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ORIGINAL INVESTIGATION

Transitions in formal and informal care utilisation amongst older Europeans: the impact of national contexts

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Abstract The objective of this study was to explore how long-term care systems, and in particular the incorporation of needs-based entitlements to care services or benefits, influence formal and informal care utilisation dynamics. We used the Survey of Health, Ageing and Retirement in Europe (SHARE) wave 1 and 2 data, restricting the sample to persons 65+ from 9 European countries ($N = 6{,}293$). The effects of changes in health and household composition on formal and informal care transitions were estimated using logistic regression, allowing these effects to vary across countries. The results indicated that, in all countries, formal and informal care were more often complements than substitutes. The likelihood of becoming a formal or informal care user varied significantly between countries. In the Scandinavian countries and in several continental European countries with needs-based entitlements, the transition to formal care was strongly related to informal support being or becoming unavailable. We found little evidence of country differences in the effect of health variables on the transition to formal care. The analysis suggested that, whilst rates of formal care utilisation continue to differ considerably between European countries, formal care allocation practices are not very dissimilar across Northern and continental European welfare states, as we found evidence for all countries of targeting of older persons living alone and of the most care-dependent older people.

Keywords Long-term care · Longitudinal analysis · Informal care · Formal home care · SHARE

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Introduction

EU Member States are committed to providing accessible, high-quality and sustainable long-term care (LTC). All European LTC systems provide a range of home and residential care services, often complemented with payments for care or care allowances, as well as a substantial informal care provision. Despite this common framework, levels of protection against the risk of care dependency vary widely. A major institutional difference concerns the level of universal needs-based entitlements, i.e. access to publicly-funded services or cash support based on severity of needs, regardless of financial or familial situation (OECD 2005). LTC arrangements are also influenced by cultural factors. Differences in preferences, values and norms concerning the role of the family, the public sector and the market all shape the use of care in Europe (Pfau-Effinger 2005). The study that is reported here explored how different institutional and cultural contexts influence dynamics of informal and formal home care utilisation by older adults in nine European countries: Sweden, Denmark, the Netherlands, Belgium, France, Germany, Austria, Italy and Spain. Cross-national differences were examined in transition rates to informal and formal care use and in patterns of substitution and complementarity between the two types of support. The

inter-relationship between formal and informal care has been studied extensively elsewhere (Litwin and Attias-Donfut 2009; Brandt et al. 2009). A large number of studies for the United States and for Europe have considered whether formal and informal care are substitutes or complements. The results tend to suggest the latter to be true. However, although substitution and complementarity are essentially dynamic phenomena, the data used have more often been cross-sectional than longitudinal. Other research has examined predictors of formal and informal care, but, again, mostly using cross-sectional data. The present study, by contrast, focused on transition patterns over time (substitution and complementarity, transition to informal and formal care use). The analysis also considered cross-national differences in the impact on the transition to formal care of two factors consistently identified as being strongly associated with home care use: health status and household composition (Kadushin 2004). Whilst various other studies have examined country differences in formal and informal care use and macro-level influences on care utilisation (see for instance Motel-Klingebiel et al. 2005), very few have explored how macro-contextual factors might affect the impact of individual-level determinants. Using the unique opportunities of the longitudinal and cross-nationally harmonised SHARE data to combine a comparative and dynamic approach, the analysis presented here contributes to the empirical literature on determinants of LTC care use and to the study of LTC systems in Europe.

Macro-contextual factors

According to several pioneering studies, levels of service provision and public expenditure on LTC varied widely across Europe in the 1980s and 1990s (Evers and Svetlik 1991; Jamieson 1991; Pacolet et al. 1999; Tester 1996). More recent research has demonstrated the persistence of different LTC systems in Europe, whilst also finding evidence of major reforms in some countries (Colombo et al. 2011; Da Roit and Le Bihan 2010; Huber et al. 2009; Kraus et al. 2010; OECD 2005; Pavolini and Ranci 2008; Pommer et al. 2007). In this section, we briefly discuss LTC systems in Europe to motivate our classification of countries as regards needs-based entitlements.

Central to the reforms introduced in several continental welfare states during the 1990s was the implementation of universal entitlements to public support, in-kind and/or by means of cash benefits (Da Roit and Le Bihan 2010; Morel 2007; Pavolini and Ranci 2008). The long-term care insurance in Germany (1994), the *Pflegegeld* scheme in Austria (1993) and the *Allocation Personnalisée d'Autonomie* (APA) in France (2002) all introduced non-means-tested benefits for care-dependent persons. Under these systems, benefit eligibility solely depends on a threshold level of care needs, and benefit levels vary with severity of care dependency.

