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Care Choices in Europe: To Each According to His Needs?

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Dörte Heger and Thorben Korfhage[1]

Care Choices in Europe: To Each According to His Needs?

Abstract

Growing long-term care (LTC) needs represent a major challenge for our ageing societies. Understanding how utilization patterns of different types of care are influenced by LTC policies or changes in the population composition such as age patterns or health can provide helpful insight on how to adequately prepare for this situation. To this aim, this paper explores how individuals choose between different forms of LTC. We exploit variation between countries as well as between individuals within countries using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE). Using non-linear decomposition techniques, we break down the difference in utilization rates between countries into differences based on observed sociodemographic and need related characteristics and differences in the impacts of these characteristics, which allows us to identify the drivers behind differences in the formal-informal care mix. Our results show that a substantial fraction of the observed country differences can be explained by the different features of the LTC systems.

JEL Classification: I11, J14, J18

Keywords: Long-term care; informal care; international comparison; decomposition

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1. Introduction

By 2050, the share of the population aged 80 and over is expected to double across OECD[1] countries (Colombo et al., 2011). In line with this general trend, social demand for long-term care (LTC) is expected to grow considerably. Meeting the increasing demand by supplying and financing adequate LTC services poses a serious challenge to ageing societies and LTC systems. Today, average public and private spending on LTC accounts for as much as 1.5% of GDP across OECD countries. This share is projected to double or even triple by 2050 (Colombo et al., 2011).

In order to prepare for this development, it is crucial to understand the determinants of LTC. While cross country differences in LTC use are well documented (Colombo et al., 2011; Verbeek-Oudijk et al., 2015), the underlying reasons are not fully understood. Better knowledge of these determinants allows the prediction of future costs and shortages in the supply of formal and/or informal care. The existing literature on the determinants of LTC use finds that e.g., age, impairments, or the availability of family care are important to explain the demand for specific LTC services (e.g., Portrait et al., 2000; Luppa et al., 2010; Weaver et al., 2009; de Meijer et al., 2011). Hence, a different distribution of these socioeconomic characteristics is likely to result in diverging LTC use between countries. Besides, the available mix of different LTC options may influence a person's LTC choice since different forms of LTC are associated with different costs. While some countries with strong public institutions – such as Sweden or Denmark – have put a strong emphasis on the support of formal care, most other countries prioritize family care instead, which is often seen as the least expensive form of care – at least from a budgetary point of view.[2] As a result, both the absolute amount of care use as well as the distribution between formal and informal LTC differ substantially between countries. In a study which highlights the importance of such institutional differences, de Meijer et al. (2015) find that recent trends in the choice of different forms of LTC in the Netherlands can almost entirely be explained by changes in the Dutch LTC system. Similarly, Bakx et al. (2015) and Alders et al. (2015) show that system characteristics result in a different mix of formal and informal care in Germany and the Netherlands. For policymakers it is therefore of special importance to understand the role of institutional designs such as the LTC insurance (LTCI) system on different types of LTC.[3]

Understanding the extent to which observed cross country differences in LTC use are based on need versus institutional differences or preferences is the aim of this paper. We extend the analysis of Bakx et al. (2015) and analyse the determinants of the LTC choice in

[1] The Organization for Economic Co-operation and Development.

[2] In terms of welfare cost, the cost of informal care and nursing home care can be similar (Skira, 2015).

[3] A related strand of the literature estimates the effects of LTC policy changes on care utilization. E.g., Hoerger et al. (1996) find that increased Medicaid subsidies in the US make disabled parents more likely to live independently than with their children; Karlsberg Schaffer (2015) finds that the introduction of free personal care in Scotland led to an increased supply of informal care; and Løken et al. (2014) find a significant negative impact of a formal care expansion on the work absences of informal carers in Norway and interpret their results as evidence on the substitution between formal and informal care at home.

five European countries. Each country represents a different LTC setting, which provides us with a comprehensive picture of the incentives put in place by the different LTC systems in Europe. Furthermore, we contribute to the literature by using a comprehensive health measure, which allows us to better compare the influence of health on LTC use across countries. Lastly, we provide a back-of-the-envelope forecast to predict the influence of demographic ageing and system characteristics on LTC use.

Our estimation strategy exploits the variation between countries and between individuals within countries to disentangle the determinants of LTC use analysing data from the Survey of Health, Ageing, and Retirement in Europe (SHARE).[4] Using non-linear decomposition techniques, we break down the difference in utilization rates between countries into differences based on observed socioeconomic, demographic, and need-related characteristics and differences in the impacts of these characteristics. This allows us to identify the drivers behind differences in the formal-informal care mix. We focus on individuals aged 65 and above to capture those with a high probability of LTC needs and concentrate on five countries within the European Union (EU), which are chosen as representatives of different philosophies in the organization of LTC. We choose Germany as an example of a mixed system with both formal and informal care support; Sweden represents a Scandinavian welfare-state with generous benefits and a focus on stationary care; France is similar to Germany but has more generous eligibility rules and puts a stronger emphasis on formal care at home; Spain is chosen as a Southern-European economy with a large share of family care; finally, the Czech Republic is an Eastern-European country with relatively low LTC benefits.

Our results show that while differences in health outcomes and demographics explain some of the observed country differences in LTC use, a substantial fraction remains unexplained and is likely caused by different societal values and different features of the LTC systems. Moreover, the back-of-the-envelope forecast demonstrates that while the patterns of LTC use will change as a result of population ageing, changes in the unexplained factors would have a much larger impact. Our results hence inform policymakers aiming to reduce or promote certain care options by highlighting the relative contribution of population characteristics and system characteristics on the choice of LTC options.

The remainder of the paper is organized as follows: We briefly describe the institutional settings in Germany, Spain, France, Sweden, and the Czech Republic in section 2; in section 3, we present our empirical strategy; in section 4, we describe the SHARE data set and provide a descriptive analysis of differences in LTC use; in section 5 and 6 we present

[4]This paper uses data from SHARE Wave 5 release 1.0.0, as of March 31st 2015 (DOI: 10.6103/SHARE.w5.100). The SHARE data collection has been primarily funded by the European Commission through the 5th Framework Programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5- CT-2005-028857, and SHARELIFE, -LEAP, № 227822 and SHARE M4, № 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG-4553-01, IAG BSR06-11 and OGHA 04-064) and the German Ministry of Education and Research as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

Table 1: Comparison of LTCI systems (in 2013)

	Germany	Sweden	Spain	France	Czech Rep.
LTC policies					
Unpaid leave for caring	✓		✓	✓	
Paid leave for caring		✓	✓	✓	
Tax credit for caring				✓	
Flexible work arrangements	✓			✓	✓
Allowance for carers		✓			
Cash benefits	✓	✓	✓	✓	✓
In kind benefits at home	✓	✓	✓	✓	✓
Nursing home support	✓	✓	✓	✓	✓
LTC resources					
Spending on LTC (share of GDP, 2013)	1.0%	3.2%	0.7%	1.9%	0.3%
Nursing home beds (/1,000 pop. 65+, 2013)	53.1	70.6	47.9	59.0	45.0

Sources: Colombo et al. (2011), Carrino and Orso (2014), OECD (2015a), and OECD (2015b)

our estimation results and use them to forecast future LTC use under different scenarios; section 7 concludes.

2. Institutional Settings

While elderly care has traditionally been the responsibility of the family, the reliance on family care has become more difficult with increasing female labour supply, fewer children, and, in general, smaller family sizes (Costa-Font, 2010). As a result, countries in Europe have developed different strategies to ensure a sufficient supply of LTC. While some countries still rely heavily on informal carers, others have put an emphasis on the support of formal care in order to reduce the burden for family members.[5] In Table 1, we show a rough overview of the LTCI systems in the countries of our study. One notable difference lies in support options for family carers. Flexible work arrangements or leave regulations make it easier for informal carers to combine work and care and thus are likely to increase family care (Skira, 2015). Similarly, any form of monetary transfer that supports family care is likely to increase informal care use (Geyer and Korfhage, 2015). With respect to formal care, all countries in our study offer nursing home support as well as benefits in cash and in kind for care at home. Hence, each country offers incentives for both informal and formal care use at home or in nursing homes. However, eligibility rules and the generosity of the systems differ (Carrino and Orso, 2014; Geyer et al., 2016b). In the following, we briefly describe the relevant aspects of the LTCI system of each country, putting a special focus on incentives set for informal and formal care.

