



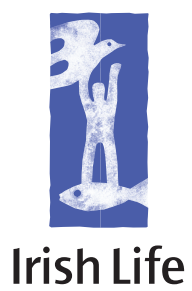
2013

PATTERNS AND DETERMINANTS OF HEALTH CARE UTILISATION IN IRELAND

tilda

Staidéar Fadaimseartha na
hÉireann um Dhul in Aois

The Irish Longitudinal
Study on Ageing



The
ATLANTIC
Philanthropies

Key Findings

- Older people use more services than younger people, but age itself is not a strong driver of the use of medical care. To understand the patterns and predict future patterns, it is important to focus on factors that, while correlated with age, are the key drivers. Use of other services that can be important in helping people stay at home is more directly associated with age.
- While strongly correlated with age, use of GP services is driven by need factors (3 or more chronic diseases, poor self-rated health), enabling factors (especially having a medical card, as those with medical cards, on average, make two additional visits per year) and to some extent by levels of disability. Age in itself is not a significant driver of service use.
- Age is not strongly associated with use of outpatient services or the likelihood of being admitted to hospital, but older people have longer hospital stays. Having a medical card increases the number of days in hospital as does having medical insurance. Removing financial barriers to health services is likely to increase demand for hospital inpatient and outpatient care. Numbers of nights in hospital increases with the number of diseases and the level of disability.
- Living alone is not a major driver of the use of GP or hospital services. Married people have longer hospital stays than single people, which is probably because single people are more likely to be discharged to other institutional care.
- Age is independently important in explaining the patterns of use of community and social care services. In particular, the use of home helps is concentrated in the older age groups. Use of social care services also increases with levels of diseases and disability. Some service use decreases with age, in particular dental care. Other services, such as physiotherapy, are not affected significantly by age.
- The effects of entitlements are complex. While those with medical cards use more of most services, and those with medical insurance use more hospital services, it is clear that those without medical cards are low users of community services, and this is particularly the case for the small numbers of people over 70 who do not have medical cards. This suggests that practical as well as financial barriers can reduce use of services such as chiropody.

Report Layout

In the first report on health care utilisation from the TILDA survey, some patterns of service use and entitlements were discussed. It was shown that while use of some services is related to age, the overall pattern is more complicated, and it was clear that the determinants of use needed more detailed study. This report looks more closely at the patterns of service use, focusing in particular on how patterns relate both to age and living status i.e. those living alone as distinct from those living with a partner or with others. It then goes into a more detailed statistical analysis of the drivers of use of the main elements of health and social care.

The report is organised as follows:

Section 1

Provides some context on the Irish health care system and its entitlements to care.

Section 2

Provides more detailed descriptive statistics of patterns of use of services according to age and living status.

Section 3

Describes the data and methodology used for the statistical analysis in this report.

Section 4

Presents results and discussion on the determinants of health and social care utilisation (GP, Hospital, Community and Social Care Services) from the statistical analysis.

Introduction

In Ireland health care utilisation depends on many factors that relate both to the health care system and to the characteristics of individual patients. In a time of social and economic transition, characterised by increased life expectancy, population ageing, changing expectations and the re-structuring of health services, it is crucial to disentangle the complex patterns and drivers of health service utilisation. This will help us understand the future demand for health care services, and better assess the potential impact of an ageing population.

The data comes from the first wave of The Irish Longitudinal Study on Ageing TILDA (Barrett A 2011), a prospective study of 8,175 participants representative of the community-living population aged 50 and over in Ireland. In particular, we look at the relationship between age and other possible drivers of the intensity of service utilisation in hospital, primary, community and social care services. We use a number of self-reported health measures (overall health, emotional and mental health, chronic conditions and limitations in daily activities) to highlight the key drivers of health care utilisation, and to characterise the most frequent service users. Ireland has a complex set of entitlements to health care. At the time of the survey almost 70% of the population were paying out of pocket costs for primary and secondary care services. About 30% of the population had medical cards, providing free access to these services. We look at entitlement status such as those with private health insurance, medical card holders and those with no (additional) health coverage to examine the effect of different prices faced by service users and their impact on use of services.

In line with previous work, this research highlights the differential utilisation rates between medical card holders and non-medical card holders (Nolan and Nolan 2004; Nolan 2007; Nolan and Nolan 2008; Nolan and Smith 2012) indicating that the price faced by users is a strong determinant of health care utilisation. Using TILDA's rich range of self-reported health measures we found that age in itself is not a significant driver of health care utilisation, the key drivers being entitlement status, poor self-rated health, limitations in daily activities and the presence of one or more chronic conditions. However, different patterns arise in the case of community and social care services with age being a major driver of utilisation.

Acknowledgements

We would like to acknowledge the vision and commitment of our funders, Irish Life, the Atlantic Philanthropies and the Department of Health, which is providing funding on behalf of the State. We would also like to state that any views expressed in this report are not necessarily those of the Department of Health or of the Minister for Health.

We would like to express our sincere thanks to the TILDA respondents for giving generously of their time, to the TILDA survey team based in TCD and to the field interviewers managed by IPSOS MORI.

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1

The Irish Health system and entitlements to care

In Ireland there is a complex system of entitlement to free or subsidized health care, with entitlements depending on income, age and in some cases the presence of illnesses (Nolan 1994; Wiley 2005). Table 1.1 presents a detailed description of these entitlements. Those in category (I) are granted a full medical card which entitles the recipient and his/her dependants to: free GP care, prescribed medicines (subject to a per item charge of 50 cents on prescriptions, at the time of survey), free access to public inpatient and outpatient hospital services in a public hospital ward (including consultant services), some dental, optical and aural services, entitlement to free maternity and infant care services and a maternity cash grant upon the birth of a child (HSE 2009). Entitlement to a medical card is decided on the basis of a means test whose income thresholds are set nationally and updated annually. However, a medical card can be granted in a situation where the refusal of a medical card would cause undue hardship to people whose income is over the financial guidelines (HSE 2009). Those aged 70 and over applying for a medical card are subject to a higher income threshold than younger people.

A sub-category of entitlement exists within category (I). The GP visit card entitles the recipient and their dependants to free GP care, but excludes prescriptions and primary care services. Eligibility is again based on income but the income threshold is 50% higher than when applying for a full medical card. Those in category (II) i.e., ('nonmedical card holders') are required to pay in full for GP services, with the exception of maternity and infant GP services which are provided free of charge for a specific number of visits. They are entitled to use public hospital services that are subject to modest charges up to an annual limit. They are also entitled to subsidized prescribed drugs and medicine through the Drugs Payment Scheme when their monthly expenditure on drugs exceeds a certain limit.

Table 1.1: Category of Entitlements (as at the date of survey).

| Categories | GP | Prescription Medications | Public Hospital Care: Acute Hospital Outpatient: | Public Hospital Care: Acute Hospital Outpatient: (Including Emergency Department) |
|---------------------------------|---|---|--|---|
| Category 1 Full medical card | Free | €0.50 per item | Free public care | Free public care |
| Category 2 GP visit card | Free | Free above €120.00 out of pocket payment for the month. Free for specific long term illness conditions. | €75.00 per night subject to annual limit | Free with referral |
| Category 3 | About €50-€55 Free Maternity & infant care services | Free above €120.00 out of pocket payment for the month. Free for specific long term illness conditions. | €75.00 per night subject to annual limit | Free with referral |

In addition to the categories outlined above, around half of the population (at the time of survey) had supplementary private medical insurance. This provides a range of benefits including access to private services in public hospitals, access to private hospital inpatient services and coverage of public hospital fees. In general, private insurance does not provide significant outpatient or primary care cover. Table 1.2 below, derived from the TILDA dataset described in detail later, outlines the patterns of health insurance for those over 50 in Ireland. There are now 3 main providers of private insurance, each offering a variety of policies, so entitlement status for those covered varies greatly and the trend is for increasing diversity (HIA 2007).

Table 1.1: Category of Entitlements (as at the date of survey).

| Entitlement Status | 50-59 | 60-64 | 65-69 | 70-79 | 80+ | All Ages 50+ |
|-------------------------------|-------|-------|-------|-------|------|--------------|
| (a) Medical Card Only | 24% | 31% | 32% | 52% | 68% | 36% |
| (b) Dual Cover | 5% | 9% | 17% | 39% | 29% | 16% |
| (c) Health Insurance Only | 52% | 51% | 42% | 8% | 3% | 37% |
| (d) No Additional Cover | 19% | 10% | 10% | 1% | 0% | 11% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% |
| All Medical Cards (a) +(b) | 30% | 39% | 49% | 91% | 97% | 52% |
| All Health Insurance (b) +(c) | 57% | 59% | 59% | 46% | 31% | 53% |

2

Descriptive statistics of patterns of service utilisation according to age and living status

This section of the report develops further the presentation of descriptive statistics on health service use from the first report (Barrett et al 2011). The earlier report focused on the distinction between those who were and were not users of the different services. This report goes further by providing an analysis of the amount of use, allowing a fuller understanding of resource use and cost patterns. In particular, the frequency of GP use, the length of hospital stays and total bed days are used to show patterns of primary care and hospital use. Table 2.1 provides detail of the use of health services by age group.

