CHARLES UNIVERSITY
FACULTY OF SOCIAL SCIENCES
Institute of Economic Studies

Payoff of having children

Do elderly parents of more children live in a nursing home less often?

Bachelor's thesis

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Declaration of Authorship

The author hereby declares that she compiled this thesis independently, using only the listed resources and literature, and the thesis has not been used to obtain any other academic title.

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Prague, May 4, 2021

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Abstract

This thesis examines how having children impacts the probability of elderly parents to be placed in a nursing home using logit models. Three alternative dependent variables are tested - admission regardless of length, long-term and short-term residency. Additional regressors include demographics, living arrangements, health status, social network, functional and cognitive limitations and job situation. The results show that residential proximity of children affects each type of institutionalisation. The number of children was important for the overall admissions regardless of length and short-term stays in a nursing home when size of the household was considered. It was never significant in case of long-term stayers. When partners shared a household together, the number of children did not play a significant role in any type of nursing home placement. In a robustness check, the number of grandchildren replaced the number of children. It was significant in case of admissions and short-term residency even though elderly partners shared one household. Therefore, our results implicate that social policy should be focused on attracting younger cohorts to stay in areas densely populated by the elderly.

Keywords	elderly parents, housing arrangements, number of children
Title	Payoff of having children - Do elderly parents of more children live in a nursing home less often?

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Abstrakt

Táto práca skúma vplyv detí na pravdepodobnosť umiestnenia starnúcich rodičov do domova dôchodcov pomocou logitových modelov. Testujú sa tri alternatívne závislé premenné - prijatie do domova dôchodcov bez ohľadu na dĺžku pobytu, dlhodobý a krátkodobý pobyt. Medzi ďalšie použité nezávislé premenné patria tie, ktoré reprezentujú demografické údaje, usporiadanie domácnosti, zdravotný stav, sociálne kontakty, pracovný stav, funkčné a kognitívne obmedzenia respondentov. Výsledky ukazujú, že rezidenčná dostupnosť detí ovplyvňuje každý typ inštitutionalizácie. Počet detí ovplyvňoval prijatie ako také bez ohľadu na dĺžku do domova a krátkodobé pobyty pri zohľadnení veľkosti domácnosti, ale nikdy neovplyvnil dlhodobý pobyt osôb v domove. Keď sa v modeloch zohľadnilo spoločné zdieľanie domácnosti s partnerom, počet detí nikdy nehral významnú úlohu pri žiadnom type inštitutionalizácie. Potom sme skúmali efekt vnúčat na pobyt starších obyvateľov v domove dôchodcov. Ich počet bol signifikantný v prípade prijatia a krátkodobého pobytu, aj keď partneri zdieľali jednu domácnosť. Naše výsledky preto naznačujú, že sociálna politika by sa mala zamerať na udržanie mladších skupín v oblastiach husto obývaných staršími ľuďmi.

Klíčová slova	seniori, domov dôchodcov, počet detí
Název práce	Výhoda mať deti - Žijú rodičia viacerých detí zriedkavejšie v domove dôchodcov?

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Acronyms

AME Average Marginal Effects

LR likelihood ratio test

SHARE Survey of Health, Ageing and Retirement in Europe

Bachelor's Thesis Proposal

Author	Katarína Gömöryová
Supervisor	PhDr. Mgr. Jana Votápková, Ph.D.
Proposed topic	Payoff of having children - Do elderly parents of more children live in a nursing home less often?

Research question and motivation The proportion and number of elderly people are increasing dramatically worldwide. As people are getting older, they often loose ability to take care of themselves. Fingerman and Birditt (2012) suggest that relationships between adults and their parents are distinct from other types of social ties due to their long-shared history and the evolving nature of the relationship from infancy through adulthood. Thus, the most common informal caregiving relationship can be defined such that an adult child provides assistance to an aging parent (Pope et al, 2012).

Ruggles (1994) found that at the beginning of the 20th century more than 70 % of Americans aged 65 or older resided with kin. Seelbach et al (1989) further suggest that females are more likely to endorse living with their children if they did not wish to live alone or were unable to take care of themselves. However, Klinenberg (2012) has shown that if there is a possibility adult Americans over 65 years prefer to live independently. This trend of separate housing changes with time. Only 15 % of widows aged 65 and older lived alone in 1900, whereas 66 % lived alone in 2011 and 42 % of population aged 65 and more lived alone in America (Ruggles 1996; U.S. Census Bureau 2011), while not taking into consideration any other aspects like activities of daily lives (ADL), distance from children. Despite of the trend toward independent living among older Americans many of them are not capable of living alone without assistance. In that case Seelbach et al (1989) show that older parents expect their adult children to assist them in times of need. Indeed, overwhelming majority, at least 90 %, of adults over 65 who need help with daily tasks receive help informally from friends or family (National Alliance for Caregiving AARP Public Policy Institute, 2015). Silverstein, Gans Yang (2006) who examined living arrangements of aging parents found out that older men that need help with activities

of daily life (ADLs) generally receive care from their wives, whereas older women with disabilities are more likely rely on family or enter nursing homes. This phenomenon is however consistent with longer expected length of life of women compared to men.

In my thesis I will focus on the elder adults living in the Europe in order to inspect whether having more children decreases the probability that an elderly parent lives in a nursing home or increases the probability that he or she lives in one's own home or shares a household with children. The phenomenon will be investigated for different institutional settings. Observable socio-demographic characteristics will be controlled for too.

Methodology I will use data provided by SHARE - Survey of Health, Ageing and Retirement in Europe, a database on individuals aged 50+ from all EU countries, Switzerland and Israel. Whether aging respondent lived in a nursing home at the time of interview will be the dependent variable. Alternative variables of the type of accommodation will be tested too. Independent variables will be selected appropriately and their effect on the probability of being in a nursing home will be tested using an econometric model. The model we will use is a linear probability model.

Contribution The aim of the thesis is to contribute to existing literature and to broaden the existing research on aging population by finding out whether having more children will decrease the probability of aging parents to live in nursing homes. In addition, we will find out other aspects that may influence the probability of living in a nursing home. The results should identify accommodation arrangements of the elderly, and help policy-makers while deciding family policies regarding the elderly segment of population.

Outline

1. Literature review
2. Methodology
3. Data description
4. Comments on results
5. Discussion
6. Conclusion

Core bibliography

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Chapter 1

Introduction

Ageing population has raised attention of researchers and politicians since recent demographic changes are expected to challenge public finances of many developed countries. This phenomenon is caused by enhanced longevity and lower fertility rates. Once older people are not capable taking care of themselves their life becomes dependant on external help. It can be provided informally by family members and close friends or formally by caring facilities and paid home care services. Informal help is less expensive for governments and often accessible and pleasant for care receiver (Agree and Glaser, 2009). Whereas impact of institutionalisation on the quality of life of the elderly is questionable (De Medeiros et al., 2020).

In developed countries, however, it is very likely that the need for institutionalisation will increase given insufficient number of potential caregivers among offspring and their busy life-styles. Therefore, identifying risk factors for nursing home admission or residency is crucial to optimally set the goals of social/family policy to reduce entry into nursing homes. Determinants that affect institutionalisation of the elderly vary based on the research set-up and institutional setting. However, Cohen et al. (1986) summarise most cited factors from previous studies that include age, race, marital status, gender, income, level of disability and health condition.

This thesis aims to discover whether having kids decreases the probability of elderly parents being placed in a nursing home. To test the hypothesis, we employ the logistic regression on three different dependent variables describing entry and residency (both short and long term) in nursing homes. Employment of alternative dependent variables reflecting length of stay inspired by Coughlin et al. (1990) serves to find out whether determinants of different types of in-

stitutionalisation change and whether having children affects them differently. Not only number of children and children's residential proximity are being controlled for but also other determinants that might impact placement in a nursing home.

This thesis is structured in the following way. In Chapter 2, we comment on stylised facts i.e. increased life expectancy and low fertility rates in Europe and the Czech Republic. Moreover, we review empirical literature for determinants of living arrangements of the ageing population and institutionalisation of the elderly. In Chapter 3, variables used, descriptive statistics and correlations are described. Chapter 4 introduces the methodology. In Chapter 5, all final models are displayed, and results from the analysis are interpreted. In Chapter 6, the results are summarised and discussed. Furthermore, possible limitations and improvements of the thesis are outlined.

Chapter 2

Literature Review

The impact of population ageing has become centre of interest to policymakers and researchers who want to understand the social implications of these demographic changes. This section will analyse the available empirical and theoretical research. We will investigate how different family structures that evolve determine the level of support the children provide to their parents later in life. We will first identify who the natural caregivers are, once an individual is not self-sufficient anymore. We will then analyse available literature to determine what role is played by various determinants, such as culture, living arrangements, employment and income, etc. in determining the choice between different care arrangements.

2.1 Stylized facts

Population ageing is influenced by two trends. The first is the drop in the fertility rates that is mainly the result of improved education and access to contraception. In the European Union, fertility rates were falling steadily from the 1960s until the beginning of the twenty-first century (2001 total fertility rate 1.43). Data then displayed rising rates until the year 2010 (total fertility rate 1.57). In 2018, the total fertility rate reached 1.55 live births per woman; in the meantime, it was fluctuating between those two values (Eurostat, 2021). Mean age of women at childbirth rose from 29 to 30.8 in between the years 2001 and 2018 due to increased access of women to education. Therefore, a partial explanation for the fertility rate fluctuations is the catching up effect to the trend of giving birth in the later years (Eurostat, 2021). The second trend is a dramatic increase in life expectancy. Improved living standards

and lifestyle caused increased life expectancy. Between 2002 and 2018 life expectancy increased on average by 3.3 years, for males it was by 3.9 years and for females by 2.8 years. In 2018 in the EU-27, the mean expected age at birth was 81 years. Interestingly, in 2018 gender difference in life expectancy was on average 5.5 years across the EU-27. The highest gender gap approximately 9 to 10 years was recorded in the Baltic States. The smallest gender gap around 3.1 years was observed in the Netherlands, Ireland, Cyprus, Denmark and Sweden (Eurostat, 2020).