[5] E.g., Bonsang (2009) or Bolin et al. (2008) provide evidence that informal and formal care are substitutes rather than complements, which is an important condition for policy reforms aiming to strengthen one of the two options to be effective.

2.1. Germany

Germany introduced mandatory LTCI in 1995. Since the LTCI aims to support and strengthen family care, informal care is given precedence over formal care at home, and home care takes precedence over stationary care (Bundesminesterium für Gesundheit, 2007). The insurance system provides benefits without regard to age or financial status to individuals with permanent (at least six months) impairments in at least two activities of daily living (ADL) and one instrumental activity of daily living (IADL), with mental disabilities being largely disregarded until recently.[6] Depending on the level of impairments, three care-levels are distinguished, which are assessed by the German Health Insurance Medical Service (MDK). If a care-level is established, LTCI for care at home covers informal care, which is generally provided by family members, or formal care provided by professional health care services. Informal care benefits are given as cash transfer whereas formal care is organized as an in kind transfer. In 2015 monthly benefits in cash for informal care ranged from 244 euro (in care-level I) up to 728 euro (in care-level III). Cash benefits can also be used to reimburse informal carers. These benefits are not means-tested or earmarked, and their spending is not monitored. Benefits in kind for formal care are more generous. They range from 468 euro per month up to 1,612 euro and are directly paid to an ambulatory care service. However, the benefits do not fully cover the costs of long-term care; they are designed to support and complement family care but not to replace it.

For nursing home care, the LTCI pays the nursing home a fixed monthly payment ranging from 1,064 euro in care-level I up to 1,612 euro in care-level III. However, co-payments for institutional care are high and the costs for accommodation have to be paid by the resident. Schulz (2010) estimates that the LTCI covers only about 50% of the total cost of the nursing home; the difference has to be financed by the care recipient, social insurance or close family members.[7] Due to the high co-payments and the preference of most elderly to remain in their own home, nursing home entry is often seen as a last resort (Alders et al., 2015). Hence, while the German LTC system is a mixed system that provides benefits for informal and formal care, the high co-payments and the unmonitored cash transfers set strong incentives for informal care.

2.2. Sweden

Sweden has a strong welfare state, which also includes the supply of LTC. Contrary to Germany, the state is traditionally seen as having the main responsibility in providing care for people in need and consequently most benefits aim at supporting formal care. Any

[6] For a description of the ADL / IADL index see Katz et al. (1963), Katz et al. (1970), and Katz (1983). Schulz (2010) provides a detailed overview about the long term care insurance in Germany. Note that a fundamental reform of the assessment of needs was passed in 2015 that will put a stronger focus on cognitive conditions starting in 2017. See Bundesministerium für Gesundheit (2015) for an overview of the reform.

[7] Children have a legal obligation to support their parents if their financial situation allows it.

person with residence in Sweden who has permanent impairments is eligible for care. There is no universal scheme to determine eligibility because local authorities are responsible to provide care for the elderly and each of them sets their own standards. Generally, individuals have to make a request to the local authority, which arranges an interview with an evaluator in order to determine the extent of care that is required. The available kinds of formal care are institutional care, home care, and home nursing care (Fukushima et al., 2010). When the evaluator determines the amount of care needed, it is further assessed whether formal home care is feasible or whether institutional care is the preferred option. Due to a long tradition of institutional care, it is still usually seen as the regular option for LTC. However, in response to the increasing share of oldest old as well as technological improvements in the supply of home based formal care, formal care at home is becoming a more popular option. Compared to other countries, home based formal care is rather generous, offered around the clock and with up to seven visits a day (Fukushima et al., 2010). Even though individuals are obliged to make co-payments, which depends on individual income, most of the fees for formal care are covered by the welfare state. In 2006, only about 5% of the total costs of LTC were financed privately, the rest was covered by tax financed public funds (Fukushima et al., 2010).

The support of informal care plays a minor role in the Swedish LTC system. Only with the increasing numbers of care recipients who stay at home, family care is recognized as an additional source of care. Hence, only starting in 2009, municipalities are required to support informal care. Yet the design of this support varies between local authorities and is still fragmented. Some offer cash benefits as compensation ranging from 100 euro to 300 euro in 2010, others offer the possibility of paid leave from employment, but the majority of LTC support is still provided for formal care (Fukushima et al., 2010). While, like the German system, the Swedish LTC system is a mixed system, cash benefits are not well established and formal care support is quite generous. We thus expect incentives for formal care to be stronger than in Germany.

2.3. France

In France, dependency for LTC services is determined by the AGGIR[8] scale, which is based on the degree of difficulty when performing ADLs, e.g., eating, dressing, or bathing. Based on this score, six iso-groups (GIR) of need are classified. They range from GIR1 (very dependent) to GIR6 (not dependent). Individuals who are aged 60 or older and are classified GIR1–GIR4 are entitled to receive the main French LTC allowance, the Personalized Allowance for Autonomy (APA), created in 2001.[9] Those who have mental limitations are assigned to GIR1 or GIR2; being classified into GIR4 or higher requires difficulties with at least two ADLs (Carrino and Orso, 2014). The APA is an earmarked in-kind benefit that can be used for LTC at home or for residential care. It is not means-tested

[8] Autonomie Gérontologique – Groupes Iso-Ressources

[9] For a detailed overview of the French LTC System see Martin and Le Bihan (2007); Joël et al. (2010); for a description of the AGGIR scale see Carrino and Orso (2014).

but depends on the level of impairment as well as on individual income. For individuals with monthly disposable income larger than 739 euro (in 2014) the amount of the benefit decreases progressively from 100% to 10% of the maximum amount. In 2014, the maximum APA amount ranged from 563 euro per month in GIR4 to 1,313 euro in GIR1 (Carrino and Orso, 2014). Usually, the benefit is paid directly to a formal care provider; it can only be paid to the care recipient if he or she provides proof of the correct use of the benefit. However, the benefit can also be used to pay a member of the family – except husband or wife – if he or she provides the required assistance.

If individuals live in a nursing home they have to finance a large fraction of the care costs themselves. With estimated nursing home fees ranging from about 1,300 euro to 2,000 euro per month and average APA-benefits for a person in a nursing home at about 410 euro per month, about two thirds of the expenditures have to be paid for by the person in need of care or their relatives (Joël et al., 2010). Though families play a non-negligible role in financing and assisting LTC in France, public opinion primarily sees the state responsible for LTC provision (Joël et al., 2010). Hence, while private contributions are similar to Germany, mental limitations also qualify for benefits and formal care is more accepted in France. We therefore expect the preference for formal care to be stronger than in Germany.

2.4. Spain

Traditionally, the provision of LTC in Spain has been a family responsibility. However, in order to respond to increasing female labour supply and changing family structures the Spanish government passed an act to increase and harmonize the state's support for LTC in 2006 (Gutiérrez et al., 2010; Jiménez-Martín and Prieto, 2012). Under the newly introduced System for Autonomy and the Care of Dependency (SAAD) the Spanish law distinguishes between three degrees of dependency (moderate, severe, and major dependency). The three degrees are assessed by a scoring system that takes into account a list of 11 daily activities such as eating, washing, or dressing. Individuals receive a score for each activity they need assistance with, which is further weighted by the degree of supervision required to perform the activity (Carrino and Orso, 2014). Moreover, within each of the three degrees the system distinguishes between two levels depending on the person's autonomy and on the intensity of required care. While the first level corresponds to individuals who are able to perform the activities without direct support of a third person, the second level is for individuals who need additional support (Carrino and Orso, 2014).