Table 2.1: Utilisation of health services by age (Average number in the 12 months prior to interview).

| Age | 50-54 | 55-59 | 60-64 | 64-69 | 70-79 | 80+ |
|---------------------|-------|-------|-------|-------|-------|-----|
| GP visits | 2.9 | 3.6 | 3.5 | 4.2 | 4.8 | 5.7 |
| ED visits | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 |
| Outpatient visits | 1.2 | 1.1 | 1.5 | 1.7 | 1.7 | 1.7 |
| Total bed nights | 0.5 | 1.0 | 1.0 | 1.1 | 1.9 | 1.9 |
| Hospital admissions | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 |
| Nursing home days | 0 | 0 | 0 | 0 | 0 | 0.1 |

While it has been shown elsewhere (Barrett et al 2011) that people in their 80s are not more likely to have been a user of GP services than people in their 70s, those who do visit utilise the service more intensively. However, there is no similar pattern of use of outpatient or emergency department for people in their 60s, 70s and 80s. Use of nursing home beds (for those who normally live at home) is low for all ages but does rise with age.

Research has shown (Inouye et al 2008) that living alone increases the risk of using certain health services. From the TILDA data, it is possible to provide a breakdown of service use by those living alone, those living only with a partner and those living in other circumstances (typically households with two or more generations). This is potentially important since increasing proportions of older people are living with partners as life expectancy is converging between men and women, and there is increasing evidence that this can reduce the use of high cost care and other services.

Tables 2.2 to 2.7 show the breakdown of patterns of use by age group and by living status. In the younger age groups the usage rate of some services is very low, and the differences between different living conditions are not statistically significant. Where differences are significant, they are highlighted in the text.

Table 2.2: Utilisation of services for those 50-54 (Average number in the 12 months prior to interview).

| Age 50-54 | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 3.8 | 3.4 | 2.6 | 2.9 |
| ED visits | 0.2 | 0.1 | 0.2 | 0.2 |
| Outpatient visits | 1.5 | 1.4 | 1.1 | 1.2 |
| Total bed nights | 1.4 | 0.4 | 0.4 | 0.5 |
| Hospital admissions | 0.2 | 0.1 | 0.1 | 0.1 |
| Nursing home days | 0.01 | 0 | 0 | 0 |

Living alone is associated with more GP visits in this age group. Nights in hospital are higher for those living alone, which contrasts with the findings in other age groups, and appears to be driven by a small number of intensive users in this age group. There are no other significant differences for usage of other services.

Table 2.3 Service use for those 55-59 (Average number in the 12 months prior to interview).

| Age 55-59 | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 4.4 | 3.4 | 2.6 | 3.6 |
| ED visits | 0.3 | 0.3 | 0.2 | 0.2 |
| Outpatient visits | 1.4 | 0.9 | 1.1 | 1.1 |
| Total bed nights | 0.7 | 1.1 | 1.07 | 1.04 |
| Hospital admissions | 0.2 | 0.2 | 0.1 | 0.1 |
| Nursing home days | 0 | 0 | 0 | 0 |

The only service that is clearly used more by those living alone in this age group is GP visits.

Table 2.4 Service use for those 60-64 (Average number in the 12 months prior to interview).

| Age 60-64 | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 3.8 | 3.6 | 3.2 | 3.5 |
| ED visits | 0.2 | 0.1 | 0.1 | 0.1 |
| Outpatient visits | 1.6 | 1.6 | 1.4 | 1.5 |
| Total bed nights | 0.9 | 1.08 | 0.9 | 1.02 |
| Hospital admissions | 0.1 | 0.2 | 0.1 | 0.1 |
| Nursing home days | 0 | 0 | 0.07 | 0.04 |

Living status does not affect the levels of services use in this age group.

Table 2.5 Service use by those 65-69 (Average number in the 12 months prior to interview).

| Age 65-69 | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 3.8 | 3.6 | 3.2 | 3.5 |
| ED visits | 0.2 | 0.1 | 0.1 | 0.1 |
| Outpatient visits | 1.6 | 1.6 | 1.4 | 1.5 |
| Total bed nights | 0.9 | 1.08 | 0.9 | 1.02 |
| Hospital admissions | 0.1 | 0.2 | 0.1 | 0.1 |
| Nursing home days | 0 | 0 | 0.07 | 0.04 |

Overall, people in their sixties who normally live in their own homes have similar patterns of service use to those in their 50s, with slightly greater frequency of GP use. Interestingly, being over the statutory retirement age has little effect on the patterns of use. This may be important given the tendency in many reports to model the likely effects of ageing in terms of the numbers of people over 65. The data does not suggest that this is an important threshold for service use.

Table 2.6 Service use for people aged 70-79 (Average number in the 12 months prior to interview).

| Age 70-79 | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 5.4 | 5.1 | 5.9 | 4.8 |
| ED visits | 0.3 | 0.2 | 0.2 | 0.2 |
| Outpatient visits | 1.9 | 1.7 | 1.5 | 1.7 |
| Total bed nights | 2.1 | 1.5 | 2.6 | 1.9 |
| Hospital admissions | 0.2 | 0.2 | 0.4 | 0.2 |
| Nursing home days | 0.17 | 0.04 | 0.02 | 0.07 |

The patterns for those in their seventies show higher service use compared to younger age groups, with generally higher levels of GP attendance for all. Interestingly, the levels of GP attendances and hospital admissions are not higher for those living alone compared to those living with others. What is clear is that those who do go into hospital who are living alone are more likely to be discharged to a nursing home, and this is shown in the much higher (if still very low) usage of nursing home care. From the TILDA data it can be shown that those living alone and who have a hospital stay are the only group who are more likely to use short term nursing home care.

Table 2.7: Service use for people aged 80+ (Average number in the 12 months prior to interview).

| Age 80+ | Living alone | Living with long term partner | Living with others | Total |
|---------------------|--------------|-------------------------------|--------------------|-------|
| GP visits | 6 | 5.1 | 5.9 | 5.7 |
| ED visits | 0.2 | 0.3 | 0.2 | 0.2 |
| Outpatient visits | 1.6 | 1.7 | 1.5 | 1.7 |
| Total bed nights | 1.7 | 2.8 | 0.8 | 1.9 |
| Hospital admissions | 0.3 | 0.2 | 0.2 | 0.2 |
| Nursing home days | 0.40 | 0 | 0 | 0.1 |

An interesting pattern which emerges here is that those living alone in their 80s are more likely to be admitted to hospital than those living with a partner, but those who are admitted do not stay so long. Part of the explanation seems to be their greater likelihood of spending time in a nursing home, presumably due to more limited care support at home. Those living with a partner are more likely to return straight home, although they have slightly longer hospital stays. The results here should be treated with caution since the days in hospital and nursing homes are distorted by a relatively small number of people with long stays, and the observed differences in the use of services are small.

Living status has been shown above to be related to use of some health care services, but the overall effects are not large. A related question is whether it is also connected with the need for home help support. Table 2.8 gives the percentages receiving home help support by age category and living status.

Table 2.8: Percentage of those with home help, classified by living status and age.

| | Living alone % | Living with long term partner % | Living with others % | Total % |
|--------------|----------------|---------------------------------|----------------------|------------|
| Age 50-54 | 2.8 | 1.3 | 1.2 | 1.4 |
| Age 55-59 | 2.4 | 0 | 2.6 | 2.0 |
| Age 60-64 | 1.7 | 0 | 1.6 | 1.2 |
| Age 65-69 | 3.3 | 1.1 | 2.7 | 3.3 |
| Age 70-79 | 5.3 | 2.2 | 2.7 | 3.3 |
| Age 80+ | 3.7 | 2.0 | 4.0 | 3.2 |
| Total | 3.6 | 1.3 | 1.8 | 2.0 |

Not surprisingly living status is clearly associated with use of home help services, as those living alone generally use more. Interestingly those over 80 who live with family are also more likely to have home help support, possibly because this group is more dependent than those living alone or with a partner, or that families are effective advocates for their older relatives.

Table 2.9 shows patterns of use of community and social care services by age.

