Tracking demand and supply for Long Term Care in Europe 2007-2015: A cross-national analysis

by:

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Abstract

This paper charts Long-Term Care needs across Europe and proceeds to see the extent to which these needs are unmet, but also how the means employed to meet them in different countries. The paper covers 19 European countries and uses internationally and intertemporally comparable data from wave 2 (2007), wave 5 (2013) and wave 6 (2015) of the Survey of Health Ageing and Retirement in Europe (SHARE) for people aged 65+. The focus is on two key indicators. The *Care Gap*, that is, the extent to which the need for care is not met by *any* kind of provision, and the *Care Mix*, that is, how the overall provision is split into formal care (professional both public and private), informal (unpaid care by family, friends or neighbours) and a mix of both. Findings for the 65+ population are supplemented by an analysis by large age group and gender. A panel analysis covering the period from 2007 to 2015, for the eleven countries that participate both in wave 2 and wave 6, is also presented. The goal of the paper is to feed the discussion for the need of developing integrated and sustainable long-term care provision systems and the need to be considered as a Social Investment, which is the subject under examination of the SPRINT (Social Protection Investment in Long-Term Care) project.

Keywords

Long term care; European comparison study; Formal care; Informal care; Care needs; Social Investment

1. Introduction

The paper addresses the following *three main research questions*, all relating in one way or another to benchmarking:

1. How many persons of age 65+, who consider themselves in need of care, actually *receive* care? (The Care gap)
2. Do formal and informal care provisions act as substitutes or complements? (The care mix)
3. Has the mix of formal and informal care provision changed over the years? (time trends)

Following these research questions, the following *sub-questions* are also approached:

1. Does the care gap decrease with intensity of need?
2. Are there gender differences in the receipt of care?
3. To what extent does the care provided to those in need of care, actually meet their needs?
4. Did the care gap change over the years and what are the underlying reasons?
5. What is the first type of help that someone entering in the need-of care- status receives in different countries? What is the trend regarding transitions of type of care receipt?

The goal is to feed the discussion for the need of developing integrated and sustainable long-term care provision systems and the need to be seen as a social investment (SI), where social investment is defined by Social Protection Innovative Investment in Long Term Care (SPRINT) -which is a collaborative H2020 project spanning the European Union that aims to examine Long Term Care (LTC) as an instance of social investment (SI)- as: *Welfare expenditure and policies that generate equitable access to care to meet the needs of ageing populations, reduce current and future costs of care, improve quality of care and quality of life, increase*

capacities to participate in society and the economy, and promote sustainable and efficient resource allocation.

Given that long term care provision systems and social investment perceived concept vary among countries, it is of importance to benchmark international variation and to anchor differences on the national situations in both the demand and the supply of long term care.

The paper is structured as follows: In the two first sections, the literature review and a brief description of methodology & data used are presented. The next section moves to analysis, and discusses the Care Gap and Care Mix in Europe based on the 2015 Wave of SHARE; it looks at time trends by comparisons with 2007; it looks at issues linked to the first appearance of need for care (the longitudinal dimension). The final section presents key findings and conclusions.

2. Literature Review

Researchers agree that with the ageing of populations, policy makers are faced with ever-increasing expectations from current and future long-term care (LTC) recipients to make high-quality long-term care services available (Murakambi and Colombo, 2013). In times of rapid demographic change the number of people in need of care is expected to increase (Kaschowitz and Brandt, 2017). Users of care services demand a greater voice and more control over their lives (Murakambi and Colombo, 2013). In terms of gender differences, women are the largest consumers, as well as the main producers, of long-term care (Bettio and Veraschagina, 2010). Disability rates tend to be higher for women, although this is not consistently the case.

The way that people “in need of care” receive care can be summarized in four distinctive organizational settings as far as home care provisions are concerned: (i) comprehensive, publicly subsidized and administered home care packages typified by Sweden, (ii) employment of live-in

untrained and mostly foreign workers, typified by Italy (the migrant-in the-family model), (iii) voucher schemes *(cheque)* exemplified by France, and (iv) predominant reliance on family carers, as in Poland. Each of these types can be considered broadly representative of a larger group of countries (Bettio and Veraschagina, 2010). Across countries, there are marked differences in the nature of social expectations about the role of the family and the community in supporting people in need (Fernandez et al., 2009, Greve 2017).

All researchers agree that financing and funding of LTC services is a major future challenge. The system in Netherlands is focusing in trying to keep the public LTC provider's expenditures within a budget (Mot et al., 2010), while in Germany LTC social insurance covers almost the entire population. Members of the public health insurance system become members of the public LTCI scheme, and those who have private health insurance are obliged to buy private, mandatory LTCI providing the same benefit packages (Schultz, 2010).

More recent findings indicate that the likelihood of receiving informal personal care follows a pattern opposite to the one observed for formal care and are in line with previous studies (Albertini et al. 2017). Regarding the income effect, the likelihood of receiving formal care in Italy and Germany increases progressively along the income distribution, while in France, Denmark and Netherlands the relation between household income and formal care provision is not significant (Albertini et al. 2017, Bakx et al. 2015). Childless persons and individuals living alone are more likely to use formal care (Albertini et al. 2017, Bakx et al. 2015), while the further away the children are, the lower the provision of informal care (Bonsang 2009). LTC use is also strongly affected by country-specific eligibility criteria. For instance, the spouse's ability to provide informal care is an eligibility criterion in the Netherlands, but not in Germany (Bakx et al. 2015). Regarding individual characteristics, elderly women are more likely to use paid domestic help than men. Education plays no role in the decision using paid domestic help but it has a significant positive impact regarding the quantity of domestic help (Bonsang 2009).

