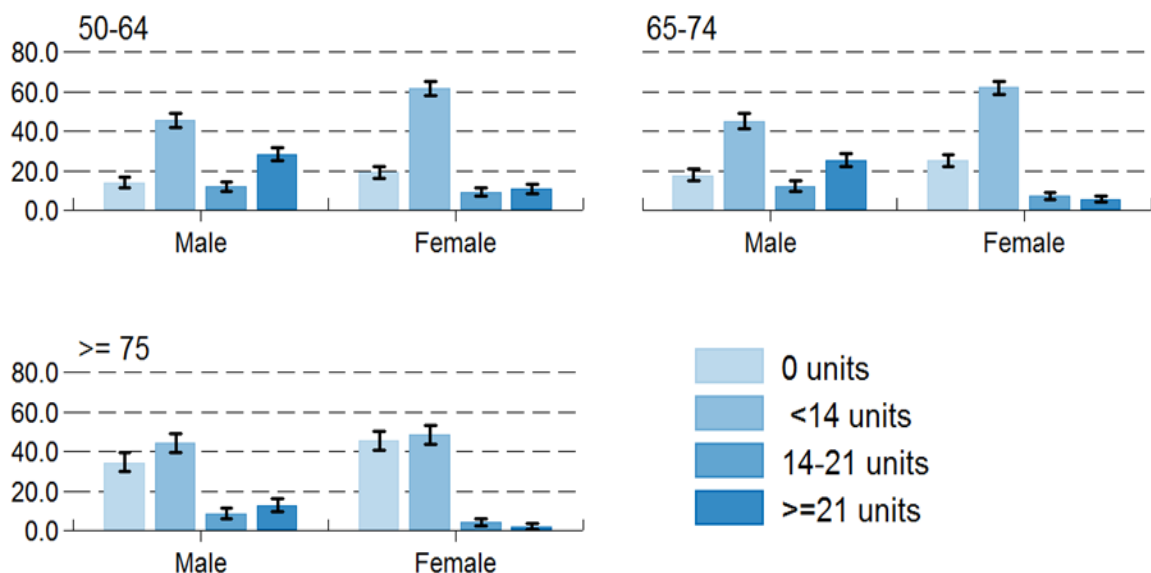
Note. N = 5159; Error bars correspond to 95% confidence in intervals

### 6.5.2 Alcohol

Alcohol is responsible for a wide range of health and social harms in society and places a significant burden on the resources of the state when dealing with the consequences of its misuse (18). The World Health Organisation reports that the harmful use of alcohol is a causal factor for more than 200 diseases and injury conditions, and can cause death and disability relatively early in life (19). Recently, a new Lancet report stated that contrary to popular beliefs, no amount of alcohol is safe as the risks of cancer and other illnesses outweigh potential benefits (20).

In TILDA, alcohol consumption levels were assessed in the SCQ. At Wave 4, participants were asked if they drink alcohol, what drink they typically consumed, how often they drank alcohol and how much they drank in an average sitting. They were also asked whether they had attempted to cut down their alcohol intake. This information was used to calculate the number of units of alcohol intake per week. At Wave 4, 14% of participants who completed the SCQ questions on alcohol (total n=4,454) reported that they had never consumed alcohol, while 33% reported that they had attempted to cut down their alcohol intake in the last 2 years. Levels of alcohol consumption were higher in men than women at all age groups, while the actual levels of consumption decreased with age (Figure 6.11). It is notable that over 40% of women over the age of 75 drank no alcohol.

Figure 6.11: Prevalence of alcohol intake per week at Wave 4, by age group and sex.

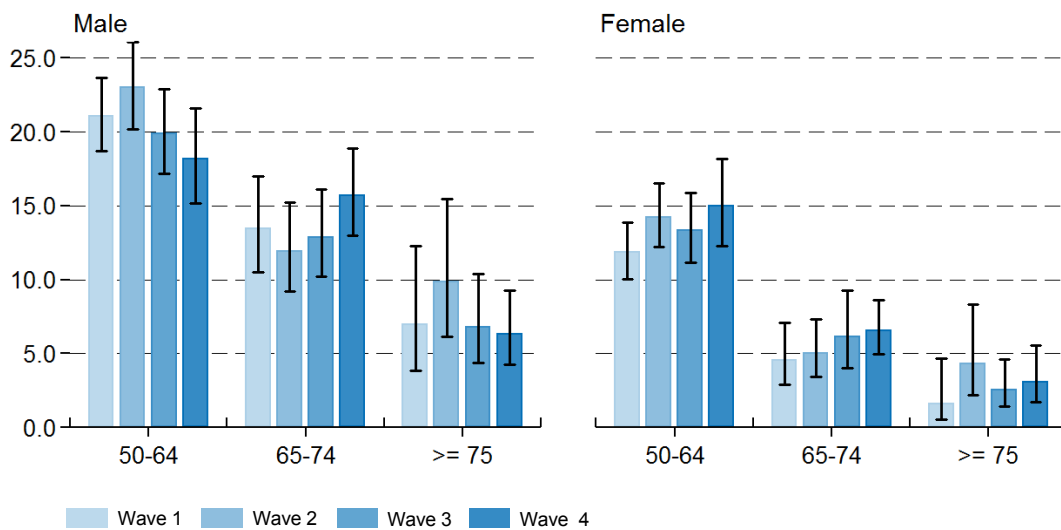


Note. N = 4454; Error bars correspond to 95% confidence intervals

To assess for harmful drinking patterns, participants were asked about their drinking habits using the “Cut down, Annoyed, Guilty, Eye-opener” (CAGE) questionnaire (21), a screening tool for problematic drinking. Questions in the CAGE questionnaire included ‘Have you ever felt you should cut down on your drinking’, ‘Have people annoyed you by criticizing your drinking?’, ‘Have you ever felt bad or guilty about your drinking?’, ‘Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener)?’ A CAGE score of  $\geq 2$  indicated problem alcohol use.

Figure 6.12 demonstrates the proportion of men and women aged 50 and over in Ireland who reported problematic alcohol use based on the CAGE questionnaire from Waves 1 to 4. Further breakdown of these results can be found in Appendix Table 6.8. Problematic alcohol use was more prevalent in men than women (15% versus 9% at Wave 4) and decreased with age in both genders (Figure 6.13). There was no significant change in the prevalence of alcohol misuse from Wave 1 to Wave 4 (13% to 12%).

Figure 6.12: Prevalence of problematic alcohol use from Waves 1 to 4, by sex and age group.



Note. N = 3826; Error bars correspond to 95% confidence in intervals

### 6.5.3 Physical Activity

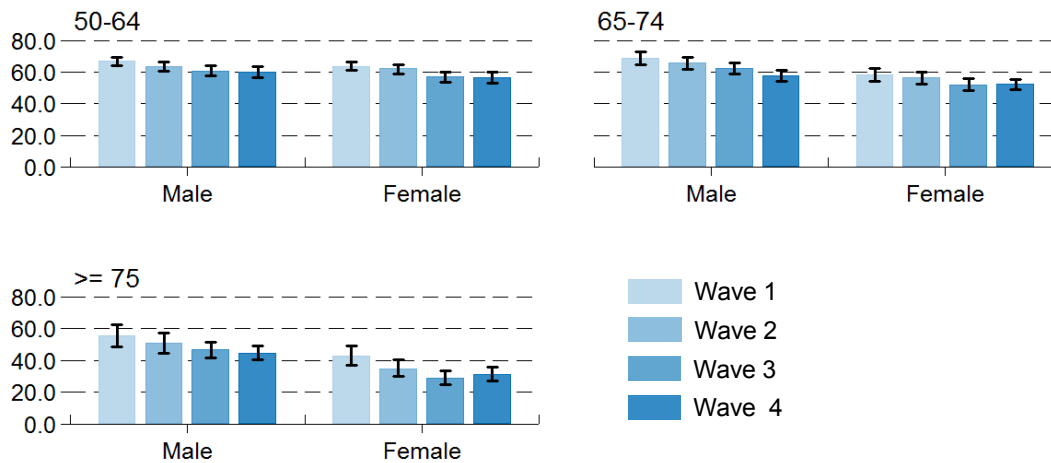
There is comprehensive evidence that moderate levels of physical activity can help prevent disease, improve quality of life and promote physical and mental health (21). Physical inactivity is recognised by the World Health Organisation as the fourth leading risk factor for global mortality. The *National Guidelines on Physical Activity for Ireland* recommend that all adults take part in at least 150 minutes of moderate activity per week (22). Walking is the most common and accessible activity for older adults and brisk walking for 150 minutes per week is also sufficient to meet the physical activity guidelines.

During the CAPI, participants were asked how many days they walked for at least 10 minutes at a time in the last week and on these days, how many minutes did they spend walking. These results were then used to determine whether participants were meeting the recommended 150 minutes per week. Overall, a large proportion of the TILDA sample (48% at Wave 4) did not walk at least 150 minutes per week. This observation was most



notable in adults aged 75 and older – 63% versus 42% of 50-64 year olds at Wave 4 (Figure 6.14 and Appendix Table 6.8). While women aged 75 and older were less likely to walk at least 150 minutes compared to men (31% versus 45% at Wave 4, Figure 6.13), there was no gender difference in the younger age groups (Figure 6.13).

Figure 6.13: Proportion of older adults walking 150 minutes or more per week at each wave, by sex and age group.



Note. N = 5182; Error bars correspond to 95% confidence in intervals

## 6.6 Conclusion

There was an overall increase in the prevalence of chronic health conditions across the first four waves of TILDA (average follow-up 6 years). Only participants who were present at all four waves were included in the analysis and they were asked if they have ever suffered from each condition. However, there was a decrease in the number of new cases of certain conditions such as hypertension, cataracts and osteoporosis. The notable increase at Wave 2 may have been augmented, due to feedback on blood pressure and bone density received at the Wave 1 health assessment which may have prompted participants to seek further assessment from their GP.

The most prevalent conditions among adults aged 50 years and over in Ireland were hypertension (38% at Wave 4), arthritis (39% at Wave 4) and pain (35% at Wave 4), each being equivalent to almost half a million adults. Awareness of the proportion of adults with conditions such as hypertension is important, given its association with multiple cardiovascular conditions such as ischaemic heart disease and stroke. Arthritis and pain are commonly disabling for older adults, and awareness of the increasing burden is relevant for planning of care needs in the future, as well as highlighting the need for improving treatment and pain management in these individuals.

Notably, there was an increase in the proportion of participants who reported falling in the last year between Waves 1 and 3. There was no further increase in falls from Wave 3 to Wave 4 which may reflect an increased awareness following a number of public health reports addressing the issue of falls, including reports from TILDA (23). However, falls remain an important public health issue – by Wave 4, 52% of TILDA participants reported at least one fall, equivalent to 660,000 adults in Ireland of this age.

Despite the increased prevalence of chronic conditions, the proportion of adults under 75 years of age who rated their health as Fair or Poor decreased from Wave 1 to Wave 4, however this was not as evident in the 75 and older age group. This may reflect the increased burden of chronic disease in this age group. Social participation, volunteering and caring were associated with the highest levels of self-rated health at Wave 4. Therefore, encouraging social participation amongst older adults may help improve levels of self-rated health.

Encouragingly, there were some improvements evident in health behaviours across the waves. Most notably there was a reduction in the proportion of current smokers (driven largely by females aged 50-64 years), and very low numbers commenced smoking for the first time. Ireland has been progressive in introducing measures to try to reduce smoking, in particular being the first country to introduce a workplace smoking ban. The reduction in smoking could also be due to the 56% increase in the price of cigarettes between Wave 1 and Wave 4. There was no significant change in levels of problem alcohol use, suggesting more public health strategies are required to target this issue. The new *Public Alcohol Bill (2018)* has been officially signed into law and legislates that all alcohol products will now have to feature health warnings including the link between alcohol and cancers. Additionally, new measures such as minimum unit pricing and restrictions on how alcohol is displayed in shops are also forthcoming. The effectiveness of this legislation in reducing alcohol consumption can be examined in future waves of TILDA.

Of concern is the observation that there was an increased proportion of adults aged 50 and over who walked for less than the recommended 150 minutes per week at Wave 4 (48%) compared to Wave 1 (38%). Despite multiple policy initiatives to support increased physical activity, a low proportion of the oldest group ( $\geq 75$  years old) walked at least 150 minutes per week (37% at Wave 4). An increased focus on this specific group is needed to support them in achieving adequate activity levels.

It is important to note that the data presented in this Chapter were based on self-reported information, however a major benefit is that we presented information on health and health behaviours in adults in Ireland across multiple time points. It is envisaged that the longitudinal nature of this data will be a useful resource in health policy and planning for older adults particularly in regards to planning resources for chronic disease and positive behavioural health initiatives.

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# Appendices

Table 6.1: Self-rated health at Waves 1 to 4, by age group.

	Cataracts (%)	Osteoporosis (%)	Arthritis (%)	Lung Disease (%)	Wrist Fracture (%)	Hip Fracture (%)	Pain (%)	(95% CI)	Ever reported a fall (%)	Recurrent Falls	(95% CI)	(95% CI)
<b>50-64</b>												
Wave 1	3 (2.1-4.2)	1 (0.6-1.7)	15.5 (13.4-17.8)	2.9 (2.1-4.1)	13.9 (12.0-16.1)	2.6 (1.7-3.8)	33.6 (30.8-36.6)	17.7 (15.6-20.0)	7.6 (6.2-9.3)			
Wave 2	2.5 (1.7-3.6)	2.6 (1.8-3.7)	19.1 (16.8-21.7)	2.8 (1.9-4.1)	15.4 (13.3-17.8)	2.5 (1.6-3.8)	30.8 (28.1-33.7)	27.2 (24.6-30.1)	7 (5.6-8.8)			
Wave 3	4.4 (3.2-6.0)	3.2 (2.2-4.6)	20.6 (18.0-23.4)	3.2 (2.2-4.8)	16.1 (13.8-18.7)	2.3 (1.4-3.6)	30.1 (27.1-33.1)	35.4 (32.4-38.6)	7.1 (5.6-9.0)			
Wave 4	4.3 (3.0-6.2)	4.5 (3.1-6.4)	22.4 (19.5-25.6)	3.5 (2.3-5.5)	17.4 (14.8-20.4)	2.1 (1.2-3.5)	31.5 (28.1-35.2)	39.3 (35.8-42.8)	5.8 (4.2-7.8)			
<b>Total</b>	<b>3.4 (2.6-4.5)</b>	<b>2.6 (1.9-3.5)</b>	<b>18.9 (16.8-21.2)</b>	<b>3.1 (2.2-4.2)</b>	<b>15.5 (13.4-17.8)</b>	<b>2.4 (1.6-3.5)</b>	<b>31.7 (29.4-33.9)</b>	<b>28.4 (26.1-30.8)</b>	<b>7 (5.9-8.2)</b>			
<b>65-74</b>												
Wave 1	8.6 (6.7-11.1)	2 (1.1-3.5)	27.1 (23.5-31.1)	3.8 (2.4-6.0)	10.2 (8.0-13.0)	3.5 (2.2-5.3)	26.7 (23.2-30.5)	18.4 (15.4-22.0)	7.1 (5.3-9.4)			
Wave 2	9.3 (7.2-12.0)	4 (2.8-5.7)	29.8 (26.4-33.4)	3.6 (2.4-5.5)	10.8 (8.6-13.5)	3.7 (2.4-5.6)	27.8 (24.6-31.3)	31.6 (27.8-35.7)	10.4 (8.3-12.9)			
Wave 3	10.6 (8.6-13.0)	4.8 (3.5-6.6)	32.9 (29.5-36.5)	4.3 (2.9-6.2)	13 (10.5-16.1)	4.3 (2.9-6.3)	29.6 (26.3-33.2)	41.5 (37.6-45.5)	7.9 (6.2-10.1)			
Wave 4	10.2 (8.3-12.5)	5.2 (3.9-6.8)	31.7 (28.5-35.1)	4.8 (3.4-6.8)	13 (10.6-15.8)	4.1 (2.8-6.1)	29.2 (26.0-32.6)	45.1 (41.3-48.9)	8.1 (6.3-10.4)			
<b>Total</b>	<b>9.8 (8.3-11.5)</b>	<b>4.2 (3.2-5.4)</b>	<b>30.7 (28.0-33.5)</b>	<b>4.2 (3.1-5.7)</b>	<b>12 (9.9-14.3)</b>	<b>3.9 (2.8-5.6)</b>	<b>28.5 (26.1-31.0)</b>	<b>35.9 (32.9-39.0)</b>	<b>8.4 (7.1-9.8)</b>			
<b>&gt;= 75</b>												
Wave 1	28.3 (22.6-34.8)	2.6 (1.1-6.0)	30.5 (24.4-37.4)	3 (1.3-6.9)	10.3 (6.7-15.6)	4 (1.9-8.1)	28 (22.0-35.0)	23.3 (17.9-29.8)	5.8 (3.1-10.7)			
Wave 2	21.7 (17.3-26.9)	3.6 (1.9-6.5)	39.8 (34.2-45.8)	3.9 (2.1-7.2)	10.3 (7.1-14.7)	4.1 (2.3-7.3)	30.6 (25.5-36.2)	38.2 (32.7-44.0)	8 (5.3-11.9)			
Wave 3	24.8 (20.7-29.4)	4.3 (2.7-6.8)	39.1 (34.4-44.0)	4.8 (3.0-7.4)	10.7 (7.9-14.2)	5 (3.1-8.0)	29.9 (25.7-34.6)	47.3 (42.5-52.2)	10.8 (8.0-14.5)			
Wave 4	21.2 (17.8-25.1)	5.9 (4.2-8.2)	42 (37.9-46.3)	4.3 (2.8-6.4)	11.3 (8.8-14.5)	5.8 (3.9-8.5)	25.4 (21.9-29.3)	55.1 (50.7-59.3)	11 (8.4-14.3)			
<b>Total</b>	<b>23.5 (20.7-26.5)</b>	<b>4.4 (2.9-6.6)</b>	<b>38.8 (34.6-43.3)</b>	<b>4.1 (2.8-6.0)</b>	<b>10.8 (8.0-14.3)</b>	<b>4.9 (3.2-7.6)</b>	<b>28.2 (25.0-31.6)</b>	<b>44.1 (39.9-48.3)</b>	<b>9.5 (7.6-11.7)</b>			
<b>Total</b>												
Wave 1	7.3 (6.2-8.5)	1.4 (1.0-2.0)	20 (18.2-21.9)	3.1 (2.4-4.0)	12.6 (11.2-14.3)	2.9 (2.2-3.9)	31.3 (29.1-33.7)	18.5 (16.8-20.3)	7.3 (6.1-8.6)			
Wave 2	7.2 (6.1-8.5)	3.1 (2.4-4.0)	25.1 (23.2-27.2)	3.2 (2.5-4.1)	13.3 (11.8-15.0)	3.1 (2.3-4.0)	29.9 (28.0-32.0)	30.1 (28.0-32.2)	8.1 (6.9-9.4)			
Wave 3	10.3 (9.1-11.8)	4 (3.2-4.9)	28.2 (26.2-30.3)	3.9 (3.1-4.9)	14 (12.5-15.7)	3.4 (2.6-4.5)	29.9 (27.8-32.0)	39.7 (37.5-41.9)	8.1 (7.0-9.3)			
Wave 4	10.6 (9.3-12.0)	5.1 (4.2-6.1)	30.6 (28.6-32.7)	4.2 (3.3-5.3)	14.3 (12.8-16.0)	3.7 (2.9-4.8)	29.2 (27.2-31.3)	45.3 (43.1-47.4)	7.9 (6.7-9.3)			
<b>Total</b>	<b>8.9 (7.9-9.9)</b>	<b>3.4 (2.8-4.1)</b>	<b>26 (24.2-27.9)</b>	<b>3.6 (2.9-4.4)</b>	<b>13.6 (12.1-15.2)</b>	<b>3.3 (2.5-4.3)</b>	<b>30.1 (28.5-31.7)</b>	<b>33.4 (31.5-35.3)</b>	<b>7.8 (6.7-9.3)</b>			

Table 6.2: Prevalence of cardiovascular disease at Waves 1 to 4, by sex.