In *Scandinavia and the Netherlands,* universal entitlements to public support for care-dependent persons are long-existing. Since the 1990s, however, services in Sweden have become increasingly restricted to severely care-dependent persons with limited familial and economic resources, whilst copayments have increased (Da Roit and Le Bihan 2010; Rauch 2008). Similar trends have been observed in the Netherlands (Schut and Van den Berg 2010), where stringent rationing policies were implemented during the 1990s, resulting in longer waiting lists. Increasingly, the availability of informal care has been taken into account in determining eligibility and entitlement amounts for publicly financed care. In Denmark, unlike in Sweden and the Netherlands, the level of universal care provision has remained high. Disability assessments have been tightened somewhat, but tests of familial resources are still rather uncommon and public home help services are provided free of charge (Rauch 2008).

In the Mediterranean countries, publicly financed services are, generally speaking, traditionally scarce. Families continue to assume a key role in providing support to care-dependent older people (Brandt et al. 2009; Albertini et al. 2007). National universal needs-based entitlements are non-existent or limited. In Italy, a universal cash scheme, the *Indennità di accompagnamento*, has been in force since the 1980s. Benefits are restricted to severely care-dependent persons and amounts are rather low, but some regional and local authorities provide additional means-tested benefits (Da Roit and le Bihan 2010). In Spain, access to—scarcely provided—publicly-funded LTC services has traditionally been based on an assessment of needs and financial resources, with considerable regional differences in eligibility criteria (Comas-Herrera and Wittenberg 2003). In 2006, a new law (*ley de dependencia*) was passed, introducing an entitlement to claim benefits based on grade of dependency (Gutiérrez et al. 2010; Costa-Font 2010), but thus far its implementation has been highly fragmented across regions, and harmonisation with respect to entitlement and co-payment criteria has been lacking (Gutiérrez et al. 2010).

Belgium occupies an intermediate position with regard to universal entitlements (Geerts 2009; Willemé 2010). On the one hand, nursing and personal care, both in residential care facilities and at home, are largely part of the public healthcare system, which combines universal coverage with relatively low rates of out-of-pocket payment. On the other, availability of home help, which is organised and subsidised by the regional authorities, is limited by yearly quotas and there are no uniform and standardised allocation criteria determining entitlement to services and levels of help.

Not only do entitlements to public support differ across Europe, but there also appear to be different LTC cultures (Daatland and Herlofson 2003; Pfau-Effinger 2005). Earlier research has revealed a clearly marked north–south divide, with individualistic values and public responsibility norms prevailing in Northern Europe, and familialism and norms of filial obligations more dominant in Southern European countries (Reher 1998; TNS Opinion and Social 2007). This is confirmed by SHARE respondents' answers to the question of who—the family or the state—should bear responsibility for personal care for older persons (Geerts 2009). In the Mediterranean countries public opinion is much more in favour of familial responsibility than in Northern Europe and the Netherlands, where personal care is seen mostly as the state's responsibility. Germany and Austria share a rather familialistic outlook with the countries of Southern Europe, whilst Belgium and France hold the middle ground.

As several authors have argued, institutional and cultural factors are not independent, but contradictions are possible between the institutions and the culture within a 'care arrangement', increasing the likelihood of change (Brandt et al. 2009; Daatland and Herlofson 2003; Pfau-effinger 2005; Pommer et al. 2007). Table 1 summarises this discussion of needs-based entitlements and degree of familialism in European countries and indeed suggests that there is only partial congruence between institutional and cultural characteristics of LTC systems. In the Mediterranean countries, extensive familial obligations traditionally coincide with a rudimentary care infrastructure. Whilst this pattern still holds in countries such as Greece and Italy, service levels have risen in recent years in Spain. In Scandinavia and the Netherlands, broadly accessible public services go hand in hand with limited familial obligations. However, this coexistence of needs-based entitlements with an individualistic care culture is not observed in Austria and Germany, where needs-based entitlements coincide with a high level of familialism.

Table 1 Institutional and cultural characteristics of LTC arrangements

Institutional: universal needs-based entitlements[a]	Cultural: level of familialism		
	High	Medium	Low
Yes	Austria, Germany	France	Netherlands, Sweden, Denmark
No/Partially	Italy, Spain	Belgium	

[a] In the assessment of whether universal needs-based entitlements exist, we do not consider the exact legal status of such entitlements. They may be enforceable rights for the individual, or obligations on the part of the service provider. Whilst this is an important distinction in many respects, for our purposes it is important that persons who are in need can expect to get a service, regardless of the exact legal basis of this expectation