Table 2.9 Use of social and community care services by age (Percentage who used each service at least once in the year prior to interview).

| | Age 50-59 % | Age 60-69 % | Age 70-79 % | Age 80+ % | Total % |
|------------------------------------|----------------|----------------|----------------|--------------|------------|
| Public Health Nurse | 2.2 | 3.7 | 11.8 | 24.9 | 6.6 |
| Occupational therapy | 0.9 | 1.3 | 2.2 | 3.2 | 1.5 |
| Chiropody services | 1.3 | 2.2 | 9.8 | 15.6 | 4.5 |
| Physiotherapy services | 3.9 | 5.1 | 7.0 | 6.9 | 5.2 |
| Speech and language therapist | 0.2 | 0.2 | 0.4 | 0.2 | 0.2 |
| Social work services | 0.3 | 0.1 | 0.4 | 0 | 0.3 |
| Psychological/counselling services | 1.4 | 0.5 | 0.6 | 0.1 | 0.8 |
| Home help | 0.5 | 1.3 | 6.2 | 19.2 | 3.5 |
| Personal care attendant | 0.1 | 0.2 | 0.9 | 3.3 | 0.6 |
| Meals-on-Wheels | 0.1 | 0.3 | 2.4 | 3.3 | 0.9 |
| Day centre services | 0.3 | 0.6 | 1.6 | 6.8 | 1.2 |
| Optician service | 7.9 | 10.7 | 20.9 | 18.5 | 12.3 |
| Dental services | 9.8 | 11.6 | 12.0 | 8.7 | 10.7 |
| Hearing services | 0.8 | 1.4 | 2.9 | 5.3 | 1.8 |
| Dietician services | 1.1 | 1.6 | 2.3 | 0.3 | 1.5 |
| Respite services | 0.2 | 0.3 | 0.8 | 1.1 | 0.5 |

A number of interesting issues become clear from this table. Public health and community nursing services are strongly concentrated in the older age groups, especially those over 80. Some other services show a significant age gradient, such as chiropody and to a lesser extent occupational therapy. However, the overall level of use of most of these services is low in all age groups and there are few signs of an age gradient. In many cases entitlement to these services is restricted, in principle, to those with medical cards (which does of course include almost all of those over 80 and most people over 70). When this is broken down by medical card status, a more complicated pattern emerges. Tables 2.10 and 2.11 show the rates of service use by medical card status and age. It should be noted that the numbers in the categories of older people without medical cards are small, but nevertheless the differences in some cases are large.

Table 2.10: Percentage of the population with medical cards availing of different social care services in the past year, classified by age.

| | Age 50-54% | Age 55-59% | Age 60-64% | Age 65-69% | Age 70-79% | Age 80+ % | Total |
|------------------------------------|------------|------------|------------|------------|------------|-----------|-------|
| Public Health Nurse | 4.8 | 6.9 | 8.6 | 6.1 | 12.7 | 25.5 | 12.08 |
| Occupational therapy | 3.2 | 1.9 | 3.3 | 1.09 | 2.3 | 3.3 | 2.5 |
| Chiropody services | 2.9 | 3.1 | 2.9 | 4.9 | 10.7 | 16.1 | 8.2 |
| Physiotherapy services | 9.3 | 6.7 | 9.5 | 6.6 | 7.3 | 7.3 | 7.6 |
| Speech and language therapist | 0.27 | 0.22 | 0.11 | 0.22 | 0.39 | 0.21 | 0.27 |
| Social work services | 1.5 | 0.27 | 0.21 | 0.33 | 0.49 | 0 | 0.43 |
| Psychological/counselling services | 4.1 | 2.3 | 0.42 | 1.1 | 0.67 | 0 | 1.1 |
| Home help | 1.1 | 1.6 | 2.5 | 2.7 | 6.4 | 19.5 | 6.5 |
| Personal care attendant | 0.27 | 0.7 | 0.33 | 0.4 | 0.9 | 3.4 | 1.1 |
| Meals-on-Wheels | 0.57 | 0 | 0.68 | 0.65 | 2.5 | 3.3 | 1.7 |
| Day centre services | 0.87 | 0.62 | 1.3 | 1.2 | 1.7 | 6.8 | 2.2 |
| Optician service | 18.0 | 18.0 | 18.0 | 22.7 | 22.5 | 18.9 | 20.4 |
| Dental services | 20.4 | 23.7 | 21.2 | 22.4 | 13.0 | 8.7 | 16.6 |
| Hearing services | 1.7 | 2.3 | 2.4 | 3.4 | 3 | 5.5 | 3.2 |
| Dietician services | 2.4 | 2.3 | 1.5 | 2.4 | 2.4 | 0.34 | 1.9 |
| Respite services | 1.1 | 0.49 | 0.68 | 0.75 | 0.93 | 1.1 | 0.88 |

Community and social care services are strongly affected by age, but at least part of this is due to the age pattern of medical card status. Those facing user fees for services report lower levels of use than those who get the services free at the point of use.

Table 2.11: Percentage of the population without medical cards. (i.e., those with GP visit card, medical insurance and no additional cover) availing of different community and social services in the past year, classified by age.

| | Age 50-54% | Age 55-59% | Age 60-64% | Age 65-69% | Age 70-79% | Age 80+ % | Total |
|------------------------------------|------------|------------|------------|------------|------------|-----------|-------|
| Public Health Nurse | .89 | 0.62 | 0.64 | 1.7 | 2.6 | 5.1 | 0.98 |
| Occupational therapy | 0.31 | 0.14 | .28 | .11 | .62 | 0 | 37 |
| Chiropody services | 0.45 | 0.67 | 0.59 | 1.9 | 1.1 | 2.9 | 0.8 |
| Physiotherapy services | 2.9 | 2.6 | 2.7 | 3 | 2.9 | 1.8 | 2.5 |
| Speech and language therapist | 0.14 | 0 | 0.12 | 0.25 | 0 | 0 | 0.13 |
| Social work services | 0.26 | 0 | 0 | 0 | 0 | 0 | 0 |
| Psychological/counselling services | 1 | .34 | .51 | 0 | 0 | 0 | .54 |
| Home help | 0.15 | 0 | 0.13 | 0.65 | 3.9 | 4.2 | .34 |
| Personal care attendant | 0 | 0 | 0 | 0 | 1.1 | 0 | 0 |
| Meals-on-Wheels | 0.21 | 0 | 0 | 0 | 1.1 | 0 | .11 |
| Day centre services | 0 | 0.19 | 0 | 0.16 | 0 | 0 | 0 |
| Optician service | 3.9 | 3.9 | 3 | 5 | 4.7 | 10.3 | 3.9 |
| Dental services | 5.2 | 4.7 | 3.8 | 5.2 | 1.7 | 5.4 | 4.6 |
| Hearing services | 0.19 | 0.29 | 0.31 | 0.33 | 1.2 | 0 | .3 |
| Dietician services | .51 | .81 | 1.1 | 1.6 | 1.6 | 0 | .94 |
| Respite services | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

It is clear that, while age remains a major determinant of service use, the lack of entitlement has the effect of reducing the use of most community services. For example, in case of physiotherapy, those without medical cards do not appear to be buying private services. This suggests that those without medical cards are not substituting private services for public ones, despite the fact that they are in higher income categories. This is in line with general international evidence that suggests user fees and charges deter use even in those who can in principle pay.

The overall findings of the descriptive statistics are that age affects the pattern of some service use but the effects are limited to certain services and are in many cases gradual. Living status does affect use of primary care and some hospital services but the effects do not seem to be very strong.

3

Data description and variables for Statistical Analysis

The statistical analysis uses data from the first wave of the Irish Longitudinal study on Ageing in (TILDA) collected in 2010. TILDA is a large-scale, nationally representative study of over 8,000 people aged 50 (or their spouses/partners) resident in Ireland. TILDA captures detailed information on respondents' use of health and social care services in the previous year and on how much the respondent spends on healthcare. The questionnaire asks a set of questions about the level of utilisation of health care services, respondents' satisfaction with them and perceived deficiencies in care provision. It is important to note that the sample in the first wave did not include those in residential care. Although this was estimated to cover only 2% of those over 50 years, it represents a larger proportion of those in older age categories and people in residential care typically have more chronic disease. This means that the findings presented in this paper do not apply to either the population under fifty or to those residents in long stay institutions.

TILDA contains indicators of health status and a range of social and demographic variables that can be used to explain differences in health care utilisation. Table 3.1 presents the list of dependent and explanatory variables used in this study. The dependent variables in our analysis reflect the intensity of use of different types of services. We consider primary care, hospital services and health and social services provided in the community.

The GP and hospital variables used were:

- (1) The number of visits made to a GP during the year preceding the survey date
- (2) The number of visits made to an emergency department during the year preceding the survey date
- (3) The number of outpatient visits during the year preceding the survey date
- (4) The number of hospital admissions
- (5) The number of overnight stays during the year preceding the survey date.

Fifteen community and social care variables were examined. Respondents were asked if, in the last 12 months, they had availed of any of the following services: public health nurse, occupational therapy, dietician, home help, physiotherapy, chiropody, care attendant, day care, dentist, speech and language therapy, psychology services, meals on wheels, optician, hearing aid services, and respite care. Table 3.1 describes the data in more detail.