Once a person is eligible for benefits, the state provides in-kind benefits consisting of e.g., home-help services, personal care, day-care centres, or residential care services (for a detailed list of available services see Gutiérrez et al., 2010). Only if the in-kind benefits are not available in the community means-tested cash benefits can be granted. In 2010, they ranged from 300 up to 833 euro per month when linked to a professional care provider and from 180 up to 520 euro per month when used for informal care within the family (Carrino and Orso, 2014). Even though the system prioritizes in-kind services, the necessary

infrastructure is not available in many communities yet. Consequently, about 45% of the benefits are still granted in cash and informal family care is still an important pillar of the Spanish LTC mix (Gutiérrez et al., 2010). We therefore expect the incentives for informal family care to dominate.

2.5. Czech Republic

LTC assistance in the Czech Republic is fragmented. Instead of having a single body, responsibilities for LTC benefits are divided between the health care and social service sector. The Ministry of Health is responsible for home health-care and care provided in health institutions; the Ministry of Labor and Social Affairs is responsible for other forms of home care and offers cash benefits (Sowa, 2010).

Eligibility for cash benefits, which were introduced with the 2006 Social Service Act[10], depends on individual impairments. A list of 10 activities relating to the ADL concept is used to assess four dependency levels. They range from light dependency (level 1) if a person needs help in at least three activities up to very heavy dependency (level 4) if help in at least nine activities is required (Carrino and Orso, 2014). However, the assessment of need can vary by the assessing doctor or social worker as no clear definition exists. In 2014, monthly cash allowances ranged from 29 euro in level 1 up to 438 euro in level 4 – which corresponds to about 3% up to 30% in relation to average disposable income (Carrino and Orso, 2014; OECD, 2016).[11] The allowance is not means-tested and is designated to help pay for the provision of needed home care rather than to provide a full reimbursement of the costs. It can also be used to pay for family care or care given by other informal carers.

While informal care supported by cash benefits is the main pillar of the Czech LTC system, support for formal care is also provided. The social service sector offers support for institutional full-time elderly homes but, in general, the number of beds in nursing homes is too low to meet demand. In 2003, more than half of all applications for retirement homes had to be rejected due to insufficient capacities (Sowa, 2010).[12] Since both benefits and the number of available nursing home beds are low, we expect the incentives for informal family care to dominate.

3. Empirical Strategy

The five LTC systems described above set different incentives for formal and informal care. Besides, the countries also differ in other aspects such as, e.g., in their demographic structure. The aim of the following analysis is to determine to what extent system charac-

[10] Social Services Act No. 108/2006

[11] According to the OECD Better Life Index, the average disposable income in the Czech Republic was about 1,400 euro in 2015.

[12] The health system also provides care in different institutional settings e.g., hospitals, facilities for long-term patients, and rehabilitation hospitals (Wija, 2015). However, it is usually restricted in the maximum length of time a person can stay in those facilities. Furthermore, it is unclear whether medical accommodation should be considered LTC.

teristics and population characteristics can explain differences in different patterns of LTC use across countries.[13] Our empirical strategy follows a two stage approach. First, we estimate multinomial logit models in order to explain care use in each country separately. The considered care choices are: no care, only informal care, and formal care (alone or in addition to informal care). Second, we use non-linear decomposition techniques to break down the differences in LTC utilization.

The first step mutinomial logit results provide a first impression of how coefficients differ between countries. However, because differences in care use not only result from differences in coefficients but also from different distributions of the independent variables, we use an extension of the Blinder-Oaxaca decomposition method proposed by Yun (2004). It allows us to break down the difference in utilization rates between countries into differences based on observed characteristics (*endowment effect*) and differences in the impacts of these characteristics (*coefficient effect*). For non-linear models, Yun (2004) proposes to calculate the decomposition at first moments. Since it is not possible to calculate conditional expectations in multinomial models (see e.g., Bauer and Sinning, 2008), we follow Bakx et al. (2015) and treat the choice probabilities estimated in the multinomial logit model as binary choices. That is, we decompose the probability for each care choice separately, which provides us with decomposition results for informal and formal care separately. Our approach is summarized in the following equation:

$$\begin{aligned}\overline{P}_{jA} - \overline{P}_{jB} &= \overline{P(X_A\beta_{jA})} - \overline{P(X_B\beta_{jB})} \\ &= \left[\overline{P(X_A\beta_{jA})} - \overline{P(X_B\beta_{jA})}\right] + \left[\overline{P(X_B\beta_{jA})} - \overline{P(X_B\beta_{jB})}\right], j = 0, 1, 2; \quad (1)\end{aligned}$$

where $\overline{P}_{jA}$ ($\overline{P}_{jB}$) is the probability mean of choice j in country A (B), X denotes the endowments and β denotes the coefficients. In the second line, the first part represents the contribution of the endowment effect and the second part represents the contribution of the coefficient effect. An advantage of this decomposition approach is that it allows a detailed decomposition in which the contribution of each variable is estimated. As shown in Equation (2), weights are needed to quantify the relative distribution of each variable:

$$\begin{aligned}\overline{P}_{jA} - \overline{P}_{jB} = &\sum_{i=1}^{i=K} W^i_{\Delta X}\left[\overline{P(X_A\beta_{jA})} - \overline{P(X_B\beta_A)}\right] \\ &+ \sum_{i=1}^{i=K} W^i_{\Delta\beta_j}\left[\overline{P(X_B\beta_{jA})} - \overline{P(X_B\beta_{jB})}\right], j = 0, 1, 2. \quad (2)\end{aligned}$$

K denotes the number of independent variables and W represents the weight given to each of them. Using a first order Taylor expression to linearize the coefficients and

[13] Some of the observed country differences in LTC use are likely due to preference heterogeneity that cannot be observed beyond the manifestation of these preferences in the LTC system.

characteristics effects around $\overline{X}_A\beta_{jA}$ and $\overline{X}_B\beta_{jB}$, Yun (2004) shows that the following weights can be used to perform a detailed decomposition at first moments:

$$W^i_{\Delta X} = \frac{(\overline{X}^i_A - \overline{X}^i_B)\beta^i_A}{(\overline{X}_A - \overline{X}_B)\beta_A}; \tag{3}$$

$$W^i_{\Delta \beta} = \frac{\overline{X}^i_B(\beta^i_A - \beta^i_B)}{\overline{X}_B(\beta_A - \beta_B)}; \tag{4}$$

where $\sum W^i_{\Delta X} = \sum W^i_{\Delta \beta} = 1$. Following Yun (2008), we normalize the contribution of differences in coefficients of dummy variables. Standard errors are calculated using the delta method.

4. Data

We use data from the fifth wave of the Survey for Health, Ageing and Retirement in Europe (SHARE) collected in 2013, which covers the population 50+ in Europe (Börsch-Supan, 2015).[14] SHARE is the first data set to include information on health, socioeconomic status, and the demographic situation of the elderly at a pan-European level, which provides the unique opportunity to study the effect of institutional differences.[15] We limit the sample to individuals aged 65 or older as LTC needs increase steeply with age and hence the need for LTC is higher for older age groups. After deleting observations with missing information, our sample includes 14,347 individuals.[16]

Summary statistics are presented in Table 2 separately by country. Informal care is defined as regular help with personal care such as washing, getting out of bed, or dressing by someone living in the same household during the last twelve months.[17] Formal care is defined somewhat more broadly and includes any professional or paid services a person receives in his or her own home (ambulant formal care) to help with a physical, mental, emotional or memory problem as well as any overnight stay in a nursing home or residential care facility during the last twelve months. While SHARE aims to include the institutionalized population, this group is often difficult to sample and therefore under-represented (Schulz and Doblhammer, 2011). As a consequence our estimates of formal care use may also be underestimated. Details are discussed in the results section. Ambulant formal care comprises help with personal care (e.g. getting in and out of bed, dressing, bathing and showering), domestic tasks (e.g. cleaning, ironing, cooking), services such as meals-on-

[14] The SHARE questionnaires and data are available at www.share-project.org.

[15] Data is collected using a computer-assisted personal interviewing technique (CAPI). Sample selection varies across countries from simple random selection of households to multi-stage designs due to varying institutional conditions regarding sampling (Börsch-Supan, A. and Jürges, H. (eds.), 2005, chap. 5).

[16] SHARE provides five imputed data sets to deal with missing information in key variables (see Christelis, 2011). The results in this study are based on the first of these data sets. Our results are not sensitive to which imputed data set is used.