Individual-level determinants

Determinants of formal home care utilisation have been examined in numerous studies, predominantly in the United States, but also in Europe (see Kadushin 2004 for a review). The behavioural model proposed by Andersen and colleagues (Aday and Andersen 1974; Andersen 1995, 2008; Andersen and Newman 1973) has become the dominant model in this research field (Calsyn and Winter 2000; Kadushin 2004; Lyons and Zarit 1999). The Andersen model identifies societal determinants (technology and norms), health services system level determinants (resources and organisational characteristics) and individual determinants of healthcare utilisation. Determinants at the individual level may be divided into three categories: predisposing characteristics, enabling resources and need factors. Predisposing factors influence the propensity towards use and include demographical variables such as age and gender, socio-structural variables such as education and occupation, and attitudes to or beliefs about disease and care. Enabling factors facilitate or impede access to health services and include income and health insurance coverage. Need factors represent the most immediate cause of health service use and include measures of perceived and evaluated illness. Age, living alone or, more generally, a low level of informal support, and need variables, in particular limitations in activities of daily living (ADL) and limitations in instrumental activities of daily living (IADL) have consistently been found to be strongly associated with utilisation of home care services (Larsson 2004; Geerts 2010; Kadushin 2004). The Andersen model has also proved useful for analysing the predictors of informal care. Health and the presence of an informal social network, in particular of a partner and/or children, have been shown to be important predictors of informal care use.

The Andersen model and its empirical applications have been criticised for largely ignoring the dynamic nature of care utilisation (Pescosolido and Kronenfeld 1995; Pescosolido et al. 1999). However, the longitudinal approach is rapidly gaining ground, also in Europe, where an increasing number of longitudinal datasets have become available. Geerlings et al. (2005), for example, examined static and dynamic predictors of the transition to informal and professional care use amongst older people in the Netherlands. They found that need factors are important predictors of most transitions in care, and that factors such as age, partner status and income, also played a role. Longitudinal studies of the oldest old by Armi et al. (2008), using the Swiss SWILSO-O data, and by Bravell et al. (2008), using

data for Sweden, are other examples of research examining transitions in formal and informal care utilisation over time. The study by Bravell et al. (2008) showed that use of formal help by the oldest old increased with age, and the study by Armi et al. revealed that informal care use increased significantly with frequency of formal care. A further critique of the empirical literature is that most studies have focused on individual-level determinants and have failed to examine macro-contextual factors (societal determinants and characteristics of the service system), which are part of the original conceptual model (Declercq et al. 2009; Muramatsu and Campbell 2002).

Research questions

The present study explored how macro-contextual factors affect transitions in formal and informal care utilisation by older Europeans. Two research questions were considered. First, do transitions in formal and informal home care use differ between countries with a different institutional and cultural context? Second, do countries differ in the extent to which becoming a formal care user is related to changes in the health status and living situation of older people?

We hypothesised that, in countries with *stronger needs-based entitlements* to LTC services or allowances, rates of transition to formal care would be higher, more strongly associated with health changes and less related to changes in household composition. We assumed that needs-based entitlements would facilitate access to formal care services for persons confronted with deteriorating health and rising care dependencies. Service access might be facilitated directly, in case of in-kind benefits, or indirectly, in case of cash benefits that can be used to buy care from service providers. Under such conditions, formal care utilisation rates will be higher than in countries where needs-based entitlements are absent. In the case of needs-based entitlements, it may also be reasonably assumed that health status criteria have a strong impact on formal care access and that the circumstance of living alone or with others—and thus potential availability of informal care within the household—is less relevant to formal care allocation.

Furthermore, the *level of familialism* may be assumed to influence the association between potential availability and actual provision of informal care. In countries with strong norms of familial responsibility, not only will family members of care-dependent persons generally feel more obliged to provide care, but older people will also feel more inclined to call upon family members, whilst in more individualistic countries, both provision and receipt of informal care will be more of an individual choice (Pommer et al. 2007). Daatland and Herlofson (2003), for instance, found a correlation between normative familialism and actual or 'expressed' familialism, albeit a rather weak one. Drawing upon these findings, we hypothesised that, in more familialistic countries, transition rates to informal care use would be higher and transitions to formal care use more strongly related to unavailability of informal care. As Germany and Austria combine universal needs-based entitlements with a high level of familialism, the impact in these countries was assumed to be mixed.