	Hypertension (%)	(95% CI)	Diabetes (%)	(95% CI)	Heart Attack (%)	(95% CI)	Angina (%)	(95% CI)	Stroke (%)	(95% CI)	TIA (%)	(95% CI)	Heart Failure (%)	(95% CI)
<b>Male</b>														
Wave 1	34.3	(32.3-36.3)	9	(7.8-10.4)	5.9	(5.0-7.1)	6	(5.0-7.1)	1.2	(0.8-1.8)	1.8	(0.8-1.8)	1.4	(0.9-2.0)
Wave 2	34.8	(32.7-36.9)	10.2	(9.0-11.6)	7	(5.9-8.2)	4.3	(5.9-8.2)	1.4	(1.0-2.0)	2.7	(1.0-2.0)	1.1	(0.7-1.8)
Wave 3	35.3	(33.2-37.5)	11.5	(10.2-13.0)	8.2	(7.0-9.5)	4.8	(7.0-9.5)	2	(1.5-2.7)	3.6	(1.5-2.7)	1.1	(0.7-1.7)
Wave 4	37.3	(35.1-39.5)	12.8	(11.3-14.3)	9.1	(7.9-10.4)	5.3	(7.9-10.4)	2.4	(1.8-3.1)	4.3	(1.8-3.1)	1.1	(0.7-1.8)
<b>Total</b>	<b>35.4</b>	<b>(33.6-37.3)</b>	<b>10.9</b>	<b>(9.7-12.3)</b>	<b>7.5</b>	<b>(6.5-8.7)</b>	<b>5.1</b>	<b>(6.5-8.7)</b>	<b>1.7</b>	<b>(1.3-2.4)</b>	<b>3.1</b>	<b>(1.3-2.4)</b>	<b>1.2</b>	<b>(0.8-1.7)</b>
<b>Female</b>														
Wave 1	35.9	(34.0-38.0)	6	(5.1-7.1)	1.8	(1.3-2.5)	3.8	(1.3-2.5)	1.2	(0.8-1.8)	1.8	(0.8-1.8)	0.5	(0.3-0.9)
Wave 2	36.1	(34.0-38.2)	7.1	(6.0-8.3)	2.3	(1.7-3.1)	3.6	(1.7-3.1)	1.4	(1.0-2.0)	2.4	(1.0-2.0)	0.4	(0.2-0.8)
Wave 3	36.2	(34.1-38.2)	7.6	(6.5-8.9)	2.7	(2.1-3.6)	3.4	(2.1-3.6)	2	(1.4-2.7)	3.5	(1.4-2.7)	0.5	(0.3-0.9)
Wave 4	39.4	(37.3-41.5)	8.4	(7.2-9.7)	3.2	(2.4-4.1)	3.8	(2.4-4.1)	2.4	(1.8-3.2)	4	(1.8-3.2)	0.6	(0.4-1.1)
<b>Total</b>	<b>36.9</b>	<b>(35.1-38.8)</b>	<b>7.3</b>	<b>(6.3-8.4)</b>	<b>2.5</b>	<b>(1.9-3.3)</b>	<b>3.6</b>	<b>(1.9-3.3)</b>	<b>1.8</b>	<b>(1.3-2.4)</b>	<b>2.9</b>	<b>(1.3-2.4)</b>	<b>0.5</b>	<b>(0.3-0.8)</b>
<b>Total</b>														
Wave 1	35.1	(33.7-36.6)	7.5	(6.7-8.3)	3.8	(3.2-4.5)	4.8	(3.2-4.5)	1.2	(0.9-1.6)	1.8	(0.9-1.6)	0.9	(0.7-1.2)
Wave 2	35.5	(34.0-37.0)	8.6	(7.8-9.4)	4.6	(3.9-5.3)	3.9	(3.9-5.3)	1.4	(1.1-1.8)	2.5	(1.1-1.8)	0.7	(0.5-1.1)
Wave 3	35.8	(34.3-37.2)	9.5	(8.7-10.4)	5.3	(4.7-6.1)	4.1	(4.7-6.1)	2	(1.6-2.5)	3.5	(1.6-2.5)	0.8	(0.5-1.1)
Wave 4	38.4	(36.8-39.9)	10.5	(9.6-11.5)	6	(5.3-6.8)	4.5	(5.3-6.8)	2.4	(2.0-2.9)	4.1	(2.0-2.9)	0.9	(0.6-1.3)
<b>Total</b>	<b>36.2</b>	<b>(34.9-37.5)</b>	<b>9</b>	<b>(8.2-9.8)</b>	<b>4.9</b>	<b>(4.3-5.6)</b>	<b>4.3</b>	<b>(4.3-5.6)</b>	<b>1.7</b>	<b>(1.4-2.2)</b>	<b>3</b>	<b>(1.4-2.2)</b>	<b>0.8</b>	<b>(0.6-1.1)</b>

Table 6.3: Prevalence of cardiovascular disease at Wave 1 to Wave 4, by age group.

	Hypertension (%)	(95% CI)	Diabetes (%)	(95% CI)	Heart Attack (%)	(95% CI)	Angina (%)	(95% CI)	Stroke (%)	(95% CI)	TIA (%)	(95% CI)	Heart Failure (%)	(95% CI)
<b>50-64</b>														
Wave 1	28.9	(27.2-30.6)	5.8	(5.0-6.7)	2.4	(1.9-3.1)	2.3	(1.8-3.1)	0.8	(0.5-1.3)	0.9	(0.6-1.3)	0.8	(0.5-1.2)
Wave 2	28.6	(26.8-30.4)	6.2	(5.3-7.3)	2.6	(2.0-3.4)	1.7	(1.2-2.4)	1	(0.6-1.5)	1.1	(0.7-1.6)	0.8	(0.5-1.3)
Wave 3	27.6	(25.7-29.6)	6.9	(5.8-8.1)	3.1	(2.3-4.1)	1.8	(1.3-2.6)	1.2	(0.8-1.9)	1.4	(0.9-1.9)	0.6	(0.3-1.1)
Wave 4	29.3	(27.1-31.7)	7.7	(6.5-9.2)	3.8	(2.8-5.0)	1.8	(1.2-2.7)	1.4	(0.9-2.2)	1.8	(1.2-2.6)	0.8	(0.4-1.5)
<b>Total</b>	<b>28.6</b>	<b>(27.0-30.2)</b>	<b>6.5</b>	<b>(5.7-7.5)</b>	<b>2.9</b>	<b>(2.3-3.7)</b>	<b>1.9</b>	<b>(1.5-2.6)</b>	<b>1.1</b>	<b>(0.7-1.6)</b>	<b>1.2</b>	<b>(0.9-1.7)</b>	<b>0.7</b>	<b>(0.4-1.2)</b>
<b>65-74</b>														
Wave 1	42.4	(39.6-45.3)	10.7	(9.0-12.6)	5.5	(4.3-7.0)	7.8	(6.2-9.7)	2	(1.4-3.0)	2.1	(1.4-3.2)	1.2	(0.7-2.0)
Wave 2	41.9	(39.2-44.5)	11.9	(10.3-13.7)	6.6	(5.4-8.2)	5.1	(3.9-6.6)	1.8	(1.2-2.7)	3	(2.2-4.0)	0.7	(0.3-1.3)
Wave 3	40.2	(37.8-42.7)	12	(10.5-13.7)	5.7	(4.6-7.2)	4.4	(3.5-5.7)	2.2	(1.6-3.1)	3.9	(3.1-4.9)	0.7	(0.4-1.4)
Wave 4	40.3	(37.9-42.8)	11.8	(10.3-13.4)	5.4	(4.4-6.8)	4.1	(3.2-5.2)	2.1	(1.5-2.9)	3.6	(2.9-4.6)	0.6	(0.3-1.2)
<b>Total</b>	<b>41.1</b>	<b>(39.1-43.1)</b>	<b>11.6</b>	<b>(10.3-13.1)</b>	<b>5.8</b>	<b>(4.8-7.0)</b>	<b>5.1</b>	<b>(4.2-6.3)</b>	<b>2</b>	<b>(1.5-2.8)</b>	<b>3.3</b>	<b>(2.6-4.0)</b>	<b>0.8</b>	<b>(0.5-1.2)</b>
<b>&gt;= 75</b>														
Wave 1	50.7	(46.0-55.4)	9.4	(7.1-12.4)	6.9	(5.0-9.4)	11	(8.3-14.5)	1.5	(0.7-3.0)	5.1	(3.4-7.4)	0.9	(0.4-2.3)
Wave 2	47.6	(43.6-51.7)	10.9	(8.7-13.6)	7.4	(5.7-9.7)	9.1	(6.9-11.9)	2.1	(1.2-3.7)	6.4	(4.7-8.6)	0.7	(0.3-1.8)
Wave 3	46.5	(43.3-49.9)	11.4	(9.5-13.8)	9.5	(7.8-11.6)	8.4	(6.6-10.5)	3.2	(2.2-4.8)	7.7	(6.0-9.8)	1.2	(0.6-2.3)
Wave 4	48.6	(45.5-51.7)	12.8	(10.9-14.9)	10	(8.3-11.9)	9.1	(7.4-11.1)	4.2	(3.1-5.7)	8.2	(6.7-10.1)	1.4	(0.8-2.4)
<b>Total</b>	<b>48.2</b>	<b>(45.2-51.2)</b>	<b>11.4</b>	<b>(9.5-13.6)</b>	<b>8.8</b>	<b>(7.1-10.7)</b>	<b>9.2</b>	<b>(7.5-11.3)</b>	<b>3</b>	<b>(2.1-4.3)</b>	<b>7.1</b>	<b>(5.6-9.0)</b>	<b>1.1</b>	<b>(0.6-1.9)</b>
<b>Total</b>														
Wave 1	35.1	(33.7-36.6)	7.5	(6.7-8.3)	3.8	(3.2-4.5)	4.8	(4.1-5.6)	1.2	(0.9-1.6)	1.8	(1.4-2.2)	0.9	(0.7-1.2)
Wave 2	35.5	(34.0-37.0)	8.6	(7.8-9.4)	4.6	(3.9-5.3)	3.9	(3.3-4.7)	1.4	(1.1-1.8)	2.5	(2.1-3.0)	0.7	(0.5-1.1)
Wave 3	35.8	(34.3-37.2)	9.5	(8.7-10.4)	5.3	(4.7-6.1)	4.1	(3.5-4.8)	2	(1.6-2.5)	3.5	(3.0-4.1)	0.8	(0.5-1.1)
Wave 4	38.4	(36.8-39.9)	10.5	(9.6-11.5)	6	(5.3-6.8)	4.5	(3.9-5.3)	2.4	(2.0-2.9)	4.1	(3.6-4.8)	0.9	(0.6-1.3)
<b>Total</b>	<b>36.2</b>	<b>(34.9-37.5)</b>	<b>9</b>	<b>(8.2-9.8)</b>	<b>4.9</b>	<b>(4.3-5.6)</b>	<b>4.3</b>	<b>(3.8-5.0)</b>	<b>1.7</b>	<b>(1.4-2.2)</b>	<b>3</b>	<b>(2.6-3.5)</b>	<b>0.8</b>	<b>(0.6-1.1)</b>



Table 6.4: Prevalence of non-cardiovascular chronic conditions, falls and fractures at Wave 1 to Wave 4, by age group.

	Cataracts (%)	Osteoporosis (%)	Arthritis (%)	(95% CI)	Lung Disease (%)	(95% CI)	Wrist Fracture (%)	(95% CI)	Hip Fracture (%)	(95% CI)	Pain (%)	(95% CI)	Ever reported a fall (%)	(95% CI)	Recurrent Falls	(95% CI)
<b>50-64</b>																
Wave 1	3.3	6.7	18.7	(5.9-7.6)	3.3	(2.7-4.1)	11.3	(10.1-12.6)	1.8	(1.3-2.5)	36.1	(34.1-38.2)	18.5	(17.0-20.2)	7.4	(6.4-8.6)
Wave 2	3.2	10.2	22.8	(9.1-11.3)	3.7	(3.0-4.7)	12.4	(11.1-13.9)	1.9	(1.4-2.7)	34.4	(32.4-36.5)	30.4	(28.4-32.3)	7.5	(6.5-8.8)
Wave 3	4.9	10.7	25.5	(9.5-12.0)	4.1	(3.2-5.2)	13.8	(12.3-15.5)	1.8	(1.3-2.7)	34.5	(32.3-36.7)	39.6	(37.4-41.8)	8.4	(7.2-9.8)
Wave 4	5.3	12.4	27.1	(10.8-14.1)	4.4	(3.4-5.7)	14.7	(13.0-16.6)	1.9	(1.2-2.9)	33.5	(31.1-35.9)	45.3	(42.7-47.9)	7.9	(6.6-9.4)
<b>Total</b>	<b>4</b>	<b>9.6</b>	<b>23</b>	<b>(8.7-10.6)</b>	<b>3.8</b>	<b>(3.2-4.6)</b>	<b>12.8</b>	<b>(11.5-14.3)</b>	<b>1.9</b>	<b>(1.3-2.6)</b>	<b>34.8</b>	<b>(33.1-36.5)</b>	<b>31.6</b>	<b>(29.9-33.3)</b>	<b>7.8</b>	<b>(7.0-8.6)</b>
<b>65-74</b>																
Wave 1	11.4	11.7	35.1	(9.9-13.8)	4.4	(3.3-6.0)	10.4	(8.8-12.3)	2.5	(1.7-3.6)	35.6	(32.6-38.7)	21.3	(18.7-24.1)	7.4	(6.0-9.2)
Wave 2	12.7	17.6	39.2	(15.8-19.6)	4.6	(3.6-6.0)	11.4	(9.8-13.3)	2.4	(1.7-3.5)	35.1	(32.4-37.8)	36.5	(33.9-39.2)	10	(8.5-11.7)
Wave 3	13.8	17.3	41.1	(15.5-19.2)	5.1	(4.1-6.4)	12.8	(11.1-14.8)	3	(2.2-4.1)	35.3	(32.7-37.9)	46.2	(43.6-48.7)	9.2	(7.8-10.7)
Wave 4	13.7	17.8	40.2	(16.1-19.6)	5.9	(4.7-7.2)	12.9	(11.3-14.7)	2.9	(2.1-4.0)	35.1	(32.8-37.5)	51.4	(48.8-53.9)	7.9	(6.6-9.3)
<b>Total</b>	<b>13.1</b>	<b>16.4</b>	<b>39.2</b>	<b>(15.0-18.0)</b>	<b>5.1</b>	<b>(4.2-6.2)</b>	<b>12.1</b>	<b>(10.6-13.7)</b>	<b>2.7</b>	<b>(2.1-3.6)</b>	<b>35.2</b>	<b>(33.3-37.2)</b>	<b>40.6</b>	<b>(38.6-42.7)</b>	<b>8.6</b>	<b>(7.7-9.6)</b>
<b>&gt;= 75</b>																
Wave 1	32.7	17.5	42.7	(14.3-21.2)	4	(2.5-6.3)	13.7	(10.9-17.1)	3.9	(2.5-6.2)	38.3	(33.7-43.2)	24	(20.1-28.4)	7.3	(5.1-10.2)
Wave 2	24.8	21.7	51	(18.6-25.2)	5.4	(3.8-7.6)	14.4	(11.8-17.5)	4.6	(3.2-6.7)	39.5	(35.5-43.7)	41.1	(37.1-45.3)	10.1	(7.7-13.1)
Wave 3	30	23.1	51.3	(20.3-26.1)	5.8	(4.4-7.7)	14.6	(12.3-17.3)	5.3	(4.0-7.2)	37.9	(34.5-41.4)	54.9	(51.4-58.5)	14.1	(11.8-16.8)
Wave 4	27.1	23.6	52.8	(21.1-26.3)	5.5	(4.3-7.1)	15.3	(13.3-17.7)	5.7	(4.4-7.5)	38.3	(35.4-41.3)	60.7	(57.6-63.6)	13.5	(11.4-16.0)
<b>Total</b>	<b>28.4</b>	<b>22</b>	<b>50.2</b>	<b>(19.4-24.8)</b>	<b>5.3</b>	<b>(4.1-6.8)</b>	<b>14.7</b>	<b>(12.4-17.3)</b>	<b>5.1</b>	<b>(3.8-6.7)</b>	<b>38.5</b>	<b>(35.8-41.2)</b>	<b>48.4</b>	<b>(45.4-51.4)</b>	<b>11.8</b>	<b>(10.3-13.6)</b>
<b>Total</b>																
Wave 1	9.3	9.3	26	(8.5-10.3)	3.7	(3.1-4.4)	11.5	(10.5-12.5)	2.3	(1.8-2.8)	36.3	(34.6-38.0)	19.9	(18.6-21.3)	7.4	(6.6-8.3)
Wave 2	9.5	14.2	32.1	(13.2-15.2)	4.3	(3.6-5.0)	12.5	(11.5-13.6)	2.5	(2.0-3.1)	35.5	(33.9-37.0)	33.9	(32.3-35.4)	8.6	(7.8-9.6)
Wave 3	13.2	15.5	36.1	(14.5-16.6)	4.8	(4.2-5.5)	13.7	(12.6-14.8)	3	(2.4-3.6)	35.5	(33.9-37.1)	45	(43.4-46.6)	9.9	(9.0-10.8)
Wave 4	14.1	17.3	38.6	(16.2-18.5)	5.2	(4.6-6.0)	14.2	(13.2-15.4)	3.3	(2.7-4.0)	35.3	(33.8-36.9)	51.5	(49.9-53.1)	9.4	(8.5-10.4)
<b>Total</b>	<b>11.5</b>	<b>14.1</b>	<b>33.2</b>	<b>(13.2-15.0)</b>	<b>4.5</b>	<b>(4.0-5.1)</b>	<b>13</b>	<b>(11.9-14.0)</b>	<b>2.8</b>	<b>(2.3-3.4)</b>	<b>35.6</b>	<b>(34.4-36.9)</b>	<b>37.6</b>	<b>(36.2-38.9)</b>	<b>8.8</b>	<b>(8.2-9.5)</b>

Table 6.5: Prevalence of non-cardiovascular chronic conditions, falls and fractures at Wave 1 to Wave 4, by age group in men.

	Cataracts (%)	Osteoporosis (%)	Arthritis (%)	Lung Disease (%)	Wrist Fracture (%)	Hip Fracture (%)	Pain (%)	Ever reported a fall (%)	Recurrent Falls	(95% CI)
<b>50-64</b>										
Wave 1	3	1	15.5	2.9	13.9	2.6	33.6	17.7	7.6	(6.2-9.3)
Wave 2	2.5	2.6	19.1	2.8	15.4	2.5	30.8	27.2	7	(5.6-8.8)
Wave 3	4.4	3.2	20.6	3.2	16.1	2.3	30.1	35.4	7.1	(5.6-9.0)
Wave 4	4.3	4.5	22.4	3.5	17.4	2.1	31.5	39.3	5.8	(4.2-7.8)
<b>Total</b>	<b>3.4</b>	<b>2.6</b>	<b>18.9</b>	<b>3.1</b>	<b>15.5</b>	<b>2.4</b>	<b>31.7</b>	<b>28.4</b>	<b>7</b>	<b>(5.9-8.2)</b>
<b>65-74</b>										
Wave 1	8.6	2	27.1	3.8	10.2	3.5	26.7	18.4	7.1	(5.3-9.4)
Wave 2	9.3	4	29.8	3.6	10.8	3.7	27.8	31.6	10.4	(8.3-12.9)
Wave 3	10.6	4.8	32.9	4.3	13	4.3	29.6	41.5	7.9	(6.2-10.1)
Wave 4	10.2	5.2	31.7	4.8	13	4.1	29.2	45.1	8.1	(6.3-10.4)
<b>Total</b>	<b>9.8</b>	<b>4.2</b>	<b>30.7</b>	<b>4.2</b>	<b>12</b>	<b>3.9</b>	<b>28.5</b>	<b>35.9</b>	<b>8.4</b>	<b>(7.1-9.8)</b>
<b>&gt;= 75</b>										
Wave 1	28.3	2.6	30.5	3	10.3	4	28	23.3	5.8	(3.1-10.7)
Wave 2	21.7	3.6	39.8	3.9	10.3	4.1	30.6	38.2	8	(5.3-11.9)
Wave 3	24.8	4.3	39.1	4.8	10.7	5	29.9	47.3	10.8	(8.0-14.5)
Wave 4	21.2	5.9	42	4.3	11.3	5.8	25.4	55.1	11	(8.4-14.3)
<b>Total</b>	<b>23.5</b>	<b>4.4</b>	<b>38.8</b>	<b>4.1</b>	<b>10.8</b>	<b>4.9</b>	<b>28.2</b>	<b>44.1</b>	<b>9.5</b>	<b>(7.6-11.7)</b>
<b>Total</b>										
Wave 1	7.3	1.4	20	3.1	12.6	2.9	31.3	18.5	7.3	(6.1-8.6)
Wave 2	7.2	3.1	25.1	3.2	13.3	3.1	29.9	30.1	8.1	(6.9-9.4)
Wave 3	10.3	4	28.2	3.9	14	3.4	29.9	39.7	8.1	(7.0-9.3)
Wave 4	10.6	5.1	30.6	4.2	14.3	3.7	29.2	45.3	7.9	(6.7-9.3)
<b>Total</b>	<b>8.9</b>	<b>(7.9-9.9)</b>	<b>(2.8-4.1)</b>	<b>26</b>	<b>(2.9-4.4)</b>	<b>13.6</b>	<b>(2.5-4.3)</b>	<b>(28.5-31.7)</b>	<b>33.4</b>	<b>(31.5-35.3)</b>

Table 6.6: Prevalence of non-cardiovascular chronic conditions, falls and fractures at Wave 1 to Wave 4, by age group in women.