As a result, the proportion of retired people has been increasing, and the number of people in the productive age has been decreasing in the European Union (the EU-27). Eurostat (2020) states that the number of older people will expand significantly as a share of the total population. The population of the European Union at the beginning of the year 2019 was estimated at 446.8 million, the share of 65+ was approximately 20.3 %. The proportion of the elderly in the population has been increasing as in 2018 the proportion was 20 % and in 2009 it was 17.4 %. The old-age dependency ratio for the 27 states of the European Union at the beginning of the year 2019 was equal to 31.4 %, which means that there were around three working-age people for each person that was over 65 years (Eurostat, 2020). However, these results varied from approximately 20 % to 35.1 % when individual member states were considered (Eurostat, 2020).

Fertility rates in the Czech Republic were slowly increasing between years 2010 and 2018 and reached the value 1.71, however for the reproduction of population and slowing down ageing affect the value would need to be around 2.1. Life expectancy increased by 5.8 years for men and 4.8 years for women between 1996 and 2016. Hence, the society of the Czech Republic is no exception to the trend of ageing. According to the population census in 2001 14 % out of all Czech residents were seniors (people older than 65) and in 2011 16 % out of the whole Czech population were seniors. The Czech Statistical Office forecasted that in 2030 there will be around 2.4 million seniors, which will mean one-fourth of its population. In 2050 there will be around 3 million seniors, which will mean one-third of the Czech Republic population (ČSÚ, 2021).

Ministry of labour and social affairs of the Czech Republic stated that in 2013 there were 36 598 seniors placed in the nursing homes. The most of them were institutionalised in *"Stredočeský kraj"* (4 901 people) and the least of them in *"Karlovarský kraj"* (863 people). Overall, the highest number of

institutionalised people were aged 79-85 (14 287 people) and the lowest number of institutionalised people were older than 96 (760 people) (ČSÚ, 2015).

2.2 Natural caregivers

In the past family, caregiving was usually understood as a natural progression. It was even easier to accomplish as family members would not move far from each other. Also, life expectancy was not that long as it is now. Because of that, older people suffered less from diseases connected to ageing, dementia, or chronic illnesses. In comparison, now people live longer, so there is a higher probability to suffer from various diseases, along with that, the necessity of care increases. In addition, today's families are spread on a larger space. Elderly parents thus often receive care outside their own families.

In developed countries, older people live longer in full health now than they did in the past. Moreover, the elderly prefer to live separately from their children if possible (Agree and Glaser, 2009). Sometimes, when elderly individuals cannot take care of themselves anymore, they seek help. Family is the first option. We distinguish three primary natural caregivers among family members: spouse, children, and siblings. But different studies propose various orders about who is the most and the least feasible to undertake the role of caregiver. Fingerman and Birditt (2003) suggest that the most common caregivers are children because of the naturally reversing roles when they become adults and parents become fragile. Arber and Ginn (1995) argue that a spouse comes up the first. If spouse is not alive than siblings and lastly the kin. Caregiving decisions are complex and depend on various factors. Therefore, the order of caregivers might vary from case to case.

The primary caregivers to older people that are still married are most often their spouses or adult children. For the ones that are divorced or widowed, the most common caregivers are also their children or, in this case, their siblings if they have any (Stoller and Cutler, 1993).

Spouses are often under reported caregivers as most of their caregiving tasks are considered as natural help to their other halves. If spouses are alive, in good health and because of extended life expectancy, caregiving of other family members is delayed (Dwyer et al., 1994). According to US National Long Term Care Survey, American wives are on average more devoted caregivers as they spent around 28 hours per week helping their husbands, and husbands spent approximately 15 hours per week caregiving for their wives (Agree and Glaser,

2009). However, it does not mean that husbands show less interest in helping wives. They are devoted caregivers to their other halves when she is sick (Agree and Glaser, 2009).

Cicirelli (2013) and Connidis (1994) state that the number of siblings that assist their elder siblings in need is relatively low. Siblings usually step in when spouse or children are not available. Their help is rare, but they are ready when needed. On the other hand, even though siblings do not provide physical assistance so often, there is evidence that they are highly involved in emotional support and try to remain in contact mainly in cases where the other sibling has got divorced or is widowed (Miner and Uhlenberg, 2004).

Informal family care most of the time means female care. In 1981 Brody defines the term *"women in the middle"* as characteristics of female individuals whose care for children diminished as they got older and their responsibility towards helping their ageing parents started. Wives, daughters, or sisters are more likely to rearrange the schedule and assist fragile family members.

Indeed when children take care of their ageing parents, the majority of informal care is provided by daughters. Moreover, when daughters have parents-in-law that require assistance, daughters provide it (Brody, 1985). Despite the daughter's caregiving predisposition, sons also try to participate. The extent of son's help is not comparable to their sisters, as sons usually do not provide help with their parents' daily activities. But most of the time, they support parents financially, manage appointments with doctors or search for information (Eddy et al., 1995). When this financial and organisational support is then combined with daughters' help, it might smoothen caregiving and make it more beneficial.

2.3 Informal vs Formal care

It is essential to understand better the relationship between informal and formal care to formulate long-term care policies. Firstly, we will describe caregiving types. Secondly, we will discuss substitutability or complementarity between informal and formal care. The severity of life circumstances plays a vital role in decision making between formal and informal care. Pezzin and Spillman (2000) suggest that the two types of care might, in general, be substitutes, but when severely disabled older people are taken into consideration, they are complements.

As older people are getting more frail, the probability of assistance with

activities of daily lives increases. The majority of people who receive help with daily life activities (ADLs[1]) also receive help with daily life instrumental activities (IADLs[2]). However, in the opposite direction, it is not true (Eddy et al., 1995).

Pezzin and Spillman (2000) or Agree and Glaser (2009) suggest a hierarchy of care for the elderly. It begins with the closest family members then extended family members i.e. informal care, and only after that, formal care is considered.

Informal care is relatively inexpensive. Matthews and Rosner (1988) identify five types of informal aid that caregivers can provide as elderly people are losing the ability to take care of themselves. The first one is *"routine help"*, which is the most time consuming and means that elderly people need regular help and care provider needs to have flexible schedule to provide it. The second one is *"back up help"*, which means that the helper is ready to step in when the routine caregiver is not available. Back up, caregivers do not initiate help, they do whatever is needed according to the routine caregiver's instructions. The third one is *"circumscribed help"*, which means that the person is available to help, but there are certain limits to tasks he/she performs. Other co-caregivers, or elderly people know in advance which kind of help they can expect from the circumscribed caregiver and which not. The fourth one is *"sporadic help"*, which means that the person helps when it is convenient for him or her. Primary caregivers do not consider it as helpful. Lastly, *"dissociation"*, means that older family members cannot count on their relatives for help. When it cannot be counted on the female part of the family, it is mainly due to destructive relationships in the family or busy life such as still taking care of their kids or intensive employment. When the elderly cannot count on the male part of the family, it is usually due to their employment. It is more common for male caregivers to dissociate from caregiving responsibilities. That only confirms the gender differentiation in caregiving for women to be described as primary caregivers and men being financial supporters.

Formal care refers to the paid type of care that can be either performed by individuals or institutions. It can be divided into three categories: *"institutionalisation"* which means placing elderly into a nursing home with full-time care, *"home-based"* which means formal care provided at home, *"community-based"*

[1]ADLs are basic self-care tasks that we usually learn as children, e.g. bathing, eating, walking, dressing, etc.

[2]IADLs are self-care tasks that include more complex thinking and organisational skills, e.g. managing finances, preparing food, shopping, cleaning and maintaining the house, etc.

which means paid care in the community centre with a trained staff that functions during the day. The most common and dominant type of formal care is institutionalisation. The most common variables that influence the risk of institutionalisation are health status, income and area of residence of family relatives - possible informal caregivers (Dwyer et al., 1994).

2.4 Family diversity

Throughout the last few decades, developed countries underwent essential changes in the basic structure of the family. Increased life expectancy offers the possibility of various marital statuses during lifetime, such as multiple marriages or longer marriages. Moreover, the family's definition has been extended by accepting the new trends such as raising a child out of wedlock or with a new partner after remarriage, or living in an unmarried partnership (Stevenson and Wolfers, 2007). These examples conclude that older people have more diverse family structures than those in the past (Wachter, 1997).

Perception on the family has shifted. A few decades ago family structures mirrored each other. Now we have a broad scope of flexible and complex family integrations, which may untighten the family network and disrupt the strong pillars on which the family was once based. Therefore, what was once true does not have to hold now. Because of these changes, the number of informal caregivers narrows and the family support erodes.

Most of the research on how divorced parents influence the family's functioning has focused on children (Hetheringhton and Stanley-Hagan, 1999; Bream and Buchanan, 2003). But Agree and Glaser (2009) state that separation of the parents impacts also the support children provide to their parents in later life compared to the parents who stayed together. Spouses that got divorced report worse relationships with their offspring, such as a decline in future physical and emotional support.

2.5 Cultural backround

Several research pieces started to recognise cultural patterns in caregiving behaviour, which in later life may affect the children's decision making about helping their parents. There is significant evidence that identifies different approaches towards providing informal help between southern and northern

countries in Europe. Kohli et al. (2005) refer to South-North diversification of the European countries considering family ties. In the study, researchers found out that Mediterranean countries were the ones with the strongest family bonds and the Scandinavian countries with the weakest ones.

Similarly, Reher (1998) states that European countries that are in the South are regarded as *"strong-family-bonds-countries"* and consequently states in the North part of Europe are regarded as *"weak-family-bonds-countries"*. His results are mainly built on the historical perspective on the family systems. He claims that one of the North of Europe's main characteristics is that children are keen to become independent as soon as possible. And older people do not like to rely on their descendants, which is referred to as the Germanic Reformation tradition. Moreover, what he considered that helped to form strong family ties in the South was Muslim domination at the time.