Our study is not the first to explore cross-national variations in the association between formal and informal care use and care needs or other individual-level determinants. Previously, Shea et al. (2003) found evidence of differences between Sweden and the United States in the targeting of assistance according to ADL limitations. Broese van Groenou et al. (2006) compared the association of older people's socioeconomic status with their receipt of formal and informal care in four European countries. However, both studies relied on national survey data and were hampered by data comparability problems. Fontaine et al. (2007) drew on the harmonised SHARE data and observed very homogeneous patterns across Europe in children's responsiveness to their parents' level of dependency and partner status. Their findings were based on a cross-country comparison of bivariate associations. Kalmijn and Saraceno (2006), using a multilevel model, provided evidence of significant cross-level interaction effects of parents' need variables and level of familialism on the likelihood of receiving care from children. The latter two studies, both of which used SHARE data, were cross-sectional.

By combining a contextual and a longitudinal approach, the present study contributes both to the empirical literature on determinants of LTC use, which has most often been based on national data and has failed to examine macro-contextual factors, and to European comparative studies of care utilisation, which to date have been predominantly cross-sectional.

Data and methods

The data used in this study are from the Survey of Health, Ageing and Retirement in Europe, release 2.3.1. SHARE is a cross-national panel survey collecting information on the health, the socioeconomic status and the family networks of individuals aged 50 years and over. The analytical sample for this study was restricted to respondents aged 65 and over, living at home, who had participated in both the first and second waves. Younger respondents were excluded from the analysis as few persons below 65 use formal or informal care. Also, in some European countries, LTC regulations for younger disabled persons and older persons differ. Only persons residing at home were included in the analysis, as in some countries the population in residential

care had not been covered in the (wave 1) sampling frame, whilst in others it had. First-wave interviews took place in 2004 and 2005; the second wave was carried out in 2006 and 2007. Switzerland and Greece were excluded from the analysis due to either too many missing values on formal care use variables (Switzerland) or a very limited number of formal care users (Greece).

Variables

To identify care transitions, respondents' care utilisation at each wave was classified into one of the following categories: no care (N), informal care only (I), formal care only (F), informal and formal care (IF). Formal home care receipt includes professional or paid nursing or personal care, professional or paid home help for domestic tasks, and meals-on-wheels. It also includes home care or paid home help from private providers. Respondents were classified as formal care users if they had received any of these forms of care in the course of the last 12 months before the interview. Informal care was defined as including both informal care from outside and from within the household. Informal care from outside the household includes personal care, household help and help with paperwork during the 12 months leading up to the interview (wave 1) or since the past interview (wave 2) from any family member from outside the household or any friend or neighbour. For persons living with a spouse or partner, answers to the questions on support from outside the household were provided by the person designated as family informant, without explicitly mentioning who was the recipient within the household. In case of help with personal care, we attributed this support to the members of the couple who had experienced difficulties with basic activities of daily living. With respect to help with household tasks from outside the household, we assumed both members of the couple to receive such help. With regard to informal care from within the household, the SHARE questionnaire is restricted to help with personal care (during the past 12 months for wave 1 and since the past interview for wave 2). Therefore, an indicator was constructed to impute help received from within the household in relation to household tasks or paperwork. To this end, use was made of an algorithm proposed by Pommer et al. (2007). If a respondent living with others reported difficulties with everyday activities, due to a health or physical problem, and receiving help with these activities, but not informal help from outside the household, or formal help, or regular help with personal care from someone in the household, then he/she was assumed to receive help from within the household with household tasks or paperwork. Respondents were classified as informal care users if they had received informal help with personal care, household chores or paperwork, either from outside or from within the household.

Care transitions were defined as changes in care utilisation categories between wave 1 and wave 2. Theoretically, 16 (4×4) unique care transitions are possible. The present study focuses on four specific transition patterns that have attracted much interest in the LTC literature: (1) substitution, (2) complementarity, (3) transition to formal care use and (4) transition to informal care use. Substitution was defined as the transition from informal care only at wave 1 to formal care only at wave 2, or vice versa. Whilst the latter pattern is labelled by some authors as 'reverse substitution' (e.g. Ward-Griffin and Marshall 2003), in our study it was classified under the more general heading of 'substitution'. Complementarity was defined as the transition from no care or from formal or informal care only to the combined use of formal and informal care. Transition to formal care was defined as the transition from no care or informal care only to formal care, alone or combined with informal care. (Note that the transition to formal care and complementarity are partially overlapping.) It would be relevant, certainly for gaining a better understanding of the nature of the relationship of formal and informal care, to make further distinctions within the transition-to-formal-care category, for example between the transition from no care to formal care only or from informal care only to formal care only. However, as in some countries the number of observations in the disaggregated categories was too limited to allow multivariate analysis, several somewhat diverse patterns had to be combined into a single category. The same qualification holds for the transition to informal care, which was likewise defined as the transition from no care or formal care only to informal care, alone or in combination with formal care.