[17] Only daily or almost daily care during at least three months is classified as informal care to exclude short spells of help during a short-term sickness.

wheels, and other activities such as filling a drug dispenser.[18] No care use makes up the largest group in all countries. The share ranges from 63% (Czech Republic) to 81% (Sweden). In the Czech Republic, the second largest group are individuals who receive informal care only, while in Germany, Spain, Sweden, and France this is the smallest group.

Table 2: Descriptive statistics

	Germany mean	Sweden mean	Spain mean	France mean	Czech Republic mean
Care Choice					
no care use	0.752	0.809	0.732	0.694	0.626
only informal care	0.100	0.091	0.130	0.084	0.252
formal & informal care	0.148	0.100	0.137	0.222	0.122
Demographics					
Age	73.849	73.726	75.766	75.232	73.149
age 65–70	0.298	0.347	0.264	0.299	0.374
age 70–75	0.295	0.263	0.213	0.219	0.263
age 75–80	0.214	0.182	0.209	0.186	0.181
age 80–85	0.114	0.116	0.168	0.145	0.117
age 85+	0.080	0.091	0.146	0.150	0.065
partner in HH	0.701	0.722	0.729	0.580	0.564
female	0.493	0.522	0.541	0.584	0.590
at least one child	0.890	0.932	0.909	0.895	0.955
migration background[a]	0.113	0.040	0.014	0.003	0.010
Health					
Health index	23.064	17.892	26.190	24.196	24.920
SES					
Education					
low (ISCED 97 0-2)	0.170	0.455	0.876	0.554	0.419
medium (ISCED 97 3)	0.525	0.199	0.047	0.271	0.429
high (ISCED 97 4-6)	0.305	0.347	0.077	0.174	0.152
hh net assets / 1,000	27.759	72.280	11.070	57.218	6.701
Observations	2501	2836	3609	2399	3002

All means are calculated without the use of individual weights.
[a] Migration background in first generation.
Source: Share w5, own calculation.

As explanatory variables we include demographic characteristics such as age, whether the person lives with a partner, and whether he or she has children. Health information is summarized by a health index, which combines information on chronic conditions and health problems diagnosed by a doctor, self-assessed health, depression (measured by the EURO depression scale ranging from 0 (not depressed) to 12 (depressed)), the number of limitations with activities of daily living and with instrumental activities of daily living, mobility limitations, cognitive ability (measured by whether the person can name the day and year or the interview), and whether the respondent has had at least one hospital stay in the 12 months prior to the interview using principal component analysis.[19] By

[18] The definition of informal care is restricted to personal care, since domestic tasks are often shared between household members and do not necessarily represent care activities. If a household receives informal care but the care recipient is not identified because of multiple disabled household members, all observations from this household are dropped. Thereby, we loose about 5% of the original sample.

[19] The health index is based on principal component analysis. We use the method proposed by Kolenikov and Angeles (2009) based on polychoric and polyserial correlations, which is suited for the inclusion of

including both subjective and objective measures of health, the health index provides a measure of multiple aspects of health. The index is standardized to range from 0 (the best possible health outcome) to 100 (the worst possible health outcome). Elderly individuals in Sweden are the healthiest, while those in Spain are the sickest. Further, socioeconomic status (SES) is included, which is captured by the education level, and household net wealth.[20] The explanatory variables serve as indicators for the need for care as well as for the availability of informal care. Moreover, the education level and household wealth provide information about how easily a person can navigate the LTC system and the affordability of co-payments for formal care (see, e.g. Feinstein (1993) for an overview of the relationship between socioeconomic status and health).

5. Results

Table 3 shows marginal effects from the multinomial logit regression for informal and formal care for individuals aged 65 and above. Results are largely as expected and in line with previous findings (Luppa et al., 2010; Bakx et al., 2015). The older the individual, the higher the probability that he or she relies on formal care services. This is true for all countries in the sample and the effects are highly statistically significant. For informal care marginal effects are usually smaller and their direction is more heterogeneous. The reason is that generally two counteracting effects are observed: as people age, they first switch from no care to informal care but eventually they switch from informal care to formal care. Consequently, only in the Czech Republic, individuals aged 85 or older are also significantly more likely to receive informal care, which points to a strong dependence on informal care in the country. Consistent with this situation, a poor health status, i.e. a higher health index, has almost the same influence on the probability of receiving informal and formal care for elderly Czechs. Likewise, in Spain the association between care and poor health status is similar for formal and informal care. There the effect on informal care is even slightly larger. Like the Czech Republic, Spain depends heavily on informal care, partly due to a lack of formal care options. While poor health also increases both formal and informal care use in all other countries, the effects on formal care dominate as sicker individuals are more likely to receive formal care.

Further, having at least one child increases the probability of informal care and reduces the probability of formal care, though only the effect on formal caregiving is consistently statistically significant. Similar effects might be expected for living with a partner since partners provide care even more frequently than children. Instead, the effect is negative for both informal and formal care. Arguably, spousal support is not always considered informal care and therefore may be under-reported. Moreover, individuals who still have a partner tend to be younger and therefore less in need of care. In Germany, which has

binary and ordinal variables. Results are shown in Table 7 in the Appendix. Descriptive statistics of the variables used to construct the index are reported in Table 6 in the Appendix.

[20] Household net wealth has been adjusted for household size by dividing by the square root of the number of household members.

Table 3: Multinomial logit results

	Germany		Sweden		Spain		France		Czech Republic	
	informal	formal	informal	formal	informal	formal	informal	formal	informal	formal
Demografics										
age 70–75	−0.016	0.027	−0.015	0.017	0.006	0.024	−0.018	0.052**	0.004	0.033*
age 75–80	−0.022	0.039**	−0.008	0.056***	−0.043**	0.100***	0.006	0.077***	−0.022	0.077***
age 80–85	0.014	0.097***	0.007	0.108***	−0.001	0.109***	0.023	0.152***	0.024	0.097***
age 85+	0.019	0.157***	0.012	0.141***	0.013	0.179***	0.010	0.266***	0.115***	0.164***
female	0.014	0.016	0.006	0.012	−0.025**	0.025**	−0.023*	0.044***	0.033*	0.016
at least one child	0.016	−0.055***	0.013	−0.059***	0.054***	−0.085***	0.023	−0.045**	0.038	−0.052***
partner in HH	−0.083***	−0.043***	−0.075***	−0.023**	−0.060***	−0.027**	−0.027**	−0.084***	−0.143***	−0.037***
migration background[a]	0.037**	−0.008	−0.016	0.006	−1.443	0.461	0.060	−0.166	0.039	−0.042
Health										
Health index	0.002***	0.007***	0.003***	0.005***	0.005***	0.004***	0.002***	0.008***	0.004***	0.005***
SES										
Education										
medium (ISCED 97 3)	0.004	−0.010	0.011	−0.003	−0.105**	0.133***	−0.013	0.022	0.009	0.004
high (ISCED 97 4-6)	0.010	0.044**	0.035***	0.026**	−0.044*	0.112***	0.005	0.037*	0.039*	0.026
HH Wealth below median	0.002	0.019	−0.003	−0.006	0.011	−0.012	0.008	−0.027*	−0.033**	0.011
Observations	2501	2501	2836	2836	3609	3609	2399	2399	3002	3002

Standard errors are calculated with the delta-method.
Significance levels: ∗ p <0.10, ∗∗ p <0.05, ∗∗∗ p <0.01
[a] Migration background in first generation.
Source: Share w5, own calculation.

the largest share of first generation immigrants, immigrant background is associated with a higher probability of informal care of 4 PP, which is significant at the 5% level. Given the small share of immigrants in the other countries, the effects in these countries are volatile and statistically insignificant. Looking at socioeconomic factors, we find that more educated individuals are more likely to receive formal care while owning household wealth below the country's median only has a minor influence on care choices. In the Czech Republic it slightly reduces the probability of receiving informal care, while in France the slight reduction occurs for formal care.