Esping-Andersen (1990) uses a slightly different approach by separating countries into three groups: Anglo-Saxon, Scandinavian and Continental Europe. The separation depends on similar approaches of government on supporting formal care. Anglo-Saxon countries or liberal countries, like the UK, are those with low public transfers which are made when needed. Scandinavian countries or social-democratic regimes are known for generous payments and support of the government. The last are countries in the group Continental Europe or conservative-corporate countries, such as Belgium, France, Austria or Germany, mostly focused on insurance systems. Arts and Gelissen (2002) add one more group to Esping-Andersen separation, the group of southern countries of Europe because the government's support is relatively low, but relations between family members are strong and sometimes enforced by law.

2.6 Residency

One factor that might disrupt the frequency of contact between older parents and their children is their accommodation arrangements. The distance between the households of the relatives or their possible cohabitation and where their home is situated.

Growing up, children between 18-30 tend to finish their formal education, move out from the parents' house, and start their own family in separated households. The number of elderly that live alone has been increasing since the 1960s, and at the end of the twentieth century, the rate slowed down but remained increasing in America and most of the European countries. Improved

health status and financial situation and increased life expectancy of the older North Americans and elderly from some European countries revealed that they prefer to spend their late years with their spouses not in the same households as their children if possible. Klinenberg (2013) shows that older individuals are willing to pay a substantial proportion of their income to keep their independence. If that is the case, the geographical distance is crucial in distinguishing relative's/children's availability to help.

In the Czech Republic in 2011, there were 1 069 505 households that included elderly people. Age of the elderly was an important variable in distinguishing their living arrangements. Most females and males (56 %) aged between 65 and 74 years were living together as wife and husband in one household rather than individually, and only 1 % of the particular age group was institutionalised. For elderly being more than 85 years old, 43 % lived with their spouse, or individually, 13 % lived in another household (with children or other family members), and 12 % lived in nursing homes. From 2001 to 2011, number of senior households in the Czech Republic increased by approximately 9 %, either one of individuals or married couples. But the number of households where grandparents live with their children and even grandchildren decreased, which supports the international trend of elder people to live independently if possible (ČSÚ, 2014).

Once elderly are not self-sufficient anymore, one of the options is cohabitation with the kin. Women are more likely to reside with kin. This is explained by lower-income and longer life expectancy compared to men (Agree and Glaser, 2009). Coresidence of the parents and children automatically implies informal caregiving (Finch et al., 1995).

Elderly people living in rural or urban areas is an important variable to distinguish which type of care is preferred. But it is very complex, and therefore, other variables like lifestyle predominant in the area and economic situation will help to determine whether elderly cohabit with their offspring or live in a nursing home. Dwyer et al. (1994) provide evidence in their research on the connection between the area of residence and the utilisation of formal health care services. They suggest that there is a lower probability of the elders being institutionalised when there is community-based support or family support in the area. Therefore, elders living in rural areas without family members close by and lacking community support in the area are at increased risk of being admitted to the nursing home while being younger and healthier than their peers in the urban areas. Moscovice and Rosenblatt (1982) or Norton and McManus

(1989) believe that elders living in the countryside are disadvantaged as access to various benefits shrinks once living in more remote areas.

2.7 Employment and income

Paid employment of caregiver impacts decision-making between formal and informal care for elderly people. As siblings and spouses of the elderly are usually out of workforce, available research is mostly focused on how adult children's employment and income impact their decision on caregiving for their ageing parents. Literature supports the idea that decisions will vary with a gender of ageing parents' children. There are three expected conclusions children can make: they can balance caregiving and their job, switch to less time demanding job or decide to leave their job (Blieszner and Mancini, 1989).

Findings that are focused on daughters are more mixed. Some studies have concluded that daughters are willing to reduce their participation in the labour force, meaning both terminating the employment or switching to part-time jobs in order to care for their parents (Short and Stone, 1990; Ettner, 1995). Short and Stone employed as dependent variables two measures: whether caregivers are employed and caregiver's willingness to alter their schedule. They used data from Informal Caregivers Survey (ICS) that is part of the National Long Term Care Survey (NLTCS) from 1982. Data were collected from informal caregivers in the United States that were assisting elder people who could not perform one or more ADLs. Data on caregivers were part of ISC, and data on care receivers were part of NLTCS. They omitted observations that included spouses as it is harder to distinguish caregiving in this case, and also they were often out of the workforce.

Other studies have shown that daughters are not willing to give up their position, and as a consequence, they provide less assistance (Crown et al., 1998). Crown et al. (1998) used the same survey as research mentioned above but from the year 1989. The difference between those datasets is that the one collected later (1989) is expanded dataset that provides more information about elderly people and types of care they receive. Therefore, it was possible to distinguish how primary informal caregiver employment influenced the amount of help elderly people received and how much of the care was provided by a primary caregiver, secondary helper, or even formal home paid care. Because of that, they used six dependent variables that express how many hours of assistance with ADLs and IADLs elderly people received by female primary caregivers,

secondary unpaid helpers, formal caregivers, all other sources of help that does not include primary caregivers, secondary unpaid caregivers that are male, all sources of formal and informal caregiving.

Finally, some studies provide evidence that the daughter's employment does not influence caregiving decisions at all (Couch et al., 1999; Soldo and Wolf, 1994). Couch et al. (1999) used data from the Panel Study of Income Dynamics (PSID) that includes information on family labour supply, living arrangements and health status of elderly in the United States. They used only observations of married couples or single persons with at least one living parent or parent in law, who is not institutionalised and lives in different households. The PSID dataset allowed them to choose four dependent variables: money spent to help parents, time spent with parents, hours caregivers spent in work and hours adult children spent doing house chores.

In the studies described above, researchers have drawn their information from various datasets from different years, used different restrictions to adjust data, and used different approaches to explain how much time females spent caregiving and how much time they spent in the job (various dependent variables). Those decisions could bring them to diverse results of the relationship between female's employment and caregiving activity. Also, women being part of the labour market at that time became more common as before and because of that more of them could have decided to stay in the job or not.

On the other hand, results concerning son's attitude to caregiving when they are employed are mostly consistent and agree with the gender theory. When it comes to decision-making, sons usually choose paid employment over caregiving and instead financially support their parents or pay them, professional caregivers. However, the decision making might vary as sons are in different life situations. Married sons will count on their wives if they do not have sisters and unmarried sons will either pay for care or when they do not have sisters they admit the obligations toward parents and take care of them. Mentioned decisions will also depend on the son's income. When employed, sons usually find ways to stay in work and seek alternative ways to take care of parents, unemployed sons or early retired sons usually face responsibilities toward their parents (Arber and Ginn, 1995).

2.8 Health status

The health status of the elderly is critical in determining the choice of

informal care, formal care, and self-care. Several studies have shown that the disability of the older generation had a decreasing character in the last decades for Americans and some of the OECD countries (Manton et al., 2006; Robine et al., 2006). The older generation in relatively good health can take care of themselves on their own. Even when minor disabilities occur, they are often independent with the help of the proper technologies. Conveniences of the modern era might delay the need for assistance or intensity of formal care and a combination of formal and informal care by having some balanced combination (Agree and Glaser, 2009).

Major health issues of the elderly can indicate the higher probability of being institutionalised as family members might not provide the assistance needed. Moreover, severe disabilities require more time or sudden availability at any time of the day, which might not be possible for fully active and employed family members. Thus individuals of worse health status are more often placed in nursing homes (Houde, 1998).

2.9 Determinants of institutionalisation

Institutionalisation presents a large proportion of the budget of informal caregivers or government on behalf of the elderly. On average, around 10 % of all bills that are related to the health of the elderly are spent on care in nursing homes (Fisher, 1980). Consequently, it is important to study determinants that impact the older generation's institutionalisation as it might help delay the process.

All previous research focused on the determinants that affect elderly people being placed in nursing homes mentions two groups: elderly people who stay in the nursing home for the short term or long term. People that are institutionalised for a short time are usually there for rehabilitative reasons after staying in the hospital. They either get better and then are transferred home or die in the nursing home (Coughlin et al., 1990). On the other hand, long term stay usually implies that elderly people live in these institutions permanently.

Branch and Jette (1982) used logistic regression analysis to find the key determinants of the long term nursing home care of elderly people in the US. Limited dependent variable described whether people were treated in the care institutions (either chronic disease hospitals or nursing homes) for long term or not. Results suggested that age, marital status, living arrangements, level of disability, relationship with family and wealth influence the risk of being

institutionalised. As the study was also focused on delaying institutionalisation, they suggested that people aged 80-99, needing help with IADLs, with mental defects or ones living alone are prospective groups for choosing non-institutional care instead of institutional care. Moreover, they stated that elderly that lost their spouse, are living far from other family members or have some general disability are not at increased risk of being placed in nursing homes.

Cohen et al. (1986) assessed the probability of aged people entering the nursing home. They used dataset from the Medicare Survey from 1977 that included both people living in their households and people living in the long term care institutions. In the questionnaire there was not a specific question on admission of elderly into nursing home. But authors specified a proxy variable and considered a person that talked or was visited by a physician in a nursing home during one-year period after interview as someone who was institutionalised. The proxy variable was used as limited dependent variable, with two possible outcomes, entry or no entry. Logit model was then applied to uncover the relationship between dependent and independent variables. Statistically significant variables that they found were age, marital status, ability to take care of themselves, required informal help and wealth.

Coughlin et al. (1990) analysed determinants of temporary and permanent institutionalisation. For this purpose, they separated people into 3 groups: long term stayers, short term stayers and ones that have never entered nursing home. Therefore, to evaluate their results they chose multinomial logit model. They discovered that some elderly groups were at higher risk to be institutionalised temporarily and some permanently. People with cognitive and functional impairments and non-homeowners are at highest risk of being permanently in a nursing home. Those who only had some functional disability usually stayed in a nursing home temporarily and then were cared for by family members informally.