Turning to the question whether formal and informal care are complements or substitutes, in all countries transitions to complementarity were observed more often than substitution transitions (Geerts et al. 2011). Moreover, a positive and significant relationship was obtained between hours of informal care and the probability of having received any formal care, suggesting that formal and informal care are complements. On the other hand, a negative and significant correlation between formal and informal care suggest that the two could be substitutes (Bolin et al. 2007). Thus, one could say that depending on other individual characteristics that need to be specified, formal and informal care can be either complements or substitutes.

When studying the effect of the financial crisis in Europe, it was found that it was associated with an increase in informal care receipt and this increase was driven by caregivers from outside the household. The impact of the crisis appears to have been stronger in the North and weaker in the South, with the countries in between being closer to Scandinavia than to Southern Europe (Costa-Font et al. 2016).

3. Methodology and Data

The current paper uses Survey of Health Ageing and Retirement in Europe (SHARE) data, to benchmark differences across countries. It uses the latest available data (Wave 6 -2015) but adds a temporal dimension by comparing them with previous waves of the same survey. It aims to generate a set of empirical findings (stylised facts) about how LTC appears in Europe and how that may be changing over time. In doing so, it focuses on two key concepts: (i) the *care gap*, which is the extent of *unmet* need for care, i.e. the extent to which demand for care exceeds supply under different definitions of demand, and (ii) the *care mix* -i.e. how the care offered is distributed between formal and informal, paid or unpaid. The two concepts are used to examine

differences by large age group and gender. Information from the older wave 2 of SHARE is brought to bear on *attitudes* to care, to see whether these can account for observed difference.

SHARE is a panel survey, where respondents are followed regularly after first being contacted until the end of their life. The first wave took place in 2004, and was followed by others in 2007, 2009, 2011, 2013. Wave 6 was conducted in 2015 and data were released in 2017. The panel nature of the survey means that the youngest person interviewed in 2004, entered the survey aged 50 and is now 62.

SHARE has four key characteristics, use of which is made for this research:

1. *The data are interdisciplinary*, using questions from the fields of economics, health care, psychology, sociology etc.
2. *The data are internationally comparable,* and systemically independent. The questionnaire relies on generic wording, rather than using system-specific terminology. Consistency of translation is heavily tested and checked across countries and waves.
3. *The data have a panel structure.* Individuals are followed over time and hence we can distinguish the impact of age group and cohort. Certain key events are observed and reaction to them can be monitored: ADLs; Income changes; major illness leading to disability.
4. *It is geared towards sampling an older population.* Proxy interviews and other devices are used to make sure that all eligible individuals are surveyed. Though it is a survey of households, individuals, once surveyed are followed in old age homes etc in subsequent waves.

The total sample of Wave 6 is 68.231 persons (age 50+) at 18 countries, of which 31.142 are between 65-80 years old while 8.686 persons are older than 80 years old. Compared to Wave 2

(2007), where 14 countries participated, only Ireland is not present in w6. The analysis includes only persons of age 65+.

The key starting point is that of demand – *the need for care.* That is determined by the answer of the standard self-assessed "Activity of Daily Life" Question, asking whether an individual can fulfil functions such as dressing, bathing, eating, etc[i]. We focus on a strict definition (>2 ADLs), though the analysis was conducted also with a looser definition (>1 ADL), and differences noted where substantial.

The *care gap* is related to need– those who declare need, but do not appear to be receiving care of any kind. It is defined as the proportion of persons who are deemed to need care (with the 2 above mentioned definitions of care) but did *not* receive: either (i) "Any type of formal care/help" (i.e. help with personal care; help with domestic tasks; meals-on-wheels; help with other activities due to a physical, mental, emotional or memory problem), nor (ii) "Any type of informal care/help" (i.e. personal care, practical help, help with paperwork from persons outside the household on a daily/weekly basis and/or personal care received regularly from a person within the household).

The *Care Mix* is defined as the type of care received by the persons in need. The care received can be either formal (professional or paid service) or informal (non-professional service). *Formal* in this sense essentially means professional that is delivered by a person whose job it is to provide it. So formal care covers *both* services delivered as part of social protection by public bodies or NGOs, and services acquired through the market as long as they are paid and not delivered free. Wave 6 (though not wave 2) asks for out of pocket payments connected to LTC. These could be payments for providers (who may or may not be a trained professional) but also co-payments for public services. As a result the public/private mix for services cannot be

measured. *Informal* care in its turn can either be provided by people outside the household or by people living in the household. Some people may receive both professional and informal care.

More formally, the type of care in the care mix is defined as follows: *(i) Formal care/help,* which includes receiving in own home any of the following professional or paid services Help with personal care; Help with domestic tasks; Meals-on-wheels; Help with other activities) due to a physical, mental, emotional or memory problem *(ii) Informal care/help,* which includes Informal care/help (personal care, practical help, help with paperwork) received either from person outside the household on a daily/weekly basis and/or personal care received regularly from a person within the household.