Table 3.1: Description of Dependent variables.

| Dependent Variable | Description |
|-----------------------------|--|
| GP visits | In the last 12 months, about how often did you visit your GP? |
| Ed visits | In the last 12 months, how many accident & Emergency Department (A&E) visits as a patient? |
| Hosponadmit | In the last 12 months, on how many occasions were you admitted to hospital overnight? |
| Totbednights | In total, about how many nights did you spend in hospital in the last 12 months? |
| Outpvists | In the last 12 months, about how many visits did you make to a hospital as an outpatient? |
| Public Health Nurse | In the last 12 months did you receive the services of a public health nurse? |
| Occupational Therapy | In the last 12 months did you receive occupational therapy services? |
| Dietician | In the last 12 months did you use dietician services? |
| Home Help | In the last 12 months did you receive home help services? |
| Physio | In the last 12 months did you receive physiotherapy services? |
| Chiropody | In the last 12 months did you receive chiropody (podiatry) services? |
| Careatnd | In the last 12 months did you receive the services of a care attendant? |
| Daycare | In the last 12 months did you use day care services? |
| Dentist | In the last 12 months did you visit a dentist? |
| S&L | In the last 12 months did you receive speech and language therapy services? |
| Psych | In the last 12 months did you see a psychologist? |
| Mealsonw | In the last 12 months did you receive meals on wheels? |
| Optician | In the last 12 months did you see an optician (optometrist)? |
| Hearing aid | In the last 12 months did you see a hearing aid service? |
| Respite care | In the last 12 months did you use respite care services? |

Turning to explanatory variables, Anderson's conceptual model of health care utilisation was used, to compile indices of predisposing, enabling and need characteristics as set out in Table 3.2 below.

Table 3.2 TILDA variables grouped according to Anderson's conceptual model into predisposing, enabling & need factors.

| Independent Variable | Value = 1 if respondent |
|----------------------|---|
| Predisposing: | |
| Sex | Female |
| Age 55-59 | Aged between 55 - 59yrs |
| Age 60-64 | Aged between 60 - 64yrs |
| Age 65-69 | Aged between 65 - 69yrs |
| Age 70-79 | Aged between 70 - 79yrs |
| Age 80+ | Aged between 80yrs & over |
| Atwork | Employed |
| MarriedLWP | Married or living with long term partner (as if married) |
| Enabling: | |
| Primaryed | Has no more than Primary level Education |
| Dublin | Lives in Dublin |
| Medcard | Has a medical card |
| Medinsurance | Has medical insurance |
| Need: | |
| chrdis1 | Has 1 chronic condition |
| chrdis2 | Has 2 chronic conditions |
| chrdis3ormore | Has 3 or more chronic conditions |
| SRHG | Has self-rated health which is excellent, good or very good in comparison to others of same age |
| MHG | Has self-rated emotional or mental health which is excellent, very good and good |
| DISADL | Has at least 1 limitation in activities of daily living |
| DISIADL | Has at least 1 limitation in instrumental activities of daily living |

Predisposing characteristics are individual propensities to use services (Andersen 1995) which exist prior to the onset of the illness episodes (Andersen 1995). They typically include; age, sex, race, religion, and values concerning health and illness. (Andersen 1995). We included the following predisposing variables: gender (female =1, male =0); marital status (married or living with long term partner = 1, otherwise =0). Five dummy variables capture age differences: 55-59 years, 60-64 years, 65-69 years, 70-79 years and 80 years or older, leaving 50-54 years as the reference category. Employment status is represented by a dummy. If one is at work = 1 and retired or not working = 0.

Enabling characteristics are described as the “means” individuals have at their disposal to avail of services. Resources specific to the individual and his/her family (e.g., income, insurance entitlement status) and attributes of the community in which the individual lives (e.g. rural-urban, region) are included (Andersen 1995). Enabling variables for this study include the following:

- **Educational status** of the respondent measured by a dummy variable equalling 1 for those with primary or no education and 0 otherwise.
- **Location** is characterised by a dummy variable. Dublin = 1 and rest of the country = 0.

To analyse the differences in utilisation between those with free care and those who face a cost, we use two dummy variables: medical-card holders vs. the rest of the population and those with private health insurance vs. the rest of the population. This leaves those with no additional cover as the reference category.

Need characteristics capture the need for health care and refer to the severity of illness or incapacity. The need for care may be either that perceived by the individual or that evaluated by the delivery system (Andersen 1995). For this study we used the number of chronic conditions reported by the respondent as one indicator of health care need. The World Health Organisation defines chronic conditions as health problems that require ongoing management over a period of years or decades and include: (WHO Chronic conditions health strategy 2012) Non-communicable conditions, persistent communicable conditions, long-term mental disorders and ongoing physical/structural impairments. We are interested in looking at the intensity of utilisation for those with different numbers of chronic conditions. We compiled a list of 17 chronic conditions that fell under the World Health Organisations definition, reported by respondents: Heart attack, Heart failure or Angina, Mental illness, Hypertension, High Cholesterol, Stroke, Diabetes, Lung Disease, Asthma, Arthritis, Osteoporosis, Cancer, Parkinson’s disease, Peptic Ulcer, Hip Fracture and Alcohol addiction. We then grouped participants according to the number of chronic conditions they had, ranging from no chronic conditions to those with three or more chronic conditions. In using the number of chronic disease variables, we wanted to see if there was an increase in utilisation by those with more conditions¹.

¹ A very detailed analysis of the rôle of multimorbidity as a driver of health services use is currently under way by Olga McDaid, and this will provide a better understanding of the observed patterns.

The measurement of care need was based on four types of questions:

1. The respondents' self-assessment of their general health status in comparison to others of the same age: "In general, compared to other people your age, would you say your health is excellent, very good, good, fair or poor?" We use a dummy variable to represent self-rated health as good by grouping excellent, very good and good together, and leaving self-rated health as poor by grouping fair and poor together, as the reference category.
2. The respondents' self-assessment of their emotional or mental health: "What about your emotional or mental health? Is it excellent, very good, good, fair or poor?" A dummy variable is used to represent emotional / mental health as good by grouping excellent, very good and good together, leaving fair or poor emotional / mental health as the reference category.
3. Basic activities of daily living. (ADL) "Because of a health or memory problem, do you have difficulty doing any the following activities: dressing, walking across a room, bathing or showering, eating, getting in or out of bed, using the toilet?" A dummy variable is used to represent those with at least 1 limitation in ADL and the reference category represents those with no such limitations.
4. Instrumental activities of daily living (IADL): "Because of a health or memory problem, do you have difficulty doing any of the following activities: preparing meals, doing household chores, shopping, using the telephone, taking medications or managing money?" A dummy variable is used to represent those with at least one IADL limitation and the reference category is those without.

4

Statistical Analysis: Results and Discussion

Section 4 provides a statistical examination of the determinants of health and social care utilisation by adults over the age of 50 years resident in Ireland.

Section 4.1 Utilisation of GP and hospital services.

In this section we examine the utilisation of health care of the following services, general practitioner, hospital emergency department, hospital overnight stays and outpatient visits. The most appropriate model to use given the nature of our data was a multivariate negative binomial regression model. This is frequently used when examining the determinants of health care utilisation (Sarma and Simpson 2006). The analysis allows the importance of each of the drivers to be determined and whether or not the effects are statistically significant at conventional levels. The aim is to understand how much each of the drivers affects use of services, holding other things constant.

Care must be taken in interpreting the co-efficients in a negative binomial model since they are not in the same units as the independent variables, but the aim here is to identify the important and statistically significant drivers of utilisation. Positive co-efficients indicate that service use increases as this variable increases and negative co-efficients indicate a fall in use as the variable increases. Some guidance on how the results should be interpreted is included especially on the volumes of GP use and use of hospital outpatient and inpatient care. The full regression results, structured in accordance with Anderson's conceptual model, are presented in tabular form (Tables 4.1 to 4.5) at the end of this chapter. There is one table for each of the five health care variables. Each table shows four regressions: age alone, adding the predisposing factors, then adding the enabling factors and finally adding the need factors. We now discuss the main substantive conclusions from these tables.

Predisposing Characteristics

Age: When age was entered into a regression on its own, it appeared to be a significant driver of health care utilisation. The results of the models using only age are shown in the first column of each table. The relationship of all age groups with the number of GP visits reported is highly significant. A similarly significant result is reported for outpatient visits and admissions to hospital overnight and total bed nights, but not emergency department visits.

In order to explore this relationship in more detail, we estimated the effect of Anderson's predisposing, enabling and need factors on the usage of health care services to see if the influence of age remained evident. Once we added need characteristics, the effect of age was in most cases no longer significant. There were small significant effects of age on admission to hospital and bed days in hospital, but not on other hospital or primary care services.

Thus, our results suggest that, in general, it is not age itself that drives utilisation but rather the characteristics with which age is correlated, such as having poor self-rated health, limitations in daily activities and the presence of one or more chronic conditions or service entitlement. As will be discussed below, this difference is important given that the relationship of age and disability is changing over time, so projections based on age alone will exaggerate the likely changes in needs.