	Cataracts (%)	(95% CI)	Osteoporosis (%)	(95% CI)	Arthritis (%)	(95% CI)	Lung Disease (%)	(95% CI)	Wrist Fracture (%)	(95% CI)	Hip Fracture (%)	(95% CI)	Pain (%)	(95% CI)	Ever reported a fall (%)	(95% CI)	Recurrent Falls (%)	(95% CI)
<b>50-64</b>																		
Wave 1	3.6	(2.7-4.7)	12.4	(10.8-14.1)	22	(20.0-24.1)	3.7	(2.8-4.8)	8.7	(7.4-10.3)	1.1	(0.6-1.9)	38.6	(35.9-41.3)	19.3	(17.2-21.6)	7.2	(5.9-8.8)
Wave 2	3.9	(3.0-5.1)	17.7	(15.9-19.7)	26.4	(24.1-28.8)	4.7	(3.5-6.1)	9.4	(7.9-11.2)	1.4	(0.8-2.4)	38	(35.3-40.8)	33.4	(30.8-36.2)	8.1	(6.6-9.8)
Wave 3	5.5	(4.2-7.1)	18.2	(16.1-20.5)	30.5	(27.7-33.4)	4.9	(3.7-6.6)	11.5	(9.7-13.7)	1.4	(0.8-2.6)	38.9	(35.9-41.9)	43.7	(40.7-46.7)	9.7	(8.0-11.8)
Wave 4	6.1	(4.7-8.1)	20	(17.5-22.8)	31.7	(28.6-34.9)	5.3	(3.8-7.2)	12	(9.9-14.5)	1.7	(1.0-3.2)	35.3	(32.2-38.5)	51.1	(47.6-54.6)	9.9	(7.9-12.4)
<b>Total</b>	<b>4.6</b>	<b>(3.7-5.6)</b>	<b>16.6</b>	<b>(15.0-18.3)</b>	<b>26.9</b>	<b>(24.9-29.1)</b>	<b>4.5</b>	<b>(3.6-5.7)</b>	<b>10.2</b>	<b>(8.7-11.9)</b>	<b>1.4</b>	<b>(0.8-2.4)</b>	<b>37.9</b>	<b>(35.7-40.2)</b>	<b>34.7</b>	<b>(32.4-37.1)</b>	<b>8.5</b>	<b>(7.4-9.8)</b>
<b>65-74</b>																		
Wave 1	14.1	(11.5-17.1)	20.7	(17.5-24.3)	42.7	(38.7-46.7)	5.1	(3.4-7.5)	10.6	(8.3-13.4)	1.5	(0.7-3.1)	43.9	(39.8-48.1)	24	(20.2-28.1)	7.8	(5.8-10.4)
Wave 2	15.9	(13.4-18.8)	30.4	(27.2-33.9)	48.1	(44.2-52.0)	5.6	(4.0-7.8)	12	(9.8-14.7)	1.2	(0.6-2.5)	41.9	(38.2-45.7)	41.1	(37.4-44.9)	9.6	(7.6-12.1)
Wave 3	16.9	(14.4-19.7)	29.3	(26.2-32.5)	49	(45.4-52.6)	6	(4.5-7.9)	12.6	(10.5-15.2)	1.8	(1.0-3.1)	40.7	(37.2-44.3)	50.7	(47.3-54.0)	10.4	(8.4-12.7)
Wave 4	17.2	(14.9-19.8)	30.3	(27.4-33.3)	48.7	(45.5-51.9)	6.9	(5.3-8.9)	12.9	(10.9-15.3)	1.8	(1.1-2.9)	41	(37.8-44.3)	57.6	(54.5-60.6)	7.6	(5.9-9.7)
<b>Total</b>	<b>16.2</b>	<b>(14.4-18.2)</b>	<b>28.2</b>	<b>(25.7-30.8)</b>	<b>47.4</b>	<b>(44.5-50.3)</b>	<b>6</b>	<b>(4.7-7.6)</b>	<b>12.2</b>	<b>(10.3-14.3)</b>	<b>1.6</b>	<b>(1.0-2.6)</b>	<b>41.7</b>	<b>(39.1-44.4)</b>	<b>45.2</b>	<b>(42.5-47.8)</b>	<b>8.8</b>	<b>(7.7-10.2)</b>
<b>&gt;= 75</b>																		
Wave 1	35.7	(29.9-41.8)	27.6	(22.5-33.3)	50.9	(44.5-57.3)	4.6	(2.6-8.0)	15.9	(12.1-20.7)	3.9	(2.1-7.1)	45.3	(39.2-51.6)	24.4	(19.4-30.3)	8.3	(5.4-12.6)
Wave 2	27.1	(22.3-32.4)	34.8	(29.8-40.3)	59	(53.3-64.5)	6.4	(4.1-9.9)	17.4	(13.7-21.8)	4.9	(3.0-8.0)	46	(40.4-51.8)	43.3	(37.8-48.9)	11.6	(8.3-16.0)
Wave 3	33.8	(29.3-38.7)	37.1	(32.6-41.9)	60.5	(55.5-65.2)	6.7	(4.7-9.5)	17.6	(14.3-21.5)	5.6	(3.7-8.2)	43.9	(38.9-48.9)	60.7	(55.6-65.6)	16.5	(13.3-20.4)
Wave 4	31.8	(28.1-35.8)	37.7	(33.5-42.1)	61.4	(57.0-65.7)	6.5	(4.7-8.9)	18.5	(15.5-22.0)	5.7	(4.0-8.1)	48.5	(44.2-52.9)	65.1	(60.8-69.2)	15.6	(12.6-19.1)
<b>Total</b>	<b>32.1</b>	<b>(29.1-35.2)</b>	<b>35.1</b>	<b>(30.9-39.5)</b>	<b>58.7</b>	<b>(54.2-63.1)</b>	<b>6.2</b>	<b>(4.5-8.5)</b>	<b>17.6</b>	<b>(14.3-21.3)</b>	<b>5.2</b>	<b>(3.5-7.6)</b>	<b>46.1</b>	<b>(42.4-49.9)</b>	<b>51.7</b>	<b>(47.5-55.8)</b>	<b>13.6</b>	<b>(11.4-16.3)</b>
<b>Total</b>																		
Wave 1	11.1	(9.8-12.6)	16.7	(15.2-18.3)	31.5	(29.5-33.5)	4.2	(3.4-5.2)	10.4	(9.1-11.7)	1.6	(1.1-2.3)	40.9	(38.8-43.1)	21.2	(19.4-23.1)	7.5	(6.4-8.8)
Wave 2	11.6	(10.2-13.1)	24.4	(22.7-26.2)	38.5	(36.4-40.6)	5.3	(4.3-6.4)	11.7	(10.4-13.1)	2	(1.4-2.8)	40.6	(38.5-42.7)	37.4	(35.4-39.5)	9.2	(8.0-10.5)
Wave 3	15.8	(14.3-17.5)	26.2	(24.4-28.1)	43.5	(41.4-45.5)	5.7	(4.7-6.8)	13.3	(12.0-14.8)	2.5	(1.9-3.4)	40.7	(38.6-42.8)	49.9	(47.8-52.0)	11.5	(10.2-13.0)
Wave 4	17.3	(15.8-18.9)	28.6	(26.8-30.5)	46	(43.9-48.1)	6.2	(5.2-7.3)	14.2	(12.8-15.7)	2.9	(2.2-3.8)	41	(38.8-43.2)	57.3	(55.3-59.3)	10.8	(9.5-12.3)
<b>Total</b>	<b>14</b>	<b>(12.9-15.1)</b>	<b>24</b>	<b>(22.4-25.6)</b>	<b>39.9</b>	<b>(38.0-41.7)</b>	<b>5.3</b>	<b>(4.5-6.3)</b>	<b>12.4</b>	<b>(11.1-13.8)</b>	<b>2.3</b>	<b>(1.7-3.0)</b>	<b>40.8</b>	<b>(39.1-42.5)</b>	<b>41.5</b>	<b>(39.7-43.2)</b>	<b>9.8</b>	<b>(8.9-10.7)</b>

Table 6.7: Smoking status at Wave 1 to Wave 4, by age group.

	Never		Past		Current		Total	Number in sample
	%	95% CI	%	95% CI	%	95% CI		
<b>50-64</b>								
Wave 1	42	(40-44)	36	(34-37)	23	(21-24)	100	3274
Wave 2	43	(41-45)	35	(33-37)	22	(20-24)	100	2779
Wave 3	41	(39-43)	40	(38-42)	19	(17-21)	100	2392
Wave 4	42	(39-44)	41	(38-43)	18	(16-20)	100	1922
<b>65-74</b>								
Wave 1	44	(41-47)	41	(38-44)	15	(13-18)	100	1372
Wave 2	45	(42-48)	42	(39-45)	13	(11-15)	100	1547
Wave 3	43	(40-45)	45	(42-47)	13	(11-15)	100	1773
Wave 4	42	(39-44)	44	(42-47)	14	(12-16)	100	1970
<b>&gt;= 75</b>								
Wave 1	50	(45-55)	43	(38-48)	7	(5-10)	100	546
Wave 2	50	(46-54)	43	(39-47)	7	(5-10)	100	727
Wave 3	49	(46-53)	43	(39-46)	8	(6-10)	100	1029
Wave 4	48	(44-51)	45	(42-48)	7	(6-9)	100	1305
<b>Total</b>								
Wave 1	43	(42-45)	38	(36-39)	19	(17-20)	100	5200
Wave 2	45	(43-46)	38	(37-40)	17	(16-18)	100	5054
Wave 3	43	(42-45)	42	(40-44)	15	(13-16)	100	5197
Wave 4	43	(42-45)	43	(42-45)	13	(12-15)	100	5197

Table 6.8: Problem alcohol use at Wave 1 to Wave 4, by age group.

	Never		Past		Current		Total	Number in sample
	%	95% CI	%	95% CI	%	95% CI		
<b>50-64</b>								
Wave 1	83	(82-85)	17	(15-18)	100	2900	100	3274
Wave 2	81	(79-83)	19	(17-21)	100	2454	100	2779
Wave 3	83	(81-84)	17	(16-19)	100	2051	100	2392
Wave 4	82	(80-84)	18	(16-20)	100	1630	100	1922
<b>65-74</b>								
Wave 1	91	(89-93)	9	(7-11)	100	1247	100	1372
Wave 2	91	(89-93)	9	(7-11)	100	1382	100	1547
Wave 3	90	(88-92)	10	(8-12)	100	1550	100	1773
Wave 4	89	(87-90)	11	(10-13)	100	1726	100	1970
<b>&gt;= 75</b>								
Wave 1	96	(94-97)	4	(3-6)	100	490	100	546
Wave 2	93	(91-95)	7	(5-9)	100	588	100	727
Wave 3	95	(93-97)	5	(3-7)	100	809	100	1029
Wave 4	95	(94-97)	5	(3-6)	100	1057	100	1305
<b>Total</b>								
Wave 1	87	(86-88)	13	(12-14)	100	4643	100	5200
Wave 2	86	(85-87)	14	(13-15)	100	4425	100	5054
Wave 3	88	(87-89)	12	(11-13)	100	4412	100	5197
Wave 4	88	(87-89)	12	(11-13)	100	4416	100	5197

Table 6.9: Proportion of adults who walked  $\geq 150$  minutes per week at Wave 1 to Wave 4, by age group.

	<150 mins per week		$\geq 150$ mins per week		Total	Number in sample
	%	95% CI	%	95% CI		
<b>50-64</b>						
Wave 1	35	(33-37)	65	(63-67)	100	3274
Wave 2	37	(35-39)	63	(61-65)	100	2882
Wave 3	41	(39-43)	59	(57-61)	100	2364
Wave 4	42	(39-44)	58	(56-61)	100	1922
<b>65-74</b>						
Wave 1	37	(34-40)	63	(60-66)	100	1372
Wave 2	39	(36-42)	61	(58-64)	100	1580
Wave 3	43	(40-46)	57	(54-60)	100	1759
Wave 4	45	(43-47)	55	(53-57)	100	1970
<b><math>\geq 75</math></b>						
Wave 1	52	(47-57)	48	(43-53)	100	546
Wave 2	58	(54-62)	42	(38-46)	100	737
Wave 3	63	(60-67)	37	(33-40)	100	1019
Wave 4	63	(60-66)	37	(34-40)	100	1305
<b>Total</b>						
Wave 1	38	(36-39)	62	(61-64)	100	5200
Wave 2	41	(39-43)	59	(57-61)	100	5200
Wave 3	46	(45-48)	54	(52-55)	100	5144
Wave 4	48	(47-50)	52	(50-53)	100	5197

# 7 Frailty

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## Contents

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# 7

## Frailty

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- Frailty is a common condition affecting 12.7% of adults aged 50 years and over and 21.5% of people aged 65 and over in Ireland.
- Frailty is a dynamic process that can change over time and people living with frailty can transition in either direction between the different states of frailty namely robustness, pre-frailty (an intermediate state) and frailty.
- The prevalence of frailty among women is twice that of men at Wave 4 (24.9% versus 12.6%) and increases with age in both sexes. Frailty is also more prevalent among people who are living alone, are widowed, and those with lower levels of educational attainment.
- Frailty is a risk factor for single and recurrent falls, fear of falling and disability among adults aged 50 and over.
- People living with frailty are more likely to experience declines in mental health including lower levels of cognitive function and higher levels of depressive symptoms.
- Frailty is not inevitable and can be avoided, delayed and reversed with timely and appropriate interventions.



## 7.1 Introduction

Frailty is described as a distinctive health state related to the ageing process in which multiple body systems gradually lose their in-built reserves. Older adults living with frailty are at an increased risk of unpredictable deterioration in their health following minor stressor events such as an infection, dehydration or adverse effects related to a new medication (1). Frailty is a common condition in older adults although it is not an inevitable part of the ageing process (2). Frailty can occur at any age but becomes more prevalent with advancing age, with the prevalence in community living older adults aged 65 years and older ranging from 4% to 59% (3). This association with increasing age has implications for Ireland which has an ageing population. Frailty is becoming a key concept in healthcare service planning, development and delivery for our ageing population (4).

Frailty is a dynamic process that changes over time and can be viewed on a continuum. An older person can transition in either direction between the different states of frailty namely robustness, pre-frailty (an intermediate state) and frailty (5). Robust older people may have some health problems but these problems are being managed well. Older people with pre-frailty are at an increased risk of adverse outcomes but are coping; and older people with frailty have complex health problems and functional limitations that put them at the highest risk of adverse health outcomes such as falls, disability, hospitalisation, nursing home admission and even death (6). Identification of frailty in older adults is important as it has modifiable risk factors for disability and death. Identifying people living with, or at risk for, frailty provides an opportunity to prevent or intervene in the development of subsequent adverse health consequences (7). Proactive and preventative health care responses can improve quality of life and reduce costs of healthcare for older adults.

Although frailty is a recognisable and common phenomenon in ageing, it is difficult to accurately define and diagnose. The gold standard for the assessment and management of frailty is the Comprehensive Geriatric Assessment (CGA). CGA is a holistic and interdisciplinary assessment of an individual and has been demonstrated to reduce adverse outcomes including disability, cognitive decline, long-term residential care and death (8). However, CGA is time consuming and must be carried out by trained clinicians so it is not feasible for everyone living with frailty to undergo a full multidisciplinary review. Despite a lack of agreement on an internationally accepted and easily administered consensus measure of frailty, two methods of screening are commonly used (9). One method is the Frailty Phenotype model which views frailty as the presence of three or more of the following characteristics: unintended weight loss, exhaustion, weakness, slow gait speed and low physical activity. A person is considered pre-frail if they have 1-2 characteristics and robust if they have none of these characteristics (6, 10).

The second method is the Cumulative Deficit or Frailty Index (FI) model which views frailty as a state of system breakdown due to the accumulation of physical, social and psychological health symptoms and conditions, described as health deficits. The FI measures the number of health deficits present as a proportion of the total number of potential health deficits tested to determine whether a person is in robust health, living with pre-frailty or living with frailty (11, 12).

Population based cohort studies such as TILDA commonly use the Frailty Phenotype and the FI to measure frailty in large population representative samples and to explore relationships between frailty and potential risk factors and health outcomes. Using the FI, this Chapter provides information on the prevalence, incidence and transitions of frailty in adults aged 50 and over, and examines the associations between frailty and sociodemographic factors, physical health outcomes and mental health outcomes. The information presented is based on cross-sectional analyses of the same 5,304 TILDA participants at each wave of data collection - Wave 1 (2009-2011), Wave 2 (2012-2013), Wave 3 (2014-2015) and Wave 4 (2016) of TILDA.

## 7.2 Frailty prevalence, incidence and transitions

### 7.2.1 Prevalence of frailty at Waves 1 to 4

A deficit accumulation FI was constructed using 32 self-reported health deficits identified during the TILDA home interview at Waves 1, 2, 3 and 4, following the previously published methodology (11-13). The 32 deficits were associated with poor health, were distributed across several health domains and were associated with advancing age. Each deficit was coded as present (1) or absent (0). Deficits with more than two categories were coded as a proportion of the number and order of responses (e.g. five answer categories – Excellent, Very Good, Good, Fair and Poor were coded as 0, 0.25, 0.5, 0.75 and 1.0). The 32 deficits included in the FI are listed in Appendix 7.1. The total was then summed and divided by 32. This produced FI scores between 0.0 and 1.0. Scores of <0.10, 0.10-0.24 and  $\geq 0.25$  were used to classify participants as robust, pre-frail and frail respectively.

The prevalence, or the proportion of the community-dwelling population aged 50 years and over, by frailty status at Waves 1 to 4 are provided in Table 7.1. The prevalence of frailty increased from 12.7% to 19.0% between Waves 1 and 4, while pre-frailty increased from 30.9% to 39.2%. Correspondingly the prevalence of robustness decreased from 56.4% at Wave 1 to 41.8% at Wave 4. These data indicated that frailty and pre-frailty were common among older adults in Ireland. The increasing prevalence of pre-frailty and frailty at each wave was mainly due to the ageing of the cohort between Waves 1 and 4.

*Table 7.1: Prevalence of frailty status (robust, pre-frail and frail) at Waves 1, 2, 3 and 4 using the FI measure.*

Frailty Status	Wave 1	Wave 2	Wave 3	Wave 4
<b>N</b>	5,304	5,304	5,304	5,304
<b>Robust (%)</b>	56.4	52.7	50.1	41.8
<b>Pre-frail (%)</b>	30.9	33.0	34.1	39.2
<b>Frail (%)</b>	12.7	14.3	15.8	19.0

### 7.2.2 Incidence of frailty at Waves 2 to 4

The incidence, or rate of occurrence of new cases, by frailty status is provided in Table 7.2. In this case, incidence refers to adults aged 50 and over who were robust at Wave 1 but transitioned to pre-frailty or frailty at Waves 2, 3 or 4. The incidence of frailty increased from 1.5% at Wave 2 to 5.4% at Wave 4 among the group who were robust at Wave 1, While the incidence of pre-frailty increased from 19.2% at Wave 2 to 30.9% at Wave 4. The majority of adults in the robust group at Wave 1 remained robust at Waves 2-4. These data suggest that the incidence of both frailty and pre-frailty was significant over time even among those who were considered to be healthy and robust at Wave 1.

*Table 7.2: Incidence of frailty status (robust, pre-frail and frail) at Waves 2, 3 and 4 if robust at Wave 1 using the FI measure.*

Frailty Status	Wave 1	Wave 2	Wave 3	Wave 4
<b>N</b>	3,069	3,069	3,069	3,069
<b>Robust (%)</b>	100.0	79.3	74.1	63.7
<b>Pre-frail (%)</b>	-	19.2	22.9	30.9
<b>Frail (%)</b>	-	1.5	3.0	5.4

### 7.2.3 Transitions of frailty status between Waves 1 and 4

The incidence of transitions between the three frailty states at Waves 1 and 4 are provided in Table 7.3. Among the robust group at Wave 1, 30.9% transitioned to pre-frailty and 5.4% to frailty with the majority remaining robust at Wave 4. Among the pre-frail group at Wave 1, the majority remained pre-frail at Wave 4 (57.7%) whilst the incidence of robustness and frailty was 18.1% and 24.2% respectively. Among the frail group at Wave 1, 66.9% remained frail at Wave 4 whilst the incidence of robustness and pre-frailty was 1.8% and 31.3% respectively. In summary, the overall incidence of stability (no transitions) was 6 in 10 participants, negative transitions (robust -> pre-frail -> frail) was 3 in 10 participants and

positive transitions (frail -> pre-frail -> robust) was 1 in 10 participants between Waves 1 and 4. These data indicate that frailty is a dynamic process and that an older person can transition between the different states of frailty over time. It also highlights that frailty is a modifiable and potentially reversible condition, amenable to prevention and intervention strategies to halt or ameliorate the development of frailty itself and related adverse health outcomes.

*Table 7.3: Incidence of transitions in frailty status (robust, pre-frail and frail) between Waves 1 and 4 using the FI measure (n = 5,304).*

		Wave 1		
		Robust (%)	Pre-frail (%)	Frail (%)
Wave 4	Robust (%)	63.7	18.1	1.8
	Pre-frail (%)	30.9	57.7	31.3
	Frail (%)	5.4	24.2	66.9
	Total	100.0	100.0	100.0
	N	3,069	1,631	604

### 7.3 Sociodemographics of frailty

The development of frailty at older ages is related to demographic and social factors that are determined much earlier during the life-course. Here we examined the impact on frailty of self-reported demographic and social data regarding age, gender, highest level of educational attainment, marital status and living arrangements, provided by participants during the home interview.

#### 7.3.1 Age and frailty

The prevalence of frailty and pre-frailty increased with increasing age in all age groups and at all waves as summarised in Table 7.4. There was a progressive increase in the prevalence of frailty in the 75+ age group from 30.2% to 39.1% between Waves 1 and 4, however this trend was not observed for pre-frailty. These data support the well documented relationship between increasing prevalence of frailty with advancing age.

*Table 7.4: Age and frailty at Waves 1 - 4 using the FI measure (n = 5,304).*

Age	Wave 1			Wave 2			Wave 3			Wave 4		
	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail
50-64 (%)	67	25.5	7.5	67.1	25.0	7.9	66.6	25.9	7.5	60.1	31.2	8.7
65-74 (%)	46.7	37.1	16.2	43.0	40.5	16.5	45.4	39.9	14.7	40.7	44.4	14.9
>=75 (%)	25	44.8	30.2	21.4	46.9	31.7	21.9	42.8	35.3	17.2	43.7	39.1

### 7.3.2 Gender and frailty

The prevalence of frailty among women was higher at all waves and was approximately twice that of men at Waves 2-4 as summarised in Table 7.5. The change in prevalence of frailty between Waves 1 and 4 was three times higher for women compared to men (9.2% versus 3.2%). There is no statistical difference in the prevalence of pre-frailty among men and women at any wave. These data support the documented relationship between increasing prevalence of frailty among women compared to men.

Table 7.5: Gender and frailty at Waves 1 - 4 using the FI measure (n = 5,304).