4. Benchmarking LTC – the care gap and care mix

In the current section we will present and interpret the findings for 19 European countries regarding the "in need of care status" and the care received to meet these needs for persons of age 65+ (larger group) and of age 80+[ii] (more focused group). The objectives are: To identify cross country differences in the "in need of care status" and how the needs of care are being increased with age; to identify potential differences in demand and supply of long-term care services among countries; to examine whether different types of care (formal vs. informal) act as complements or substitutes.

4.1. Need for care

One would expect the *need* for care to be largely physiologically determined. We would thus expect little variation in comparable samples of relatively homogeneous individuals However, in practice, care need as shown in Table 1 shows surprisingly wide variation.

Even for the persons of age 80+, the percentage that reported more than 2 ADLs varies from 4.8 to 45.0%. More specifically, Switzerland is the country where fewer people reported such limitations (3.7% for persons of age 65+ and 6.8% for the more focused age group of 80+) followed by Sweden (4.3% and 9.4% respectively), Netherlands (5.8% and 16.7%), Denmark (6.9% and 15.5%) and Greece (7.2% and 14.2%), while at the other extreme Portugal (16.5% and 39.6%), Poland 13.4% and 25.8%) and Israel (13.5% and 31.8%) are the countries with largest percentage of reported ADL limitations. Most of the countries report ADL limitations relatively close to the average which is 10.32% (larger age group of 65+) and 23.2% (more focused group of age 80+).

What seems to be comparable for all countries is the level of increase of number of ADLs reported from people of age 80+, compared to the age 65+ population. This rate of increase is approximately 2 to 2.8 times higher for persons of age 80+ compared to the general population of age 65+, while the data are also more dispersed.

Table 1

Percentage (%) of persons in need of care (with 2 or more reported ADLs)

Country	Men 65+	Women 65+	Total 65+	Men 80+	Women 80+	Total 80+
SE - Sweden	3.4	5.0	4.3	6.3	11.4	9.4
DK - Denmark	6.4	7.3	6.9	15.8	15.4	15.5
NL* -Netherlands	2.5	8.5	5.8	8.5	21.1	16.7
DE - Germany	7.8	10.7	9.5	14.2	24.7	21.2
BE - Belgium	7.0	13.1	10.4	16.1	25.3	22.1
LU - Luxembourg	6.0	11.8	9.1	11.7	29.1	22.9
FR - France	8.6	9.4	9.1	22.2	22.2	22.2
CH - Switzerland	2.7	4.5	3.7	4.8	7.9	6.8
AT - Austria	7.4	10.4	9.1	17.3	27.4	24.0
IT - Italy	7.0	14.9	11.5	14.2	30.9	25.0
ES - Spain	9.3	14.3	12.1	20.3	32.0	27.7
GR - Greece	6.4	7.8	7.2	12.3	15.4	14.2
PT - Portugal	10.9	20.5	16.5	29.1	45.4	39.6
CZ - Czech	7.2	11.2	9.5	13.1	25.9	21.8
PL - Poland	11.0	14.9	13.4	19.0	28.9	25.8
SI - Slovenia	9.3	10.8	10.2	15.0	21.5	19.6
EE - Estonia	10.2	12.6	11.8	15.4	22.3	20.6
HR - Croatia	5.6	12.9	10.0	10.5	31.0	24.7

IL – Israel	12.0	14.8	13.5	30.1	32.9	31.8
Average (%)	8.0	12.1	10.3	17.0	26.5	23.2
st.dev	*2.7*	*3.9*	*3.2*	*6.6*	*8.6*	*7.5*

Source of primary data: SHARE, wave 6, (release 6.0.0: March 31st, 2017). **Netherlands' data are from wave 5*

A question that arises from these results is why persons in different countries but of similar age seem have different "in need of care status"? The differences could be due to better physical health; they could due to cultural reasons - differences in stoicism; they might reflect internalization of bureaucratic categories of eligibility for services; or other reasons as yet unknown. It might be the case that "light" limitations are deemed as something serious in some places and not in others, possibly linked to a 'still upper lip' mentality as opposed to externalizing need. However, the countries do not seem to lie in a simple North-South gradient.

In Germany for example, people are familiar with ADL and LTC concept, since there clearly defined criteria which are used in long term care insurance; people thus internalize what is 'really' in bureaucratic terms, an ADL. The entitlement to claim benefits is based on whether the individual needs help with carrying out at least two basic activities of daily living (ADL) and one additional instrumental activity of daily living (E. Schultz, 2010). In the Netherlands a system of public long-term care insurance has been in place since 1968 (Mot et al., 2010). This observation implies that demand is not independent of supply; a kind of 'Say's Law' of supply creating its own demand may even be in operation.

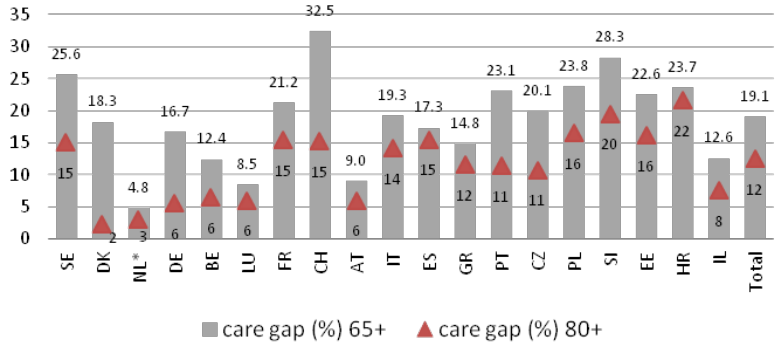
4.2. The Care Gap

In this section we examine to what extent persons who say they need care, *actually* receive some. This includes any type of care (formal or informal). In other words, we put demand and supply together.