The independent variables considered in the analysis are changes in health status and changes in household composition. Health change measures included change in number of ADL limitations, in number of IADL limitations, and in chronic health conditions. The number of ADL limitations could range from 0 to 6 and included problems with the following activities: dressing, walking across a room, bathing or showering, eating, getting in and out of bed and using the toilet. IADL limitations could range from 0 to 7, and included difficulties reading a map, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden and managing money. Changes between wave 1 and wave 2 in the number of limitations were recoded into three categories: decreasing, stable and increasing. The chronic-conditions-change variable encompassed four categories: no chronic conditions at both waves (stable no chronic conditions), no chronic conditions at wave 1 and chronic conditions at wave 2 (emergent

chronic conditions), chronic conditions at wave 1 and no chronic conditions at wave 2 (recovery), stable suffering from one or more chronic conditions at both waves (stable chronic conditions). The change-in-household-composition variable used in this study consisted of two categories: respondents living with others at both waves or having made a transition from living alone at wave 1 to living with others were grouped together in one category (living with others), whilst respondents continuously living alone or having made a transition from living with others to living alone were grouped together in a second category (living alone). Again, different transition patterns had to be grouped together because of limited numbers of household composition changes.

The selection of other individual determinants of care utilisation to include in the model as control variables was based on the Andersen model (Aday and Andersen 1974; Andersen 1995, 2008; Andersen and Newman 1973). Selected *predisposing* factors included age, gender and educational level. Age was included as follows: (1) 65–74, (2) 75–84 and (3) 85 or more years. Educational level was coded using ISCED 97 categories, ranging from (0) = no or pre-primary education to (6) = second stage of tertiary education, and introduced as a continuous variable. Baseline income was included as an *enabling* characteristic; the income measure was based on the gross household income standardised by the square root of the household size. Country-specific decile scores were introduced as a continuous variable. Finally, baseline ADL and IADL limitations and chronic diseases, recoded as dichotomous indicators 'no limitations/diseases' versus 'one or more limitations/diseases', were included as *need* variables.

Table 2 shows the weighted distribution of the study variables by country.

Analysis

The analysis proceeded as follows. First, a descriptive analysis of cross-country variation in transition patterns was carried out. Second, country differences in transitions

Table 2 Proportions and means of study variables per country, weighted by longitudinal weights, only cases used in analysis

	DK	SW	NL	BE	FR	DE	AT	IT	ES
Transition to informal care	0.240	0.259	0.219	0.290	0.191	0.371	0.303	0.229	0.307
Transition to formal care	0.090	0.057	0.106	0.141	0.172	0.090	0.104	0.087	0.091
Age (at baseline)									
Aged 65–74	0.595	0.561	0.655	0.551	0.537	0.607	0.585	0.581	0.565
Aged 75–84	0.334	0.346	0.318	0.392	0.391	0.354	0.371	0.367	0.356
Aged 85 +	0.071	0.093	0.027	0.057	0.072	0.039	0.044	0.052	0.079
Female	0.537	0.547	0.531	0.577	0.591	0.575	0.605	0.594	0.565
Became or remained single	0.428	0.463	0.398	0.325	0.396	0.373	0.464	0.317	0.255
Education ISCED code (mean)	2.863	2.203	2.386	2.426	1.793	3.130	2.657	1.312	1.022
Standardised household income decile (at baseline) (mean)	5.764	5.365	5.473	5.619	5.557	5.238	5.356	5.264	5.113
1 or more ADL limitations at baseline	0.095	0.085	0.052	0.165	0.143	0.137	0.106	0.183	0.160
1 or more IADL limitations at baseline	0.170	0.168	0.137	0.235	0.222	0.180	0.223	0.247	0.297
1 or more chronic diseases at baseline	0.840	0.850	0.759	0.850	0.880	0.855	0.812	0.869	0.875
Change in ADL limitations									
Decrease	0.053	0.055	0.040	0.086	0.079	0.069	0.054	0.075	0.086
Stable	0.872	0.867	0.878	0.783	0.813	0.806	0.815	0.758	0.738
Increase	0.075	0.078	0.081	0.131	0.108	0.125	0.130	0.167	0.176
Change in IADL limitations									
Decrease	0.079	0.094	0.071	0.111	0.097	0.102	0.117	0.091	0.159
Stable	0.769	0.770	0.810	0.696	0.706	0.716	0.669	0.664	0.601
Increase	0.152	0.135	0.119	0.193	0.197	0.182	0.213	0.245	0.240
Change in chronic conditions									
Stable no chronic condition	0.296	0.251	0.434	0.368	0.233	0.175	0.337	0.291	0.178
From no chronic condition to chronic condition	0.104	0.156	0.142	0.132	0.171	0.133	0.175	0.152	0.153
From chronic condition to no chronic condition	0.198	0.131	0.142	0.145	0.135	0.149	0.160	0.161	0.143
Always chronic condition	0.402	0.461	0.280	0.355	0.460	0.544	0.329	0.396	0.526
Sample sizes	435	806	564	1174	800	618	522	733	641