In the following, the cross country differences are analyzed further using decomposition methods. It should be kept in mind that the decomposition is a statistical exercise and provides no information on causation. In each decomposition Germany is chosen as the reference country. Theoretically, any country or even an average of all countries could serve as the reference category. The reasons we choose Germany is that first, we find a single country as reference group easier to interpret than an average; second, compared to other European countries Germany can be classified as an intermediate case concerning eligibility rules and generosity of benefits; and third, Germany has a mixed system providing both cash and in kind benefits and can therefore be seen as a benchmark for systems that put a strong emphasis on only one of those benefits. The decomposition results are shown in Table 4 and Table 5 for informal and formal care, respectively. For easier interpretation, variables are grouped into demographic, health, and socioeconomic variables and only aggregate endowment and coefficient effects as well as the overall difference in care use of each country relative to Germany are shown.[21]

The average probability of informal care use is very similar in Germany and Sweden. Decomposition results of small differences ought to be interpreted with caution since even minor differences in coefficients or endowments often explain a larger difference than the one observed. With this caveat in mind, the slightly lower use of informal care (-0.1 PP)

[21] Detailed results are shown in the Appendix.

is completely explained by differences in endowments (153%) and in particular in health status (145%) as the Swedish population is very healthy compared to Germany. With respect to formal care, Swedish elderly have a 4.8 PP lower probability of receiving such care. Similarly, this difference is mainly due to endowment differences (82%), again in particular due to differences in health status (78%) and to a smaller extent in demographic variables (8%). The coefficient effect is not statistically significant. While many similarities in the LTC systems exist between Germany and Sweden – e.g. both offer support for formal as well as for informal care – the Swedish system is generally considered more generous especially with respect to formal care support. Hence, the finding that coefficients are not statistically different is somewhat surprising. Two possible explanations exist. First, the institutional differences are either too small or balance each other out and hence do not lead to different patterns of formal care use. Second, as nursing home residents are under-represented in SHARE, our findings might underpredict Sweden's reliance on formal care if people are more likely to move to nursing homes in Sweden than they are in Germany. Given Sweden's strong focus on nursing home care, this seems the most plausible explanation.

Table 4: Decomposition of informal care

	Sweden		Spain		France		Czech Republic	
	PP	%	PP	%	PP	%	PP	%
E								
Demographics	0.000	−3.284	0.051	167.636	0.001	−7.734	0.017***	11.393***
Health	−0.013***	144.595***	0.008	24.846	0.001	−4.000	0.010***	6.626***
SES	−0.001	12.071	0.012	38.922	0.000	−0.047	−0.008***	−4.935***
C								
Demographics	0.048	−537.759	0.104	344.691	0.010	−60.778	0.014	9.431
Health	0.038	−424.688	0.012	40.696	0.033**	−202.593**	0.003	1.851
SES	0.002	−26.909	−0.002	−7.330	−0.002	11.035	0.001	0.608
Constant	−0.084	935.974	−0.154	−509.461	−0.059	364.117	0.114***	75.027***
Summary								
E	−0.014**	153.383**	0.070***	231.404***	0.002	−11.781	0.020**	13.084**
C	0.005	−53.383	−0.040***	−131.404***	−0.018	111.781	0.132***	86.916***
Total	−0.009	100.000	0.030***	100.000***	−0.016*	100.000*	0.152***	100.000***
Observations	5337	5337	6110	6110	4900	4900	5503	5503

Standard errors are calculated with the delta-method.
Significance levels: * p <0.10, ** p <0.05, *** p <0.01
Source: Share w5, own calculation.

In Spain, elderly individuals have a 3.0 PP higher probability of receiving informal care but a 1.1 PP lower probability of receiving formal care than in Germany. Differences in the endowments alone would explain a 7.0 PP higher rate of informal care use in Spain, whereas differences in coefficients would explain a lower rate of informal care (-4.0 PP). Albeit statistically insignificantly, the negative coefficient effect is driven by the constant term. Given the same health status or demographic characteristics, Spanish individuals are more likely to receive informal care than their German counterparts. With respect to formal care, the endowment and coefficient effects also point in different directions. The worse health status of Spanish elderly and differences in demographic variables alone would result in a higher rate of formal care use in Spain. However, if Spain had Germany's socioeconomic characteristics, formal care use would be lower, resulting in an overall negative endowment

Table 5: Decomposition of formal care

	Sweden		Spain		France		Czech Republic	
	PP	%	PP	%	PP	%	PP	%
E								
Demographics	−0.004**	8.488**	0.024***	−220.134***	0.057***	77.374***	0.007	−26.606
Health	−0.037***	77.595***	0.025***	−232.065***	0.012***	15.973***	0.012***	−43.465***
SES	0.002	−4.509	−0.099***	904.316***	−0.011*	−15.204*	−0.007**	24.535**
C								
Demographics	−0.015	30.481	0.008	−73.409	0.061	83.307	0.155	−580.527
Health	−0.009	19.786	−0.045***	416.287***	−0.021	−29.130	−0.635	2374.922
SES	0.002	−3.934	0.015	−132.975	0.007	8.955	0.063	−234.192
Constant	0.013	−27.907	0.061**	−562.019**	−0.030	−41.274	0.378	−1414.667
Summary								
E	−0.039***	81.573***	−0.049***	452.117***	0.057***	78.143***	0.012**	−45.536**
C	−0.009	18.427	0.038**	−352.117**	0.016	21.857	−0.039***	145.536***
Total	−0.048***	100.000***	−0.011	100.000	0.073***	100.000***	−0.027***	100.000***
Observations	5337	5337	6110	6110	4900	4900	5503	5503

Standard errors are calculated with the delta-method.
Significance levels: * p <0.10, ** p <0.05, *** p <0.01
Source: Share w5, own calculation.

effect (-4.9 PP). Likewise, the coefficient effect (3.8 PP) is the result of two opposing effects: given the same influence of the health status as in Germany, formal care would be lower in Spain (-4.5 PP), but the coefficient effects of the other variables, especially the constant, overcompensate this effect. While informal care use is higher and formal care use is lower in Spain than in Germany due to, e.g., demographic differences, the results are in line with the fact that, contrary to Germany, ambulatory and stationary professional care takes precedence over cash benefits in Spain even though they are not yet nationwide available.

The probability of French elderly to use informal care is 1.6 PP lower than in Germany, which is entirely explained by the coefficient effect (112%). While given the same influence of the health status, French elderly are more likely to receive informal care (3.3 PP), this effect is counteracted by the constant (-5.9 PP); though this latter term is not statistically significant. In contrast, the probability to use formal care is 7.3 PP higher. While 78% of the difference can be explained by differences in endowments, the remaining 22% are driven by differences in coefficients, indicating a general lower preference for informal care and a stronger preference for formal care in France. While eligibility rules are similar between France and Germany a major difference between the two systems are their benefit schemes. Cash benefits are earmarked and monitored in France, but in Germany they are not. Hence, to use those benefits to pay for formal care at home is more likely in France than it is in Germany where benefits can be kept as additional household income. Care must than be compensated by family care instead.

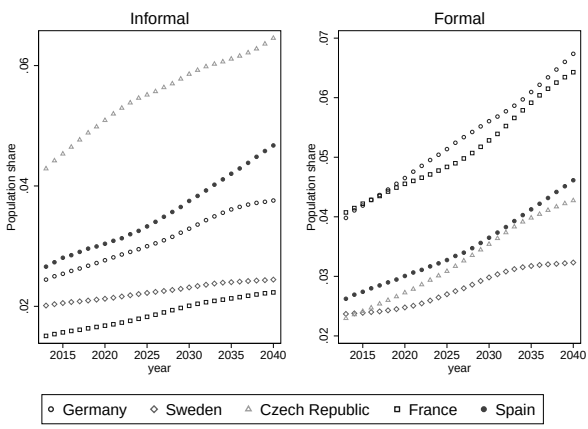
In the Czech Republic, receiving informal care is much more common than in Germany: The difference in the probability of receiving informal care amounts to 15.2 PP. Almost 87% of this difference can be explained by differences in coefficients, 13% by different endowments. Like in France, the constant is primarily responsible for the large coefficient effect. Contrary to informal care, formal care use is low. Czech elderly are 2.7 PP less likely to receive formal care with differences in coefficients explaining over 100% of this

difference. Though statistically insignificant, the health index is driving the coefficient effect; i.e. Czech elderly are less likely to receive formal care for any given level of health. Since public expenditures for LTC in the Czech Republic are low, this result may be caused by barriers to access to formal LTC. It is thus likely that in the Czech Republic family care often acts as care of last resort: Family members have to support their parent or spouse if public support is not available.