Boaz and Muller (1994) searched for different aspects that impact permanent and transitory nursing home stay and how availability of informal care influences the probability of long term institutionalisation. They used National Long Term Care Survey with answers from the US citizens from 1982 and 1984. They separated respondents into 4 categories: people that have never been institutionalised and died, people that have never been institutionalised but at the time were still alive, people that stayed in nursing home for short time and people that stayed in nursing home for long time. The separation then served as a dependent variable in the multinomial logistic model to observe

how chosen independent variables affect it. In the study they described how personal characteristics of residents differ for permanent and temporary stay in a nursing home. Moreover, they imply that adequate informal help might delay long term institutionalisation.

Chapter 3

Data Description

In this chapter, we will describe the dataset and variables used in the analysis.

3.1 Dataset

For the analysis, easySHARE dataset, wave 6 from 2015, is employed. It is a simplified dataset of the Survey of Health, Ageing and Retirement in Europe (SHARE) interviewing respondents 50+years old that are citizens of European countries or Israel. This survey is conducted every two years. Each year is clustered in waves. Individual waves may differ in the countries involved and questions asked. Individuals are often not interviewed repeatedly, although some panel observations occur. The simplified version contains the same number of respondents as the waves of the main SHARE release, but the amount of questions is reduced.

3.2 Characteristics of variables

3.2.1 Dependent variables

Binary dependent variables that are used in the analysis are created from the original variable named *hc029_* that describes whether a person was accommodated in the nursing home for the short term, long term or did not live there at all. Three alternative variables are used to distinguish how long the respondent stayed in the nursing home. This separation is inspired by empirical research trying to find effects on different types of institutionalisation. Coughlin et al. (1990) stress the importance of the difference between residency and

entry into a nursing home. In our thesis we test three alternative dependent variables in order to see whether determinants change depending on the length of stay and whether having children will affect it differently.

The dependent variable *Nursing home (NH)* describes whether a person was admitted to the nursing home regardless of the duration of one's stay. Therefore, both short term and long term stayers are assigned a value of 1 and people not admitted in the nursing home are assigned a value of 0. Stays that lasted for more than twelve months at the time of interview were defined as long term. And stays that lasted less than twelve months were considered as short term. *Nursing home long-term stayers (NHLS)* takes the value 1 for the respondent staying in the nursing home for a long term and 0 otherwise, i.e not staying there at all. Temporary stayers were excluded. *Nursing home short-term stayers (NHSS)* takes the value 1 for respondents that resided nursing homes temporarily only, and 0 otherwise. Long-term stayers were excluded.

Dependent variables used in the study acquire a maximum of 0.5427 % of elderly people that were either short- or long-term residents of a nursing home. Therefore, as the number of residents and non-residents in nursing homes is quite uneven, the logit model is a feasible choice for this analysis. The total of 52 respondents were long-term residents and 135 lived there temporarily for a shorter period.

3.2.2 Independent variables

Children

The variable *children* is of our primary interest. It either confirms or rejects our main hypothesis that having more children reduces the probability of nursing home residency. Average household size in the sample is 1.8 members per household (Table 3.1) and the size of a household is highly correlated with the presence of a partner in the household which suggests that an average respondent does not live with his/her children and their families. However, there may be other channels at play through which the children help their parents to keep independent households so that the elderly parents should not be institutionalised.

Bar chart provided in the Figure 3.1 below demonstrates distribution of the variable *children*. From the bar chart we can see that there are childless respondents in the sample. On average respondents have 2 children. Two children is also the median and the highest frequency. The highest number of

children reported is 19. The distribution is unimodal and roughly symmetric. Spread of observations suggests that there might be outliers included in the dataset. Descriptive statistics in the Table 3.1 provides information on dataset corrected for abnormal values. The new range of the *children* is 6 and the standard deviation is 1.2048.

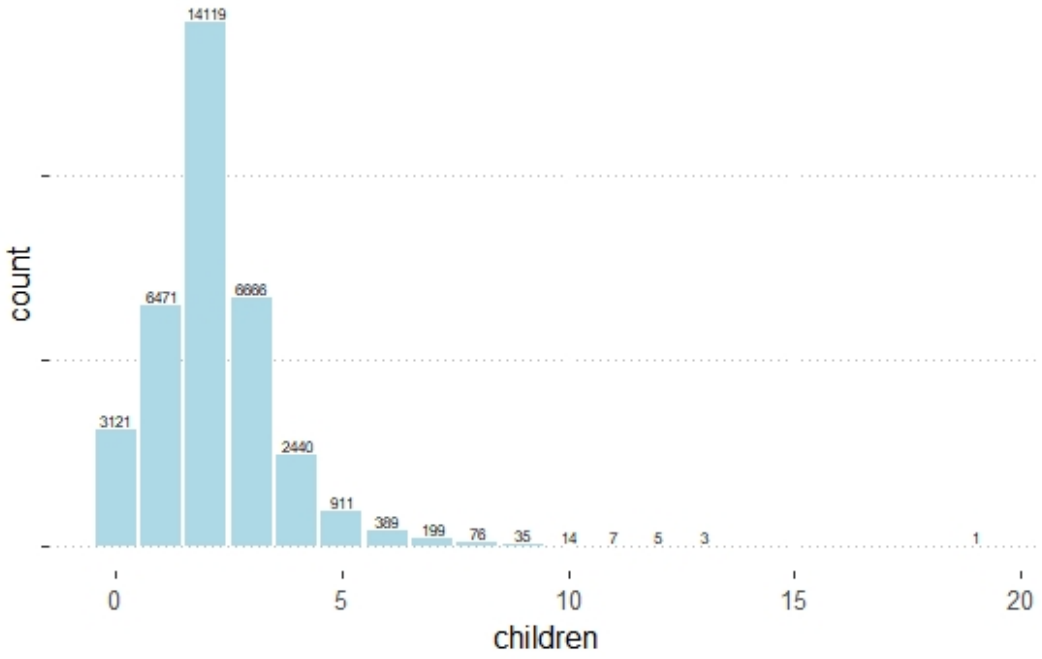

Figure 3.1: Distribution of number of children

Other independent variables

Other independent variables describe demographics, household composition, social network, health, functional and cognitive limitations and job situation.

Age measures the age of respondent at the time of the interview. The average respondent is 74.6 years old. And a median respondent is 73.5. Standard deviation is around 7 years. We expect that age should have a positive effect on nursing home placement as suggested by Coughlin et al. (1990).

Female is a dummy variable that equals 1 for a female and 0 for a male. There are more females than males in the sample. Even though Cohen et al. (1986) describe females as a characteristics for long term residency, Branch and Jette (1982) in their summary of long term stay characteristics show that

gender does not play a role. Due to inconsistent results of previous research, we do not express any prior expectations either.

Nevermarried is a dummy variable that equals 1 for the person that was never married and 0 otherwise. It is inspired by Coughlin et al. (1990) who suggest that unmarried respondents report higher nursing home admission rate. This variable is created from the variable describing marital status. A respondent chose one of the following options: married and living together, married and living separately from the spouse, divorced, widowed, registered partnership and never married. In our sample there are only 4.11 % of respondents that were never married. We expect a negative effect on the nursing home residency because unmarried individuals are expected to reveal preference for independence.

Countries included in our analyses are Austria, Belgium, the Czech Republic, Denmark, Estonia, France, Germany, Greece, Italy, Israel, Luxembourg, Poland, Portugal, Slovenia, Spain, Sweden and Switzerland. The countries are divided according to their geographical location which corresponds with the social tradition and family ties (Reher, 1998). A dummy variable *south* equals 1 for countries located in the south of Europe, i.e. Greece, Italy, Portugal, Spain, *north* equals 1 for Nordic countries i.e Sweden, Denmark, Estonia. and *central* includes Austria, Germany, France, Switzerland, Belgium, the Czech Republic, Poland, Luxembourg and Slovenia *North* is used as a control to prevent perfect colinearity. Only *south* and *central* are used in the analysis. According to descriptive statistics, most respondents, about half, come from central European countries. Northern and southern countries are represented equally. We expect a negative effect of southern location and a positive effect of central European location due to social traditions and family ties which are very strong in southern countries and much weaker in central Europe.

Household composition is represented by the variables *partnerinh* and *hhsize*. *Partner in the household (partnerinh)* is dummy variable that assigns 1 when partners or spouses live together in one household and 0 otherwise. There are about 67 % of individuals who live with a partner. Since partners help each other, share expenses and household chores, we expect this variable to have a negative effect on nursing home placement. *Household size (hhsize)* contains information on the number of people living in the same household as the respondent. A median household has 2 members suggesting that the elderly live with only 1 additional person. We can thus assume that the elderly do not by large share household with their children and their families, but rather with

a spouse if any. The variables partner in the household and household size are strongly correlated, thus are used in separate analyses as robustness checks only.

In terms of the social network and support, a dummy variable *child_km* is used that represents residential proximity to children. If at least one child lives less than 1 km away from the respondent's residence, it takes the value 1. There are around 41 % of individuals whose at least one child lives in 1 km radius. We expect that this variable will impact institutionalisation negatively hence children are more accessible and ready to help since they live closer to their parents. A dummy variable *helpout_hh* equals 1 when the respondent received help outside of his/her household from other family members, friends or someone else and equals 0 for the respondent that is fully self-dependant. According to descriptive statistics around 26 % of respondents receive help outside their household. Variable *grand_children* captures the number of grandchildren respondents have. A median is 3. We expect similar to the effect of children.

The health status, functional and cognitive abilities of respondents are measured as follows. Variable *health* shows respondents' self-perceived health status and can attain values from 1 (excellent) to 5 (poor). A mean value of self-perceived health status is a slightly above 3, so on average respondents consider their health to be moderate. Positive effect can be expected as with worse health the probability of institutionalisation increases.