Table 3 Percentage of persons 65 and over making a substitution transition, or a transition towards complementarity

	Denmark	Sweden	Nether-lands	Belgium	France	Germany	Austria	Italy	Spain
Transition into complementarity	6.8	3.0	6.3	9.4	7.8	7.7	6.9	7.3	5.1
Substitution transition	2.3	1.7	2.6	3.3	3.8	0.9	1.5	2.6	1.2
Sample size (*n*)	370	627	451	947	626	457	437	528	471

Detailed results of transition patterns and confidence intervals are available upon request

Table 4 Country effects on transition to informal and formal care (ref. = Belgium) (non-users at wave1 included only)

	Transitions to informal care					Transitions to formal care				
	Not controlled for other variables		Controlled for other variables[a]		*n*	Not controlled for other variables		Controlled for other variables[a]		*n*
	OR	Sig.	OR	Sig.		OR	Sig.	OR	Sig.	
Denmark	0.77		0.92		230	0.60	*	0.59	*	375
Sweden	0.85		0.97		402	0.37	***	0.31	***	742
Netherlands	0.69	*	0.81		301	0.72		0.93		502
France	0.58	**	0.50	***	418	1.26		1.23		608
Germany	1.44	*	1.81	**	247	0.60	*	0.37	***	601
Austria	1.06		1.18		252	0.71		0.53	**	479
Italy	0.73		0.63	*	334	0.58	*	0.34	***	681
Spain	1.08		0.73		304	0.61	*	0.40	***	569

[a] Age, gender, education, income, ADL and IADL limitations, chronic diseases; changes in living situation, ADL and IADL limitations, chronic conditions. Full results of the logistic regressions are available upon request

Significance levels: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

to informal care use and to formal care use were examined using hierarchical logistic regression. The first model included country dummies only. Next, individual-level predisposing, enabling and need variables were entered into the model. Finally, country * change interaction terms were introduced one by one into the formal care model to gain insight into country differences in the effect of health changes and changes in household composition. Cluster robust variance estimation was used to correct for the clustering of respondents within households. The analysis was carried out with the statistical package STATA 11.

Results

Overall, the proportion of persons making either a substitution transition or a transition into complementarity was fairly low (Table 3, results for all transition patterns are available upon request), as most older persons either continued to receive no care or informal care only, or switched from no care to informal care only. In all countries, transitions into complementarity were observed more often than substitution transitions. In the majority of the former transitions, the initial care situation was informal care only. Transition from formal care only into the combination of formal and informal care occurred relatively frequently in Belgium, Denmark and France (2–3%), whilst transition from no care to the combination of both types of care was a fairly rare event. Most substitution transitions were in fact transitions from informal to formal care.

Substitution transitions were most frequently observed in France, Belgium, the Netherlands, Italy and Denmark. They were relatively rare in Germany, Spain, Austria and Sweden. Transitions into complementarity were relatively frequent in Belgium, and relatively infrequent in Sweden (where all of the transitions considered were fairly rare) and in Spain, whilst differences between the remaining countries were limited. It should be noted, though, that confidence intervals for these percentages are overlapping for nearly all pairs of countries (results available upon request).

Results of the logistic regression models examining country differences in transitions to informal and formal care use are shown in Table 4. Without controlling for other variables, the likelihood of transition to informal care (from any situation without informal care) was highest in Germany, and low in France and the Netherlands. After controlling for age, gender, income, education, chronic

diseases and ADL and IADL limitations at baseline, as well as changes in living situation, chronic conditions and ADL and IADL limitations, the respective differences between Denmark, Sweden, the Netherlands and the reference country Belgium were reduced. After controlling for these variables, the likelihood of transition to informal care became significantly lower in Italy than in Belgium, whilst Spain approximated more closely to Italy. Most strikingly, a high incidence of informal care was observed for Germany and low incidences for France and Italy. The low rates of transition to informal care in Southern countries, and Italy in particular, may to an extent be an artefact of data collection procedures, since in those countries cohabitation of children with their parents is relatively common (Brandt et al. 2009), whereas within-household informal care was only partially measured. The hypothesis that transitions rates to informal care are higher in familialistic countries was not clearly confirmed.