	Wave 1			Wave 2			Wave 3			Wave 4		
Gender	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail
Male (%)	61.3	29.3	9.4	58.5	32.1	9.4	56.1	33.0	10.9	48.0	39.4	12.6
Female (%)	51.9	32.4	15.7	47.2	33.9	18.8	44.4	35.1	20.5	36.0	39.1	24.9

### 7.3.3 Education and frailty

Among the older adult population, 46% attained a secondary education level, 29% attained a primary education level and 25% attained third level education as described in Table 7.6. Frailty was twice as prevalent among those who attained a primary level of education only compared to those who attained secondary level and over three-times more prevalent compared to those who attained third level education. The prevalence of frailty increased from 22.2% at Wave 1 to 30.6% at Wave 4 for participants who attained a primary level of education. The prevalence of pre-frailty follows a similar pattern with a smaller but still significant effect.

Table 7.6: Highest level of educational attainment and frailty at Waves 1 - 4 using the FI measure (n = 5,304).

	Wave 1			Wave 2			Wave 3			Wave 4		
	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail
Primary (%)	43.5	36.3	22.2	38.8	38.6	22.6	34.8	38.6	26.6	27.0	42.4	30.6
Secondary (%)	59.7	29.0	11.3	54.7	32.4	12.9	52.9	33.2	13.9	44.3	38.4	17.3
Third level (%)	65.6	28.0	6.4	64.7	28.0	7.3	62.1	30.5	7.4	53.7	37.1	9.2

### 7.3.4 Marital status and frailty

During the home interview, participants were asked about their marital status and their responses were categorised as married (currently married or living with a partner as if married), single (never married), separated or divorced and widowed. The prevalence of frailty by marital status at Waves 1-4 is summarised in Table 7.7.

The prevalence of frailty was lowest in those who are married and highest in those who are widowed at all waves e.g. 10.1% and 25.2% respectively at Wave 1. A similar pattern was observed for pre-frailty (29.0% of married vs 39.3% of widowed participants at Wave 1). By Wave 4, the prevalence of frailty had increased in all groups but most notably from 25.2% to 37.2% in those who were widowed.

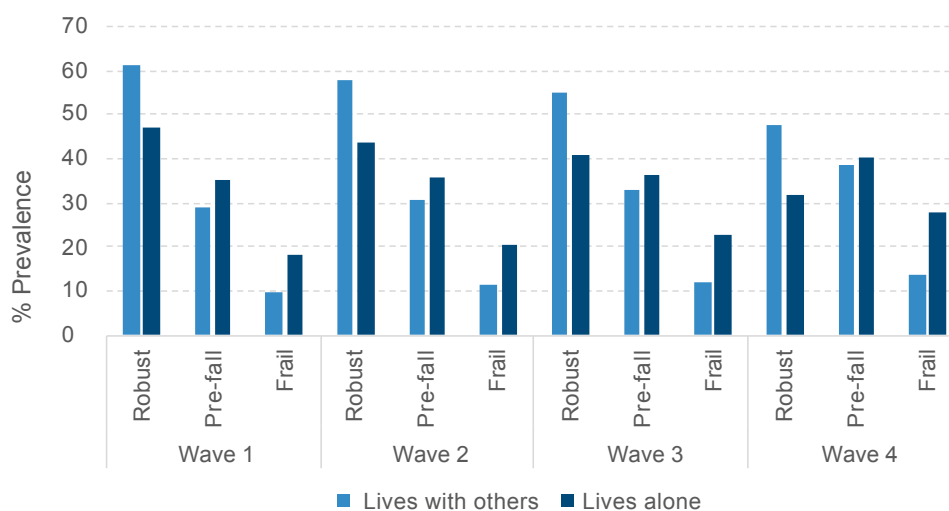
Table 7.7: Marital status and frailty at Waves 1 - 4 using the FI measure (n = 5,304).

	Wave 1			Wave 2			Wave 3			Wave 4		
	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail
<b>Married (%)</b>	60.9	29.0	10.1	57.3	31.8	10.9	54.7	33.3	12.0	47.4	38.6	14.0
<b>Single (%)</b>	54.2	32.5	13.3	53.1	32.6	14.3	50.2	34.8	15.0	40.6	40.7	18.7
<b>Separated/ Divorced (%)</b>	52.8	32.4	14.8	49.9	31.3	18.8	48.8	34.2	17.0	38.9	39.6	21.5
<b>Widowed (%)</b>	35.5	39.3	25.2	31.6	40.5	27.9	31.3	36.7	32.0	22.4	40.4	37.2

### 7.3.5 Living arrangements and frailty

The prevalence of frailty by living arrangements at Waves 1-4 is summarised in Figure 7.1. The prevalence of frailty among adults aged 50 and over who lived alone was approximately twice that of older adults who lived with other people e.g. spouse/partner, child, relative or others. This finding was consistent across Waves 1-4 but the actual prevalence of frailty increase in both groups by Wave 4 (28% lived alone versus 13.7% lived with others). The prevalence of pre-frailty was also higher among those who live alone but the difference was smaller than for frailty.

Figure 7.1: Living arrangement and frailty at Waves 1 - 4 using the FI measure (n = 5,304).



## 7.4 Frailty, falls, fear of falling and disability

Frailty is a known risk factor for falls, fear of falling and disability. Self-reported information regarding the number of falls, whether participants had fear of falling and whether they had any disabilities in performing the basic and/or instrumental activities of daily living was provided by participants during the home interview.

### 7.4.1 Frailty and single and recurrent falls

During each interview, participants were asked if they had fallen in the past year. Falls reported at each Wave were used to define the falls outcomes i.e. no falls, single fall or recurrent falls (none, one or more than one fall in the past year). The prevalence of frailty by falls outcomes at Waves 1-4 is summarised in Table 7.8.

The prevalence of single falls was highest among people living with frailty compared to those with pre-frailty or those who were robust. This was consistent across Waves 1-4. The prevalence of recurrent falls also followed the same pattern with recurrent falls highest among adults living with frailty. Notably, those who were robust were much less likely to have recurrent falls compared to single falls across Waves 1-4. The higher prevalence of single falls could be the result of trips/slips among the robust rather than an underlying pathology among those who are living with pre-frailty or frailty.

Table 7.8: Falls outcomes and frailty at Waves 1 - 4 using the FI measure (n = 5,304).

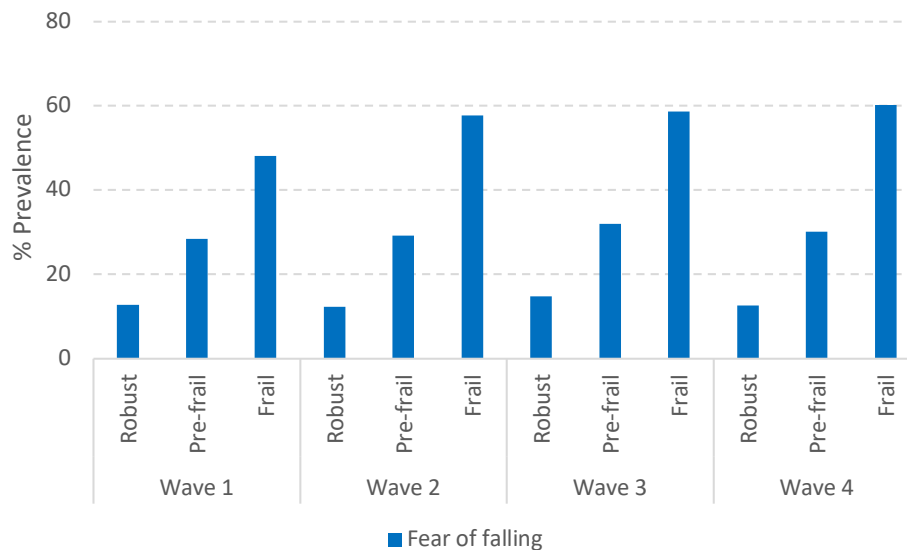
	Wave 1			Wave 2			Wave 3			Wave 4		
	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail	Robust	Pre-frail	Frail
No falls (%)	85	76.8	68.1	84.9	75.3	60.4	86.3	78.0	64.0	87.0	80.7	62.2
1 fall (%)	10.4	14.4	16.3	11.1	14.1	18.3	10.7	14.1	19.4	10.5	12.6	18.1
>=2 falls (%)	4.5	8.9	15.6	4.0	10.6	21.3	3.0	6.9	16.4	2.5	6.6	19.7

### 7.4.2 Frailty and fear of falling

During each interview, fear of falling was identified by asking participants “Are you afraid of falling?” to which they responded “Yes” or “No”. The prevalence of frailty by fear of falling at Waves 1-4 is summarised in Figure 7.2.

The prevalence of fear of falling was at least four times higher among people living with frailty and twice as high among people living with pre-frailty compared to those who were robust. This was consistent across Waves 1-4. The highest prevalence of fear of falling was at Wave 4 when 12.6%, 30.1% and 60.2% reported fear of falling among the robust, pre-frail and frail groups respectively.

Figure 7.2: Fear of falling and frailty at Waves 1 - 4 using the FI measure (n = 5,304).



### 7.4.3 Frailty and disability

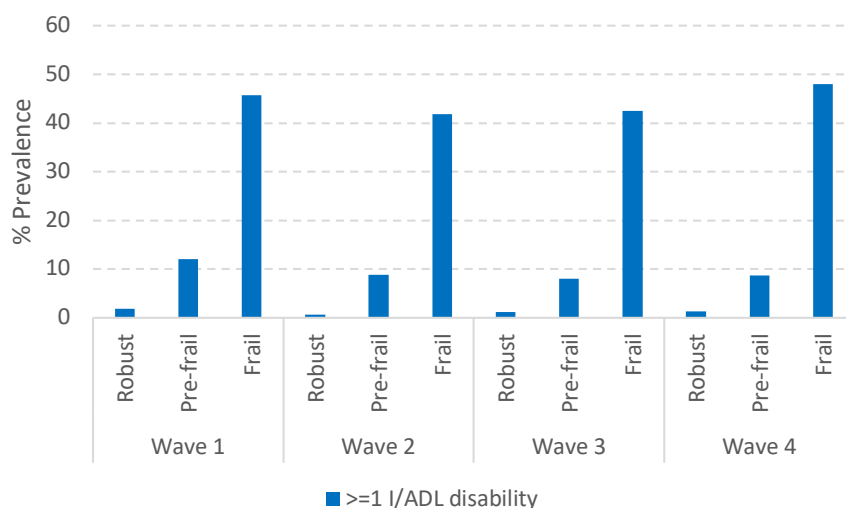
Participants were asked if they have any difficulties with basic activities of daily living (ADLs) or instrumental activities of daily living (IADLs), excluding any difficulties expected to last less than three months. ADLs included tasks such as walking, bathing, dressing



and eating, while IADLs included tasks such as preparing meals, shopping for groceries and managing medications, all tasks which help support an independent lifestyle. The prevalence of frailty by the presence of having at least one ADL or IADL disability at Waves 1-4 is summarised in Figure 7.3.

The prevalence of having at least one ADL or IADL disability was significantly higher among adults living with frailty compared to their counterparts living with pre-frailty or in robust health (45.7%, 12.1% and 1.8% respectively at Wave 1). This corresponds to almost one in two older adults with frailty having a disability, compared to one in eleven older people with pre-frailty and just one in fifty robust older adults having a disability. These findings were generally consistent across Waves 1-4.

Figure 7.3: Disability and frailty at Waves 1 - 4 using the FI measure (n = 5,304).



## 7.5 Frailty and mental health

Frailty has been shown to have a bi-directional relationship with mental health in older adults, thus frailty may be a risk factor for and a consequence of decline in cognitive function. Self-reported information regarding two aspects of mental health namely global cognitive function and depressive symptoms were gathered from participants during the home interview at Waves 1-4.

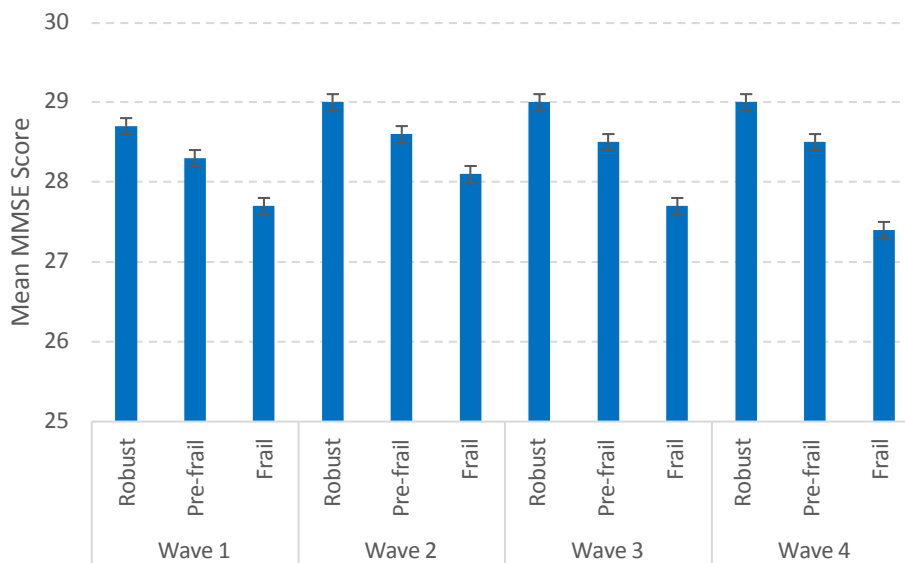
### 7.5.1 Frailty and global cognitive function

The mini-mental state examination (MMSE) is a 20-item test that was used to screen for cognitive impairment (14, 15). It is commonly used in clinical practice to screen for dementia. It is also used to estimate the severity of cognitive impairment at a given point in time and to follow the course of cognitive changes in an individual over time. It assesses

orientation, recall, attention, calculation, language abilities and visuospatial ability. The average score on the MMSE was 28.5-28.7 at each wave. The prevalence of frailty by global cognitive function (MMSE score) at Waves 1-4 is summarised in Figure 7.4.

Individuals living with frailty exhibited the lowest scores on the MMSE followed by those living with pre-frailty and robust individuals had the highest MMSE scores indicating better cognitive function. On average, adults with frailty and pre-frailty scored 0.9-1.4 and 0.4-0.5 points lower on the MMSE respectively across Waves 1-4 compared to robust older adults. On average, females scored 0.2-0.3 points higher than males and the 65-74 and  $\geq 75$  years age groups scored 0.2-0.6 and 0.7-1.1 points lower than the 50-64 age group across Waves 1-4. After adjusting for the effect of age group and gender, adults with frailty and pre-frailty scored 0.6-1.1 and 0.2-0.4 points lower on the MMSE scale compared to the robust group. This indicates a progressive decline in global cognitive function among those living with pre-frailty and frailty.

Figure 7.4: Global cognitive function (MMSE score, maximum score =30) by frailty at Waves 1 - 4 using the FI measure (n = 4,308).

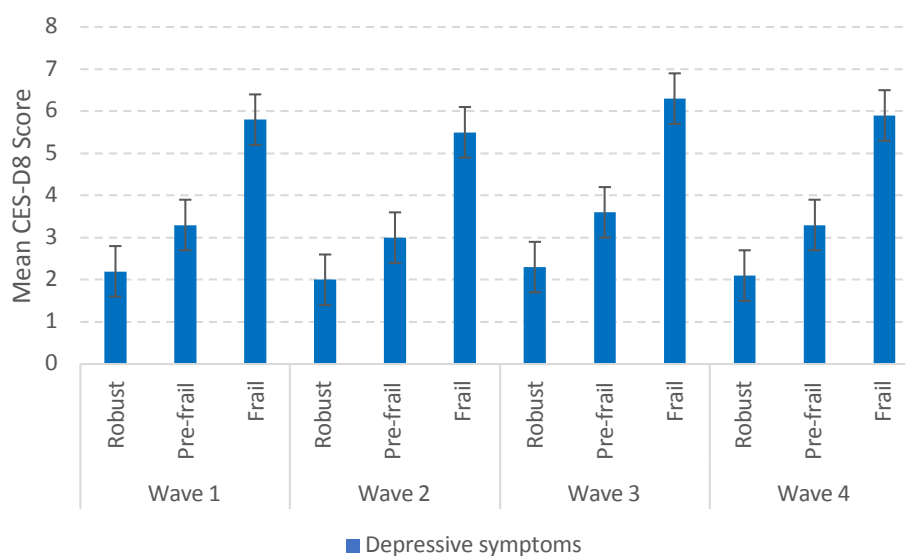


### 7.5.2 Frailty and depression

Depressive symptoms were assessed using the short 8-item version of the Centre for Epidemiological Studies-Depression (CES-D8) scale (16, 17). 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. The average score on the CES-D8 depression scale was 3.0, 2.8, 3.3 and 3.3 at Waves 1-4 respectively. The prevalence of frailty by depressive symptoms (CES-D8 score) at Waves 1-4 is summarised in Figure 7.5.

At each wave, the group with frailty reported higher levels of depressive symptoms than the pre-frail and robust groups (a CES-D8 score of 6 in the frail group versus 2 in robust group at Wave 4). Depressive symptoms are higher in women and decreased with increasing age. When the effect of age group and gender was adjusted for older adults with frailty and pre-frailty still scored 4.0-4.5 and 1.3-1.6 points higher on the CES-D8 scale compared to the robust group – indicating progressively more depressive symptoms among those older adults with pre-frailty and frailty.

Figure 7.5: Depressive symptoms (CES-D8 score, maximum score =24) by frailty at Waves 1 - 4 using the FI measure (N=5,217).



## 7.6 Conclusion

The prevalence of frailty in community living adults aged 50 years and over in Ireland was 12.7% at Wave 1 which is equivalent to 160,000 adults. The prevalence of pre-frailty was 31%, equivalent to 370,000 adults. The prevalence increased to 21.5% for frailty and 40% for pre-frailty in those aged 65 and over. In Ireland, currently 13% of the population is 65 years or older and this number is expected to double by 2040 (Central Statistics Office, 2016); the burden of frailty may also double in that time. Indeed, at each successive waves of TILDA, the incidence of frailty almost doubled from 1.5% at Wave 2 to 3.0% at Wave 3 and 5.4% at Wave 4. This underscores the importance of targeting frailty to improve the health and well-being of older adults in Ireland. The impact of frailty on the Irish health and social care system is considerable (13) and will be covered in Chapter 9.

Frailty increases with age and the prevalence doubled with each successive age group from 50-64, 65-74 and 75+ years. Frailty is more common in women, those with lower education and those who are widowed or living alone. This highlights the need to provide social interventions and promote social engagement and connectedness in older adults to help them to remain robust, staving off the development of frailty.

Adults aged 50 and over in Ireland who live with frailty are more likely to experience falls and report fear of falling compared to their counterparts who are pre-frail or robust. Given falls have very serious consequences including hip and wrist fracture it is important to reduce risk factors for falls through appropriate fall prevention programmes (18). A further consequence of living with frailty is disability. Almost half of people living with frailty report having at least one disability in basic and/or instrumental activities of daily living. For this reason, frailty is viewed as a transition between healthy ageing and disability and is considered a risk factor and intervention target for disability in older adults (1).

A bi-directional relationship between frailty and declines in cognitive function have been shown in the scientific and medical literature suggesting that frailty may be a risk factor for and a consequence of decline in cognitive function (19). Global cognitive function is lower while depressive symptoms are higher among adults with frailty in Ireland compared to those with pre-frailty or who are in robust health. Given the increasing prevalence and incidence of dementia and cognitive impairment as well as frailty among adults aged 50 and over in Ireland and worldwide, prevention and intervention strategies that can delay or halt progression of both frailty and cognitive decline are warranted.

An important finding in this Chapter is that the prevalence of frailty and the frailty-related sociodemographic physical health and mental health outcomes all increased over time moving from Wave 1 (2009-2011) to Wave 4 (2016). A significant proportion of this increase may be attributed to the ageing of the cohort but this too is important to note given current and projected ageing of the population of Ireland over the next thirty years (Central Statistics Office, 2016). As mentioned earlier, we are likely to see a doubling in the proportion of adults, particularly those aged 65 and older, presenting with frailty and related adverse health outcomes for which we must be prepared.

The significance of frailty as an impediment to healthy ageing was highlighted at a focus meeting on “Frailty and Intrinsic Capacity” by the World Health Organisation (WHO) Clinical Consortium on Healthy Ageing in December 2016. In particular, they stated that active case findings of older people with frailty is essential for the reorientation of health services to meet people's needs; that proactive identification of people in the community at risk of frailty provides opportunities to intervene and so prevent or delay functional decline

and disability (20). The significance of frailty to healthy ageing, health care planning and delivery in Ireland is recognised by the National Clinical Programme for Older People (NCPOP) and the Integrated Care Programme for Older People (ICPOP). A National Frailty Education Programme, in partnership with TILDA, was initiated in 2016 to train health professionals to understand the risk factors for frailty enabling them to implement programmes for early detection, prevention and management (21).

Frailty is not an inevitable consequence of ageing, three in five people aged 75+ and one in two people aged 80+ years are classified as robust or pre-frail. Frailty is a dynamic process and people can experience positive transitions reverting to pre-frailty from frailty and robustness from pre-frailty. Frailty is modifiable, it may be delayed, halted and even reversed with timely and appropriate prevention, detection and intervention strategies. With a concerted effort there is a very real opportunity to improve the lifespan and healthspan of older adults in Ireland by assertively targeting frailty as a condition that can be ameliorated.

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## Appendices

Appendix 7.9: Components of 32-item FI based on TILDA CAPI variables from Waves 1-4.