Gender: There is little difference in utilisation between male and female participants for any of the dependent variables, although women are slightly less likely to use outpatient services. This is not surprising given that our sample does not include many women of reproductive age.

Employment status: Those who are at work are slightly less likely to visit their GP in comparison to those who are not working, even when age and the various disease and health measures are included. Employment status also plays a small role in emergency department and outpatient visits where those working have fewer visits than those not working. There is no effect of being at work on the likelihood of being admitted to hospital, but those in employment are likely to have shorter stays.

Marital status: The results for marital status show no independent effect of this on use of these services, suggesting that the observed differences relate to other characteristics of married or unmarried people.

Enabling Characteristics

Education: It was not possible to use strong socio-economic indicators such as household income, socio-economic status and social class because these variables registered high numbers of missing cases. We therefore used education as our main measure of socio-economic status. We found that those with lower levels of education have slightly more GP visits than those with higher levels of education, but this result was not significant for any other health care service.

Location (Dublin): People living in Dublin are slightly less likely to visit both primary and secondary care services in comparison to those living in another town or city, or rural area in the Republic of Ireland. This result is hard to explain but it may reflect more acute deprivation concentrated in areas surrounding the city, and in some cases poorly developed services. Dublin has a slightly higher deprivation score than the rest of the country (Kelly and Teljeur 2004). This relationship requires more detailed

analysis. Those living in Dublin are slightly less likely to have a hospital admission.

Medical card: Possession of a medical card was a strong and highly significant predictor across all health care services except emergency department services. Our result shows that people over 50 years of age with medical cards have an additional two GP visits annually compared to those without medical cards. People in these age groups typically visit the GP 3.9 times annually. Those with medical cards are much more likely to have an overnight stay in hospital and to have an outpatient visit (around 0.4 visits per year), and those admitted to hospital have a longer length of stay (approximately 0.7 extra nights per year). These results have important policy implications as the proposed universal health insurance model envisages providing access to services without a charge. Our results imply that this policy change will lead to substantially increased demand for GP services. Since around half of those over 50 currently have medical cards, the change in entitlement would lead to more than one million additional visits to primary care by those over 50 years. There might also be some increase in hospital outpatient visits, admissions and longer lengths of stay.

Health Insurance: Those with health insurance are slightly more likely to have a GP visit, are more likely to have an overnight hospital stay (which is likely to be longer by 0.3 nights). This may reflect lower thresholds for hospital admission for patients using private services. There is suggestive evidence that insured people are likely to use slightly more outpatient services.

No additional health cover: Those with no additional medical care cover utilise health care services much less than those with medical card cover and/or private insurance, with the exception of emergency services. This may represent a sub-group in society who are not accessing care services due to the price they face.

Need Characteristics

Self-rated health in comparison to others: Self-rated health has been found in previous research to be an important determinant of health care utilisation (Nolan and Nolan 2008). Our results show that those reporting poor self-rated health have a much higher number of annual GP visits (4) in comparison to those reporting good health (2). A similar pattern is evident for all other care services including emergency department visits.

Self-rated emotional health: Good self-rated mental health was associated with fewer GP visits and fewer outpatient attendances but was not a significant driver of utilisation of other medical care.

Chronic conditions: Our results show that those with a heavier burden of chronic illness utilise all of the different health services (GPs, emergency department, outpatient departments and hospital stays) substantially more frequently than those without chronic illnesses. For example, those with three or more chronic conditions

report on average six GP visits annually, in comparison to two for those with zero chronic conditions.

Limitations of daily activities: Adults reporting at least one limitation in daily activities (ADL) are slightly more likely to attend a GP and are more likely to have an overnight hospital stay in comparison to those with no limitations in daily activities. This result perhaps suggests that those patients with less capacity i.e., difficulty with eating, bathing, dressing and toileting, are more likely to be admitted to hospital overnight than those with no difficulty in such activities. This demonstrates the importance of strengthening services that support dependent people in their own homes so as to reduce the risk of admission to hospital. In general the findings show that, while the broader measure of limitations (IADL) is independently significant in some cases, larger and more significant effects can be attributed the narrower ADL limitations.

Section 4.2: Utilisation Of Community And Social Care Services

This section examines the determinants of the utilisation of community and social care services. Given that the survey data provides information only on the use or non-use of services in the past year, without specifying the intensity, a multivariate logistic regression model was used to estimate the main drivers of service use. The odds ratios quoted in Tables 4.6.1-4.6.3 show how much more (or less) likely people are to use services compared to the reference category (again all other things being equal).

The results are presented in detail in Tables 4.6.1-4.6.3 below structured by the Anderson conceptual model. We now summarise the main substantive conclusions from this table. The services included in the TILDA survey were: home help, physiotherapy, chiropody, dental care, care attendant, day-care, speech & language therapy, psychology services, meals on wheels, optician, hearing and respite services. The analysis failed to find significant drivers of the use of dietician services, respite care or speech and language therapy from the independent variables employed. Therefore, no tables are provided for the analyses of these services.

Public Health Nurse Service

Access to public health nursing can be particularly important since they provide a route to accessing a range of community provided services.

Predisposing characteristics: Use of the public health nursing services increases significantly with age. People over 80 are more than four times more likely to be users than people in their 50s. There is no effect of gender on service use. Use of services is 40% lower for people in employment.

Enabling characteristics: Those with medical cards are more than 3 times as likely to be users of public health nurse services.

Need characteristics: Use of services increases slightly with chronic conditions and with limitations in activities of daily living. Those with high self-rated health had less than half the chance of being users.

Home Help Service

These services help people to remain in their own home and to avoid going in to long-term care. Services are offered free of charge to those who have a medical card.

Predisposing characteristics: Compared to those in their fifties, those in their seventies were six times more likely to receive home help services. Those over 80 were nearly 16 times as likely to be users. Those married or living with a long term partner were three times more likely to use home help services compared to those living alone.

Enabling characteristics: Those with a medical card were six times as likely to use home help services, although this result just failed the significance test at the 5% level. This lower level of significance is not surprising given the small numbers without medical cards in the age category that is likely to receive home help services.

Need characteristics: Participants with a disability in instrumental daily activities (i.e., difficulty preparing meals, household chores and taking medications etc.) were three times more likely to have home help and those with ADL limitations were one and a half times more likely to use home help services. Those with good self-rated health had less than half the level of use of home help.

Chiropody Service

Chiropodists/podiatrists assess, diagnose and treat diseases and abnormalities of the foot and lower limb. Medical cardholders can access this service free of charge. Priority is given to those aged 65 and over and those who have contracted hepatitis C from contaminated blood products.

Predisposing characteristics: People over 65 are twice as likely to be users of chiropody services, and those over 80 are six times as likely. Those married or living with a long term partner were 50% more likely to obtain chiropody services than those not married or living alone.

Enabling characteristics: Those with a medical card are three times more likely to utilise chiropody services in comparison to those without a medical card. This may suggest that those without a medical card are put off by the cost of using the service on a private basis or have difficulty in arranging access to such services. Those participants living in Dublin are more likely to have chiropody visits in comparison to those living elsewhere.

Need characteristics: Those with three or more chronic conditions are three times more likely to visit a chiropodist than those without. Those with good self-rated health were 40% less likely to utilise chiropody services.

Physiotherapy Service

Physiotherapy services delivered through the public health service are generally provided in hospitals, either on an in-patient or outpatient basis. Physiotherapy is also delivered in private practices. Physiotherapists use mainly physical means such as exercise, manipulation, massage and electrical methods of therapy. This service is free to those with medical cards.

Predisposing characteristics: Age and gender were not significant here and did not play a role in determining the utilisation of services.

Enabling characteristics: Those with only primary education were found to use physiotherapy 30% less than those with secondary or third level education. Having a medical card nearly doubles the chance of using physiotherapy.

Need characteristics: Having a disability in both daily activities and instrumental daily activities leads to double the chance of using physiotherapy in comparison with those who don't have a disability.

Dental Service

Some dental services are provided free of charge through the medical card while citizens are required to pay full cost if they do not possess a medical card. Good oral health can be very important in maintaining health and independence.

Predisposing characteristics: Those aged between 70 and 79 have half the chance of visiting the dentist compared to those in their 50s, and those over 80 use the services even less.

Enabling characteristics: Those with only primary education were found to use dental services one third less than those with secondary or third level education. Those living in Dublin were 50% more likely to use dental services than those living in another town or city. Having a medical card increased the chance of seeing the dentist four fold.

Need characteristics: People with a chronic disease were more likely to use the dentist than those who didn't.

Occupational Therapy Service

Occupational therapists in Ireland are employed by most Local Health offices, and they are also employed by Voluntary hospitals and agencies. Their services are generally available free of charge to medical card holders. Occupational therapy services can be important in help to keep people in their own homes.

Predisposing characteristics: Use of services was not related to age and gender and was lower for people in employment.