With regard to the incidence of the transition to formal care, the pattern across countries was less ambiguous. In France, the Netherlands and Austria, the likelihood of transition to formal care was not significantly different from Belgium, whilst incidence rates were significantly lower in Denmark, Sweden, Germany, Italy and Spain. This pattern appeared without controlling for other variables, and became even clearer after controlling for baseline characteristic and changes therein. The likelihood of becoming a formal care user was low in 'familialistic' countries, including Germany and Austria, two countries with needs-based entitlements to care services or allowances. It was also low in Denmark and Sweden, where universal rights to long-term care have existed for a long time, but where substantial targeting of services applies, particularly in Sweden. The hypothesis that the likelihood of a transition to formal care is higher in countries with needs-based entitlements was at best partially confirmed (for France and the Netherlands, relative to the other countries).

In order to test the hypotheses that, in countries with stronger needs-based entitlements to LTC services and allowances, transitions to formal care are less related to changes in household composition, whilst the opposite holds for familialistic countries, interaction terms between country and the relevant change variable were introduced into the model. Given the specification used here, the change variable refers to becoming or remaining single, relative to finding or having a partner. The results (Table 5) showed that, in all countries, with the exception of Belgium, the likelihood of transition to formal care was higher for those older people who lost a partner or remained single. The coefficients were not significant for France and Italy, indicating that the effect of this variable was not significantly stronger in those countries than in Belgium. However, the total effect of becoming or remaining single was

Table 5 Interaction effects of changes in living situation, ADL and IADL limitations, and in chronic conditions, with country on transition into formal care (ref. = Belgium)

	Interaction with becoming or remaining single		Interaction with decrease in ADL limitations		Interaction with increase in ADL limitations		Interaction with decrease in IADL limitations		Interaction with increase in IADL limitations		Interaction with change from 0 to 1 + chronic conditions		Interaction with change from 1 + to 0 chronic conditions		Interaction with always having 1 + chronic conditions		*n*
	OR	Sig.	OR	Sig.	OR	Sig.	OR	Sig.	OR	Sig.	OR	Sig.	OR	Sig.	OR	Sig.	
(Belgium)	0.87		0.70		1.44		0.81		1.59		2.10	*	2.06		2.64	**	927
Denmark	3.55	**	0.78		2.87		0.76		2.95	*	1.60		0.40		1.26		375
Sweden	4.30	**	0.22		1.75		0.27		1.99		1.76		1.59		0.67		742
Netherlands	6.68	***	1.57		2.19		2.25		1.17		0.63		0.61		0.38		502
France	1.46		1.42		1.55		0.85		1.13		0.45		0.59		0.39	*	608
Germany	3.45	**	2.21		1.30		1.57		4.38	**	0.86		1.96		3.09		601
Austria	7.52	***	0.79		3.21	*	0.94		3.68	**	0.55		0.34		0.28	*	479
Italy	2.08		2.47		1.04		0.50		1.20		0.41		0.92		1.06		681
Spain	3.02	*	2.61		1.60		0.69		1.98		0.62		0.53		0.58		569

Full results of the logistic regressions are available upon request

Significance levels: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

significant for Italy, as was demonstrated by another specification, the result of which is not shown here. Compared to Belgium, we found significantly stronger effects of changes in living situation in Denmark, Sweden, the Netherlands, Germany, Austria and Spain, i.e. mostly countries with needs-based entitlements. This is opposite to the pattern we hypothesised. The effect of changes in living situation was strongest in Austria, a familialistic country, but contrary to the hypothesis that transitions to formal care are more strongly related to unavailability of informal care in familialistic countries, it was also strong in non-familialistic countries such as the Netherlands, Sweden and Denmark.

Another hypothesis stated that, in countries with stronger needs-based entitlements to LTC services and allowances, transitions to formal care are more strongly related to changes in health and disability. To test this hypothesis, interaction terms between country and changes in ADL and IADL limitations, and in chronic conditions, were introduced into the models (each set of interaction terms separately). The results showed that, in general, the transition to formal care was higher if ADL limitations or IADL limitations increased. However, few significant cross-country differences were found (Table 5). For decreases in ADL and IADL limitations, the pattern of coefficients across countries was rather erratic, perhaps because some apparent decreases in ADL and IADL limitations are due to measurement error. With regard to the increases in ADL limitations, only in Austria was the effect significantly greater than in Belgium. An increase in IADL limitations was found to have a significantly larger effect on the likelihood of a transition to formal care in Denmark, Germany and Austria than in Belgium. The latter finding is consistent with the stated hypothesis. The pattern of coefficients for the interaction terms with changes (or stability) in chronic conditions is more difficult to interpret. For Belgium, the results indicated that the appearance of chronic conditions, as well as their continued presence, increased the likelihood of a transition to formal care. For most countries, the effect was weaker than for Belgium, but the differences were significant only for France and Austria, for stable chronic conditions.