	Variables in Tilda	Cut-points
1.	Difficulty walking 100m	Yes = 1; No = 0
2.	Difficulty rising from a chair	Yes = 1; No = 0
3.	Difficulty climbing stairs	Yes = 1; No = 0
4.	Difficulty stooping, kneeling or crouching	Yes = 1; No = 0
5.	Difficulty reaching above shoulder height	Yes = 1; No = 0
6.	Difficulty pushing/pulling large objects	Yes = 1; No = 0
7.	Difficulty lifting/carrying weights $\geq 10$ lb	Yes = 1; No = 0
8.	Difficulty picking up a coin from a table	Yes = 1; No = 0
9.	Feeling lonely	Rarely or none of the time=0; Some or a little of the time=0.33; Occasionally or a moderate amount of time=0.66; All of the time=1.
10.	Poor self-rated physical health	Excellent=0; Very good=0.25; Good=0.5; Fair=0.75; Poor=1.
11.	Poor self-rated vision	Excellent=0; Very good=0.25; Good=0.5; Fair=0.75; Poor=1
12.	Poor self-rated hearing	Excellent=0; Very good=0.25; Good=0.5; Fair=0.75; Poor=1
13.	Poor self-rated memory	Excellent=0; Very good=0.25; Good=0.5; Fair=0.75; Poor=1.
14.	Difficulty following a conversation	None=0; Some=0.5; Much/Impossible=1.
15.	Daytime sleepiness	Would never doze=0; Slight chance of dozing=0.33; Moderate chance of dozing=0.66; High chance of dozing=1.
16.	Polypharmacy	Yes = 1; No = 0
17.	Knee pain	Yes = 1; No = 0
18.	Hypertension	Yes = 1; No = 0
19.	Angina	Yes = 1; No = 0
20.	Heart attack	Yes = 1; No = 0
21.	Diabetes	Yes = 1; No = 0
22.	Stroke and transient ischemic attack	Yes = 1; No = 0
23.	High cholesterol	Yes = 1; No = 0
24.	Irregular heart rhythm	Yes = 1; No = 0
25.	Other CVD	Yes = 1; No = 0
26.	Cataracts	Yes = 1; No = 0
27.	Glaucoma and age-related macular degeneration	Yes = 1; No = 0
28.	Arthritis	Yes = 1; No = 0
29.	Osteoporosis	Yes = 1; No = 0
30.	Cancer	Yes = 1; No = 0
31.	Varicose ulcer	Yes = 1; No = 0
32.	Incontinence	Yes = 1; No = 0

Adapted from Roe et al, 2017 (13)



# 8

# Cognitive change over time

Joanne Feeney and Katy Tobin

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# 8

## Cognitive change over time

### Key Findings

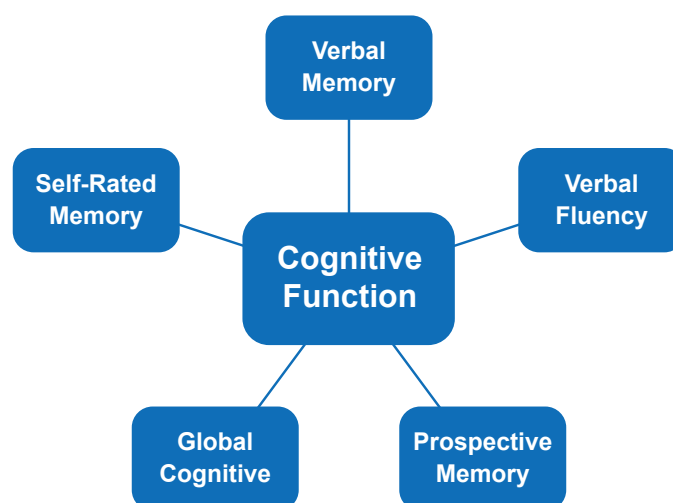
- The majority of older adults continue to perform well on core cognitive tests at an average follow-up of six years, with only minor decreases in task performance.
- There was a slight decline in verbal memory scores observed over time for adults aged 65 years and older. Decline was greatest on the 10-word delayed recall task, and among adults aged 75 and older, who recalled one word less on average at Wave 4 compared to Wave 1.
- Verbal fluency declined across the four waves in adults aged 50 and over. Decline was most pronounced in individuals aged 75 years and older; on average, they named four fewer animals at Wave 4 than at Wave 1.
- There was no decline in prospective memory over time in adults aged 50-64 and 65-74 years. However, the success rate for adults aged 75 and older dropped from 53% at Wave 1 to 40% by Wave 4.
- Older adults who were the most socially integrated at Wave 1 had higher verbal fluency scores initially than adults who were the most isolated, but this difference did not persist over time.
- The proportion of adults aged 50 and older who reported that their memory was 'Fair' or 'Poor' increased from 15% at Wave 1 to almost 20% at Wave 4.
- Seven percent of older adults felt that their memory was continuously declining over the waves. These individuals also had a slightly larger decrease in delayed word recall, verbal fluency, and MMSE scores over the four waves.

## 8.1 Introduction

As older adults age, there are often changes in certain aspects of cognitive function, which may have implications for performance of everyday tasks, retaining autonomy and independent living at older ages. In The Irish Longitudinal Study on Ageing (TILDA), there are a small number of cognitive tests that form a core component of the computer-assisted personal interview (CAPI) which is delivered by interviewers in the participant's own home. These core tests were administered to participants at every wave of data collection<sup>1</sup> and this affords the opportunity to examine any changes in cognitive function over time or particular patterns within these changes. This is helpful to determine whether there are certain groups of older adults who are more vulnerable to cognitive decline than others.

The core cognitive measures in the CAPI are designed to test several different aspects of cognitive function. Learning and memory are investigated using three separate measures: verbal memory (10-word list learning and recall), prospective memory (remembering to do something at a later point in time) and participants' own perception of their memory functioning (self-rated memory). Executive function is an umbrella term given to a number of cognitive abilities that are required for goal-directed action, including planning, mental flexibility and the ability to suppress inappropriate or incorrect responses (1). In TILDA, executive function is assessed using a verbal fluency task. Global cognitive function is assessed using the Mini-Mental State Examination (MMSE (2)). This is a brief, 30-point test comprising several aspects or domains of cognitive function, including orientation, memory, language, spatial ability, attention and abstract thinking. Further cognitive tests were included as part of the health assessment, which was carried out at Waves 1 and 3, however these measures are not utilised for this Chapter.

Figure 8.1: Measures of cognitive function in the TILDA CAPI.



<sup>1</sup> With the exception of the Mini-Mental State Examination, which formed part of the health assessment at Wave 1 but was included in the CAPI at Waves 2, 3 and 4.

The TILDA Wave 1 Key Findings Report (3) detailed the average performance and difference in performance across age, sex and education for the CAPI cognitive tests and self-rated memory at baseline. The main purpose of this Chapter is to build on those observations by examining change in objective and self-rated cognitive performance from Wave 1 through to Wave 4, by age, sex and education. A further aim is to investigate the change in objective cognitive performance according to how well socially integrated participants were at Wave 1. The degree to which a person is socially integrated rather than isolated can influence their psychological and physical health (4). Furthermore, there is evidence that social engagement may be important for maintaining good cognitive function in later life (5). A final aim is to examine the association between objective cognitive function and self-rated cognitive function, i.e. whether self-rated memory decline reflects an actual change in cognitive performance.

The sample consists of 4,975 adults in the Republic of Ireland aged 50 years or older at Wave 1, who gave a self-interview and answered all of the cognitive elements in the CAPI at each Wave. From Wave 2 onward, in the event that an individual was not physically or cognitively capable of giving an interview, a proxy interview was sought where prior consent had been given for this. This involved someone close to the participant (either a spouse/partner, close relative, friend or carer) answering the questions on their behalf. In the case of a proxy interview, cognitive tests were not administered to the participant, and those individuals are not included in the current analyses. The results presented herein therefore reflect the change in cognitive function over an average of six years among community dwelling adults aged 50 and older, who were physically and cognitively well enough to give an interview at every wave. We have applied statistical weights to account for the fact that certain groups of individuals are less likely to participate in the study at the outset and are also more likely to drop out of the study over time. Findings are presented with respect to differences across waves, age group at baseline (50-64 years, 65-74 years, 75 years and older), sex and education level (none/primary, secondary level, and third level/tertiary education). Changes in cognitive performance according to level of social integration at Wave 1 and self-rated memory decline between waves are also presented.

## **8.2 Six-year change in objective cognitive performance**

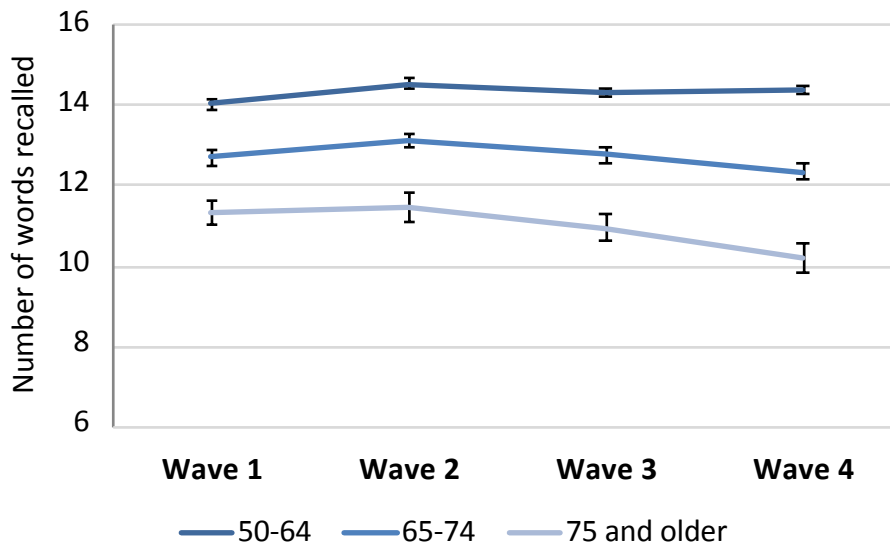
### **8.2.1 Verbal memory**

Verbal memory is particularly susceptible to age-related declines in performance (6, 7) and is one of the aspects of cognitive function most often affected early in mild cognitive impairment and dementia (8). Verbal memory is assessed in TILDA using a 10-word list learning and recall task. Participants hear a list of 10 words and are asked to recall as many words as possible. They immediately hear the same 10 words and are again asked to recall as many

words as possible. The scores from both immediate recall attempts are added together to give an immediate recall total score (range: 0-20 words). Delayed recall is tested after a time delay of approximately 15 minutes when participants are asked to recall the words they heard earlier (delayed recall score, range: 0-10 words).

Performance on the immediate recall task decreased with increasing age with a small decline in performance over time evident in individuals aged 75 years and older (see Figure 8.2). Women performed slightly better than men at all waves (mean: 13.8 words versus 13.2 words). Performance was higher among those with a higher level of education (None/primary = 11.9; secondary = 13.8; third level = 14.9).

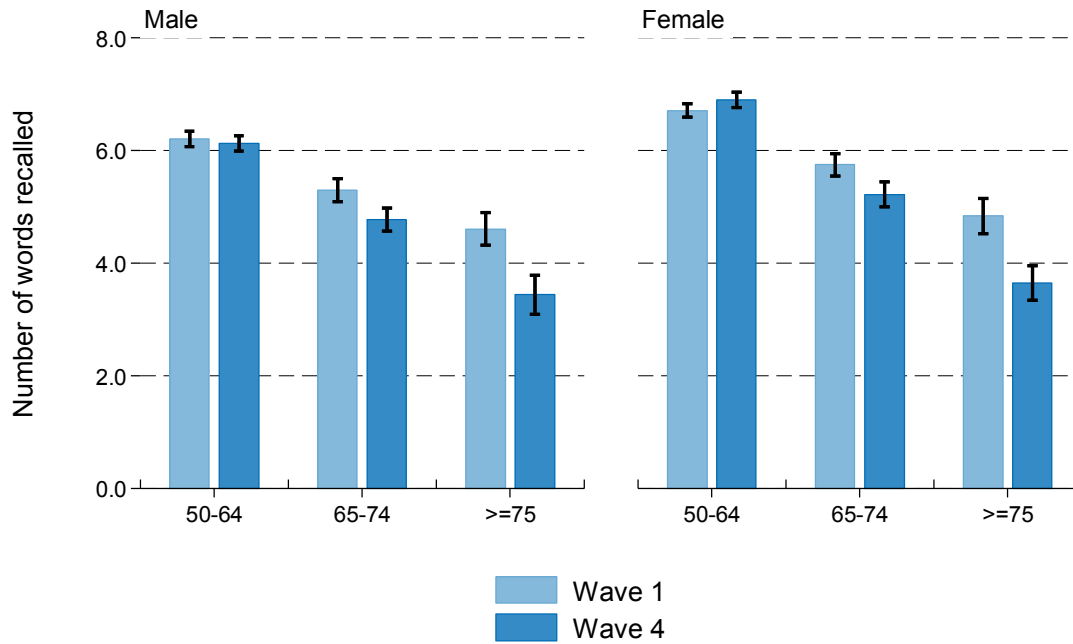
*Figure 8.2: Immediate word recall total score across Waves 1 to 4, by age group at baseline.*



Error bars correspond to 95% confidence intervals.

A similar pattern of performance on the delayed recall task by age group, sex and wave was observed (see Figure 8.3). The number of words recalled decreased between Wave 1 and Wave 4 among participants aged 65-74 years but more markedly for those aged 75 years and older, amounting to a decrease of about 1 word. Again, women outperformed men, but only among those aged less than 75 years.

Figure 8.3: Delayed word recall score at Waves 1 and 4, by age group and sex.



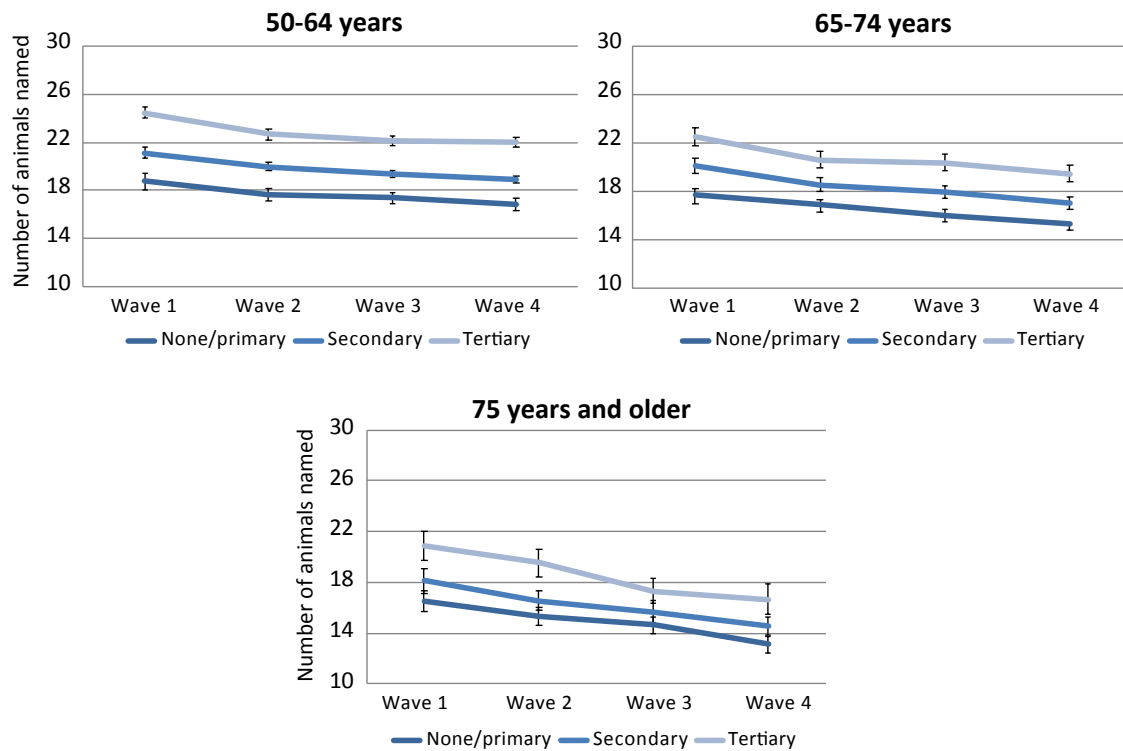
Note. N = 4,975; Error bars correspond to 95% confidence intervals

### 8.2.2 Verbal fluency

Executive function, which includes planning, mental flexibility and the ability to suppress inappropriate or incorrect responses (inhibition) was assessed using a verbal fluency task. Such tasks typically require participants to generate as many words as possible within a short time period, usually either items belonging to a particular subject category (e.g. animals, foods), or words beginning with a particular letter. Performance is dependent on a variety of executive processes such as self-monitoring, mental flexibility and inhibition, and also on language processing (9, 10). In TILDA, participants were asked to name as many animals as they could in one minute; the total number reflects the verbal fluency score.

Figure 8.4 shows the mean verbal fluency score by age and education level across Waves 1-4. Younger adults and those with higher levels of education named more animals on average than those who were older or had a lower level of education. Despite these age and education gradients, all groups displayed a decline over time in the average number of animals named (the overall change was from 20.6 at Wave 1 to 18.1 at Wave 4), however the decline in performance was greatest for those aged 75 years and older, from a mean of 17.8 words at Wave 1 to 14.2 words at Wave 4. Among individuals aged 75 and older, men performed better than women (16.7 versus 15.5 words), however they experienced a similar decline over time.

Figure 8.4: Verbal fluency score across Waves 1 to 4, by age group and education level.



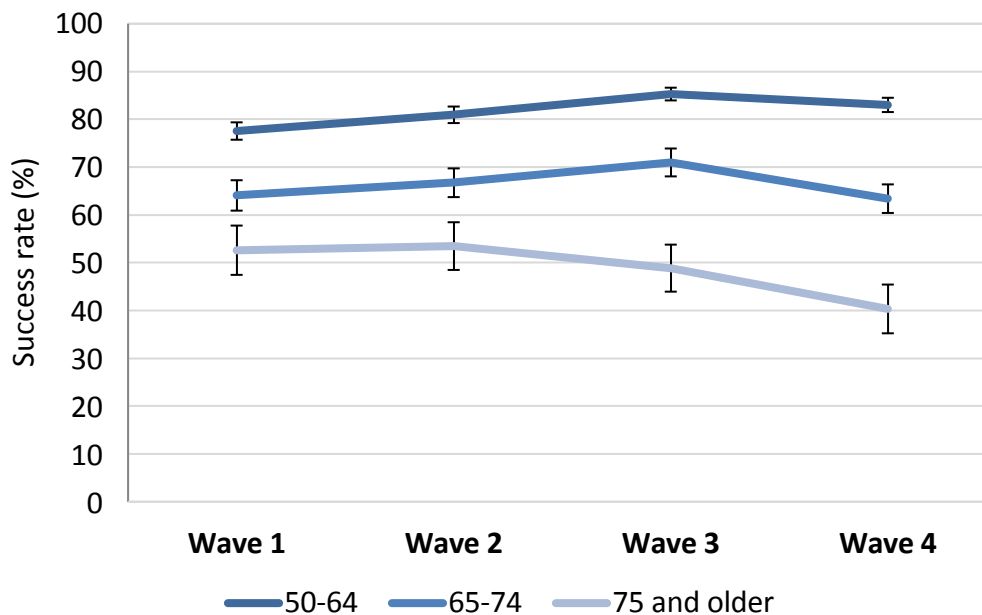
Error bars correspond to 95% confidence intervals

### 8.2.3 Prospective memory

Prospective memory is the ability to remember to perform an action in the future (11), either at a specific time, or in response to a particular cue. It is a vital skill in order to perform many day-to-day tasks, and as such, is important for maintaining independence in late-life. At an early point in the interview, participants were asked to remember that at a later point, they would be handed a piece of paper and a pen, and that when that occurred, they should write their initials in the top, left-hand corner of the piece of paper. Success on the task was defined as remembering to carry out this action precisely and doing so without receiving a prompt from the interviewer.

Overall success rates differed by age and education level, with higher success rates among younger participants and those with a higher level of education. Among adults aged 75 and older, the success rate declined across the waves from 52.6% at Wave 1 to 40.3% at Wave 4 (see Figure 8.5). However, for those aged 50-64 and 65-74 years, there was an average increase in the probability of success between Wave 1 and Wave 3 suggesting that, at least in the early waves, younger participants may have learned from having carried out the task previously.

Figure 8.5: Percentage of older adults who successfully completed the prospective memory task across Waves 1 to 4, by age group.



Error bars correspond to 95% confidence intervals.

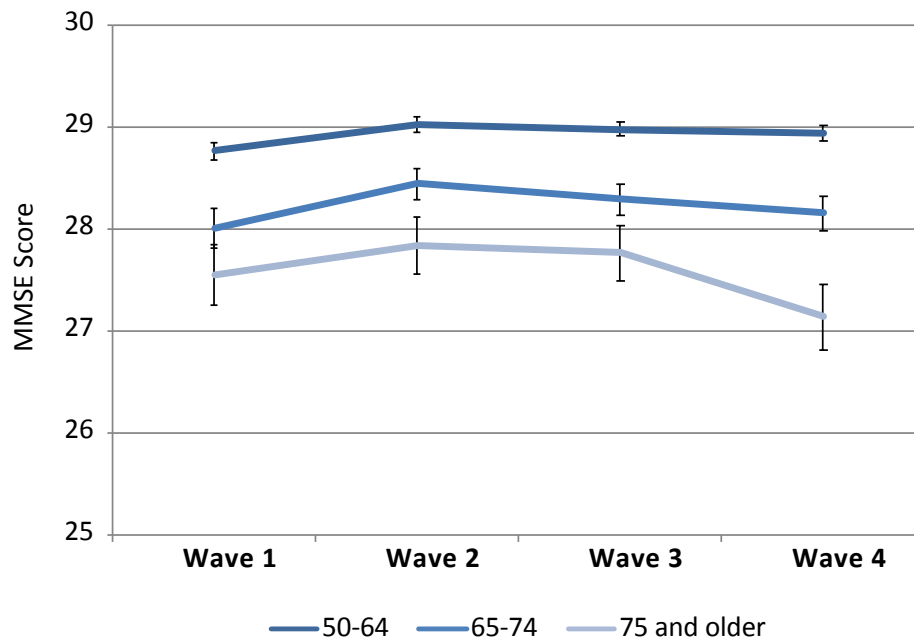
### 8.2.4 Mini-Mental State Examination (MMSE)

The MMSE (2) is a 10-minute test of cognitive function and is commonly used as a screening tool for cognitive impairment in hospital settings. The maximum score on the test is 30 points. While it can be useful clinically for identifying individuals who may need more in-depth cognitive assessment, it has been shown to be relatively insensitive to subtle changes over time in community-dwelling older adults.