Variable *physical disability (physical_dis)* refers to the index of instrumental activities of daily living that also ranges from 0 to 5, where the higher the number, the lower the respondent's ability to perform the activities. *Physical_dis* includes activities such as the ability to make telephone calls, take medication, manage money, prepare a hot meal and shop for groceries. On average respondents do not have a problem to perform any of daily tasks mentioned. We assume positive impact on institutionalisation as with higher immobility the probability of being admitted into a nursing home increases.

Dummy variable *hospital stays (hosp_stays)* indicates whether the respondent stayed overnight in a hospital during last twelve months (value 1) or not (value 0). Around 31 % of respondents spent at least one night in a hospital over last twelve months. Hospital stays might imply worsened health condition and therefore we expect a positive impact on institutionalisation.

Variable *mental disorientation (mental_dis)* describes mental health status of respondents. It controls for the respondent's ability to recognize date, month, year and day of the week. It ranges from 0, denoting good orientation, and 4

means bad orientation. On average respondents in our sample appears to be badly oriented as the mean is almost equal 4.

Retired captures whether the respondent is still active in the job market or not, taking the value 1 if outside the job market and 0 if still involved. Around 87 % of respondents are retired.

Table 3.1: Descriptive Statistics

Statistic	Mean	St. Dev.	Min	Median	Max	NA's
NH	0.0054	0.0735	0	0	1	0
NHLS	0.0015	0.0389	0	0	1	135
NHSS	0.0039	0.0625	0	0	1	52
age	74.6324	6.8042	65	73.5	95	100
female	0.544	0.4981	0	1	1	0
hhsize	1.8574	0.6562	1	2	4	665
children	2.0915	1.2048	0	2	6	340
grand_children	3.2603	2.2755	0	3	9	4700
physical_dis	0.292	0.9096	0	0	5	0
sphus	3.3793	1.0295	1	3	5	0
mental_dis	3.796	0.5761	0	4	4	1696
partnerinh	0.6698	0.4703	0	1	1	0
helpout_hh	0.2609	0.4391	0	0	1	0
hosp_stays	0.314	0.415	0	0	1	0
child_km	0.4109	0.4920	0	0	1	4076
nevermarried	0.0411	0.1984	0	0	1	0
retired	0.8746	0.3312	0	1	1	0
south	0.2754	0.4467	0	0	1	0
north	0.2206	0.4146	0	0	1	0
central	0.504	0.5	0	1	1	0

3.2.3 Preliminary analysis and adjustments of the original dataset

Respondents younger than 65 years of age are excluded. All independent variables are inspected for abnormal values using the interquartile range method to find upper and lower bounds for the data. Once observations are not within bounds, they are considered outliers and then are dropped from the dataset to prevent possible bias.

Independent variables are inspected for multicolinearity using a correlation

matrix (Table A.1). Correlations 0.5 or -0.5 are set as boundaries. Any variables with correlation above the absolute value of 0.5 are not tested jointly.

Chapter 4

Methodology

This chapter describes the logit model that is chosen for the empirical analysis. In the first part, the model will be introduced for analysing the institutionalisation of the elderly, and in the second part main, assumptions of the model will be defined. All analyses are performed in R Studio.

The model form for Predicted Probabilities is expressed as a natural logarithm of the odds ratio:

$$\ln\left[\frac{P(y)}{1-P(y)}\right] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k \tag{4.1}$$

$$\frac{P(y)}{1-P(y)} = e^{\beta_0+\beta_1 x_1+\beta_2 x_2+...+\beta_k x_k} \tag{4.2}$$

$$P(y) = e^{\beta_0+\beta_1 x_1+\beta_2 x_2+...+\beta_k x_k} - P(y)e^{\beta_0+\beta_1 x_1+\beta_2 x_2+....+\beta_k x_k} \tag{4.3}$$

$$P(y) = \frac{e^{\beta_0+\beta_1 x_1+\beta_2 x_2+...+\beta_k x_k}}{1+e^{\beta_0+\beta_1 x_1+\beta_2 x_2+....+\beta_k x_k}} \tag{4.4}$$

where $\ln\left[\frac{P(y)}{1-P(y)}\right]$ is the log (odds) of the outcomes, y is the dependent variable, $x_1, x_2, ...x_k$ are the independent variables, $\beta_1, \beta_2, ..., \beta_k$ are coefficients and β_0 is the intercept (Boateng and Albaye, 2019).

To ensure that the best possible outcomes are obtained, it is crucial to verify whether logistic regression assumptions are fulfilled. All three dependent variables can only attain two possible levels, 1 or 0. These levels are exclusive, and no respondent can be part of both. Assumptions of multicollinearity, independence and outliers are also fulfilled. The dataset corrected for outliers is in

Subsection 3.2.3. Moreover, linear relationship between independent variables and log of odds is assumed and described in Equation 4.1.

Boateng and Abaye (2019) suggest that logistic regressions should be evaluated in various steps - overall model assessment, significance of independent variables and goodness-of-fit of the model.

A step-wise procedure is employed to select optimal set of variables for the final model. Independent variables are chosen based on previous research on the ageing population and the range of variables available in the dataset. Optimal models are chosen based on the likelihood ratio test (LR). It is computed as:

$$LR = 2(L_{\text{ur}} - L_r) \tag{4.5}$$

where L_{ur} is the log-likelihood of the unrestricted model and L_r is the log-likelihood of the restricted model.

The goodness-of-fit is evaluated by the pseudo R^2. In our analysis we use two of these measures - McFadden's R squared and Nagelkerke's R squared.

McFadden's R squared is defined as:

$$R^2_{\text{McFadden}} = 1 - \frac{\log(L_c)}{\log(L_{\text{null}})} \tag{4.6}$$

Nagelkerke's R squared is a scaled version of CoxSnell's pseudo R^2, so that it can attain maximum value 1. It is defined as:

$$R^2_{\text{Nagelkerke}} = \frac{1 - [\frac{\log(L_{\text{null}})}{\log(L_c)}]^{2/n}}{1 - [\log(L_{\text{null}})]^{2/n}} \tag{4.7}$$

where L_{null} denotes value for the null model - the model with only an intercept, and L_c denotes the likelihood value from the current fitted model.

Average marginal effects are calculated in order to interpret the magnitudes of the effects of independent variables.

Marginal effects explain the effect of independent variable on the probability that y = 1. When logit model is defined by non-linear function as:

$$P(y = 1) = G(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k) = G(x\beta), \tag{4.8}$$

then marginal effects are coefficients multiplied by the derivative of function G:

$$\frac{\Delta P(y = 1)}{\Delta x_j} = G'(x\beta) * \beta_j \tag{4.9}$$

and,

$$\frac{\Delta P(y=1)}{\Delta x_j} = \overline{G'(x_k\beta)} * \beta_j = \frac{1}{n}\sum G'(x_k\beta) * \beta_j \tag{4.10}$$

Equation 4.10 thus corresponds to average marginal effects that are calculated for each observation and then averaged across all observations.

In logistic regressions, magnitudes and signs of interactions cannot be interpreted directly from output of models (Boateng and Albaye, 2019). For this reason tables with predicted probabilities are created to clarify how probability changes at each level of interacted variables (Mize, 2019).

Chapter 5

Results

This chapter presents the results of the econometric analysis to uncover the impact of having children on the institutionalisation of elderly parents.

In our models we use three different dependent variables that represent three different forms of institutionalisation as described in Chapter 3. One of the aims is to discover whether significance of determinants changes with alternative situations and whether having children will affect them differently. Multiple models are tested to guarantee robustness of the results.

Due to non-linear nature of logit models, the coefficients obtained cannot be interpreted directly. Average marginal effects (AME) are computed for significant variables. The results are provided in Appendix C.

Results of the first set of models are provided in Table 5.5. In the first two models, we estimate the influence on the admission into a nursing home regardless of its length.

The results suggest that the higher the number of children, the higher the probability that parents will be taken care of at home as children can split the assisting time and chores among themselves or split expenses for in-home caregiving. Regardless of how many children one has, it is important whether at least one child is available at a reasonable distance. If at least one of the children lives in 1 km radius, it decreases admission in a nursing home by 0.3 %. The lower probability of being placed in a nursing home in case of mental disorientation suggests that the mentally disordered are rather supported by informal or home care to be self-sufficient in ones own home. Living in the south of Europe decreases the probability of institutionalisation by 0.3 % due to stronger family ties as supported by Reher (1998). As suggested by Kohli et al. (2005), children born and raised in central parts of Europe are more

likely to move out of their parent's house and become independent as soon as possible. Their family ties are not as strong as in the southern European countries. Hence, ageing parents from the centre of Europe are more likely to end up in a nursing home.

On the other hand, increasing age increases the probability of nursing home admission. Most likely, people lose the ability to take care of themselves and performance of even the most routine tasks is a problem. Thus, they require help. Staying overnight in a hospital implies the worsened health status of respondents and, therefore, increases the probability of being admitted in a nursing home by 0.4 %. Self-perceived health was used as another proxy for the health condition of respondents. Those that report poorer health condition are more likely to be institutionalised.

To better understand the effect of interacted variables, tables for predicted probabilities were created. The interaction effects on dependent variables are displayed at different levels. Table 5.1 illustrates interaction term *children*hhsize* for Model (1). If the respondents live alone, their probability of being institutionalised decreases as the number of children they have increases. If the respondent shares his/her household with one more person, most probably their partner, as ageing parents prefer to live independently from their children if possible (Agree and Glaser, 2009). Then the probability of being institutionalised increases with increasing number of children. It might mean that these partners do not want to cause additional trouble to their children and rather reside in a nursing home together.