Enabling characteristics: Those living in Dublin were more likely to use OT services, and those employed were less likely to be users.

Need characteristics: Use of services was not directly related to chronic conditions, but was closely correlated with the ADL and IADL scores. Those with good self-rated health were much less likely to be users. This suggests that the services are mainly targeted on those with a need for support with daily living activities.

Hearing Service

The Health Service Executive (HSE) provide aural services, including hearing tests and hearing aids, to eligible people. In general, aural services are provided by the HSE's own professionals but in some cases, it may be provided by private practitioners.

Predisposing characteristics: Those over 80 are three times more likely to use hearing services than younger men. Additionally, women are much lower users than men and those in work are less likely to be users than those who are unemployed.

Enabling characteristics: Those with medical cards are twelve times more likely to use hearing services.

Need characteristics: Those with 3 or more chronic diseases are more likely to use hearing services.

Meals on Wheels Service

Meals can be supplied to older persons who are unable to provide for themselves at designated centres or in their own home. The objective is to help maintain older persons at home for as long as possible.

Predisposing characteristics: People over 70 are more than three times more likely to receive meals on wheels, and men are more likely to receive them than women. Interestingly, those who are married or living with a partner are more likely to get meals on wheels.

Enabling characteristics: Those in Dublin are more likely to get meals on wheels, suggesting that the service may be more available in the capital.

Need characteristics: As shown above, couples are more likely than single people to receive meals on wheels. Recipients with poor capacities, as measured by IADL scores, are also more likely to receive the service. This suggests that couples may be able to remain at home when their capacities to cope are individually quite low.

Care Attendant

The role of the care attendant is to provide personal care rather than domestic services.

Predisposing characteristics: Care attendants are used mainly by people in the oldest age categories. Those over 80 are seven times more likely to be users than those in their 50's.

Enabling characteristics: There were no significant effects of entitlement status.

Need characteristics: Those receiving these services are likely to have limited capacities as measured by ADL and IADL scores.

Optician Service

The Health Service Executive (HSE) is obliged to provide optical services free of charge to certain groups including those who possess a medical card. These services may be provided by Health Service Executive (HSE) staff or by private practitioners.

Predisposing characteristics: Age and gender are not an important determinant of use of optician services.

Enabling characteristics: Those with medical cards were four times more likely to be users of optician services.

Need characteristics: There is a rise in the use of optician services with more diseases and with limitations in activities of daily living.

Day care services

Predisposing characteristics: Being over 80 increases the chance of being a user by more than 4 times, compared to those in their 50s. Married people are nearly 3 times as likely to be users compared to those who are unmarried.

Enabling characteristics: Those living in Dublin were only half as likely to be users

Need characteristics: Those with disabilities as measured by ADL scores are more likely to be users.

Summary of findings in Section 4

While a simple correlation of utilisation with age suggests that ageing itself leads to higher use of services, the underlying factors are more complicated. While age seems to be independently important in explaining the use of some community social services, including home helps and public health nursing, there is little evidence that it is a major driver of the use of hospital and GP services. The apparent effect of age arises from a range of other causes such as the presence of disabilities and diseases associated with older age and entitlement factors. Some of the observed patterns reflect availability of services. Living in Dublin increased use of services such as chiropody and dental care, but reduced use of GP care.

This is important because there is growing evidence that the relationship of disability to age is changing, with people having less disability at any given age. This means that growth in demand for many services is likely to be slower than the growth in numbers in the older age categories.

While older people are only slightly more likely than younger people to be admitted to hospital, they do tend to stay longer once admitted. This suggests that at least part of the higher use of services in hospitals is coming from the lack of support facilities and services to allow people to be discharged from hospital care into step down or other intermediate types of care. In particular, for those with home support (especially those living with a spouse or partner) there may need to be a particular focus on supporting earlier discharge from hospital. The longer stays observed in our data may well reflect delays in discharge due to the absence of appropriate home-based care. The fact that people living alone have shorter stays than those who are married suggests that this group is more likely to have a spell in a nursing home or similar facility after leaving hospital.

Some of the findings reflect cohort effects. For example, it is likely that the much lower use of dental services in those over 70 (and even more those over 80) reflects the history of poor oral health earlier in life. However, it is surprising that the use of dental care is so low in older people. Similarly the use of chiropody reflects the patterns of needs, but it is clear that access is limited for some older people.

The strong association of chronic diseases and measures of disability on service use explains, in part, why age is often considered to be a driver of use. When the subsequent waves of TILDA data are available, it will be possible to explore in more detail how disease and disability change and how they drive service use. It is possible that the stronger association of proximity to death, rather than age, with use of medical care (McGrail et al 2000) may be in part explained by the patterns of chronic diseases and disabilities near the end of life. If this is the case it will be particularly important to model future demands in terms of changing health and disability patterns rather than on age.

A major finding from this analysis, which is in line with other studies, is that social care services are likely to face rapidly growing pressures with ageing. The rise in the use of hospital and GP care may be relatively modest as the population ages, but the numbers needing home help and other community services are likely to rise more rapidly. It is also clear that entitlements to free services (indeed entitlements to services that may help gain access to other services) can be very important. Despite being the wealthiest part of the elderly population, those without medical cards are not accessing a range of important community services.

Tables of Determinants of Health Care Results Discussed in Section 4.2

Table 4.1: Multivariate negative binomial model: General Practitioner visits and predisposing, enabling and need factors.

| GP | Coef. (Mod 1) | P > [t] | Coef. (Mod 2) | P > [t] | Coef. (Mod 3) | P > [t] | Coef. (Mod 4) | P > [t] |
|----------------------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|
| Predisposing: | | | | | | | | |
| age 55-59 | 0.21 | 0.000 | 0.14 | 0.006 | 0.10 | 0.036 | 0.06 | 0.122 |
| age 60-64 | 0.19 | 0.000 | 0.06 | 0.165 | 0.00 | 0.901 | -0.02 | 0.516 |
| age 65-69 | 0.38 | 0.000 | 0.13 | 0.022 | 0.08 | 0.143 | 0.08 | 0.135 |
| age 70-79 | 0.51 | 0.000 | 0.20 | 0.000 | -0.05 | 0.243 | -0.01 | 0.745 |
| age 80+ | 0.69 | 0.000 | 0.31 | 0.000 | 0.04 | 0.494 | 0.08 | 0.162 |
| Female | | | -0.53 | 0.000 | 0.01 | 0.613 | -0.01 | 0.535 |
| At work | | | 0.18 | 0.000 | -0.30 | 0.000 | -0.13 | 0.000 |
| Marrwtp | | | 1.36 | 0.000 | 0.08 | 0.009 | 0.04 | 0.137 |
| Enabling: | | | | | | | | |
| Prim Ed | | | | | 0.12 | 0.000 | 0.05 | 0.045 |
| Dublin | | | | | -0.11 | 0.000 | -0.13 | 0.000 |
| Medcard | | | | | 0.71 | 0.000 | 0.55 | 0.000 |
| Insurance | | | | | 0.14 | 0.012 | 0.13 | 0.010 |
| Need: | | | | | | | | |
| chrdis1 | | | | | | | 0.35 | 0.000 |
| chrdis2 | | | | | | | 0.56 | 0.000 |
| chrdis3 or more | | | | | | | 0.68 | 0.000 |
| disadla | | | | | | | 0.24 | 0.000 |
| disiadla | | | | | | | 0.18 | 0.012 |
| srhg | | | | | | | -0.44 | 0.000 |
| MHgood | | | | | | | -0.09 | 0.030 |
| Cons | 1.1 | 0.000 | 1.36 | 0.000 | 0.92 | 0.000 | 0.94 | 0.000 |

Table 4.2: Multivariate negative binomial model: Hospital Emergency department visits and predisposing, enabling and need factors.