In Figure 1 (used data of SHARE, wave 6, release 6.0.0: March 31st, 2017. Netherlands' data are from wave 5), we can see that the care gap (persons in need of care who do not receive any care is surprisingly wide – even though we use a relatively strict definition of need (2+ ADLs). More than one in four appear to have totally unmet meets. Even among the older group in most countries more than one out of seven individuals are being missed out.

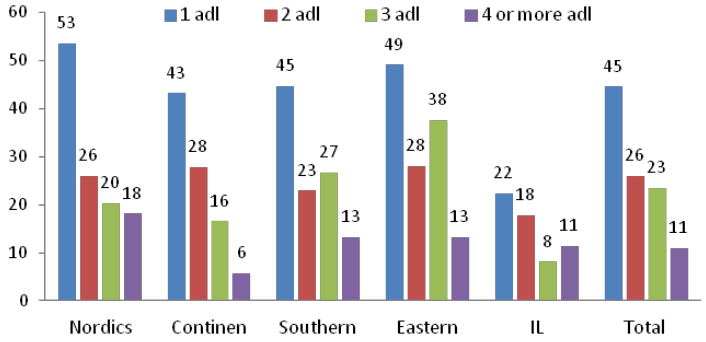
The gap also differs considerably between countries. The highest care gap for persons 65+ occurs in Switzerland followed by Slovenia, Poland and Sweden; the lowest is in Luxemburg, Austria, Israel and Netherlands. When isolating persons over age 80, the care gap still differs but is much lower in all cases. The difference is especially marked for Sweden, Denmark, Switzerland, Germany and Belgium, indicating that in those countries care provision might use age as a criterion.

Figure 1: The Care Gap (%), by age category



When grouping countries in geographical categories, as shown in Figure 2, we see whether the care gap is responsive to the intensity of need, as measured by the number of ADLs. We see that for all groups of countries the Care Gap is almost halved for those that have 2 ADLs compared to those having only 1 ADL. For Nordic countries, the care gap for those with only one ADL is higher compared to the rest and decreases more as the number of ADLs increase. A similar trend is found for Continental countries, while for Southern countries and Eastern countries it seems that persons having 2 or 3 ADLs are treated similarly.

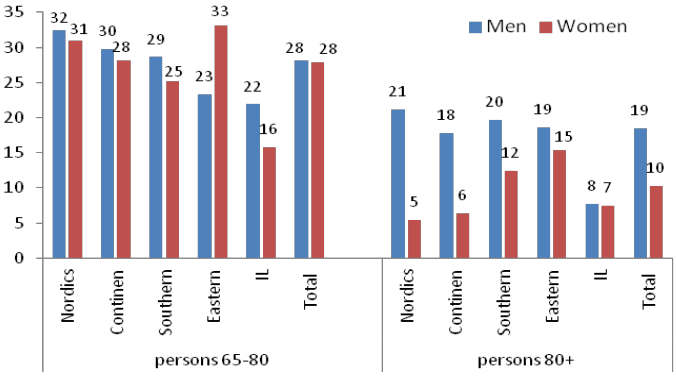
Figure 2: Care Gap (%) by in need of care status 65+



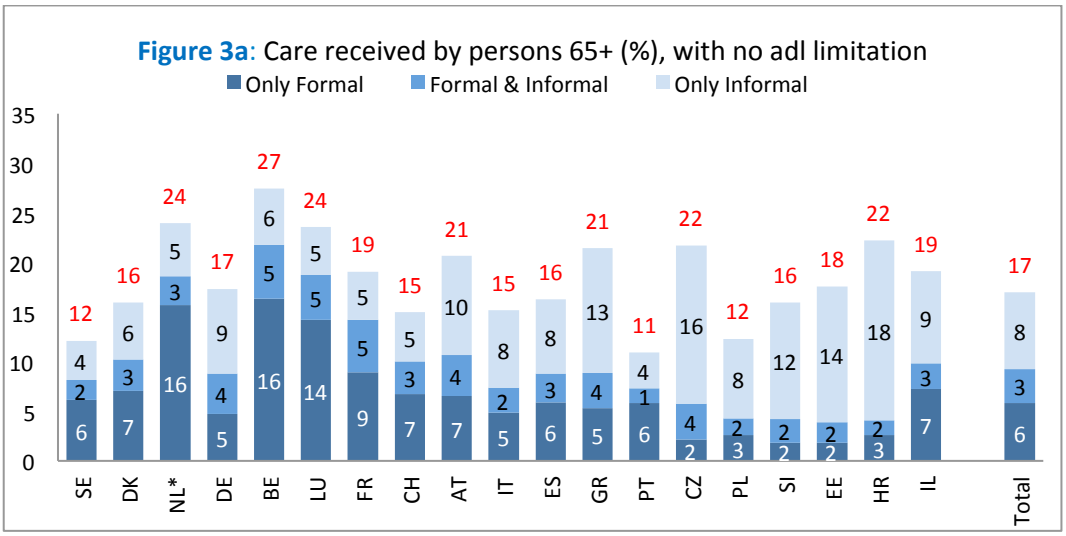
Regarding the care gap by gender, see Figure 3, age plays an important role, since for persons of age 65-80, the care gap is almost the same for men and women (except for eastern countries where the care gap for women is higher). For persons 80+, the care gap for men is higher than for women everywhere, something that is consistent with other findings (Bettio and Veraschagina, 2010). Overall, the care gap decreases as age increases and as the number of ADLs increases, indicating that care is directed towards those with more serious issues.