Discussion

How do the hypotheses fare in view of the results? The hypothesis that in countries with needs-based entitlements to LTC services and allowances the likelihood of a transition to formal care is higher was only partially confirmed, as in fact this transition rate (controlling for other variables) was relatively high in France and the Netherlands, but low in several other countries with needs-based entitlements, including the Scandinavian countries, Germany and Austria. The hypothesis that, by contrast, in more familialistic countries, transition rates to informal care are higher was partially confirmed: this transition rate was indeed highest in Germany, and also relatively high in Austria, but low in Italy. The hypotheses that, in countries with stronger needs-based entitlements to LTC services and allowances, transitions to formal care are less related to changes in household composition, whilst the opposite holds for more familialistic countries, were not supported by the data. The hypothesis that, in countries with stronger needs-based entitlements to LTC services and allowances, transitions to formal care are more strongly related to changes in health and disability was partially confirmed. Increases in IADL limitations had a stronger effect in Denmark, Germany and Austria than elsewhere. However, for other measures of health and disability (ADL limitations and chronic conditions) no such pattern was observed.

When evaluating these results, it is important to keep in mind the data limitations, the most important of which is the incomplete measurement of informal care within the household for housekeeping and administrative tasks. Such measurement may be inherently difficult if, as some authors argue, such help is hard to distinguish from usual patterns of the division of home work within households. Nevertheless, information on the help from household members for housekeeping tasks is crucial, as the demand for formal home care will inevitably be determined by the degree to which household members are able and willing to take on such tasks. One way of distinguishing such help from the usual division of tasks is to ask whether the help was given because of health limitations of another member. For the analysis presented in this article, this limitation could lead to a downward bias on the estimates of the proportion of persons who combined formal and informal care (complementarity). Also, the low likelihood of transition to informal care use that we observed in Southern Europe could to an extent be an artefact of this limitation, as the cohabitation rate of older parents with their children is much higher in these countries than in others.

Another important limitation is the low number of observations with transitions. For this reason we had to pool several kinds of transitions, which may have weakened the analysis, as more detailed distinctions could not be made in the multivariate analysis. One example is the difference between a transition from no care to formal care only and from informal care only to formal care only. Even so, standard errors were substantial, in particular for the effects of changes in living situation and health, so that possible differences between countries were found not to be statistically significant.

Nevertheless, there may also be substantive reasons why some of the hypotheses were not confirmed by the data. The finding that the overall likelihood of a transition into

formal care was relatively low in Germany and Austria, despite the fact that needs-based LTC entitlements exist in those countries, may be due to their more familialistic culture, combined with the cash option of the German LTC insurance and the cash system in Austria. This combination of factors may imply that, if informal care is an available option, older people will tend to make use of it. Such a tendency could also explain why, contrary to expectations, the study revealed a stronger effect of informal care unavailability on the transition to formal care use in those countries. For the Netherlands and Sweden, two other countries with needs-based LTC entitlements, the introduction of more restrictive allocation practices, with stronger targeting of the neediest persons—severely care-dependent older people and persons without informal support—could be part of the explanation. It is impossible with the SHARE data to distinguish between privately and publicly financed care (the latter may include informal carers paid with cash benefits), nor is it possible to distinguish adequately between formal care that is organised privately and help that is mediated by public agencies. More detailed information on who provides care and who pays might contribute to a better understanding of how LTC systems influence formal and informal care utilisation. This is all the more relevant given the considerable variation in the design of public in-kind services (e.g. level of cost-sharing) and cash benefits schemes (e.g. restrictions on hiring of family members) (Colombo et al. 2011). Perhaps the SHARE questionnaire could be improved on this point in future waves.

Also, contrary to expectations, we found little evidence of country differences in the effects of health variables. Cross-sectional analyses (Geerts 2009) did however reveal a stronger effect of physical limitations on formal care use in countries with needs-based entitlements to care. The results may indicate that, whilst rates of formal care utilisation continue to differ considerably, formal care allocation practices are not very dissimilar in Northern and continental European welfare states. The study found evidence of more targeting of older people living alone and also of the most care-dependent older people for these countries. Such a convergence could have important consequences for older persons in need of care, and for care givers. There could be implications for the health trajectories and the well-being of older people, for the burden on informal carers, and for the timing of nursing home entry.

More generally, given the great variety in systems of formal care across countries, and the limited knowledge of the effects of these systems on care outcomes, there is considerable scope for cross-country policy learning. The expansion of the SHARE study with more waves, more countries, and larger samples in each country could provide important data for future studies in this domain.

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