Table 5.1: Predicted probabilities for Model (1)

	hhsize			
children	1	2	3	4
0	0.002157	0.000745	0.000257	0.000089
1	0.001842	0.000892	0.000431	0.000209
2	0.001574	0.001067	0.000723	0.00049
3	0.001345	0.001277	0.001212	0.001151
4	0.001149	0.001527	0.002031	0.002699
5	0.000981	0.001827	0.0034	0.006318
6	0.000838	0.002186	0.005688	0.014717

The interaction effect of cognitive and functional impairment on the nursing home admission for Model (1) is displayed in Table 5.2. With worse orientation of respondents probability to be institutionalised decreases. And the opposite is the truth for physically disabled. However, when these two effects are combined

the probability of respondent to be institutionalised increases. Combination of the two impairments can be demanding for informal caregivers, hence they rather leave it up to professionals.

Table 5.2: Predicted probabilities for Model (1)

	mental_dis				
physical_dis	0	1	2	3	4
0	0.012733	0.006631	0.003443	0.001785	0.000925
1	0.013338	0.00794	0.004716	0.002797	0.001658
2	0.01397	0.009504	0.006456	0.004381	0.002971
3	0.014632	0.011373	0.008833	0.006856	0.005319
4	0.015326	0.013604	0.012074	0.010713	0.009505
5	0.016051	0.016266	0.016484	0.016704	0.016928

Model (3) of Table 5.5 reports the results for the first robustness check where the dependent variable denotes long-term nursing home stayers (*NHLS*). Only 50 respondents out of 184 reported a long-term nursing home stay. The variables *nevermarried* and *mental_dis* are excluded due to insufficient number of observations. The interaction terms are neither significant nor they bring any additional explanatory power to the model as a whole.

In overall, this robustness check confirms the results of the main analysis. However, in comparison with admissions, variable *children* loses its significance, which can be explained by the fact that long-term stayers might need professional and all-time care, which children can hardly perform. The signs and significance of majority other variables does not change. Variables *hosp_stays* and *sphus* lose significance. However, this model displays a new significant variable *helpout_hh*. Respondents that receive help from outside of their households are by 0.1 % less likely to be institutionalised for a long period. Model with variable *central* is omitted as it is neither significant nor it brings additional power to the model.

Model (4) of Table 5.5 represents another robustness check of the results with short-term nursing home stayers as the dependent variable (*NHSS*). There were 134 people institutionalised for a short-term. The variable *children* is again significant. Sign of *helpout_hh* changes to positive for short-term stayers. That can be explained by the fact that the elderly parents receive help when they need it i.e. worsened health condition.

For short-term nursing home stayers it is not important where they come from. Even strong family ties characteristic for southern countries as revealed

by Reher (1998) and models (1) and (3) of Table 5.6, do not play a role for short-term nursing home stays.

Predicted probabilities of the interacted variables for short- and long-term stayers confirmed the results of the main analysis. Results are provided in Table B.1 and Table B.3.

Results in Table B.5 serve as robustness check of results for Table 5.5 where the variable *hhsize* is replaced with the variable *partnerinh*. The correlation between these two variables reaches 0.654, the results in Table B.5 thus do not differ notably compared to the results in Table 5.5. The variable representing number of children loses significance for all specifications. It seems that while living with a partner, the number of children is not that important, probably because partners have each other to rely on. Even though the number of children is not essential, at least one of the children living not far from the respondent's household is still deterministic. The new variable *partnerinh* has a negative sign that is consistent with the variable *hhsize*. Moreover, retired people were by 0.2 % more likely to be placed in a nursing home for long term.

Predicted probabilities for the interaction *children*partnerinh* included in the Model (1) for the Table B.5 are displayed in Table 5.3. The results are consistent with the assumptions made from Table 5.1. Once respondents share households with a partner, they are more likely to enter a nursing home as they probably do not want to cause their children additional trouble.

Table 5.3: Predicted probabilities for Model (1)

	partnerinh	
children	0	1
0	0.002608	0.000381
1	0.002195	0.000562
2	0.001848	0.00083
3	0.001556	0.001225
4	0.001309	0.001808
5	0.001102	0.002668
6	0.000928	0.003934

In the table 5.6 the variable *children* is replaced with the variable *grand_children* to test the effect of a younger generation on institutionalisation of their grandparents. It serves as additional robustness check since children and grand children are correlated by 0.567. In specifications of Table 5.6, the

interaction between instrumental activities of daily life and respondent orientation is omitted as it does not bring additional value to our models. Almost all variables have the same impact on nursing home residency as in previous two sets. In comparison with previous model sets *helpout_hh* is positive and significant for admissions into nursing homes. So, people that are admitted receive more external help. Moreover, external help loses its significance for long-term stays. The new variable *grand_children* is significant in the case of admissions and short-term stays despite the respondent living with a partner. The results suggest that grandchildren might be a beneficial addition into caregiving team as respondents were by 0.03 % less likely to be admitted into nursing homes.

Predicted probabilities for the interaction *grand_children*partnerinh* included in the Model (4) for the Table 5.6 are displayed in Table 5.4. Once respondents live alone, with increasing number of grandchildren decreases their probability to be institutionalised. Even though, partners share a household together, increasing number of grandchildren decreases a probability of respondents to be institutionalised, which is a different result from the one in Table 5.3. It can be explained by the fact that while children of ageing parents are occupied, grandchildren might help.

Table 5.4: Predicted probabilities for Model (4)

	partnerinh	
grand_children	0	1
0	0.001731	0.000708
2	0.001128	0.000682
4	0.000734	0.000656
7	0.000386	0.000619
9	0.000251	0.000595

Overall the results on the importance of origins are consistent with those presented in Table 5.5 and Table B.5. Admissions are significantly affected by both *south* and *central*. Long-term stays are only affected by strong family bounds of the South. And it is never important for models describing short-term stays in nursing homes where the respondents come from. It can be explained by the fact that short-term stays might serve for recovery after hospital stays or other urgent health circumstances that can be better provided in caring facilities regardless of where they are from.

Performance of our models is measured by McFadden's pseudo R^2 and Nagelkerke's pseudo R^2. The results reach between 0.20 to 0.2825 which corresponds to moderately strong models.

Table 5.5: Logistic Regression

	Dependent variable:			
	NH		NHLS	NHSS
	(1)	(2)	(3)	(4)
age	0.081^{***}	0.080^{***}	0.093^{***}	0.090^{***}
	(0.016)	(0.016)	(0.026)	(0.018)
female	0.315	0.347	0.092	0.338
	(0.232)	(0.232)	(0.363)	(0.261)
children	-0.495^{***}	-0.491^{**}	0.018	-0.429^{**}
	(0.191)	(0.191)	(0.143)	(0.209)
nevermarried	−0.600	−0.587	-	-
	(1.058)	(1.071)		
hhsize	-1.064^{***}	-1.051^{***}	-1.339^{***}	-0.727^{**}
	(0.346)	(0.346)	(0.360)	(0.363)
physical_dis	0.047	0.043	0.836^{***}	0.128
	(0.151)	(0.151)	(0.098)	(0.178)
hosp_stays	1.088^{***}	1.072^{***}	−0.351	1.331^{***}
	(0.208)	(0.209)	(0.385)	(0.236)
sphus	0.234^{*}	0.229^{*}	0.120	0.367^{**}
	(0.121)	(0.122)	(0.187)	(0.144)
retired	0.087	0.259	1.569	0.009
	(0.348)	(0.340)	(1.038)	(0.373)
helpout_hh	0.288	0.319	-0.966^{***}	0.601^{**}
	(0.226)	(0.225)	(0.362)	(0.259)
child_km	-0.770^{***}	-0.849^{***}	-1.269^{***}	-0.649^{**}
	(0.241)	(0.239)	(0.429)	(0.262)
mental_dis	-0.659^{***}	-0.646^{***}	-	-0.483^{***}
	(0.130)	(0.130)		(0.163)
south	-0.806^{**}	-	-1.175^{**}	−0.534
	(0.322)		(0.554)	(0.334)
central	-	0.565^{***}	-	-
		(0.216)		
physical_dis:mental_dis	0.134^{***}	0.138^{***}	-	0.097^{*}
	(0.048)	(0.048)		(0.055)
children:hhsize	0.337^{***}	0.330^{***}	-	0.311^{***}
	(0.097)	(0.097)		(0.100)
Constant	-9.482^{***}	-10.060^{***}	-13.789^{***}	-12.498^{***}
	(1.727)	(1.739)	(2.597)	(1.981)
Observations	28,020	28,020	29,250	27,998
Count of dependent variable	102	102	41	80
McFadden R^2	0.2042	0.2042	0.2804	0.2139
Nagelkerke R^2	0.2081	0.2081	0.2825	0.2172
Log Likelihood	−536.856	−536.879	−223.322	−431.172
Akaike Inf. Crit.	1,105.712	1,105.759	470.644	892.345
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 5.6: Logistic Regression

	Dependent variable:			
	NH		NHLS	NHSS
	(1)	(2)	(3)	(4)
age	0.081^{***}	0.080^{***}	0.071^{***}	0.087^{***}
	(0.017)	(0.017)	(0.027)	(0.019)
female	0.204	0.238	−0.006	0.282
	(0.253)	(0.253)	(0.396)	(0.289)
nevermarried	−0.662	−0.644	-	-
	(1.059)	(1.074)		
grand_children	-0.099^{**}	-0.095^{*}	−0.056	-0.215^{***}
	(0.049)	(0.049)	(0.076)	(0.079)
partnerinh	-0.592^{**}	-0.587^{**}	-1.488^{***}	-0.894^{*}
	(0.254)	(0.254)	(0.451)	(0.459)
physical_dis	0.392^{***}	0.396^{***}	0.798^{***}	0.402^{***}
	(0.083)	(0.084)	(0.106)	(0.091)
hosp_stays	1.171^{***}	1.147^{***}	−0.454	1.429^{***}
	(0.217)	(0.217)	(0.422)	(0.249)
health	0.297^{**}	0.308^{**}	0.131	0.448^{***}
	(0.128)	(0.130)	(0.201)	(0.155)
retired	0.058	0.196	1.528	0.009
	(0.365)	(0.356)	(1.043)	(0.393)
helpout_hh	0.456^{**}	0.475^{**}	−0.606	0.762^{***}
	(0.232)	(0.232)	(0.371)	(0.269)
child_km	-0.766^{***}	-0.831^{***}	-1.508^{***}	-0.535^{**}
	(0.244)	(0.242)	(0.442)	(0.263)
mental_dis	-0.393^{***}	-0.376^{***}	-	-0.289^{**}
	(0.102)	(0.102)		(0.118)
south	-0.696^{**}	-	-1.410^{**}	−0.397
	(0.325)		(0.627)	(0.338)
central	-	0.627^{***}	-	-
		(0.227)		
grand_children:partnerinh	-	-	-	0.195^{*}
				(0.114)
Constant	-11.572^{***}	-12.288^{***}	-13.143^{***}	-13.573^{***}
	(1.549)	(1.562)	(2.507)	(1.804)
Observations	26,916	26,916	28,076	26,895
Count of dependent variable	94	94	36	73
McFadden R^2	0.2029	0.2051	0.2571	0.2252
Nagelkerke R^2	0.2066	0.2089	0.2589	0.2285
Log Likelihood	−498.700	−497.281	−204.832	−390.718
Akaike Inf. Crit.	1,025.400	1,022.562	433.665	810.361
Note:				*p<0.1; **p<0.05; ***p<0.01