In order to answer the question why there is difference of care gap between genders for persons of age 65+ further analysis is required, since it could be related with issues related to behavioural differences or the composition of household which makes it more difficult for men living alone to cover their needs as compared to women living alone.

Figure 3: Care Gap (%) by gender and age



The care gap is cases where stated need is not met; its flip side is the care surfeit – where care is received when no need is noted. As far as it concerns care Surfeit, as seen in Figure 3a, where people that do not have any ADL limitations receive care, we can see that supply of formal care to those that are not in need care lies between 8% (Sweden) and 21% (Belgium), while the average for all countries in 9%. However, we have to note that formal care includes 'help with domestic tasks in the home' (thus not help with personal care) which account on average for 7.5% out of 9% of those cases, meaning that the care surfeit for 'personal care ' is 1.1%.



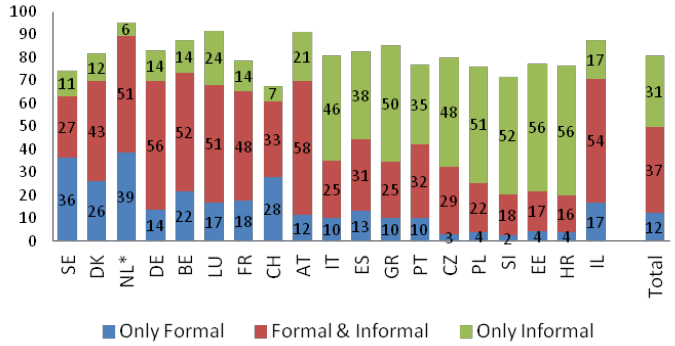
4.3. The Care Mix

In the current section we examine how care is provided as between formal and informal provision and ask whether those act as substitutes or complements.

In Figure 4**,** we see three groups of countries for formal care is concerned. The first group consists of countries where more than 60% of people in need receive formal care. This group includes all Nordic (Sweden, Denmark) and Continental countries (Germany, Netherlands, Belgium, Austria, Luxemburg, France, Switzerland) as well as Israel. The second group is consisted of countries where 35% to 45% receive formal care. The second group includes all Southern European countries (Spain, Italy, Portugal, Greece). The third group is consisted of

countries where fewer than 35% of people in need receive formal care, and includes Eastern European countries (Czech Rep., Poland, Estonia, Slovenia, Croatia).

Figure 4: Care Mix (%) per country, persons 65+



The picture regarding informal care received is almost the opposite. More specifically, Nordic Countries (Sweden, Denmark), Netherlands and Switzerland appear to have the lowest percentages in informal care receipt for those in need of care (between 39%-56%). On the other hand Czech Republic, Austria and Greece have more than 75% informal care receipt for those in need, while the rest of the countries lie between 62% to 70.

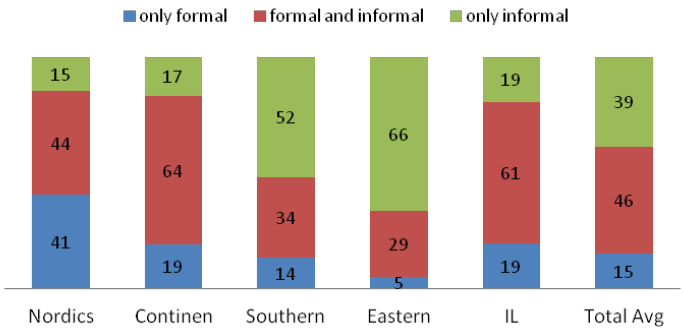
A key point to take home is that in all countries informal care is always present, even in countries with wide provision of formal care. It remains to be seen whether this argues for competition or for complementarity.

Generally speaking, Southern and Eastern countries seem to offer informal care more "generously", even for persons with only one ADL limitation (the "loose" definition of "in need of care") compared to Continental and Nordic countries.

The percentage of people receiving *only* formal care is significantly higher in Sweden, Denmark, the Netherlands and Switzerland, while those receiving *only* informal is higher in Spain, Italy, Greece, Portugal, Czech Republic, Poland, Slovenia, Estonia, Croatia. From those receiving care, receiving the combination of both is the rule in Germany, Belgium, Luxemburg, France, Austria and Israel.

When grouping into geographic categories, Figure 5, Nordic countries rely mainly on formal care (41% of persons receiving care, they receive only formal care) and on a combination of formal and informal care (44% receive both), while only 15% rely solely on informal care. At the other extreme Southern countries and Eastern countries rely on informal care (52% and 66%). Finally, In Continental Countries and Israel 64% and 61% respectively of persons receiving care, receive both formal and informal.

Figure 5: Care mix composition (%) per country group for those receiving care, persons 65+, for Def. 1 (2 or more ADL limitaions)



Thus, the answer to the question "are formal and informal substitutes or complements" is unlikely to be the same everywhere. In Eastern countries the percentage of those receiving only formal care is in inverse proportion to the percentage of those receiving only informal care, implying that informal has to step in when there is no formal – substitution. On the contrary, in Continental countries are more complements than substitutes. In Nordic and Southern countries there is a large percentage both formal and informal care, making more difficult to have an answer on the question if they are complements or substitutes.