| Emergency Department | Coef. (Mod 1) | P > [t] | Coef. (Mod 2) | P > [t] | Coef. (Mod 3) | P > [t] | Coef. (Mod 4) | P > [t] |
|----------------------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|
| Predisposing: | | | | | | | | |
| age 55-59 | 0.27 | 0.192 | 0.25 | 0.193 | 0.25 | 0.163 | 0.19 | 0.307 |
| age 60-64 | -0.15 | 0.424 | -0.27 | 0.139 | -0.27 | 0.103 | -0.32 | 0.078 |
| age 65-69 | 0.20 | 0.352 | -0.01 | 0.961 | -0.00 | 0.983 | -0.02 | 0.902 |
| age 70-79 | 0.12 | 0.542 | -0.22 | 0.308 | -0.35 | 0.064 | -0.33 | 0.111 |
| age 80+ | 0.15 | 0.507 | -0.25 | 0.308 | -0.38 | 0.093 | -0.28 | 0.254 |
| Female | | | -0.02 | 0.824 | -0.01 | 0.838 | -0.01 | 0.839 |
| At work | | | -0.63 | 0.000 | -0.49 | 0.001 | -0.34 | 0.030 |
| Marrwtp | | | 0.23 | 0.020 | 0.15 | 0.091 | 0.08 | 0.365 |
| Enabling: | | | | | | | | |
| Prim Ed | | | | | 0.02 | 0.830 | -0.05 | 0.659 |
| Dublin | | | | | -0.04 | 0.639 | -0.08 | 0.395 |
| Medcard | | | | | 0.12 | 0.624 | -0.08 | 0.767 |
| Insurance | | | | | -0.35 | 0.155 | -0.34 | 0.188 |
| Need: | | | | | | | | |
| chrdis1 | | | | | | | 0.33 | 0.113 |
| chrdis2 | | | | | | | 0.13 | 0.506 |
| chrdis3 or more | | | | | | | 0.59 | 0.007 |
| disadla | | | | | | | 0.27 | 0.030 |
| disiadla | | | | | | | 0.23 | 0.137 |
| srhg | | | | | | | -0.63 | 0.000 |
| MHgood | | | | | | | -0.05 | 0.607 |
| Cons | -1.47 | 0.000 | -1.19 | 0.000 | -1.1 | 0.002 | -0.84 | 0.036 |

Table 4.3: Multivariate negative binomial model: Hospital admissions overnight and predisposing, enabling & need factors.

| Hospital Admissions ON | Coef. (Mod 1) | P > [t] | Coef. (Mod 2) | P > [t] | Coef. (Mod 3) | P > [t] | Coef. (Mod 4) | P > [t] |
|------------------------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|
| Predisposing: | | | | | | | | |
| age 55-59 | 0.38 | 0.042 | 0.35 | 0.064 | 0.34 | 0.051 | 0.30 | 0.069 |
| age 60-64 | 0.20 | 0.164 | 0.09 | 0.534 | 0.05 | 0.723 | 0.07 | 0.618 |
| age 65-69 | 0.69 | 0.001 | 0.45 | 0.020 | 0.46 | 0.021 | 0.54 | 0.004 |
| age 70-79 | 0.67 | 0.000 | 0.37 | 0.035 | 0.20 | 0.232 | 0.29 | 0.041 |
| age 80+ | 0.61 | 0.001 | 0.25 | 0.252 | 0.09 | 0.659 | 0.27 | 0.143 |
| Female | | | -0.17 | 0.058 | -0.17 | 0.043 | -0.14 | 0.073 |
| At work | | | -0.49 | 0.000 | -0.32 | 0.025 | -0.03 | 0.776 |
| Marrwtp | | | 0.22 | 0.033 | 0.17 | 0.102 | 0.08 | 0.373 |
| Enabling: | | | | | | | | |
| Prim Ed | | | | | -0.10 | 0.319 | -0.22 | 0.023 |
| Dublin | | | | | -0.20 | 0.032 | -0.23 | 0.012 |
| Medcard | | | | | 0.89 | 0.000 | 0.64 | 0.004 |
| Insurance | | | | | 0.51 | 0.021 | 0.51 | 0.022 |
| Need: | | | | | | | | |
| chrdis1 | | | | | | | 0.34 | 0.041 |
| chrdis2 | | | | | | | 0.32 | 0.035 |
| chrdis3 or more | | | | | | | 0.58 | 0.000 |
| disadla | | | | | | | 0.39 | 0.002 |
| disiadla | | | | | | | 0.26 | 0.080 |
| srhg | | | | | | | -1.04 | 0.000 |
| MHgood | | | | | | | 0.10 | 0.477 |
| Cons | -1.9 | 0.000 | -1.6 | 0.000 | -2.2 | 0.000 | -1.95 | 0.000 |

Table 4.4: Multivariate negative binomial model: Total Bed nights in hospital and predisposing, enabling & need factors.

| Totbed Nights | Coef. (Mod 1) | P > [t] | Coef. (Mod 2) | P > [t] | Coef. (Mod 3) | P > [t] | Coef. (Mod 4) | P > [t] |
|----------------------|---------------|---------|---------------|---------|---------------|---------|---------------|---------|
| Predisposing: | | | | | | | | |
| age 55-59 | 0.57 | 0.008 | 0.28 | 0.130 | 0.26 | 0.134 | 0.38 | 0.032 |
| age 60-64 | 0.54 | 0.010 | 0.00 | 0.969 | -0.05 | 0.764 | 0.02 | 0.913 |
| age 65-69 | 0.61 | 0.001 | 0.02 | 0.889 | 0.04 | 0.794 | 0.30 | 0.145 |
| age 70-79 | 1.1 | 0.000 | 0.43 | 0.020 | 0.20 | 0.297 | 0.30 | 0.146 |
| age 80+ | 1.1 | 0.000 | 0.32 | 0.175 | 0.05 | 0.815 | 0.25 | 0.279 |
| Female | | | -0.2 | 0.065 | -0.24 | 0.027 | -0.19 | 0.069 |
| At work | | | -1.1 | 0.000 | -0.78 | 0.000 | -0.31 | 0.027 |
| Marrwtp | | | 0.28 | 0.030 | 0.22 | 0.098 | 0.24 | 0.059 |
| Enabling: | | | | | | | | |
| Prim Ed | | | | | 0.03 | 0.746 | -0.18 | 0.150 |
| Dublin | | | | | 0.02 | 0.873 | -0.07 | 0.596 |
| Medcard | | | | | 1.21 | 0.000 | 0.97 | 0.000 |
| Insurance | | | | | 0.55 | 0.009 | 0.58 | 0.008 |
| Need: | | | | | | | | |
| chrdis1 | | | | | | | 0.53 | 0.002 |
| chrdis2 | | | | | | | 0.59 | 0.001 |
| chrdis3 or more | | | | | | | 0.89 | 0.000 |
| disadla | | | | | | | 0.77 | 0.000 |
| disiadla | | | | | | | 0.35 | 0.040 |
| srhg | | | | | | | -1.1 | 0.000 |
| MHgood | | | | | | | -0.09 | 0.510 |
| Cons | -0.48 | 0.000 | 0.28 | 0.030 | -0.63 | 0.007 | -0.55 | 0.085 |

Table 4.5: Multivariate negative binomial model: Outpatient visits to hospital and predisposing, enabling & need factors.

| Outpatient | Coef. (Mod 1) | P > [t] | Coef. (Mod 2) | P > [t] | Coef. (Mod 3) | P > [t] | Coef. (Mod 4) | P > [t] |
|----------------------|------------------|---------|------------------|---------|------------------|---------|------------------|---------|
| Predisposing: | | | | | | | | |
| age 55-59 | -0.05 | 0.609 | -0.11 | 0.222 | -0.12 | 0.202 | -0.15 | 0.106 |
| age 60-64 | 0.22 | 0.037 | 0.06 | 0.549 | 0.02 | 0.788 | 0.02 | 0.830 |
| age 65-69 | 0.34 | 0.002 | 0.08 | 0.503 | 0.02 | 0.828 | 0.03 | 0.769 |
| age 70-79 | 0.33 | 0.001 | -0.03 | 0.759 | -0.20 | 0.065 | -0.11 | 0.277 |
| age 80+ | 0.15 | 0.500 | -0.27 | 0.189 | -0.48 | 0.020 | -0.23 | 0.240 |
| Female | | | -0.17 | 0.015 | -0.21 | 0.004 | -0.21 | 0.002 |
| At work | | | -0.67 | 0.000 | -0.53 | 0.000 | -0.25 | 0.001 |
| Marrwtp | | | 0.12 | 0.095 | 0.08 | 0.231 | -0.01 | 0.859 |
| Enabling: | | | | | | | | |
| Prim Ed | | | | | 0.01 | 0.800 | -0.09 | 0.173 |
| Dublin | | | | | 0.45 | 0.000 | 0.42 | 0.000 |
| Medcard | | | | | 0.59 | 0.000 | 0.34 | 0.001 |
| Insurance | | | | | 0.23 | 0.058 | 0.22 | 0.035 |
| Need: | | | | | | | | |
| chrdis1 | | | | | | | 0.49 | 0.000 |
| chrdis2 | | | | | | | 0.78 | 0.000 |
| chrdis3 or more | | | | | | | 1.10 | 0.000 |
| disadla | | | | | | | 0.17 | 0.069 |
| disiadla | | | | | | | 0.19 | 0.090 |
| srhg | | | | | | | -0.71 | 0.000 |
| MHgood | | | | | | | -0.32 | 0.037 |
| Cons | 0.22 | 0.005 | 0.66 | 0.000 | 0.17 | 0.220 | 0.34 | 0.080 |

Tables Of Results From Section 4.3: Logistic Regression Results Of Social Care Services

4.6: Multivariate Logistic Regression model of social care services.