6. Projections

While the results discussed in the previous section explore the drivers behind the observed differences in care use patterns across countries, we now relate within country differences in care use trends caused by the unexplained factors, such as cultural preferences and institutional differences, and by population ageing over time. We do this by forecasting future LTC use under different LTC systems using Eurostat population projections and linking them to the estimated care choice probabilities within different age groups.[22]

Figure 1: Projections of informal and formal care



Projected population shares of informal (left graph) and formal care (right graph). Individual weights used for calculation.

Source: Share w5, Eurostat(proj_13npms) , own calculation.

Figure 1 shows baseline results for the projected population shares of informal (left

[22]We use the Eurostat baseline population projection that provides projections by country, age, and gender until 2060 (online data code: proj_13npms; accessed: 04-13-2016). Details on the projection method and data descriptions can be found in European Commission and Economic Policy Committee (2014); European Commission and Eurostat (2015). We hence focus on population ageing only and abstract from changes in LTC use patterns due to e.g. changes in educational attainment, the share of individuals with children or the share of individuals living alone (Lakdawalla and Philipson, 2002).

graph) and formal care (right graph) use under the status quo LTCI schemes in each country in our sample.[23] As the model coefficients are held constant, the growing share of individuals requiring either formal or informal care is driven entirely by population ageing. While population ageing occurs to various extents in all countries, the speed of this process as well as its impact on LTC use differs. Germany and France, for example, already have very old populations and hence the share of individuals requiring LTC is high and will continue to increase, but the increase is less steep than e.g. in the Czech Republic. There, the population is still relatively young but is projected to age quickly. In 2013, according to the Eurostat data the proportion of the population aged 80 years and more is only 3.9% compared to 5.4% in Germany or 5.6% in France. The high fraction of informal care in the Czech Republic despite the still relatively young population highlights the importance of family care within the country's care mix. As demographic ageing catches up in the Czech Republic the share of formal care increases relative to the other countries and almost reaches the level of Spain by the year 2030.

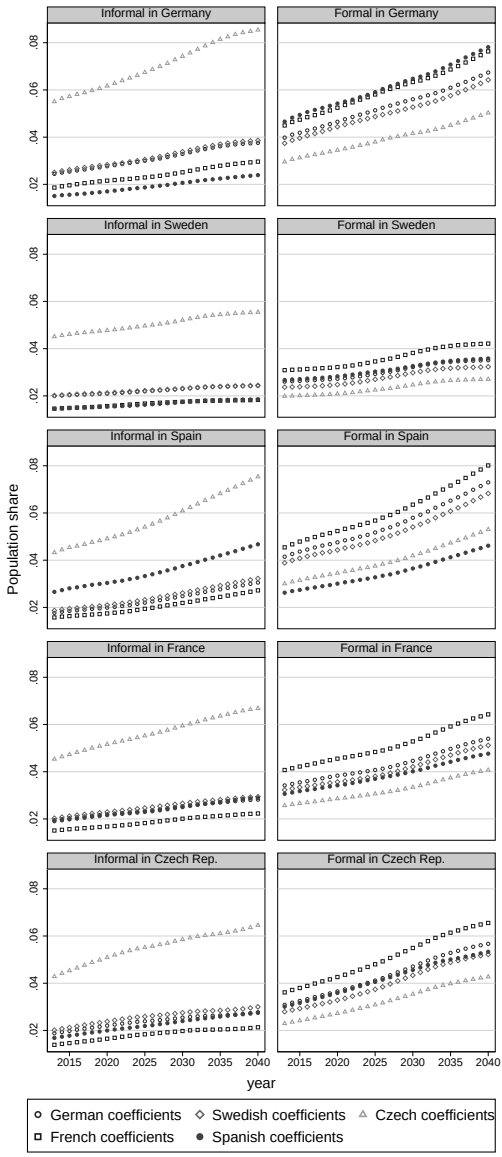
In a second step we are again interested in the different influence of the population structure and unexplained factors (e.g. institutions and preferences). In Figure 2 we use the population projections of one base country and the estimated coefficient results from the multinomial logit of the other countries to project future LTC use in the base country under alternative LTC systems. E.g., all projections in the first row show different scenarios for Germany as the base country, all projections in the second row show different scenarios for Sweden as the base country, and so on. In the first row the circle points indicate projections for Germany using the German model of care use. The differences of this projection compared to the reported projections using other countries' coefficients can be interpreted analogue to the coefficient effect from the decomposition results in section 5. Additionally, in contrast to the decomposition results, combining the multinomial logit results with population projections allows us to make back-of-the-envelope calculations of how the impact of the coefficient effects further evolve due to demographic ageing.

The results in Figure 2 show that institutions and preferences have a strong influence on the projected care mix – independent of the baseline country. E.g., if Germany were to adopt the Czech institutions and preferences, close to 6% of the population would demand informal care in 2013 instead of only slightly more than 2% under the status quo. At the same time, formal care use would drop by 1 PP to about 3%. Those results mirror the findings of our decomposition exercise in section 5. While these differences are still relatively minor, the gaps would increase with demographic ageing. In 2040, more than 8% of the population would use informal care if Czech coefficients were assumed (compared to less than 4% with German coefficients) and 4% would use formal care (compared to almost 7% with German coefficients). A similar pattern holds for all other countries as well. Adopting Czech coefficients would in general increase informal care but reduce formal care. Respectively, using French coefficients leads to increased formal care and decreased

[23] Note that unlike in section 5 we now report population shares instead of shares of people aged 65 and older. For simplicity, we assume that care use for younger individuals is zero.

informal care use instead. Most importantly, the differences become more pronounced as

Figure 2: Projections of care choices with different systems



In this graph we use Eurostat population projections and link them to the estimated care choice probabilities using the multinomial logit. E.g., all projections in the first row show different scenarios within Germany. Thereby, the blue circle indicates projections on the basis of German coefficients, the triangle indicates projected care choices if the coefficients estimated within the Czech Republic are used on German data. Individual weights used for calculation.
Source: Share w5, Eurostat(proj_13npms), own calculation.

demographic ageing increases the overall demand for LTC. Demographic ageing thus not only increases care demand in all countries analyzed here, it also emphasizes the influence of institutional settings.

7. Conclusion and Discussion

In this paper, we compare differences in formal and informal care use in Germany, Sweden, Spain, France, and the Czech Republic to obtain a comprehensive picture of care use and care choices in different European LTC systems. While all analyzed countries face ageing populations and a growing need for LTC, care patterns differ substantially across these countries. We show that these differences can be explained to some extent by differences in population composition, i.e. by the fact that some countries have a younger or healthier population. Yet, in some cases differences in coefficients are responsible for an equal or even larger difference in care use. We attribute these differences to aspects of the LTC system and societal preferences.[24] Our results hence complement findings by Bakx et al. (2015) and Alders et al. (2015) who show that differences in the German and Dutch LTC system characteristics explain a different mix of formal and informal care in these countries by extending the focus of the analysis to additional countries and by including a comprehensive measure of health.

Informal family care is most widely used in countries that have either low support for LTC or in countries that have a strong emphasis on cash benefits that can be used as additional household income or to pay informal carers. For example, the Czech Republic – the country with highest share of informal care in our sample – provides relatively low benefits and informal care supported by cash benefits is the main pillar of the LTC system. Differences in informal care use between Germany – which also offers in-kind benefits – and the Czech Republic are almost entirely explained by different coefficients and hence likely due to the different institutions. The more additional benefit schemes supporting formal care are available, the more choice options individuals have regarding their care decisions. Our results show that more generous in-kind benefits likely increase the demand for professional formal care services. This explains why e.g. Germany and Spain with their mixed systems have a more similar rate of informal and formal care use compared to the Czech Republic. If, like in France, cash benefits are earmarked and can only be used for formal care (and not to reimburse family members) the shift from informal to formal care can be expected to be even higher. However, an increase in formal care use can only occur if such care options are available. Moreover, building up the necessary infrastructure takes time and changes in care use patterns hence happen slowly. This becomes apparent in the comparison between Germany and Spain. While in the German system cash benefits take precedence over in-kind benefits, in Spain in-kind benefits are the preferred option. However, Germany introduced its LTCI reform much earlier in 1995;

[24] However, whether different preferences have led to different institutions or whether institutions themselves remain the driving force is sill an open question.