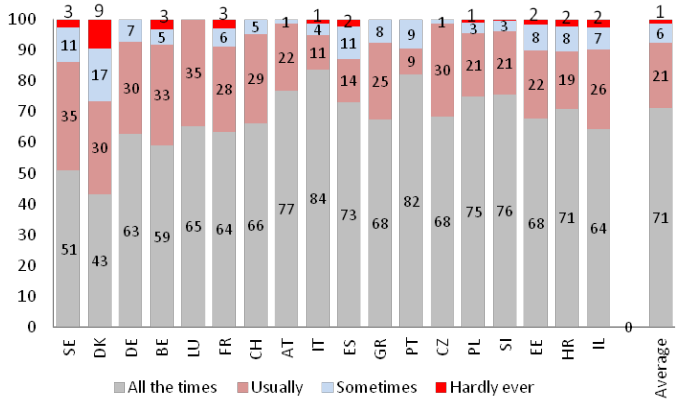
Thus when dealing with the question of one type of care can substitute the other, "Substituting formal care provision with informal one is not a panacea" (Barbieri and Ghibelli, 2017). Neither is the contrary -substituting informal care with formal one- is a panacea, we could conclude.

4.4. Level of satisfaction of care recipients

Are the needs of those receiving care, covered by the care they receive?

Interviewees receiving care were asked if the care they received meets their needs. In Figure 6 their responses have been classified – between "all the time" to "Hardly ever". In Portugal, Italy, Austria and Slovenia responds answers "All the times" more frequently (between 76 and 84%). Sweden and Denmark are the two countries with the *lowest* percentages answering "All the times" (51% and 43%) and the highest "Hardly ever" (3% and 9% respectively). It worth to mention that total average for "Hardly ever" is 1% and for "Sometimes" it is just 6%.

Figure 6: Does the care (any type) provided to persons 65+ in need of care meet their needs (%)?

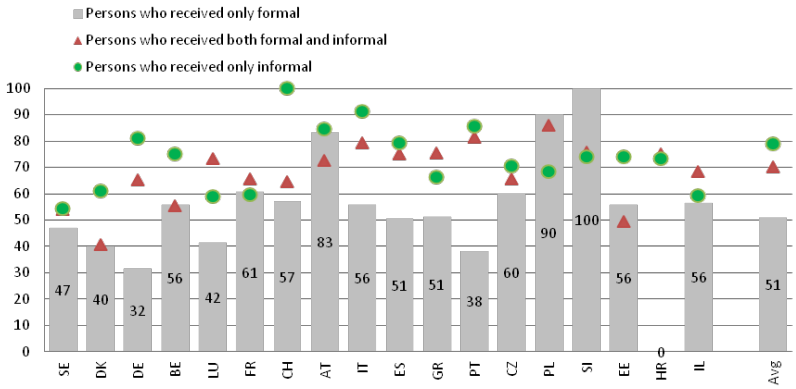


Digging further, and given the fact that the two Nordic countries are the ones relying more heavily on formal care and less in informal, we looked at satisfaction based on the type of care received (see Figure 7). Two are the principal conclusions: a) Practically in every country, informal care meets the needs of people in need of care in higher percentages than formal care and b) Formal care in Nordic countries and Germany meets the needs of persons in to a *lesser* extent than in other countries.

In other words, Sweden Denmark and Germany have more people receiving *formal* care, but are less satisfied with the care they receive. That enhances the argument that Formal care and Informal care can better act as complements rather than as substitutes. We could think of formal and informal care as complements in the following sense: informal care given to relatives or friends has no time limitations and can be intensive in time, even though it may be lacking in technical expertise or efficiency. Formal professional help can be efficient but has to economise

on face time with recipients and runs the risk of being thought impersonal. The two can thus act as complements in the sense that the presence of informal help makes the services provided more closely tailored to individual needs. An alternative interpretation is that the payment of money for professional services places the relationship with recipients on a different level – with greater expectations than for services provided free with no overt obligation.

Figure 7: Does the care provided to persons 65+ in need of care meet their needs?: Persons who reported 'all the time' (%) by type of care received



5. Time Trends – 2015 compared to 2007

In this section we compare the findings for the 12 countries that participated in the survey both in 2007 and after 2013, between SHARE Wave 2 (2007) and Wave 6 (2015) - except for the Netherlands where the comparison is with Wave 5 (2013). This comparison could examine to what extent, changes in care gap and/or care mix during the years spanning the financial crisis and ask whether the observed patterns are due to demographic, macroeconomic or fiscal factors or are due to identified policies.

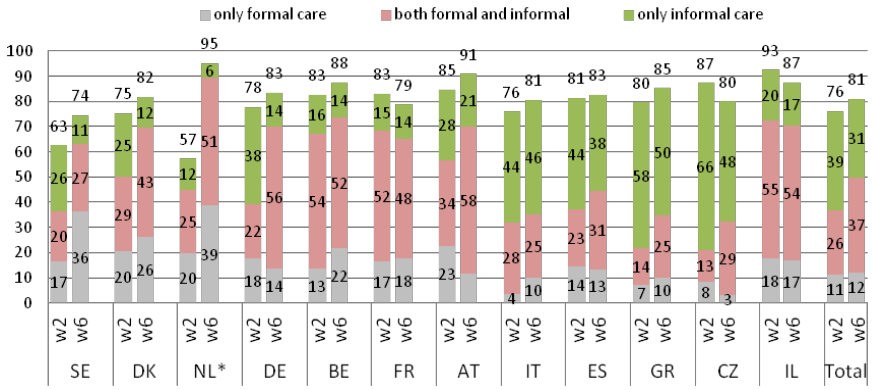
In Figure 8 we see how care provisions changed for SHARE countries. Implicitly we also see the care gap. In the eight years between 2007 and 2015 there was an acceleration of ageing, presumably increasing need, while the financial crisis was everywhere associated with austerity, hence cutting back on services. We should thus be prepared for a *widening* care gap.