Figure 8.6 displays mean MMSE scores across the four waves by age group. Individuals aged 50-64 performed better on this task at all waves, relative to individuals aged 65-74 years and 75 years and older. However, there was no significant change in scores over the average six year follow up for any age group. Women and men performed similarly on the task. Scores were greater among those with a higher level of education (none/primary = 27.6; secondary = 28.8; third level = 29.2), but change in performance over time did not differ according to education level.



Figure 8.6: Mini-Mental State Exam (MMSE) score across Waves 1 to 4, by age group.



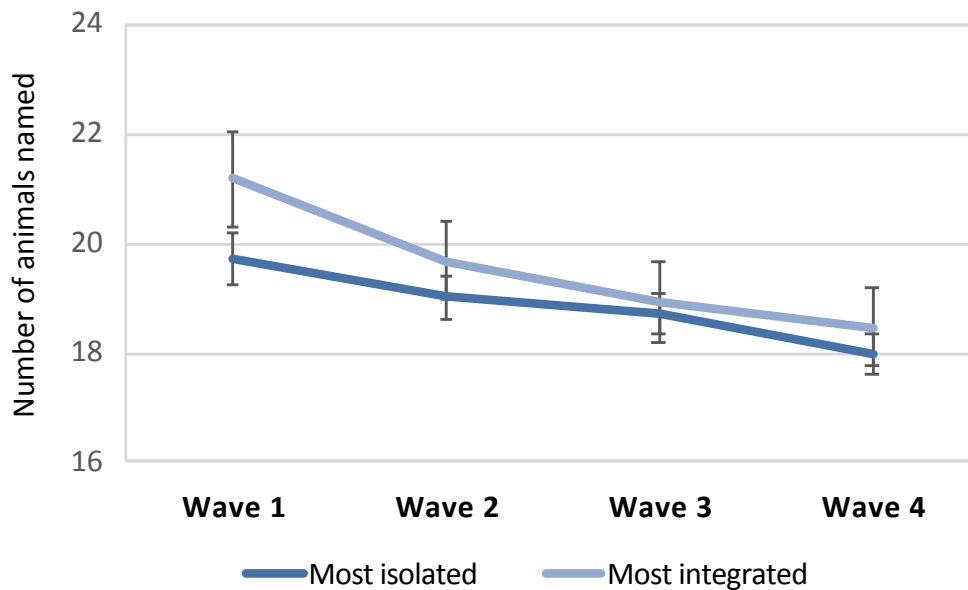
Error bars correspond to 95% confidence intervals. Note reduced n of 4,137 participants.

### 8.3 Change in cognitive performance by level of social integration

Social integration is assessed at Wave 1 using the Social Network Index (12). The scale measures the extent to which an individual has meaningful personal ties to friends and family and social ties to community. This takes into account whether an individual is married/cohabiting, the number of close friends and relatives they have, and whether they are involved in any community, church groups or charitable organisations. Individuals are grouped into four categories: 'most isolated', 'moderately isolated', 'moderately integrated' and 'most integrated'.

Figure 8.7 shows mean verbal fluency scores by wave and level of social integration. Compared to older adults who were the most socially isolated, individuals who were the most socially integrated named more animals at Wave 1 (21.2 versus 19.7). However, both groups declined in performance over the subsequent waves, and the difference between the groups was no longer evident by Wave 2. There were no significant differences in word recall performance, prospective memory or MMSE scores between social integration groups at any wave.

Figure 8.7: Verbal fluency score across Waves 1 to 4, by level of social integration at Wave 1.



Error bars correspond to 95% confidence intervals.

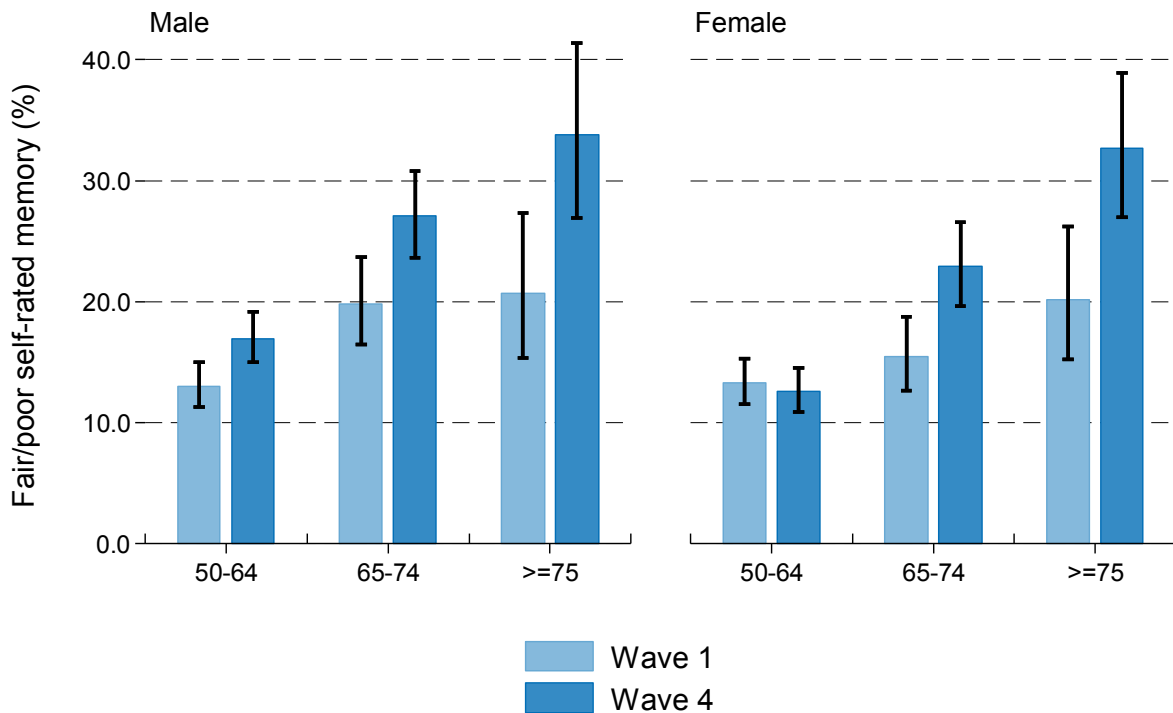
## 8.4 Self-rated memory ability and memory decline

Older adults' subjective assessment of their own cognitive functioning can be influenced by many factors. These include age and actual cognitive ability (typically measured objectively by cognitive testing), but also how old a person 'feels' (13), their physical health, mood, anxiety and personality (14). Concerns about memory and cognitive ability are common in older adults (15). In addition to this, self-rated memory decline, defined as the self-perception of a deterioration of memory functioning, can be indicative of actual or future change in performance on cognitive tests (16, 17).

### 8.4.1 Self-rated memory

Older adults in the study were asked at each Wave to rate their current memory ability on a 5-point scale: either 'Excellent', 'Very good', 'Good', 'Fair', or 'Poor'. Across all waves, on average, 82% of older adults felt that their memory was good, very good, or excellent. However, there was an increase over time in the proportion of older adults who self-reported fair or poor memory from 15.1% at Wave 1 to 19.5% at Wave 4. Figure 8.8 shows the percentage of participants who reported fair/poor memory at Waves 1 and 4 by age group and sex. The proportion reporting fair/poor memory increased with age, and among those aged less than 75 years, it was higher in men than women. However, the increase in self-reported fair/poor memory between Wave 1 and Wave 4 was greater in women. A similar trend was evident for men but did not reach statistical significance.

Figure 8.8: The percentage of older adults with fair/poor self-rated memory, at Waves 1 and 4, by age group and sex.



Note. N = 4,975; Error bars correspond to 95% confidence intervals

The proportion of participants with fair/poor self-rated memory also differed by level of education, from 25.8% of older adults with none/primary level education to 11.5% of those with third level education. There was a slight increase in the proportion reporting fair/poor memory over time among those participants with none/primary or secondary education, but no change for those with third level education.

#### 8.4.2 Self-rated memory decline

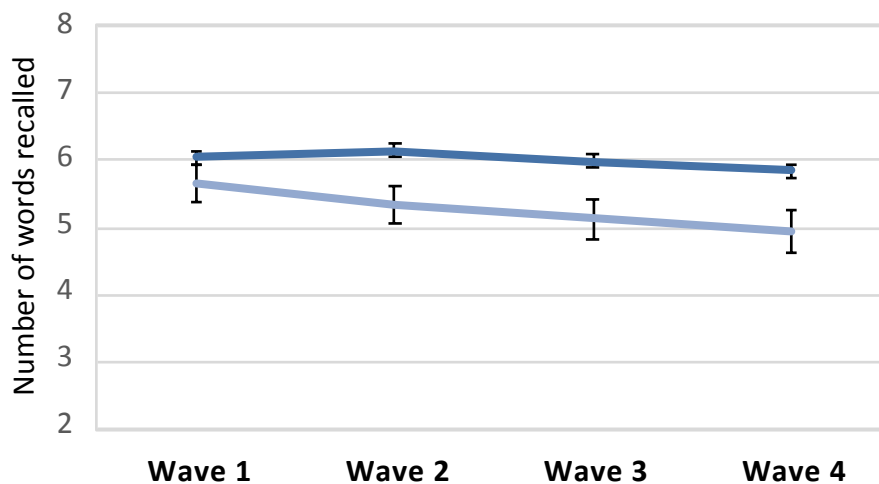
At Waves 2, 3 and 4, in addition to being asked to rate their current memory ability, participants were also asked if they felt that their memory had changed i.e. whether it was better, the same, or worse than at the previous interview. The proportion of older adults who indicated at any of Waves 2, 3 or 4 that their memory had declined since the previous interview was high, at 42%. However, only 7% of adults reported persistent memory decline i.e. a decline at all three waves. The percentage of participants with persistent self-rated memory decline increased with age from 5% of adults aged 50-64 years to 14% of participants aged 75 years and older. However, there was no difference between men and women or by level of education.

### 8.4.3 The relationship between objective cognitive test performance and self-rated memory decline

Older adults with persistent self-rated memory decline had a lower immediate recall total score than those who did not report persistent decline, recalling on average one word fewer. There was also a trend for this group to decline faster across waves but this was not statistically significant.

Figure 8.9 displays the average delayed word recall score across waves and by self-reported persistent memory decline. At all waves, participants who felt that their memory was continually declining had lower scores than those who did not feel this way. Furthermore, these individuals had a greater average decrease in performance on the delayed recall task over the six-year period, although the magnitude of this decline was less than 1 word.

Figure 8.9: Delayed word recall score across Waves 1 to 4, by persistent self-rated memory decline.



**Note:** No persistent decline = No self-reported memory decline or self-reported memory decline at one or two Waves only; Persistent decline = self-reported memory decline at all three Waves (i.e. Waves 2, 3 and 4). Error bars correspond to 95% confidence intervals.

In the verbal fluency task, individuals with persistent self-rated memory decline named an average of 18.4 animals, compared with 19.3 for participants with no persistent decline. The decline in verbal fluency score across waves was also greater for those with persistent decline from 20.6-16.9 (Table 8.1). This 4-point drop in score contrasts with a 2-point drop in those with no persist decline. On average, 35% of participants with persistent self-rated memory decline failed the prospective memory task compared with 25% of all other participants; however, their performance did not decline between Waves 1 and 4.

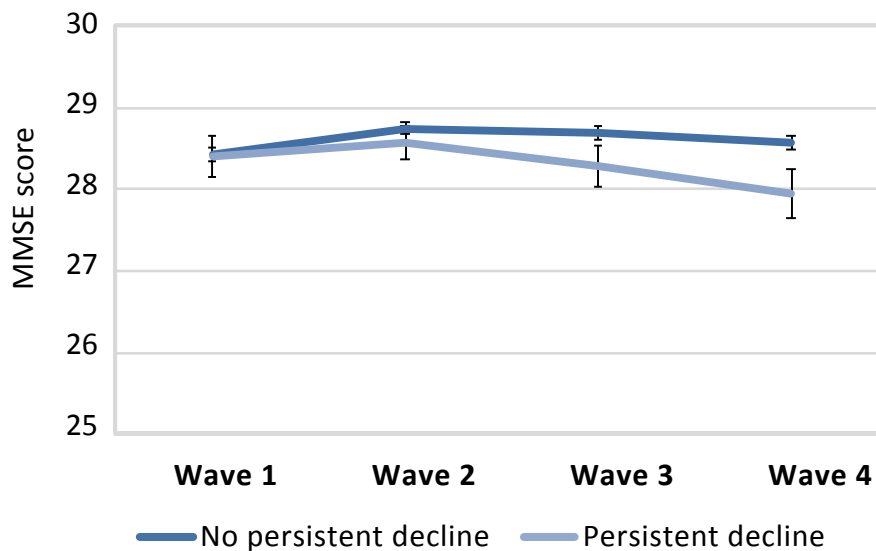
Table 8.1: Verbal fluency score across Waves 1-4, by persistent self-rated memory decline.

(N = 4,975)	Mean number of animals named			
	Wave 1	Wave 2	Wave 3	Wave 4
No persistent decline	20.6	19.4	18.7	18.2
Persistent decline	20.6	18.3	17.8	16.9

**Note:** No persistent decline = No self-report memory decline or self-report memory decline at one or two Waves only; Persistent decline = self-reported reported decline at all three Waves (i.e. Waves 2, 3 and 4).

Figure 8.10 shows MMSE scores across Waves 1 to 4 by persistent self-rated memory decline. There were no differences in baseline score between groups, but by Waves 3 and 4 a small difference in performance, of approximately half a point on average, was evident.

Figure 8.10: Mini-Mental State Examination (MMSE) score across Waves 1 to 4, by persistent self-rated memory decline.



**Note:** No persistent decline = No self-reported memory decline or self-reported memory decline at one or two Waves only; Persistent decline = self-reported reported decline at all three Waves (i.e. Waves 2, 3 and 4).

N = 4,137.

## 8.5 Discussion

This Chapter explored the change in cognitive function over four waves: between baseline and an average of six-years follow up. Overall, there was little change in cognitive function across the four waves, particularly in adults who were aged less than 75 years at Wave 1. The greatest evidence of decline in performance was in verbal memory, verbal fluency and prospective memory among adults aged 75 and over. The overall level of cognitive performance was impacted by education whereby individuals who had more years of formal education consistently performed better on the tasks than those who had received

less education. The sex of participants also affected performance on the immediate and delayed recall tasks with women recalling more words than men. Conversely, men in the oldest age group performed better than women on the test of verbal fluency. Despite these overall differences by education level and sometimes by sex, neither characteristic affected whether or by what degree, cognitive performance changed over time.

The observation of only small changes in performance on the cognitive tests over six years is a positive finding. It is likely, in part, reflects the fact that adults recruited at baseline were community dwelling, and that the current analysis was carried out only on adults who were interviewed in person at all four waves, and so does not include proxy interviews. Therefore, in general, the results reflect individuals without severe cognitive impairment. In addition, as the majority of TILDA participants are still relatively young, we would not expect much cognitive decline to have occurred, even after six years. We did however, observe a small decline in cognitive function in those aged 75 years and over at baseline. This is in keeping with international evidence, which suggests acceleration in cognitive decline, at least in some domains, from age 75-80 years onwards (e.g.(18, 19)). Nonetheless, the average drop in test scores between waves was small, suggesting that for most individuals, this would likely have a negligible effect on their everyday functioning. The lack of significant decline among those aged less than 75 years at baseline is evidence that the majority of community dwelling older adults in their 50s, 60s and early 70s function very well. This lends support to recent European Union policy initiatives to extend working lives, and to the move by the Irish government in particular, to raise the state pension age to 68.

Social engagement and social participation are associated with better health in later life and evidence suggests that they may help to reduce deterioration in cognitive abilities with age (5, 20). Our results show that while there was an initial difference in verbal fluency according to how socially integrated adults were at Wave 1, this difference did not persist across waves.

By Wave 4, there was an increase in the proportion of participants who self-reported their memory as fair or poor, and this increased with age. Although there are many factors that influence self-rated memory on any given occasion, evidence increasingly suggests that subjective memory decline can predict the future development of mild cognitive impairment and/or dementia (21, 22). While a high proportion of adults reported at some point that they felt their memory had declined since the previous wave, only a small percentage of adults reported persistent memory decline wave on wave. Self-reported persistent decline over a period of years may be important in predicting future dementia risk (23), and this group also showed a decline in verbal fluency, delayed recall and MMSE scores over time.

Once again, however, the size of these decreases was small, indicating that at the group level, there was no major deterioration in cognitive abilities over the six years.

## 8.6 References

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# 9

## Trends in healthcare cover and healthcare use for older adults in Ireland during the austerity years of 2009 to 2016

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# 9

## Trends in healthcare cover and healthcare use for older adults in Ireland during the austerity years of 2009 to 2016

### Key Findings

Following the financial crash in 2008, Ireland entered a period of austerity. This report examines trends from 2009 to 2016 to explore potential effects of this period in healthcare cover and healthcare utilisation. Key trends are summarised here:

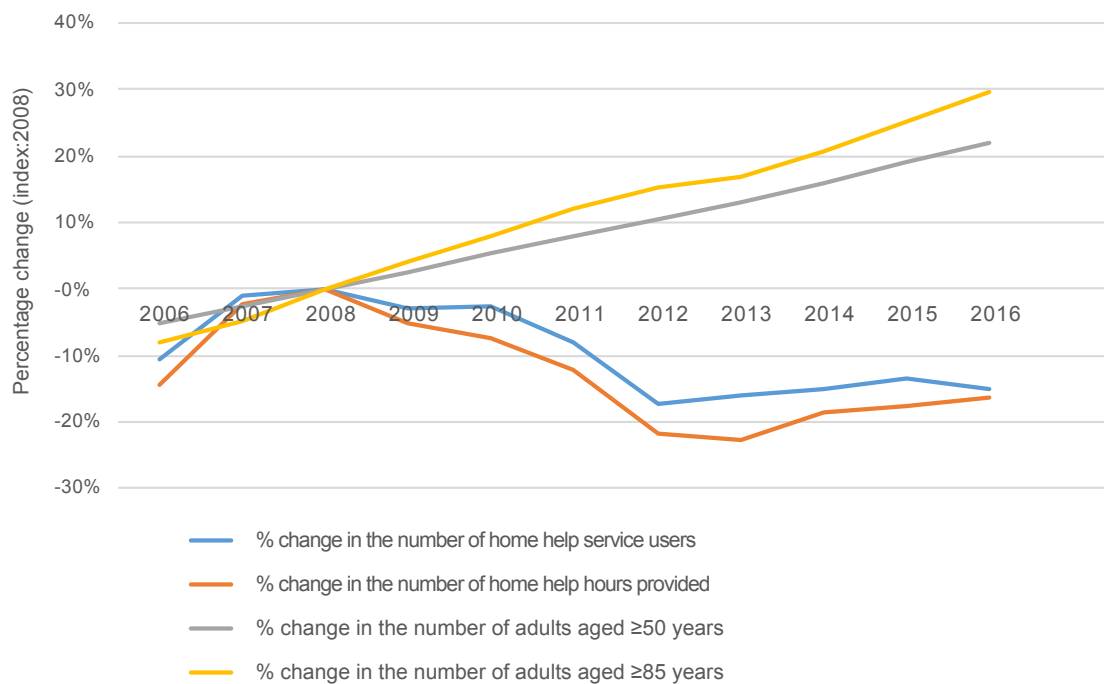
- The proportion with a medical card increased (from 45% to 53%) but, dropped in the over 70s (from 90% to 74%). A means testing system for medical card entitlement for the over 70s was introduced in January 2009 and the threshold decreased during subsequent Budgets.
- The proportion with a GP visit card increased (from 2% to 9%) and, within the over 70s, increased substantially (from 1% to 19%) between Waves 1 and 4. A universal GP visit card for the over 70s was introduced in 2015.
- We did not detect any changes in the rate of purchasing private health insurance among older adults in Ireland.
- We found an increase in the proportion of older adults in Ireland who visited a range of medical care services at least once in the previous year including visits to their General Practitioner (from 87% to 92%), the Emergency Department (15% to 18%) and hospital admissions (12% to 26%). We detected a marginal increase in the average number of nights spent in hospital (1.0 to 2.0 nights).
- For older adults with frailty, the proportion with at least one overnight hospital admission increased (from 23% to 31%) while the average number of nights spent in hospital more than doubled (from 2.7 nights to 6.5 nights). The proportion with at least one outpatient clinic visit fell (from 69% to 59%) and the average number of outpatient clinic visits decreased (from 3.1 visits to 2.1 visits).
- Dental care use reduced (from 11% to 9%); though the rate of decline was most notable for those who were classified as frail (from 17% to 11%).