Table 4.6.1: Drivers of use of home helps, chiropody, physiotherapy and dental services.

| | OR Home Help | P > [z] | OR Chiropody | P > [z] | OR Physio | P > [z] | OR Dental | P > [z] |
|----------------------|--------------|---------|--------------|---------|-----------|---------|-----------|---------|
| Predisposing: | | | | | | | | |
| Age 55-59 | 1.30 | 0.631 | 1.18 | 0.599 | 0.87 | 0.450 | 0.98 | 0.900 |
| Age 60-64 | 2.41 | 0.079 | 1.05 | 0.883 | 1.11 | 0.549 | 0.87 | 0.308 |
| Age 65-69 | 2.68 | 0.046 | 2.00 | 0.024 | 0.87 | 0.502 | 0.95 | 0.757 |
| Age 70-79 | 6.35 | 0.000 | 3.65 | 0.000 | 0.88 | 0.499 | 0.54 | 0.000 |
| Age 80+ | 15.7 | 0.000 | 5.81 | 0.000 | 0.72 | 0.149 | 0.39 | 0.000 |
| female | 1.16 | 0.315 | 1.22 | 0.112 | 1.21 | 0.070 | 0.88 | 0.113 |
| atwork | 0.33 | 0.014 | 0.75 | 0.236 | 0.68 | 0.013 | 0.88 | 0.237 |
| marriedLWP | 3.07 | 0.000 | 1.50 | 0.001 | 1.02 | 0.859 | 0.92 | 0.317 |
| Enabling: | | | | | | | | |
| primaryed | 0.99 | 0.991 | 0.94 | 0.676 | 0.65 | 0.000 | 0.67 | 0.000 |
| Dublin | 0.90 | 0.554 | 2.35 | 0.000 | 0.98 | 0.919 | 1.59 | 0.000 |
| Medcard | 6.07 | 0.077 | 3.37 | 0.005 | 1.77 | 0.009 | 4.14 | 0.000 |
| Medinsurance | 2.79 | 0.325 | 0.79 | 0.612 | 0.78 | 0.291 | 0.65 | 0.010 |
| Need: | | | | | | | | |
| chrdis1 | 0.94 | 0.831 | 1.86 | 0.016 | 1.94 | 0.001 | 1.08 | 0.491 |
| chrdis2 | 0.87 | 0.640 | 2.05 | 0.005 | 1.89 | 0.001 | 1.17 | 0.169 |
| chrdis3ormore | 1.48 | 0.119 | 2.96 | 0.000 | 2.65 | 0.000 | 1.50 | 0.000 |
| disadla | 1.47 | 0.033 | 1.58 | 0.004 | 2.05 | 0.000 | 1.40 | 0.007 |
| disiadla | 3.09 | 0.000 | 1.36 | 0.065 | 1.85 | 0.000 | 1.04 | 0.741 |
| srhg | 0.46 | 0.000 | 0.60 | 0.001 | 0.65 | 0.001 | 1.08 | 0.425 |
| MHgood | 0.77 | 0.184 | 0.78 | 0.144 | 1.14 | 0.366 | 0.98 | 0.916 |
| cons | 0.00 | 0.000 | 0.00 | 0.000 | 0.02 | 0.000 | 0.06 | 0.000 |

Table 4.6.2: Drivers of use of Public Health Nursing, Occupational Therapy, Hearing Services and Meals on Wheels.

| | OR PHN | P > [z] | OR OT | P > [z] | OR Hearing | P > [z] | OR Meal Onwheels | P > [z] |
|----------------------|--------|---------|-------|---------|------------|---------|------------------|---------|
| Predisposing: | | | | | | | | |
| Age 55-59 | 1.16 | 0.538 | 0.52 | 0.100 | 1.35 | 0.494 | * | * |
| Age 60-64 | 1.52 | 0.086 | 0.96 | 0.912 | 1.38 | 0.458 | 0.76 | 0.730 |
| Age 65-69 | 1.24 | 0.393 | 0.62 | 0.221 | 1.65 | 0.239 | 0.73 | 0.703 |
| Age 70-79 | 2.43 | 0.000 | 0.66 | 0.221 | 1.90 | 0.099 | 3.67 | 0.024 |
| Age 80+ | 4.34 | 0.000 | 0.75 | 0.452 | 3.15 | 0.005 | 3.60 | 0.036 |
| female | 1.00 | 0.951 | 0.97 | 0.884 | 0.67 | 0.029 | 0.29 | 0.000 |
| atwork | 0.62 | 0.020 | 0.34 | 0.008 | 0.43 | 0.023 | 0.89 | 0.844 |
| marriedLWP | 0.65 | 0.000 | 1.05 | 0.807 | 0.90 | 0.594 | 6.84 | 0.000 |
| Enabling: | | | | | | | | |
| primaryed | 1.05 | 0.612 | 0.66 | 0.055 | 0.88 | 0.491 | 1.04 | 0.870 |
| Dublin | 1.02 | 0.830 | 1.59 | 0.028 | 0.95 | 0.821 | 2.05 | 0.010 |
| Medcard | 3.56 | 0.000 | 2.62 | 0.075 | 12.0 | 0.014 | * | * |
| Medinsurance | 0.84 | 0.655 | 0.85 | 0.789 | 2.71 | 0.338 | * | * |
| Need: | | | | | | | | |
| chrdis1 | 1.19 | 0.380 | 1.01 | 0.973 | 1.49 | 0.226 | 1.20 | 0.704 |
| chrdis2 | 1.25 | 0.261 | 1.10 | 0.808 | 1.36 | 0.370 | 0.68 | 0.458 |
| chrdis3ormore | 1.77 | 0.002 | 1.93 | 0.071 | 2.04 | 0.025 | 1.44 | 0.412 |
| disadla | 1.79 | 0.000 | 3.04 | 0.000 | 1.38 | 0.191 | 1.19 | 0.599 |
| disiadla | 2.73 | 0.000 | 2.63 | 0.000 | 1.57 | 0.181 | 2.67 | 0.003 |
| srhg | 0.43 | 0.000 | 0.44 | 0.000 | 0.97 | 0.917 | 0.35 | 0.001 |
| MHgood | 1.05 | 0.696 | 1.44 | 0.154 | 0.83 | 0.478 | 0.61 | 0.127 |
| cons | 0.01 | 0.000 | 0.00 | 0.000 | 0.00 | 0.000 | 5.67 | 0.987 |

*Coefficients could not be estimated because of insufficient cell size.

Table 4.6.3: Multivariate Logistic Regression model of social care services.

| | OR Care Att | P > [z] | OR Optician | P > [z] | OR Daycare Services | P > [z] |
|----------------------|----------------|---------|----------------|---------|---------------------------|---------|
| Predisposing: | | | | | | |
| Age 55-59 | 1.57 | 0.625 | 0.88 | 0.359 | 1.03 | 0.961 |
| Age 60-64 | 1.08 | 0.938 | 0.81 | 0.138 | 1.26 | 0.718 |
| Age 65-69 | 1.52 | 0.654 | 1.08 | 0.547 | 1.50 | 0.519 |
| Age 70-79 | 3.13 | 0.155 | 1.08 | 0.505 | 1.57 | 0.423 |
| Age 80+ | 7.74 | 0.012 | 0.87 | 0.375 | 4.46 | 0.008 |
| female | 1.54 | 0.225 | 0.97 | 0.779 | 1.10 | 0.690 |
| atwork | * | * | 0.91 | 0.368 | * | * |
| marriedLWP | 0.70 | 0.340 | 1.13 | 0.103 | 2.72 | 0.000 |
| Enabling: | | | | | | |
| primaryed | 0.54 | 0.077 | 0.99 | 0.926 | 1.05 | 0.836 |
| Dublin | 1.04 | 0.910 | 1.21 | 0.020 | 0.44 | 0.024 |
| Medcard | * | * | 4.52 | 0.000 | 1.34 | 0.690 |
| Medinsurance | * | * | 0.85 | 0.408 | 0.11 | 0.081 |
| Need: | | | | | | |
| chrdis1 | 0.75 | 0.634 | 1.38 | 0.005 | 1.00 | 0.990 |
| chrdis2 | 0.33 | 0.098 | 1.30 | 0.029 | 0.67 | 0.387 |
| chrdis3ormore | 0.80 | 0.682 | 1.71 | 0.000 | 1.28 | 0.524 |
| disadla | 4.70 | 0.000 | 1.31 | 0.021 | 2.46 | 0.001 |
| disiadla | 4.66 | 0.000 | 1.10 | 0.419 | 1.65 | 0.088 |
| srhg | 0.82 | 0.613 | 0.96 | 0.719 | 0.66 | 0.126 |
| MHgood | 0.70 | 0.381 | 0.99 | 0.977 | 0.76 | 0.440 |
| cons | 3.61 | 0.987 | 0.03 | 0.000 | 0.00 | 0.000 |

*Coefficients could not be estimated because of insufficient cell size.

5

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NOTES

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hÉireann um Dhul in Aois

The Irish Longitudinal
Study on Ageing