However, what we see is the *opposite*: For the vast majority of countries the care gap has decreased among waves. The maximum decrease was 38% pp for the Netherlands and a minimum decrease of 2% pp for Spain. Care coverage has improved for the vast majority of the countries except France (marginally) and the Czech Republic.

Regarding formal care in all countries, except France, formal care significantly increased and mostly accounts for closing gaps. This is especially notable for Sweden, Denmark, Germany and Netherlands, reaching levels attained in 2007 by countries such as France, Belgium and Austria. In some countries this increases in parallel with informal care while in others, it increases in inverse proportion.

More specifically, in Sweden and the Netherlands we see sharp increase of persons in need of care of age 65+ that receive only formal care, while in Denmark, Germany and Austria we see a sharp increase in receiving both formal and informal care. In almost every country, persons receiving only informal care declines. This is in line with conclusions of researchers that imply that a shortage of unpaid care-providers is likely to happen in the next future (Barbieri and Ghibelli, 2017).

Figure 8: Care Gap & Care mix (%) across waves of persons 65+ with 2+ adl



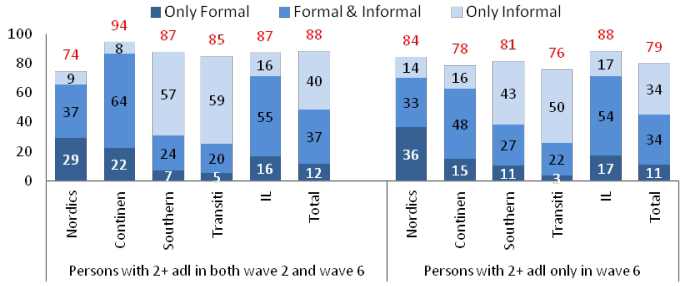
The picture emerging is that wherever we have data formal care is increasing and hence care gaps are shrinking. It is surprising that this is in the opposite direction to the casual expectation linking it with demographics or austerity. Though further investigation is warranted a possible

explanation could lie with policy towards LTC having come of age and yielding some measurable fruits.

5.1. The longitudinal dimension – Panel analysis

In this section we look at what happened to individuals who participated in both waves and who encountered need for LTC for the first time in the intervening period. We see whether there are differences in the type of care received by this group in different countries. Given that these are *new* needs, a question could be which subsystem is the first to respond. In Figure 9, we see the differences in the type of care received for those entered in need of care status in 2015.

Figure 9: Panel sample w2-w6: Care received (%) by persons 65+



As expected, results differ among country groups. More specifically, in Nordic countries formal care for those in need of care only in wave 6 is higher than for those that were already in need of care from wave 2, confirming the increasing tendency of these countries in formal care. As we can expect 'new' needs take more time to be met – the care gap is larger for them. Somewhat counter intuitively the opposite holds in the north of Europe, implying that new needs are met to a greater extent than older ones. In Southern and Eastern countries those in need of care for the first time in wave 6 rely *less* in "only informal care" as compared to the ones that where in need of care from wave 2, implying that informal networks can also be slow to respond (or possibly a cohort effect if newer beneficiaries have smaller networks to call upon).

Another interesting research question is: what is the First "port of call". What is the *first* type of help received by someone becoming needy? Examining those with 1 ADL in w6 and none in w2,

we define 4 categories, depending on the combination of formal, informal and no care. In Nordic countries the first contact is formal Care (43.9% when for Continental and Southern countries are 16.8% and only 0.9%). In Southern countries the first contact is informal help (59.6% while the respective numbers for Continental and Nordic countries are 9.3 and 8.5% respectively). In continental countries the first contact are both types equally (61.3%). Importantly, No care is higher in the Nordics (22.6%), indicating that people entering the ADL limitations group do not receive immediately care compared to Continental (12.6%) and Southern countries (14.9%). See Table 2. The results are in line with several research that show that Southern countries are mainly relying on informal care, that Nordic countries mainly rely on formal care and that continental countries rely on both.

Table 2: Type of care receipt for persons in need of care *only* in w6, panel sample persons 65+ at w2

	Only formal	*Both formal and informal*	*Only informal*	*None*
Nordics	43.9%	25.0%	8.5%	22.6%
Continental	16.8%	61.3%	9.3%	12.6%
Southern	0.9%	24.6%	59.6%	14.9%

In Table 3, we can see how care provision has changed and if there has been supplementation or substitution in type of care receipt. In longitudinal data we can observe the reaction if one type of care is withdrawn. In this limited sense we can infer the extent of substitution or complementarity within the context of the following definitions: (i) Substitutes, when someone was receiving only Formal care or only Informal care in Wave 2 and receives the opposite type of care in Wave 6 and (ii) Complements, when someone was receiving no care or only Formal care or only Formal care n Wave 2 and receives both Formal and Informal care in Wave 6.