Spain on the other hand started offering comprehensive in-kind benefits only rather recently in 2006. Consequently, in many areas of Spain the sufficient infrastructure is not available yet and formal care use is thus still lower than in Germany.

To highlight the respective contribution of institutional differences and population ageing, we project LTC use until 2040 for each country under different LTC systems. The results demonstrate that a growing population share of the oldest old will increase the influence of the institutional settings and preferences on the care mix. As demographic ageing increases the overall demand for LTC, country differences between different care choices will likely increase due to their different institutions (assuming they are not reformed).

While population ageing leads to growing LTC needs, the underlying increase in life expectancy is a positive development. Hence, policy efforts to reduce the demand for LTC can only target a reduction of morbidity to reduce the effect of ageing on LTC need. However, such improvements in population health are very difficult to achieve. A second mechanism available to policy makers, shown by our projection models, is the design of the institutional setting. By providing different incentives, both the mix between formal and informal care use as well as the absolute share of either form of care use can be influenced. A caveat, however, remains as our results only consider the share of care use for each form or care but not its costs. While formal care is generally considered to be more expensive, this result might no longer hold if all societal costs are considered (Skira, 2015; Geyer et al., 2016a). Thus, the design of LTC systems should not only focus on reducing public spending for LTC by lowering formal care use but should aim to reduce societal costs while providing adequate care to individuals with LTC needs.

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A. Tables

A.1. Health Index

Table 6: Descriptive statistics of variables in health index

	Germany mean	Sweden mean	Spain mean	France mean	Czech Republic mean
1+ adl limitations	0.137	0.095	0.170	0.178	0.175
2+ adls	0.081	0.038	0.109	0.084	0.088
1+ iadl limitations	0.181	0.142	0.290	0.251	0.236
2+ iadls	0.081	0.038	0.109	0.084	0.088
1+ mobility, arm function and fine motor limitations	0.554	0.476	0.601	0.602	0.631
3+ mobility, arm function and fine motor limitations	0.276	0.171	0.404	0.336	0.343
Self-perceived health - US scale	3.393	2.792	3.543	3.412	3.521
EURO depression scale	2.238	1.953	2.837	2.970	2.514
day/year knowledge	0.105	0.071	0.113	0.006	0.035
stayed in hospital last 12 month	0.238	0.157	0.140	0.189	0.207
heart attack	0.162	0.122	0.143	0.170	0.169
high blood pressure or hypertension	0.508	0.449	0.471	0.387	0.564
high blood cholesterol	0.242	0.180	0.318	0.265	0.269
stroke	0.071	0.073	0.030	0.043	0.080
diabetes or high blood sugar	0.174	0.120	0.204	0.141	0.233
chronic lung disease	0.088	0.048	0.070	0.074	0.067
cancer	0.124	0.104	0.053	0.060	0.061
stomach or duodenal ulcer	0.048	0.040	0.040	0.028	0.046
parkinson	0.013	0.009	0.019	0.015	0.014
cataracts	0.168	0.176	0.136	0.104	0.154
hip or other fractures	0.137	0.099	0.081	0.064	0.108
alzheimer's disease, dementia, senility	0.019	0.019	0.049	0.022	0.018
other affective/emotional disorders	0.054	0.035	0.076	0.065	0.027
rheumatism	0.286	0.237	0.306	0.437	0.357
other conditions	0.155	0.205	0.237	0.126	0.137
Observations	2501	2836	3609	2399	3002

All means are calculated without the use of individual weights.
Source: Share w5, own calculation.

Table 7: Scoring coefficients as basis of health index

Variable	Categories	Scoring coefficients
adl limitations	0	-0.5050
	1	-0.2990
	2	-0.2846
	3	-0.2782
	4	-0.2743
	5	-0.2712
	6	0.1363
iadl limitations	0	-0.5336
	1	-0.3226
	2	-0.3004
	3	-0.2907
	4	-0.2850
	5	-0.2812
	6	-0.2781
	7	0.1384
mobility, arm function and fine motor limitations[a]		0.3239
self-perceived health (US scale)	1	-0.9178
	2	-0.6938
	3	-0.5003
	4	-0.3548
	5	0.1208
EURO depression scale[a]		0.2510
day/year knowledge	0	-0.1611
	1	0.0431
stayed in hospital last 12 month	0	-0.2947
	1	0.0667
heart attack	0	-0.2615
	1	0.0618
high blood pressure or hypertension	0	-0.1728
	1	0.0229
high blood cholesterol	0	-0.1425
	1	0.0287
stroke	0	-0.2806
	1	0.0761
diabetes or high blood sugar	0	-0.2088
	1	0.0475
chronic lung disease	0	-0.2220
	1	0.0591
cancer	0	-0.1019
	1	0.0268
stomach or duodenal ulcer	0	-0.1820
	1	0.0505
parkinson	0	-0.2722
	1	0.0783
cataracts	0	-0.2127
	1	0.0507
hip or other fractures	0	-0.2068
	1	0.0531
alzheimer's disease, dementia, senility	0	-0.3610
	1	0.1020
other affective/emotional disorders	0	-0.2834
	1	0.0774
rheumatism	0	-0.2452
	1	0.0442
other conditions	0	-0.0524
	1	0.0119

The scoring coefficients are calculated using principal component analysis. We use the method proposed by Kolenikov and Angeles (2009) based on polychoric and polyserial correlations, which is suited for the inclusion of binary and ordinal variables. The heath index is based on the estimated score and standardized to range from 0 (the best possible health outcome) to 100 (the worst possible health outcome). [a] Because the number of the categories is greater than 10 we treat them as continuous.

Source: Share w5, own calculation.