- Community services (e.g. respite, day centre, meals on wheels, occupational therapy or community nursing) were accessed infrequently and we found minimal change in the utilisation of these services across the waves.
- Home help and personal care provision increased marginally (from 3% to 5%) however, the users of the home help service changed – 19% of users had concurrent limitations in activities of daily living (ADL) and instrumental activities of daily living (IADL) in 2010 compared to 41% in 2016. The HSE changed the objective of the home help service in 2012 from provision of ‘domestic help’ to provision of ‘personal care.’
- Informal care (i.e. care from family or friend) use increased (5% to 9%), and particularly among older adults with frailty (27% to 36%) between Wave 1 and Wave 4.

## 9.1 Introduction

Older people's health service utilisation and healthcare cover is captured at each wave of TILDA, beginning with Wave 1 in 2009. By Wave 4, we have captured a seven year period allowing us to examine changes in these areas between 2009 and 2016. This was a period of significant change in Ireland – the so called 'austerity years' where public revenue for the health sector was substantially reduced and private incomes and employment fell. Government non-capital spending on health fell from €14.4 billion in 2009 to €13.1 billion<sup>1</sup> in 2015 while a public sector recruitment embargo and a voluntary redundancy scheme introduced in March 2009 resulted in the loss of over 8,000 whole time equivalent positions from the health service between 2008 and 2014 (1). At the same time, aggregate demand for healthcare increased, as more people became entitled to means-tested medical cards and the number of older adults, who are the main users of health services, increased. Figure 9.1 shows the percentage change in the number of older adults in the population, the number of home help users<sup>2</sup> and the number of home help hours provided relative to the values recorded in 2008, see Table 9.10 in the appendices for the aggregate data.

*Figure 9.1: Percentage change in the number of home help users, hours of home help care provided, older adults aged ≥50 years & ≥85 years 2006–2016.*



1 Later increasing to €14.6 billion in 2016  
 2 Not including users of home care packages

This HSE data shows that the number of home help hours provided declined relative to the levels provided in 2008 while the proportion of people in the older age groups increased, requiring the home help service to be shared among a greater number of people. The rules governing the allocation of the service also changed. Prior to 2012, the home help service prioritised the provision of ‘domestic help’ (e.g. household cleaning, shopping), but this was changed to prioritise the provision of ‘personal care’ (e.g. assistance into or out of bed, bathing); a more stringent test for allocating the home help service (2)<sup>3</sup>.

While greater efficiencies in hospital care were noted between 2008 and 2012 such as an increase in hospital day case activities<sup>4</sup> (4), 2012 was marked as a tipping point where the ‘fat had been trimmed’ and further budget cuts meant that the healthcare system was forced to do ‘less with less’ (5). From the end of 2012, through 2013 and 2014, inpatient activity decreased and day case activity levelled off despite increased demand, leading to even longer waiting lists for planned hospital care (5). At the end of 2013, health service managers reported that over 25% of their time was taken up with two activities - living within budget and managing change (6).

In addition to changes made to service provision, a substantial number of changes were made to healthcare cover, which is the protection that people have from being exposed to the full cost of healthcare. In the Irish healthcare system, any individual who is ordinarily a resident in Ireland is entitled to subsidised hospital care and prescribed medications financed through taxation (7). Those on low incomes are offered additional protection with the provision of a medical card<sup>5</sup>, or a GP visit card<sup>6</sup>. Some people purchase private health insurance which is typically used for quicker access to hospital care. Between 2009 and 2016, healthcare cover changed substantially (Table 9.11).

In 2009, the universal ‘over 70s’ medical card was changed to a means-tested benefit and the income at which an individual could qualify for this benefit was lowered in subsequent budgets<sup>7</sup>. A charge on each item prescribed to those with a medical card, the ‘prescription charge’, was introduced in 2010 and this charge was increased incrementally. Entitlements to free dental and aural care were stopped as a medical card benefit.

3 “...Re-focusing home help services to prioritise personal care...There will be reductions of 4.5% nationally in the level of home help hours provided but this reduction will be compensated by a more rigorous approach to the allocation of these supports to ensure that the people most in need receive them by deprioritising non-personal care.” (2 pg 7)

4 A ‘day patient’ is admitted to hospital for treatment on an elective (rather than an emergency) basis and is discharged alive, as scheduled, on the same day...Births are not included (3).

5 Provides access free at the point of use to GP care, hospital care, community care and subsidised medications.

6 Provides access free at the point of use to GP care only.

7 In July 2015, a universal GP-visit card was introduced for the over-70s who were no longer entitled to a medical card.

For those who did not have a medical card, the charges for public healthcare increased. The threshold for the Drugs Payment Scheme increased from €90 to €144, charges for an Emergency Department (ED) visit without a General Practitioner (GP) referral rose from €66 to €100 and charges for each night spent as an inpatient rose from €66 to €80 (capped at €800 per annum). Also the entitlements to dental and optical care were cut in 2010 and the entitlement to hearing aids was cut in 2012. Finally, the tax relief available to those who purchase private health insurance was lowered and in 2015, the Government introduced 'Lifetime Community Rating' which was a policy that incentivised people to purchase private health insurance. Within the population in Ireland, the proportion with private health insurance fell from 51% in 2008 to 43% in 2014 before increasing to 45% in 2017 (8).

Overall, the period 2009-2016 represents a period of significant change. A number of policy decisions were made that were driven by a financial imperative. The aim of this Chapter is to determine how entitlements to a medical card or a GP visit card, trends of purchasing private health insurance and health service utilisation changed over this period among the community-dwelling population aged 50 years and older. Data for this Chapter were obtained from the computer assisted personal interview (CAPI) conducted during four waves of TILDA.

*Table 9.1: Timelines for data collection at each wave.*

Wave	Data collection period
Wave 1	October 2009 – February 2011
Wave 2	February 2012 – March 2013
Wave 3	March 2014 – October 2015
Wave 4	January 2016 – December 2016

As our aim was to examine change at each time point, only those TILDA respondents who participated in all four waves were included in the analysis. Of the 8,175 participants in TILDA aged 50 years or more at baseline, 2,869 individuals who did not participate in all four waves were excluded, leaving us with an analytical sample of 5,306. We employed an attrition weight to deal with attrition bias and report on weighted means and proportions<sup>8</sup> at each wave. We recommend interpreting changes using the point estimates and confidence intervals.

<sup>8</sup> As only participants who completed all four waves were included in this analysis, there may be small differences in the estimates reported for a wave compared to previous reports.

There are three parts to our analysis. Firstly, we examine participant's health cover at each wave, and categorised according to their age at the given wave.

Secondly, as we know that there is a relationship between frailty and service use (9), we examined the frailty status of service users to establish if there were changes in resource allocation on the basis of severity of need (i.e. frailty). Frailty occurs when people experience failure in multiple bodily systems leading to whole system breakdown. Frailty in older adults is viewed on a continuum and can change over time. Older adults classified as 'robust' may have health problems but these problems are being managed well. Older adults classified as 'pre-frail' are at an increased risk of adverse outcomes but are coping; and older adults classified as 'frail' are at highest risk of adverse health outcomes such as falls, disability, hospitalisation, nursing home admission and even death (10). Frailty was measured using a 'frailty index' which consists of 32 problems including chronic disease, functional measures and quality of life measures (Table 9.13). Participants were categorised as robust (0-3 health problems), pre-frail (4-7 health problems) or frail (8 or more health problems) at each wave.

Finally, we examined if the type and severity of disability of home help users changed over the waves in keeping with the policy change mentioned earlier. We measured disability with instrumental activities of daily living (IADL) and activities of daily living (ADL). IADLs are understood as higher order functional limitations (such as taking medications correctly, shopping, using the telephone, housekeeping, preparing meals and managing money) which align with the domestic management of the household (11). ADLs are the basic tasks of everyday life such as eating, bathing, dressing, toileting, and moving about (12). We examine the severity of an individual's functional limitations by reporting on the following categories: (1) "No ADL or IADL limitations"; (2) "one or more IADL limitations"; (3) "one or more ADL limitations"; (4) "one or more ADL and IADL limitations."

When examining a participant's health cover or patterns of service use stratified by their age, frailty status or disability status, it is important to note that we are reporting their status at each wave. As these characteristics will change over time, the corresponding numbers within each category will change at each wave. For example, a person who is classified as pre-frail in Wave 1, might be frail by Wave 3.

## A description of the analytical sample

As the same participants took part in each wave, it is important to note the effects of cohort ageing. In Wave 1, the sample was aged a minimum of 50 years and this increased to 52 years and older in Wave 2, 54 years and older in Wave 3, and 56 years and older in Wave 4. This ageing of the sample is linked to the increasing proportion of the sample who were classified as frail or pre-frail over time in Chapter 7 (frail: 12.7% to 19.0% between Waves 1 and 4; pre-frail: 30.9% to 39.2% between Waves 1 and 4).

## 9.2 Health care cover

Healthcare cover refers to the protection that people have from being exposed to the full cost of healthcare. We describe healthcare cover from three different perspectives. Firstly, by examining the proportion of older adults in Ireland with additional public cover from a medical card or a GP visit card. Secondly, by examining the proportion with additional private cover from having purchased private health insurance. Thirdly, by examining the distribution of additional public or private healthcare cover across five categories: (1) 'None' indicates no medical card, GP visit card or private health insurance; (2) 'Medical card' indicates having a medical card only; (3) 'PHI' indicates having private health insurance only; (4) 'GP visit card' indicates having a GP visit card only and (5) 'Dual cover' indicates adults with either a medical card or GP visit card in addition to having private health insurance. These patterns are likely driven by the ageing of the cohort as the means-test thresholds for medical cards change as people age. Therefore, we examine the distribution of public and private healthcare cover by age group at each wave. Age has been categorised into three groups (50-65 years, 66-69 years, 70 years or more) that match those of public entitlements to a medical card or GP visit card (13, 14) to aid interpretation.

### 9.2.1 Additional public cover: Medical card or a GP visit card

Between 2009 and 2016, the proportion of people who had a medical card increased from 45% to 53% while the proportion with a GP visit card increased – from 2% to 9%, (Table 9.2). At each wave, approximately a third of 50 to 65 year olds had public healthcare cover indicating a persistent proportion of people pre-retirement on low household incomes. Approximately half of 66 to 69 year olds had public healthcare cover. The higher rate of public cover in this age group is likely explained by the combination of a drop in income following retirement and the slightly lower means-test threshold for additional public entitlements for this age group.



The majority of those aged 70 years or older had public cover at each wave, however the proportion with a medical card fell from 90% to 74% between 2009 and 2016 while the proportion with a GP visit card was 19% in 2016. This reflects the changing thresholds for the medical card and the policy decision to introduce a universal GP visit card for the over 70s in 2015.

*Table 9.2: Proportion of older adults with additional public health cover between 2009 and 2016 by age group.*

	No Medical/GP Visit Card		Medical Card		GP Visit Card		Total	Number in sample
	%	95% CI	%	95% CI	%	95% CI		
<b>50-65 years</b>								
Wave 1	68	(66-71)	29	(27-32)	2	(2-3)	100	3479
Wave 2	65	(62-67)	33	(31-36)	2	(2-3)	100	3071
Wave 3	65	(62-67)	33	(31-35)	3	(2-3)	100	2593
Wave 4	64	(61-67)	34	(31-37)	2	(1-3)	100	2148
<b>66-69 years</b>								
Wave 1	52	(48-56)	46	(41-50)	2	(1-4)	100	620
Wave 2	50	(46-55)	46	(42-51)	3	(2-6)	100	733
Wave 3	51	(46-55)	46	(41-50)	4	(3-6)	100	818
Wave 4	52	(48-56)	45	(41-49)	3	(2-5)	100	833
<b>70 years or more</b>								
Wave 1	9	(8-12)	90	(88-92)	0	(0-1)	100	1200
Wave 2	12	(10-14)	88	(86-89)	1	(0-1)	100	1482
Wave 3	16	(14-18)	79	(77-81)	5	(4-7)	100	1886
Wave 4	8	(7-9)	74	(71-76)	19	(17-21)	100	2315
<b>Total</b>								
Wave 1	53	(51-55)	45	(43-47)	2	(1-2)	100	5299
Wave 2	48	(46-50)	50	(48-52)	2	(2-2)	100	5286
Wave 3	45	(43-47)	51	(49-53)	4	(3-4)	100	5297
Wave 4	38	(36-40)	53	(51-54)	9	(8-10)	100	5296

## 9.2.2 Private health insurance

The proportion of older adults in Ireland purchasing private health insurance was consistent across the waves ranging from 54% to 57% (Table 9.3). At each wave, the rate of purchasing private health insurance was marginally lower for older adults aged 70 years and older compared to younger adults, suggesting important interactions between the public and private system where some older adults who become eligible for public cover cease to maintain their private cover.

*Table 9.3: Proportion of older adults who purchased private health insurance between 2009 and 2016 by age group.*

	No Private Health Insurance		Private Health Insurance		Total	Number in sample
	%	95% CI	%	95% CI		
<b>50-65 years</b>						
Wave 1	41	(39-44)	59	(56-61)	100	3483
Wave 2	44	(41-46)	56	(54-59)	100	3085
Wave 3	46	(43-49)	54	(51-57)	100	2595
Wave 4	45	(42-48)	55	(52-58)	100	2155
<b>66-69 years</b>						
Wave 1	37	(33-42)	63	(58-67)	100	619
Wave 2	40	(36-44)	60	(56-64)	100	735
Wave 3	42	(38-47)	58	(53-62)	100	820
Wave 4	44	(40-48)	56	(52-60)	100	833
<b>70 years or more</b>						
Wave 1	52	(48-55)	48	(45-52)	100	1202
Wave 2	50	(46-53)	50	(47-54)	100	1482
Wave 3	49	(46-52)	51	(48-54)	100	1887
Wave 4	48	(45-51)	52	(49-55)	100	2315
<b>Total</b>						
Wave 1	43	(41-45)	57	(55-59)	100	5304
Wave 2	45	(43-47)	55	(53-57)	100	5302
Wave 3	46	(44-49)	54	(51-56)	100	5302
Wave 4	46	(44-48)	54	(52-56)	100	5303

### 9.2.3 The distribution of public and private healthcare cover

With respect to the distribution of public and private cover, the proportion of those with no additional cover or with private health insurance only decreased while those with a medical card only or dual cover increased between the waves (Table 9.4).

We did not find any significant change in the distribution of public and private cover over time among adults aged 50 to 65 years. This age group had the highest proportion of people with no additional cover or private health insurance only and the lowest proportion of people with dual cover in comparison to other age groups. Among older adults aged 66 to 69 years, the proportion with dual cover decreased from 19% in Wave 1 to 13% in Wave 4. Among those aged 70 years or more, the proportion with private health insurance only fell from 9% in Wave 1 to 7% in Wave 4. Very few adults aged 70 years or more had no additional cover or a GP visit card only, it was more common to have either a medical card only or dual cover. This reflects the higher income limits available for the medical card for people aged 70 years or older.

Table 9.4: Proportion of older adults with public or private healthcare coverage between 2009 and 2016 by age group.

	No additional cover		Medical card only		Private Health Insurance only		Dual cover		GP visit card only		Total	Number in sample
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI		
<b>50-65 years</b>												
Wave 1	16	(15-18)	24	(22-26)	52	(50-55)	7	(6-8)	1	(1-2)	100	3478
Wave 2	16	(14-17)	27	(25-29)	49	(46-51)	7	(6-8)	1	(1-2)	100	3070
Wave 3	16	(14-18)	28	(26-31)	49	(46-51)	5	(5-6)	2	(1-2)	100	2593
Wave 4	16	(14-18)	28	(25-31)	48	(45-51)	7	(5-8)	1	(1-2)	100	2148
<b>66-69 years</b>												
Wave 1	8	(6-10)	28	(24-33)	44	(40-49)	19	(16-23)	1	(0-3)	100	619
Wave 2	7	(5-9)	32	(28-36)	44	(39-48)	16	(13-20)	1	(1-3)	100	732
Wave 3	7	(6-10)	33	(29-37)	43	(39-47)	15	(12-17)	2	(1-3)	100	818
Wave 4	8	(6-11)	34	(30-39)	43	(39-48)	13	(10-15)	1	(1-2)	100	833
<b>70 years or more</b>												
Wave 1	1	(0-2)	51	(47-55)	9	(7-11)	40	(36-43)	0	(0-1)	100	1200
Wave 2	1	(0-1)	49	(45-52)	11	(9-13)	39	(36-42)	0	(0-1)	100	1481
Wave 3	2	(1-2)	47	(44-50)	14	(12-16)	37	(34-39)	0	(0-1)	100	1884
Wave 4	1	(0-1)	46	(43-49)	7	(6-8)	45	(42-48)	1	(1-2)	100	2313
<b>Total</b>												
Wave 1	12	(11-13)	31	(29-32)	41	(39-43)	16	(14-17)	1	(1-1)	100	5297
Wave 2	10	(9-11)	34	(32-36)	38	(36-39)	17	(16-19)	1	(1-1)	100	5283
Wave 3	10	(8-11)	36	(34-38)	36	(34-38)	18	(16-19)	1	(1-2)	100	5295
Wave 4	8	(7-9)	37	(35-39)	30	(28-32)	24	(23-26)	1	(1-2)	100	5294

### 9.3 Utilisation of medical care

At each wave, TILDA participants were asked about the number of times they visited a range of medical services including the General Practitioner (GP), an outpatient clinic and the Emergency Department (ED), the number of overnight hospital admissions and the number of nights spent in hospital over the previous 12 months.

We examine both the proportion of older adults in Ireland who had at least one visit to these medical services, and the average number of visits to each service. We distinguished between planned hospital care where a visit is determined by a medical referral (e.g. an outpatient clinic visit) and an unplanned visit which is determined by a medical crisis (e.g. an ED visit, overnight hospital admission and nights spent in hospital).

We found a higher proportion of older adults who were classified as frail visit each of the services in comparison to the robust or pre-frail at each time point. However, a higher proportion of older adults classified as frail report overnight hospital admissions, while a lower proportion report outpatient clinic visits in Wave 4 versus Wave 1.

Table 9.5: Proportion of older adults visiting each service in the previous year between 2009 and 2016 by their frailty status.

	ED admissions		Visit to a GP		Outpatients clinic visits		Overnight hospital admissions		Number in sample
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
<b>Robust</b>									
Wave 1	10	(9-11)	80	(78-81)	29	(27-31)	7	(6-8)	3072
Wave 2	10	(9-12)	85	(84-86)	33	(31-35)	7	(6-8)	2880
Wave 3	12	(10-13)	88	(86-89)	33	(31-35)	8	(7-9)	2733
Wave 4	10	(9-12)	86	(84-87)	32	(30-35)	9	(7-10)	2300
<b>Pre-frail</b>									
Wave 1	19	(17-21)	94	(93-95)	52	(49-54)	17	(15-19)	1631
Wave 2	17	(16-20)	94	(92-95)	53	(50-55)	15	(14-17)	1743
Wave 3	19	(17-21)	95	(94-96)	53	(51-56)	15	(13-17)	1826
Wave 4	19	(17-21)	95	(94-96)	49	(47-52)	17	(16-19)	2105
<b>Frail</b>									
Wave 1	26	(22-30)	99	(97-99)	69	(65-74)	23	(20-27)	603
Wave 2	29	(26-33)	98	(96-99)	69	(65-72)	29	(25-33)	682
Wave 3	33	(30-37)	97	(96-98)	62	(58-65)	29	(25-33)	747
Wave 4	31	(28-35)	99	(97-99)	59	(56-63)	31	(27-35)	901
<b>Total</b>									
Wave 1	15	(14-16)	87	(86-88)	41	(39-43)	12	(11-13)	5306
Wave 2	15	(14-17)	90	(89-91)	45	(43-46)	13	(12-14)	5306
Wave 3	17	(16-19)	92	(91-93)	44	(43-46)	14	(13-15)	5306
Wave 4	18	(17-19)	92	(91-93)	44	(43-46)	16	(15-17)	5306

The average number of nights spent in hospital increased from 1 to 2 nights between 2009 and 2016 (Table 9.6). This was mostly driven by the fact that the number of nights that older adults classified as frail spent in hospital had doubled between 2009 and 2016 (2.7 nights to 6.5 nights). By comparison, the average number of visits to the outpatient clinic (3.1 visits to 2.1 visits) had fallen among older adults classified as frail.