Chapter 6

Discussion and Conclusion

This thesis analysed the determinants of institutionalisation of the elderly with a particular focus on the effect of having children. We tested the hypothesis of whether having children lowers the probability of living in a nursing home when old. For the analysis, we used the easySHARE dataset, wave 6, from 2015.

To test the hypothesis, we employed the logistic regression on three different dependent variables representing admission into a nursing home, short-term and long-term nursing home residency. This separation was inspired by Coughlin et al. (1990). By this diversification, we examined whether determinants changed with alternative types of institutionalisation and whether having children affects them differently.

Our analysis confirmed that number of children decreases probability to be admitted into a nursing home or institutionalised for the short term. Moreover, for respondents that live alone, the probability of being institutionalised decreases with additional children. The long-term residency was not influenced by the number of children. However, having at least one child at a reasonable distance from the respondent's household was significant when both long-term and short-term nursing home residency were analysed.

We also carried out robustness check to find out whether living with a partner, rather then controlling only for the size of the households, changes the influence children have on institutionalisation. The results suggested that while elderly parents live with their partners, the number of children they have is not significant. Just living with their partner decreased their probability of being placed in a nursing home. However, if they have children, the interaction between having them and living with a partner showed increasing probability

to be institutionalised with each additional child. It can mean that partners rather enter a nursing home together than be a burden to their children.

Furthermore, we tested how the number of grandchildren affects institutionalisation. Respondents that share households with their partners are less likely admitted to a nursing home with each additional grandchild regardless of the length of their stay. The effect was consistent across the specification of the dependent variable. If elderly people have grandchildren, the interaction between the number of grandchildren and living with a partner imposed a strong effect due to more support. The number of grandchildren did not influence the probability of being institutionalised for the long term similar to the models where children were controlled for.

The area of residence of the respondent was never relevant when short-term stays were considered in our analysis. Nevertheless, it did matter for the admissions and long-term placements. Respondents from central Europe were more likely to be admitted into a nursing home, and strong family ties from the South decreased both admissions and long-term stays by approximately 0.3 %. Since short-term stays might be related to temporarily worsened health condition that requires professional care, social tradition does not matter.

We further found out that age exerts a positive effect on institutionalisation, consistent with Coughlin et al. (1990). As hospital stays, the respondent's self-perceived health status and functional disabilities all proxy different forms of health conditions, they revealed a positive effect on institutionalisation as expected. Negative effect was recognised for variables that represent household size, living with a partner and mental disorientation. External help affected negatively long-term stays and positively short-term stays in our analysis.

In comparison with Cohen et al. (1986) or Coughlin et al. (1990) who found out that gender and marital status are significant for nursing home placement, variables *female* and *nevermarried* did not impact institutionalisation in our analysis.

Our results suggest that short-term nursing home stays are related to health condition of the elderly people. If the elderly do not have kids that would help them directly, the individuals are temporarily placed in a nursing home. Thus having kids and their number per se is a decisive factor. Whereas, for long-term stays, the determining factor is the physical proximity to children rather than their number. Which is also supported by our results where help from the outside of the household decreased the probability of elderly to be

institutionalised for a long term. Thus, it suggests that the in-person help of the children is more important for long-term institutionalisation.

Our analysis confirms importance of children as informal caregivers particularly when a partner is lost. Specifically, our results suggest that children significantly decrease institutionalisation of lonely parents whereas if the elderly live in a couple they prefer to be institutionalised together.

The children have a potential to substitute formal care i.e. home paid services or reduce nursing home placement and re-hospitalisation. However, for most of the tasks such as doctor's appointments or dealing with emergencies, flexible time schedule of caregiver is required. Since children of ageing parents are active in the labor market, grandchildren can step in and help with necessary tasks supposing they are old enough but not yet working. Having children and grandchildren as informal caregivers can help governments to decrease excessive expenditure on healthcare and ageing population to spend their time in pleasant family environment.

Our research thus has implication for social/family policy. Having found that proximity of children is in many cases even more important than the number of children per se in decreasing institutionalisation of elderly parents, our research has immediate implication for regional politics and regional development too. Specifically, areas densely populated by the elderly should aim to attract younger cohorts because grown-up children often leave the area of their origin if it is not attractive enough for their active life whereas the elderly often stay where they spent their adulthood.

Most of the research done in this field used more regionally oriented samples with a detailed set of variables. The dataset used for our analysis includes a relatively limited amount of variables, but they cover the main determinants that impact the ageing population. We tested our hypothesis on a broader scope of states which allowed us to test whether social tradition affects institutionalisation.

Our analysis was performed on a cross-sectional dataset. For further research, panel data should be considered as observing panel structure can help to uncover additional individual characteristics. Moreover, including more detailed information on children's life pathways, health condition of respondents or systemic factors (i.e. availability of nursing home beds) could help get a deeper insight on decision making that affects the institutionalisation of elderly parents.

Also, the conclusions of this thesis resulted in assumption on the self-

perceived quality of life of the elderly in the nursing home when lonely and with a partner. Further research should analyse it in a considerable detail.

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Appendix A

Correlation matrices

Table A.1: Correlation Matrix - part 1

	age	female	hhsize	children	grand_children	physical_dis	health	mental_dis	partnerinh
age	1	0.030	-0.192	-0.001	0.140	0.297	0.224	-0.202	-0.247
female	0.030	1	-0.202	-0.010	0.051	0.035	0.066	-0.010	-0.290
hhsize	-0.192	-0.202	1	0.156	-0.105	-0.003	-0.016	0.035	0.654
children	-0.001	-0.010	0.156	1	0.567	0.013	-0.007	-0.022	0.122
grand_children	0.140	0.051	-0.105	0.567	1	0.039	0.041	-0.036	-0.016
physical_dis	0.297	0.035	-0.003	0.013	0.039	1	0.321	-0.346	-0.116
health	0.224	0.066	-0.016	-0.007	0.041	0.321	1	-0.146	-0.102
mental_dis	-0.202	-0.010	0.035	-0.022	-0.036	-0.346	-0.146	1	0.072
partnerinh	-0.247	-0.290	0.654	0.122	-0.016	-0.116	-0.102	0.072	1
helpout_hh	0.200	0.108	-0.193	0.011	0.062	0.224	0.197	-0.101	-0.219
hosp_stays	0.086	-0.025	-0.038	0.016	0.028	0.147	0.220	-0.042	-0.037
child_km	0.037	0.017	0.241	0.056	-0.015	0.072	0.083	-0.041	-0.023
nevermarried	-0.022	0.004	-0.176	-0.276	-0.049	0.012	0.008	0.002	-0.243
retired	0.028	-0.213	-0.035	-0.048	0.017	-0.046	-0.012	0.033	0.013
south	0.029	-0.030	0.157	-0.019	-0.126	0.044	0.068	-0.059	0.056
north	0.010	0.024	-0.088	-0.003	0.094	-0.020	-0.027	0.034	-0.024
central	-0.034	0.006	-0.067	0.019	0.035	-0.022	-0.038	0.023	-0.030

Table A.2: Correlation Matrix - part 2

	helpout_hh	hosp_stays	child_km	nevermarried	retired	south	north	central
age	0.200	0.086	0.037	-0.022	0.028	0.029	0.010	-0.034
female	0.108	-0.025	0.017	0.004	-0.213	-0.030	0.024	0.006
hhsize	-0.193	-0.038	0.241	-0.176	-0.035	0.157	-0.088	-0.067
children	0.011	0.016	0.056	-0.276	-0.048	-0.019	-0.003	0.019
grand_children	0.062	0.028	-0.015	-0.049	0.017	-0.126	0.094	0.035
physical_dis	0.224	0.147	0.072	0.012	-0.046	0.044	-0.020	-0.022
health	0.197	0.220	0.083	0.008	-0.012	0.068	-0.027	-0.038
mental_dis	-0.101	-0.042	-0.041	0.002	0.033	-0.059	0.034	0.023
partnerinh	-0.219	-0.037	-0.023	-0.243	0.013	0.056	-0.024	-0.030
helpout_hh	1	0.132	-0.008	0.017	0.005	-0.101	0.050	0.049
hosp_stays	0.132	1	-0.004	-0.004	0.032	-0.077	-0.018	0.083
child_km	-0.008	-0.004	1	-0.022	-0.058	0.174	-0.179	-0.005
nevermarried	0.017	-0.004	-0.022	1	0.033	-0.002	0.019	-0.014
retired	0.005	0.032	-0.058	0.033	1	-0.229	0.081	0.138
south	-0.101	-0.077	0.174	-0.002	-0.229	1	-0.328	-0.621
north	0.050	-0.018	-0.179	0.019	0.081	-0.328	1	-0.536
central	0.049	0.083	-0.005	-0.014	0.138	-0.621	-0.536	1