A.2. Full Decomposition Results

Table 8: Decomposition of informal care

	Sweden		Spain		France		Czech Republic	
	PP	%	PP	%	PP	%	PP	%
E								
age 65–70	−0.000	4.798	0.000	1.028	−0.000	0.026	−0.004***	−2.513***
age 70–75	0.001**	−5.705**	0.000	0.906	0.000	−2.287	0.001***	0.686***
age 75–80	0.000	−1.990	0.000	0.188	0.000	−0.138	0.001***	0.797***
age 80–85	0.000	−0.262	0.000	0.891	0.000	−0.772	0.000	0.018
age 85+	0.000**	−2.470**	0.001	4.348	0.000	−2.549	−0.002***	−1.072***
male	0.000	−0.931	−0.000	−0.509	−0.000	0.487	0.002**	1.056**
female	0.000	−0.931	−0.000	−0.509	−0.000	0.487	0.002**	1.056**
no child	0.000	−0.034	0.000	0.301	0.000	−0.026	0.000	0.212
at least one child	0.000	−0.034	0.000	0.301	0.000	−0.026	0.000	0.212
no partner in HH	−0.001***	6.041***	−0.000	−1.252	0.000	−2.421	0.009***	5.968***
partner in HH	−0.001***	6.041***	−0.000	−1.252	0.000	−2.421	0.009***	5.968***
no migration background	0.000	−3.904	0.025	81.598	−0.000	0.953	−0.001	−0.497
migration background[a]	0.000	−3.904	0.025	81.598	−0.000	0.953	−0.001	−0.497
Health index	−0.013***	144.595***	0.008	24.846	0.001	−4.000	0.010***	6.626***
low (ISCED 97 0-2)	−0.003*	35.078*	0.006	20.113	−0.000	0.697	−0.004**	−2.867**
medium (ISCED 97 3)	0.001	−15.877	0.007	23.514	0.000	−2.038	0.001	0.498
high (ISCED 97 4-6)	0.001***	−7.134***	−0.001	−4.741	−0.000	1.294	−0.004**	−2.569**
HH Wealth below median	−0.000	0.003	0.000	0.019	0.000	−0.000	0.000*	0.002*
HH Wealth above median	−0.000	0.003	0.000	0.019	0.000	−0.000	0.000*	0.002*
C								
age 65–70	−0.000	2.455	−0.001	−1.691	−0.006	36.440	−0.009	−5.599
age 70–75	−0.002	26.516	0.001	2.951	−0.005	31.897	0.001	0.598
age 75–80	0.008	−93.389	−0.000	−0.599	0.004	−24.143	0.001	0.749
age 80–85	−0.001	10.620	−0.000	−0.768	0.001	−7.557	−0.003	−1.977
age 85+	−0.002	19.573	0.000	0.414	0.001	−4.060	0.004	2.434
male	0.004	−49.811	0.002	5.741	0.008	−46.914	−0.002	−0.997
female	−0.004	48.514	−0.002	−5.591	−0.007	45.692	0.001	0.971
no child	0.000	−4.249	−0.000	−0.785	−0.001	3.611	−0.000	−0.174
at least one child	−0.003	34.396	0.002	6.357	0.005	−29.227	0.002	1.406
no partner in HH	−0.002	27.601	−0.001	−2.615	−0.005	31.489	−0.002	−1.236
partner in HH	0.006	−64.685	0.002	6.129	0.012	−73.797	0.004	2.896
no migration background	0.051	−567.406	0.116	383.944	0.004	−27.733	0.018	11.867
migration background[a]	−0.006	72.108	−0.015	−48.793	−0.001	3.524	−0.002	−1.508
Health index	0.038	−424.688	0.012	40.696	0.033**	−202.593**	0.003	1.851
low (ISCED 97 0-2)	−0.004	45.206	0.001	3.329	0.001	−4.903	−0.001	−0.635
medium (ISCED 97 3)	−0.002	21.760	−0.003	−11.192	−0.003	17.042	0.000	0.254
high (ISCED 97 4-6)	0.008	−93.936	0.000	0.533	0.000	−1.110	0.002	0.993
HH Wealth below median	−0.007	75.205	−0.000	−0.040	−0.001	7.843	−0.009	−5.640
HH Wealth above median	0.007	−75.145	0.000	0.040	0.001	−7.837	0.009	5.635
Constant	−0.084	935.974	−0.154	−509.461	−0.059	364.117	0.114***	75.027***
Summary								
E	−0.014**	153.383**	0.070***	231.404***	0.002	−11.781	0.020**	13.084**
C	0.005	−53.383	−0.040***	−131.404***	−0.018	111.781	0.132***	86.916***
Total	−0.009	100.000	0.030***	100.000***	−0.016*	100.000*	0.152***	100.000***
Observations	5337	5337	6110	6110	4900	4900	5503	5503

Standard errors are calculated with the delta-method.

Significance levels: * p <0.10, ** p <0.05, *** p <0.01

[a] Migration background in first generation.

Source: Share w5, own calculation.

Table 9: Decomposition of formal care

	Sweden		Spain		France		Czech Republic	
	PP	%	PP	%	PP	%	PP	%
E								
age 65–70	−0.004***	8.151***	0.004***	−36.887***	−0.000***	−0.178***	−0.007***	24.903***
age 70–75	0.002***	−4.073***	0.006***	−58.451***	0.006***	7.836***	0.002***	−5.891***
age 75–80	0.000	−0.765	−0.000	0.297	0.001**	1.368**	0.000	−1.021
age 80–85	0.000***	−0.238***	0.002***	−19.598***	0.002***	2.450***	0.000*	−0.276*
age 85+	0.001***	−2.340***	0.010***	−90.393***	0.013***	17.718***	−0.002***	6.652***
male	0.000	−0.498	0.001	−5.171	0.002**	2.585**	0.001*	−4.625*
female	0.000	−0.498	0.001	−5.171	0.002**	2.585**	0.001*	−4.625*
no child	−0.001***	3.070***	−0.001***	8.174***	−0.000*	−0.144*	−0.002**	5.759**
at least one child	−0.001***	3.070***	−0.001***	8.174***	−0.000*	−0.144*	−0.002**	5.759**
no partner in HH	−0.000***	0.977***	−0.001***	8.767***	0.007***	8.965***	0.005***	−19.650***
partner in HH	−0.000***	0.977***	−0.001***	8.767***	0.007***	8.965***	0.005***	−19.650***
no migration background	−0.000	0.327	0.002	−19.321	0.009	12.684	0.002	−6.970
migration background[a]	−0.000	0.327	0.002	−19.321	0.009	12.684	0.002	−6.970
Health index	−0.037***	77.595***	0.025***	−232.065***	0.012***	15.973***	0.012***	−43.465***
low (ISCED 97 0-2)	−0.004	7.525	−0.066***	602.825***	−0.008*	−11.516*	−0.004	14.116
medium (ISCED 97 3)	0.005	−9.705	−0.022**	203.180**	0.000	0.507	0.001	−2.823
high (ISCED 97 4-6)	0.001***	−2.332***	−0.011***	97.872***	−0.003	−4.194	−0.004*	13.239*
HH Wealth below median	−0.000	0.001	−0.000	0.220	−0.000*	−0.000*	−0.000	0.001
HH Wealth above median	−0.000	0.001	−0.000	0.220	−0.000*	−0.000*	−0.000	0.001
C								
age 65–70	−0.006	13.286	−0.003	25.928	−0.010	−13.118	−0.132	494.544
age 70–75	−0.008	17.557	−0.002	22.492	−0.004	−6.004	−0.054	199.968
age 75–80	0.005	−9.970	0.006**	−55.285**	0.001	2.036	0.089	−332.038
age 80–85	0.003	−5.907	−0.001	9.317	0.000	0.408	−0.026	96.755
age 85+	0.000	−0.445	−0.000	1.107	0.003	4.076	0.035	−129.738
male	0.001	−1.514	0.001	−6.979	−0.003	−4.407	−0.030	111.862
female	−0.001	1.474	−0.001	6.797	0.003	4.292	0.029	−108.948
no child	0.001	−2.909	0.001	−4.637	−0.002	−2.305	−0.004	15.350
at least one child	−0.011	23.550	−0.004	37.533	0.014	18.662	0.033	−124.249
no partner in HH	−0.003	6.517	−0.002	21.076	0.002	3.123	0.040	−148.190
partner in HH	0.007	−15.274	0.005	−49.394	−0.005	−7.319	−0.093	347.295
no migration background	−0.002	4.715	0.010	−93.210	0.071	96.071	0.307	−1149.181
migration background[a]	0.000	−0.599	−0.001	11.846	−0.009	−12.209	−0.039	146.043
Health index	−0.009	19.786	−0.045***	416.287***	−0.021	−29.130	−0.635	2374.922
low (ISCED 97 0-2)	−0.000	0.074	−0.007**	60.722**	−0.000	−0.668	−0.007	27.867
medium (ISCED 97 3)	0.004	−9.314	0.022*	−202.502*	0.015	20.199	0.136	−508.050
high (ISCED 97 4-6)	−0.003	5.291	−0.001	8.763	−0.008	−10.561	−0.066	245.751
HH Wealth below median	−0.009	18.713	−0.006*	52.114*	−0.014	−18.540	−0.080	299.796
HH Wealth above median	0.009	−18.698	0.006*	−52.073*	0.014	18.525	0.080	−299.557
Constant	0.013	−27.907	0.061**	−562.019**	−0.030	−41.274	0.378	−1414.667
Summary								
E	−0.039***	81.573***	−0.049***	452.117***	0.057***	78.143***	0.012**	−45.536**
C	−0.009	18.427	0.038**	−352.117**	0.016	21.857	−0.039***	145.536***
Total	−0.048***	100.000***	−0.011	100.000	0.073***	100.000***	−0.027***	100.000***
Observations	5337	5337	6110	6110	4900	4900	5503	5503

Standard errors are calculated with the delta-method.

Significance levels: * p <0.10, ** p <0.05, *** p <0.01

[a] Migration background in first generation.

Source: Share w5, own calculation.