For all country groups the result is that formal an informal care are complementary (see Table 3). More specifically in Continental and Southern countries substitution was only 1.9% and 1.2%

respectively, while complementarity was 42.7% and 21.8%. In the Nordics substitution was 9.0% while complementarity was 17.5%. The findings agree with Geerts et al. 2011 who compared SHARE W1 with W2. The fact that in Nordics there is compelementarity, is in line with the effort of policy makers in Sweden to increase informal care (Fukushima et al 2010) and the fact that in Denmark the system tendd to be less universal in order to reduce public spending and that provision of help from private sector has increased (Greve 2017).

Table 3: Complementarity vs. Substitution

	Certain classification		Unclassifiable		
Persons 65+ in-need-of care in both waves	*Substitutes*	*Complements*	*Mixed in both waves (indication of complementarity)*	*Transition from no care to Only Formal or Only Informal*	*No change in care status or elimination of care provision*
Nordics	9.0%	17.5%	7.5%	23.2%	42.8%
Continental	1.9%	42.7%	17.7%	11.3%	26.5%
Southern	1.2%	21.8%	3.4%	19.4%	54.3%
Total	*1.8%*	*32.3%*	*10.8%*	*15.4%*	*39.7%*

To answer the question" What is the trend regarding transitions of type of care receipt?", we made the two following definitions: (i) Transition into formal care, when someone shifts to a regime containing formal, while he was not in receipt of formal care in w2, i.e. started receiving formal care, (ii) Transition into informal care, the converse, when someone shifts to a regime containing informal, while he was not in receipt of informal care in w2, i.e. started receiving informal care.

At Table 4, we see that transition into formal care was 28.7% for Nordics, 30.5% for Continental countries and 19.8% for the south. Apart from the age effect it is interesting to note that in Southern countries that are known for informal care, still had 19.7% transition to formal care. This is in line with policies starting new formal systems between 2007 and 2015: Spain implemented (with difficulties) the National Program of Long term Care in in 2008 (Gutierrez et

al. 2010, Bocquaire E. 2016). Greece, after 2007 expancded a nationwide network "Help at Home" run by municipalities and financed by structural funds (Tinios 2017).

Transition into informal care on the other hand was 20.7% for the Nordic countries, 28.3% for the Continental countries and 29.9% for the Southern countries. Here, the interesting finding is the 20.7% transition to informal care for the Nordics, which –as in the case of complementarity- is in line with the effort of the policy makers in Sweden to increase informal care (Fukushima et al 2010) and the fact that in Denmark the system tend to be less universal in order to reduce public spending and that provision of help from private sector has increased (Greve 2017).

Table 4: Receiving formal or informal care for the first time

Persons 65+ in-need-of care in both waves	*transition to formal care*	*transition to informal care*
Nordics	28.7%	20.7%
Continental	30.5%	28.3%
Southern	19.8%	29.9%

6. Conclusions

The extent of persons "in need of care", receiving care seems to be directly related to number of ADLs and to age. The older someone is and the greater the need one has, the lowest the care gap is.

As far as it concerns the "country" dimension, the highest care gap for persons 65+ occurs in Switzerland followed by Slovenia, Poland and Sweden. Given that both Switzerland and Sweden relying significantly on formal care, while on the other hand Poland and Slovenia are mainly relying on informal care, we cannot see any relation of care gap with the type of care received.

For countries however that have a combination of formal and informal care, care gap seem to be lower.

Regarding gender differentiations, there is clear a conclusion -which however needs more analysis in order to interpret - that men, and especially men over 80 years old, find it more difficult to cover their care needs, since the care gap for them is significantly larger than for women.

As far as the care mix is concerned, we can group the countries into the following categories: countries that rely more on formal care (Nordic countries), countries that rely more on informal care (Eastern and partially Southern countries), and countries having a more balanced mix relying both on formal and informal care (Continental, partially Southern countries and Israel).

The answer of the question "if formal and informal care, act as substitutes or complements", based on the panel analysis it seems that they seem to be complements rather than substitutes. More specifically in Continental and Southern countries substitution was only 1.5% and 1.1% respectively show, while complementarity was 35.5% an 19.7%. In Nordics substitution was 7.2% while complementarity was 13.9%. These findings agree with Geerts et al. 2011 who compared W1 with W2. The fact that in Nordics there is compelementarity, is in line with the effort of the policy makers in Sweden to increase informal care (Fukushima et al 2010) and the fact that in Denmark the system tend to be less universal in order to reduce public spending and that provision of help from private sector has increased (Greve 2017).

When comparing W6 (2015) data with W2 (2007) data, we see that the Care Gap for persons in need of care of age 65+ with 2 or more ADLs has significantly *decreased*, meaning that care has improved, for the vast majority of the countries. Regarding formal care, we note that almost in all countries formal care has been significantly increased across waves. This increase in formal care does not mean the same thing for all countries, since in some countries it increases in

parallel with informal care while in other countries it increases in inverse proportion to informal care.

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[i] ADLs include the following six activities: i) Dressing, including putting on shoes and socks; ii) Walking across a room; iii) Bathing or showering; iv) Eating, such as cutting up your food; v) Getting in and out of bed, vi) Using the toilet, including getting up or down. ADLs are used in the US system for determining eligibility for LTC benefits. The wording of the question is standardized across waves and follows the US.

[ii] For all countries, the following data refer to Wave 6 (2015), except for the Netherlands which did not participate in wave 6, thus we are using data of Wave 5 (2013).