Appendix B

Predicted Probabilities and Logistic Regression

Table B.1: Predicted probabilities for Model (2) in Table 5.5

	hhsize			
children	1	2	3	4
0	0.00222	0.000777	0.000272	0.000095
1	0.001891	0.00092	0.000448	0.000218
2	0.00161	0.001089	0.000737	0.000498
3	0.001371	0.00129	0.001213	0.001141
4	0.001167	0.001527	0.001997	0.002611
5	0.000994	0.001807	0.003284	0.00596
6	0.000846	0.002139	0.005397	0.013551

Table B.2: Predicted probabilities for Model (2) in Table 5.5

	mental_dis				
physical_dis	0	1	2	3	4
0	0.012334	0.006505	0.003421	0.001796	0.000943
1	0.012866	0.007781	0.004696	0.002831	0.001705
2	0.01342	0.009306	0.006444	0.004459	0.003083
3	0.013997	0.011125	0.008837	0.007017	0.005569
4	0.014599	0.013296	0.012108	0.011025	0.010037
5	0.015227	0.015884	0.016569	0.017282	0.018027

Table B.3: Predicted probabilities for Model (4) in Table 5.5

	hhsize			
children	1	2	3	4
0	0.001072	0.000518	0.000251	0.000121
1	0.000952	0.000628	0.000415	0.000274
2	0.000847	0.000762	0.000686	0.000617
3	0.000752	0.000924	0.001134	0.001393
4	0.000669	0.00112	0.001876	0.003139
5	0.000594	0.001358	0.0031	0.007059
6	0.000528	0.001646	0.005118	0.015798

Table B.4: Predicted probabilities for Model (4) in Table 5.5

	mental_dis				
physical_dis	0	1	2	3	4
0	0.004626	0.002858	0.001764	0.001088	0.000671
1	0.005254	0.003575	0.002431	0.001652	0.001123
2	0.005968	0.004471	0.003348	0.002506	0.001876
3	0.006778	0.005591	0.004611	0.003802	0.003134
4	0.007696	0.006989	0.006346	0.005762	0.005231
5	0.008739	0.008734	0.008729	0.008724	0.008719

Table B.5: Logistic Regression

	Dependent variable:			
	NH		NHLS	NHSS
	(1)	(2)	(3)	(4)
age	0.074^{***}	0.073^{***}	0.085^{***}	0.082^{***}
	(0.016)	(0.016)	(0.026)	(0.018)
female	0.200	0.234	−0.073	0.243
	(0.242)	(0.242)	(0.373)	(0.274)
children	−0.173	−0.182	0.019	−0.184
	(0.122)	(0.122)	(0.144)	(0.142)
nevermarried	−0.696	−0.687	-	-
	(1.054)	(1.066)		
partnerinh	-1.926^{***}	-1.929^{***}	-1.505^{***}	-1.855^{***}
	(0.503)	(0.502)	(0.428)	(0.560)
physical_dis	0.059	0.053	0.800^{***}	0.153
	(0.151)	(0.151)	(0.098)	(0.180)
hosp_stays	1.076^{***}	1.061^{***}	−0.330	1.304^{***}
	(0.209)	(0.209)	(0.385)	(0.236)
health	0.228^{*}	0.223^{*}	0.100	0.365^{**}
	(0.120)	(0.122)	(0.187)	(0.144)
retired	0.027	0.195	1.757^{*}	−0.061
	(0.348)	(0.339)	(1.043)	(0.373)
helpout_hh	0.260	0.290	-0.796^{**}	0.548^{**}
	(0.223)	(0.222)	(0.351)	(0.255)
child_km	-0.847^{***}	-0.921^{***}	-1.677^{***}	-0.638^{**}
	(0.237)	(0.235)	(0.434)	(0.256)
mental_dis	-0.659^{***}	-0.646^{***}	-	-0.477^{***}
	(0.131)	(0.131)		(0.165)
south	-0.779^{**}	-	-1.262^{**}	−0.499
	(0.323)		(0.556)	(0.335)
central	-	0.561^{***}	-	-
		(0.216)		
children:partnerinh	0.562^{***}	0.564^{***}	-	0.644^{***}
	(0.173)	(0.173)		(0.191)
physical_dis:mental_dis	0.131^{***}	0.136^{***}	-	0.094^{*}
	(0.048)	(0.048)		(0.056)
Constant	-9.642^{***}	-10.190^{***}	-14.503^{***}	-12.111^{***}
	(1.613)	(1.623)	(2.488)	(1.884)
Observations	28,020	28,020	29,250	27,998
Count of dependent variable	102	102	41	80
McFadden R^2	0.2076	0.2079	0.2751	0.2169
Nagelkerke R^2	0.2115	0.2119	0.2772	0.2202
Log Likelihood	−535.175	−534.376	−224.982	−430.964
Akaike Inf. Crit.	1,096.350	1,100.752	473.965	889.928
Note:				*p<0.1; **p<0.05; ***p<0.01

Table B.6: Predicted probabilities for Model (1) in Table B.5

	partnerinh	
children	0	1
0	0.002608	0.000381
1	0.002195	0.000562
2	0.001848	0.00083
3	0.001556	0.001225
4	0.001309	0.001808
5	0.001102	0.002668
6	0.000928	0.003934

Table B.7: Predicted probabilities for Model (1) in Table B.5

	mental_dis				
physical_dis	0	1	2	3	4
0	0.01239	0.006451	0.00335	0.001737	0.0009
1	0.013135	0.007795	0.004716	0.00273	0.001613
2	0.013924	0.009415	0.006357	0.004288	0.00289
3	0.014759	0.011369	0.00875	0.00673	0.005174
4	0.015644	0.013722	0.012032	0.010549	0.009246
5	0.016582	0.016554	0.016526	0.016498	0.01647

Table B.8: Predicted probabilities for Model (2) in Table B.5

	partnerinh	
children	0	1
0	0.002703	0.000394
1	0.002254	0.000577
2	0.00188	0.000845
3	0.001567	0.001238
4	0.001367	0.001813
5	0.001089	0.002655
6	0.000908	0.003888

Table B.9: Predicted probabilities for Model (2) in Table B.5

	mental_dis				
physical_dis	0	1	2	3	4
0	0.011991	0.006319	0.003321	0.001743	0.000914
1	0.012638	0.007622	0.004588	0.002758	0.001657
2	0.013319	0.009192	0.006336	0.004363	0.003003
3	0.014037	0.011082	0.008743	0.006895	0.005435
4	0.014793	0.013355	0.012055	0.010881	0.009819
5	0.015589	0.016087	0.016601	0.017131	0.017677

Table B.10: Predicted probabilities for Model (4) in Table B.5

	partnerinh	
children	0	1
0	0.001547	0.000242
1	0.001287	0.000384
2	0.001071	0.000608
3	0.000891	0.000963
4	0.000741	0.001524
5	0.000617	0.002412
6	0.000513	0.003817

Table B.11: Predicted probabilities for Model (4) in Table B.5

	mental_dis				
physical_dis	0	1	2	3	4
0	0.004351	0.002706	0.001682	0.001045	0.000649
1	0.005068	0.003463	0.002364	0.001614	0.001101
2	0.005904	0.004430	0.003323	0.002492	0.001868
3	0.006876	0.005666	0.004668	0.003845	0.003167
4	0.008006	0.007244	0.006555	0.00593	0.005365
5	0.009321	0.009258	0.009196	0.009134	0.009072

Appendix C

Average Marginal Results

Table C.1: AME for Table 5.5

	AME NH		AME NHLS	AME NHSS
	(1)	(2)	(3)	(4)
age	0.0003	0.0003	0.0001	0.0002
children	-0.002	-0.002	-	-0.001
hhsize	-0.004	-0.004	-0.002	-0.002
physical_dis	-	-	0.001	-
hosp_stays	0.004	0.004	-	0.004
health	0.001	0.0008	-	0.001
helpout_hh	-	-	-0.001	0.002
child_km	-0.003	-0.003	-0.002	-0.002
mental_dis	-0.002	-0.002	-	-0.001
south	-0.003	-	-0.002	-
central	-	0.002	-	-
children*hhsize	0.001	0.001	-	0.001
physical_dis*mental_dis	0.0005	0.0005	-	0.0003
Observations	28,020	28,020	29,250	27,998

Table C.2: AME for Table B.5

	AME NH		AME NHLS	AME NHSS
	(1)	(2)	(3)	(4)
age	0.0003	0.0003	0.0001	0.0002
partnerinh	-0.007	-0.007	-0.002	-0.005
physical_dis	-	-	0.001	-
retired	-	-	0.002	-
hosp_stays	0.004	0.004	-	0.004
health	0.001	0.001	-	0.001
helpout_hh	-	-	-0.001	0.002
child_km	-0.003	-0.003	-0.002	-0.002
mental_dis	-0.002	-0.002	-	-0.001
south	-0.003	-	-0.002	-
central	-	0.002	-	-
physical_dis*mental_dis	0.0005	0.0005	-	0.0003
children*partnerinh	0.002	0.002	-	0.002
Observations	28,020	28,020	29,250	27,998

Table C.3: AME for Table 5.6

	AME NH		AME NHLS	AME NHSS
	(1)	(2)	(3)	(4)
age	0.0003	0.0003	0.0001	0.0002
grand_children	-0.0003	-0.0003	-	-0.0006
partnerinh	-0.002	-0.002	-0.002	-0.002
physical_dis	0.001	0.001	0.001	0.001
hosp_stays	0.004	0.004	-	0.004
health	0.001	0.001	-	0.001
helpout_hh	0.002	0.002	-	0.002
child_km	-0.003	-0.003	-0.002	-0.001
mental_dis	-0.001	-0.001	-	-0.001
south	-0.002	-	-0.002	-
central	-	0.002	-	-
grand_children*partnerinh	-	-	-	0.005
Observations	26,916	26,916	28,076	26,896