*Table 9.6: Average number of times each older adult visited a service in the previous year between 2009 and 2016 by their frailty status.*

	GP visits	Nights spent in hospital	Overnight hospital admissions	Outpatient clinic visits	ED admissions	Number in sample
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	
<b>Robust</b>						
Wave 1	2.5 (2.3,2.6)	0.4 (0.3,0.5)	0.1 (0.1,0.1)	0.7 (0.6,0.8)	0.1 (0.1,0.2)	3070
Wave 2	2.6 (2.5,2.8)	0.4 (0.3,0.5)	0.1 (0.1,0.1)	0.9 (0.7,1.0)	0.1(0.1,0.2)	2880
Wave 3	2.7 (2.4,3.0)	0.7 (0.2,1.1)	0.1 (0.1,0.2)	0.8 (0.7,0.9)	0.1 (0.1,0.1)	2731
Wave 4	2.6 (2.5,2.8)	0.7 (0.4,1.0)	0.1 (0.1,0.1)	0.9 (0.7,1.0)	0.1 (0.1,0.1)	2613
<b>Pre-frail</b>						
Wave 1	4.6 (4.3,4.8)	1.3 (0.9,1.7)	0.2 (0.2,0.3)	2.0 (1.7,2.3)	0.3 (0.2,0.4)	1630
Wave 2	4.5 (4.3,4.8)	1.2 (1.0,1.4)	0.2 (0.2,0.3)	1.9 (1.6,2.2)	0.3 (0.2,0.3)	1742
Wave 3	4.4 (4.2,4.5)	1.6 (1.2,2.0)	0.2 (0.2,0.3)	1.8 (1.7,2.0)	0.2 (0.2,0.3)	1825
Wave 4	4.3 (4.0,4.5)	1.5 (1.2,1.8)	0.3 (0.2,0.3)	1.9 (1.6,2.2)	0.3 (0.2,0.3)	1865
<b>Frail</b>						
Wave 1	8.0 (7.2,8.9)	2.7 (2.0,3.4)	0.4 (0.3,0.5)	3.1 (2.6,3.6)	0.4 (0.3,0.5)	601
Wave 2	7.1 (6.4,7.8)	3.6 (2.6,4.5)	0.7 (0.5,0.9)	3.1 (2.6,3.6)	0.5 (0.4,0.6)	681
Wave 3	6.9 (6.3,7.6)	4.2 (3.1,5.2)	0.5 (0.4,0.6)	2.4 (2.1,2.8)	0.5 (0.4,0.6)	746
Wave 4	6.7 (6.2,7.3)	6.5 (4.7,8.2)	0.6 (0.5,0.7)	2.1 (1.9,2.4)	0.5 (0.4,0.6)	824
<b>Total</b>						
Wave 1	3.8 (3.6,4.0)	1.0 (0.8,1.1)	0.2 (0.2,0.2)	1.4 (1.3,1.5)	0.2 (0.2,0.3)	5301
Wave 2	3.9 (3.7,4.1)	1.1 (0.9,1.2)	0.2 (0.2,0.2)	1.5 (1.4,1.7)	0.2 (0.2,0.3)	5304
Wave 3	3.9 (3.7,4.1)	1.5 (1.2,1.8)	0.2 (0.2,0.3)	1.4 (1.3,1.5)	0.2 (0.2,0.2)	5302
Wave 4	3.9 (3.8,4.1)	2.0 (1.6,2.3)	0.2 (0.2,0.3)	1.5 (1.3,1.6)	0.2 (0.2,0.3)	5302

## 9.4 Utilisation of public allied healthcare

We also examined care services other than those provided by GPs and hospitals. At each wave, participants were asked if they had utilised any of the allied healthcare services in the preceding twelve months - excluding any services for which they had paid anything other than a token or nominal amount. This included any state provided physiotherapy, dietician, hearing, dental, optician, psychological and social work services (Table 9.7).

Unlike utilisation of medical care which increased between 2009 and 2016, at an aggregate level the proportion of older adults who accessed public allied healthcare did not change substantially. The proportion who utilised the hearing increased from 2% in 2009 to 3% in 2016, while the proportion utilising dental care decreased from 11% in 2009 to 9% in 2016.

Being an older adult classified as frail in comparison to robust or pre-frail was associated with an increased use of most services across all waves. However, in older adults with frailty, we found a decreased use of dental services (17% to 11%) and dietician services (5% to 2%) between Waves 1 and 4. Older adults classified as robust or pre-frail were associated with a decreased use of dental, optician services and physiotherapy services between Waves 1 and 4.



Table 9.7: Proportion of older adults visiting each service in the previous year between 2009 and 2016 by their frailty status.

	Physiotherapy		Dietitian		Hearing Service		Dental		Optician		Psychological		Social Work		Number in sample
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
<b>Robust</b>															
Wave 1	2	(2-3)	0	(0-1)	1	(0-1)	9	(8-10)	8	(7-9)	1	(1-1)	0	(0-0)	3072
Wave 2	2	(2-3)	1	(0-1)	1	(1-2)	8	(6-9)	8	(7-9)	1	(0-1)	0	(0-0)	2880
Wave 3	2	(2-3)	0	(0-1)	1	(0-1)	5	(4-6)	6	(5-7)	1	(0-1)	0	(-)	2733
Wave 4	1	(1-2)	0	(0-1)	1	(1-1)	6	(5-7)	5	(4-6)	0	(0-1)	0	(-)	2298
<b>Pre-frail</b>															
Wave 1	7	(6-8)	2	(1-2)	2	(2-3)	13	(12-16)	17	(15-19)	1	(0-2)	0	(0-1)	1631
Wave 2	7	(6-8)	1	(1-2)	4	(3-5)	10	(9-12)	17	(15-19)	1	(1-2)	1	(0-1)	1743
Wave 3	7	(6-8)	1	(1-2)	3	(2-4)	9	(8-10)	13	(11-15)	1	(0-1)	0	(0-0)	1826
Wave 4	5	(4-6)	1	(1-2)	3	(2-4)	10	(9-12)	13	(12-15)	1	(0-1)	0	(0-1)	2098
<b>Frail</b>															
Wave 1	15	(12-18)	5	(3-7)	4	(3-7)	17	(14-20)	22	(19-26)	2	(1-4)	1	(0-2)	603
Wave 2	15	(12-19)	4	(2-5)	7	(5-9)	17	(14-20)	29	(25-33)	2	(1-4)	0	(0-1)	682
Wave 3	14	(11-16)	3	(2-4)	6	(5-9)	9	(7-11)	18	(15-21)	1	(0-2)	0	(0-2)	747
Wave 4	13	(11-15)	2	(1-3)	7	(6-10)	11	(9-14)	20	(18-24)	1	(1-3)	0	(0-1)	882
<b>Total</b>															
Wave 1	5	(4-6)	1	(1-2)	2	(1-2)	11	(10-13)	12	(11-13)	1	(1-1)	0	(0-0)	5306
Wave 2	6	(5-7)	1	(1-2)	3	(2-3)	10	(9-11)	14	(13-15)	1	(1-1)	0	(0-1)	5306
Wave 3	5	(5-6)	1	(1-1)	2	(2-3)	7	(6-8)	10	(9-11)	1	(0-1)	0	(0-0)	5306
Wave 4	5	(4-5)	1	(1-1)	3	(3-4)	9	(8-10)	11	(10-12)	1	(1-1)	0	(0-0)	5278

## 9.5 Utilisation of public home care

Public home care reflects services which are provided by the State to support older adults to live independently at home and include; the home help and personal care service<sup>9</sup>, community nursing<sup>10</sup>, meals on wheels, day centre care, occupational therapy and respite care.

Data were not collected on the use of home care packages<sup>11</sup> until Wave 3 so it is not possible to look at use of this service in this Report. As informal carers (or family carers) are an important part of the overall care provided to older adults in Ireland we also examined respondents who reported having an informal carer at each wave (Table 9.8).

Overall, it was uncommon for adults aged 50 years and over in Ireland to use public home care services. Informal carers are the most common type of home based care provided, followed by community nursing and the home help or personal care service. During the study period, use of informal care nearly doubled (5% to 9%) as did the home help or personal care service (3% to 5%) while the use of community nursing remained the same (5/6%). An increase in the proportion of older adults classified as frail also reported having an informal carer at Wave 4 compared to Wave 1 (36% versus 27%). This may indicate that the burden of care was transferred from the State to families during this period.

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9 Home Help services are provided to assist people to maximise their independence; remain in their own home; support their informal carers; avoid where possible going into long-term care. The service provides a number of hours' assistance each week to successful applicants to deliver: personal care (washing, changing, oral hygiene, help at mealtimes); essential domestic duties related only to the individual client (lighting a fire / bringing in fuel, essential cleaning of the person's personal space) (15)

10 In TILDA this includes Public Health Nurses, Community Registered General Nurses, Community Mental Health Nurses, Clinical Nurse Specialists and Advanced Nurse Practitioners

11 The Home Care Packages scheme aims to help people with medium-to-high support needs to continue to live at home independently. There are two types of Home Care Packages provided by the HSE: Standard HCP - inclusive of the Delayed Discharge Initiative (DDI); Intensive packages – prioritises delayed discharges and acute hospital pressures providing higher levels of resources than standard HCPs. The services are provided to clients in their own homes and support is primarily aimed at older people who are: (I) living in the community or (II) who are in-patients in acute hospitals and are at risk of admission to long-term care, or (III) who are in long-term care, but who, with support, could return to limited independent living. (15)

Table 9.8: Proportion of older adults visiting each service in the previous year between 2009 and 2016 by their frailty status.

	Informal/ Family Carer		Respite		Day centre		Meals on wheels		Occupational therapy		Either home help or personal care		Community Nursing		Number in sample
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
<b>Non-frail</b>															
Wave 1	1	(0-1)	0	(0-0)	0	(0-1)	0	(0-1)	0	(0-0)	1	(0-1)	2	(1-2)	3072
Wave 2	0	(0-1)	0	(0-0)	0	(0-1)	0	(0-1)	0	(0-0)	1	(0-1)	1	(1-2)	2880
Wave 3	1	(0-1)	0	(-.-)	0	(0-0)	0	(0-1)	0	(0-0)	1	(0-1)	1	(1-1)	2733
Wave 4	1	(0-1)	0	(-.-)	0	(-.-)	0	(0-1)	0	(0-0)	1	(0-1)	1	(1-2)	2298
<b>Pre-frail</b>															
Wave 1	4	(3-5)	0	(0-1)	1	(0-1)	1	(0-1)	1	(1-2)	2	(1-3)	5	(4-7)	1631
Wave 2	5	(4-6)	0	(0-1)	1	(1-2)	1	(0-2)	1	(0-1)	3	(2-4)	5	(4-6)	1743
Wave 3	4	(3-6)	0	(0-1)	1	(0-1)	1	(0-1)	1	(1-2)	2	(2-3)	4	(3-5)	1826
Wave 4	5	(4-7)	0	(0-1)	1	(0-1)	1	(0-1)	1	(0-1)	3	(3-5)	5	(4-6)	2098
<b>Frail</b>															
Wave 1	27	(23-31)	2	(1-4)	4	(2-6)	2	(1-5)	7	(5-10)	13	(10-17)	19	(16-23)	603
Wave 2	28	(24-32)	1	(0-2)	4	(2-6)	3	(1-5)	6	(4-8)	13	(11-17)	16	(13-20)	682
Wave 3	33	(29-37)	2	(1-4)	5	(3-7)	3	(2-5)	4	(3-6)	17	(14-20)	15	(13-19)	747
Wave 4	36	(33-40)	2	(1-3)	3	(2-4)	3	(2-5)	4	(3-6)	20	(17-24)	17	(14-20)	882
<b>Total year on year</b>															
Wave 1	5	(4-6)	0	(0-1)	1	(1-1)	1	(0-1)	1	(1-2)	3	(2-3)	5	(4-6)	5306
Wave 2	6	(5-7)	0	(0-1)	1	(1-1)	1	(0-1)	1	(1-2)	3	(3-4)	4	(4-5)	5306
Wave 3	7	(6-8)	0	(0-1)	1	(1-1)	1	(1-1)	1	(1-2)	4	(3-4)	4	(4-5)	5306
Wave 4	9	(8-10)	1	(0-1)	1	(1-1)	1	(1-1)	1	(1-2)	5	(4-6)	6	(5-6)	5278

We were particularly interested in identifying any change in the characteristics of those receiving the home help service, specifically, if the re-prioritisation of the home help service in 2012 from 'domestic help' to 'personal care' was borne out in the data. We examine this by looking at the home help user's disability status at each wave (Table 9.9).

The proportion of home help users with both difficulties in ADLs and IADLs doubled (20% at Wave 2 to 41% at Wave 4) indicating a trend of targeting the service to those with a more severe burden of disability after 2012.

*Table 9.9: Proportion of the home help service allocated to older adults with different levels and types of disabilities between 2009 and 2016.*

Home Help service only	No disability		IADL disability only		ADL disability only		IADL and ADL disability		Total (%)	Number in sample
	%	95% CI	%	95% CI	%	95% CI	%	95% CI		
Wave 1	50	(40-61)	21	(13-31)	10	(5-19)	19	(12-28)	100	101
Wave 2	48	(39-57)	26	(18-35)	6	(2-14)	20	(14-29)	100	119
Wave 3	50	(41-59)	15	(10-22)	2	(1-6)	33	(25-43)	100	138
Wave 4	38	(30-46)	15	(10-22)	6	(3-12)	41	(33-49)	100	175

## 9.6 Discussion

Between 2009 and 2016, public healthcare entitlements and dual healthcare cover increased among older adults aged 50 years and over in Ireland. This is likely a result of the safety net of the social welfare system and the effect of cohort ageing. For example, a 69-year old might not have been entitled to a medical card but might be the following year on turning 70 due to the different medical card income thresholds. However, approximately 1 in 4 of the cohort aged 70 years or more in 2016 did not have a medical card and its associated benefits including access to publicly provided allied health and community services.

Private health insurance cover was consistent between 2009 and 2016 suggesting that this cohort prioritised payment for private health insurance during this period. This also suggests the small increase in private insurance coverage noted by the Health Insurance Authority was likely driven by younger people who were responding to the Governments community rating policy.

Between 2009 and 2016 there was an increase in the proportion of older adults aged 75

years or more with ADL or IADL limitations (Chapter 3), an increase in the prevalence of cardiovascular diseases.<sup>12</sup> In terms of cardiovascular disease, there was an increased prevalence of hypertension (35% to 38%), diabetes (8% to 11%), heart attack (4% to 6%), stroke (1% to 2%), and transient ischaemic attack (2% to 4%) between Waves 1 and 4. In terms of non-cardiovascular disease, there was an increased prevalence of arthritis (26% to 39%), osteoporosis (9% to 17%), cataracts (9% to 14%) and lung disease (4% to 5%) from Wave 1 to 4 (Chapter 6) and an increase in the prevalence of frailty (Chapter 7). These epidemiological patterns are an important context with which to frame our discussion on patterns in healthcare provision.

Overall, our preliminary findings point to an increase in unplanned hospital care utilisation (ED visits, hospital admissions, length of stay), a decrease in planned hospital care utilisation (outpatient clinic visits), while the proportion of older adults utilising services such as community nursing, physiotherapy and occupational therapy remained the same.

Our evidence suggests that the cut to public dental benefits (for both medical card and non-medical card holders) may have contributed to a decline in the use of dental care services within this cohort between 2009 and 2016.

We found an increased use of the home help service between 2009 and 2016 which contrasts with an overall pattern of decreased provision noted in the HSE data (Table 9.10). There are two possible explanations for this. Firstly, the HSE estimates include home help users of all ages, while this report only reports on users aged 50 years and older. Secondly, our estimates are likely to include participants who received a home help as part of their home care package which are recorded separately by the HSE.

With respect to hospital care, our data suggest that significant change occurred in Irish hospitals during the course of the recession, notably that use of planned hospital care (e.g. outpatient clinics) decreased from 69% to 59% among older adults classified as frail between 2009 and 2016 while unplanned hospital care (e.g. overnight hospital admissions and ED admissions) increased from 23% to 31% among the same group during the same period. This is consistent with previous findings about the impact of austerity on the Irish healthcare system (5) but also reflects the increasing age and care needs

<sup>12</sup> In terms of cardiovascular disease, there was an increased prevalence of hypertension (35% to 38%), diabetes (8% to 11%), heart attack (4% to 6%), stroke (1% to 2%), and transient ischaemic attack (2% to 4%) between Waves 1 and 4.

By examining the characteristics of users of hospital care, we found that frailty was driving utilisation and that hospital admissions and lengths of stay increased. In unpicking why this occurred, firstly, it is possible that the volume of older people with frailty presenting to the ED and admitted to hospital, could have crowded out the capacity of Irish hospitals to deliver its planned elective care. Secondly, the increase in the average number of nights that an older person with frailty spent in hospital is potentially a result of pressures in the community sector where provision of services was not increased to match increased need. Thirdly, the increased use of the home help service in those with higher levels of disability could be a result of strategies such as the delayed discharge initiative which relied on the home help service among others, to support safe hospital discharges and alleviate some of the pressure on the hospital system.

## 9.7 Conclusion

In conclusion, despite increases in the prevalence of chronic disease, frailty and disability, healthcare provision did not increase suggesting that policy changes made during this period influenced healthcare cover and may have made it more difficult for older adults to access services that they required. This preliminary analysis will be progressed with more sophisticated statistical modelling allowing us to unpick the effects of these policies in more detail.

## 9.8 References

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# Appendices

*Table 9.10: Aggregate number of home help clients, home help hours, older adults aged 50 years and older and older adults aged 85 years and older between 2006 and 2016.*

	Annual estimated number of home help clients recorded by the Health Service Executive <sup>1</sup>	Annual estimated number of home help hours recorded by the Health Service Executive <sup>1</sup>	Annual estimated number of adults in Ireland aged 50 years and older <sup>2</sup>	Annual estimated number of adults in Ireland aged 85 years and older <sup>2</sup>
<b>2006</b>	49,578	10,800,000	1,112,400	47,800
<b>2007</b>	54,736	12,351,088	1,142,900	49,400
<b>2008</b>	55,366	12,631,602	1,174,200	51,900
<b>2009</b>	53,791	11,970,323	1,204,600	54,000
<b>2010</b>	54,011	11,690,515	1,236,000	56,100
<b>2011</b>	50,986	11,090,000	1,265,800	58,200
<b>2012</b>	45,705	9,880,000	1,296,000	59,800
<b>2013</b>	46,454	9,740,000	1,326,300	60,700
<b>2014</b>	47,061	10,300,000	1,360,800	62,700
<b>2015</b>	47,915	10,400,000	1,396,900	64,900
<b>2016</b>	46,948	10,547,393	1,433,000	67,300

1. Health Service Estimates (HSE) estimates of home help clients can be found in the annual report for each respective year found at: <https://www.hse.ie/eng/services/publications/corporate/annualrpts.html>  
Note: HSE estimate of users of the home help service include individuals of any age
2. Annual population estimates for 2006 to 2016 come from the Central Statistics Office Statbank Table (PEA01)

Table 9.11: Changes in healthcare coverage between 2009 and 2018 (Source: authors own based on a previous version (16)).

		2009-2010	2011-2012	2013-2014	2015-2016	2017-2018
MEDICAL CARD HOLDERS						
Medical card entitlement	Over 70s medical card means-tested 2009: € per week Single: €700.00 Couple: €1400.00			Increased to €1.50 per prescribed item up to €19.50 per month per family (2013)		
GP services	No charge	No charge	No charge	No charge	No charge	No charge
Prescribed medications	Introduction of a €0.50 per prescribed item up to €10.00 per month per family (2010)			Increased to €1.50 per prescribed item up to €19.50 per month per family (2013) Increased to €2.50 per prescribed item up to €25.00 per month per family (2014)		Decreased to €2.00 per prescribed item up to €20.00 per month per family (2018)
Public inpatient hospital care	No charge	No charge	No charge	No charge	No charge	No charge
Public hospital outpatient care	No charge	No charge	No charge	No charge	No charge	No charge
Other	Dental Treatment Services Scheme: dental entitlements cut (2010)					

Table 9.11: Changes in healthcare coverage between 2009 and 2018 (Source: authors own based on a previous version).

		2009-2010		2011-2012		2013-2014		2015-2016		2017-2018	
NON MEDICAL CARD HOLDERS											
GP services		Pay full charge		Pay full charge		Pay full charge		Pay full charge		Pay full charge	
Prescribed medications		Drugs Payment Scheme: threshold increased from €90.00 to €100.00 per month (2009) Increased to €120.00 per month (2010)		Drugs Payment Scheme threshold increased to €132.00 per month (2012)		Increased to €1.50 per prescribed item up to €19.50 per month per family (2013) Increased to €2.50 per prescribed item up to €25.00 per month per family (2014)		Drugs Payment Scheme threshold increased to €144.00 per month (2013)		Drugs Payment Scheme threshold decreased to €134.00 per month (2018)	
Public inpatient hospital care		Inpatient charges increased from €66.00 to €75.00 per night (2009) ED attendance without a referral charge increased from €66.00 to €100.00 (2009)		No charge		Inpatient charges increased to €80.00 per night (2013)		No charge		No charge	
Public hospital outpatient care		No charge		No charge		No charge		No charge		No charge	
Other		Tax relief on medical expenses restricted to the standard rate (20%) (2009) Treatment Benefit Scheme: dental and ophthalmic entitlements cut (2009) Health levy doubled and income threshold lowered for higher rate (2009)		Treatment Benefit Scheme: aural statutory entitlements cut (2012) Government abolishes the health levy and replaces it with a (non-earmarked) universal social charge (USC) (2012)		Tax relief on private health insurance contributions reduced to €1000.00 for adults and €500.00 for children (2013)		Treatment Benefit Scheme: aural statutory entitlements cut (2012) Government abolishes the health levy and replaces it with a (non-earmarked) universal social charge (USC) (2012)		Treatment Benefit Scheme: €42.00 payment towards annual scale and polish; biannual entitlement to free sight test and €42.00 towards cost of glasses (2017)	

Table 9.12: The 32 items which formed the Frailty Index used in this Chapter.

Frailty Index items in the 32-item measure	
Difficulty walking 100m	Polypharmacy
Difficulty rising from chair	Knee pain
Difficulty climbing stairs	Hypertension
Difficulty stooping, kneeling or crouching	Angina
Difficulty reaching above shoulder height	Heart attack
Difficulty pushing/pulling large objects	Diabetes
Difficult lifting/carrying weights $\geq 10$ lb	Stroke or Transient ischemic attack
Difficulty picking up coin from table	High cholesterol
Difficulty following a conversation	Irregular heart rhythm
Feeling lonely	Other Cardiovascular disease
Absentmindedness	Cataracts
Poor self-rated physical health	Glaucoma or age related macular degeneration
Poor self-rated vision	Arthritis
Poor self-rated hearing	Osteoporosis
Poor self-rated memory	Cancer
Daytime sleepiness	Varicose ulcer





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