PERFORMANCE OF LONG-TERM CARE SYSTEMS IN EUROPE

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Abstract

This report evaluates the performance of long-term care (LTC) systems in Europe, with a special emphasis on four countries that were selected in Work Package 1 of the ANCIEN project as representative of different LTC systems: Germany, the Netherlands, Spain and Poland. Based on a performance framework, we use the following four core criteria for the evaluation: the quality of life of LTC users, the quality of care, equity of LTC systems and the total burden of LTC (consisting of the financial burden and the burden of informal caregiving). The quality of life is analysed by studying the experience of LTC users in 13 European countries, using data from the Survey of Health, Ageing and Retirement in Europe (SHARE). Older persons with limitations living at home have the highest probability of receiving help (formal or informal) in Germany and the lowest in Poland. Given that help is available, the sufficiency of the help is best ensured in Switzerland, Italy and the Netherlands. The indirectly observed properties of the LTC system are most favourable in France. An older person who considers all three aspects important might be best off living in Belgium or Switzerland. The horizontal and vertical equity of LTC systems are analysed for the four representative countries. The Dutch system scores highest on overall equity, followed by the German system. The Spanish and Polish systems are both less equitable than the Dutch and German systems. To show how ageing may affect the financial burden of LTC, projections until 2060 are given for LTC expenditures for the four representative countries. Under the base scenario, for all four countries the proportions of GDP spent on public and private LTC are projected to more than double between 2010 and 2060, and even treble in some cases. The projections also highlight the large differences in LTC expenditures between the four countries. The Netherlands spends by far the most on LTC. Furthermore, the report presents information for a number of European countries on quality of care, the burden of informal caregiving and other aspects of performance. The LTC systems for the four representative countries are evaluated using the four core criteria. The Dutch system has the highest scores on all four dimensions except the total burden of care, where it has the second-best score after Poland. The German system has somewhat lower scores than the Dutch on all four dimensions. The relatively large role for informal care lowers the equity of the German system. The Polish system excels in having a low total burden of care, but it scores lowest on quality of care and equity. The Spanish system has few extreme scores. Policy implications are discussed in the last chapter of this report and in the Policy Brief based on this report.

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Performance of Long-Term Care Systems in Europe
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1.   Introduction

Older people with chronic limitations are likely to need help, especially if limitations concern basic activities of daily living (ADL), such as eating, washing and going to the toilet. In general, European countries have some system in place to help older persons with limitations. In many countries informal care by partners, children and others plays a large role, but usually at least some formal care is available as well. In some countries, formal care is as or even more important than informal care in dealing with ADL limitations. The assessment of such long-term care (LTC) systems is much less developed than for healthcare systems; this is true both for the development of methods of evaluation and the availability of a literature on results. Presumably data limitations are an important reason for this trailing behind, but additionally LTC systems only recently seem to have drawn more attention, now that ageing is starting to play a larger role in European societies.

This report aims to develop an evaluation of European long-term care systems for older persons. This evaluation forms the last stage of the ANCIEN project, a broad European study of LTC for older adults, executed within the 7th Framework Programme (FP7) of the European Union. More than 20 partners from many different EU countries have been working together in ANCIEN. At the start of the project, the ANCIEN team studied the LTC systems in EU member states and made a typology with four classes of systems based on the use and financing of LTC (see Kraus et al., 2010). The typology was based on four important characteristics:

1.   Public expenditure on LTC (related to GDP and the need for care)
2.   The share of private expenditures on LTC
3.   The use of informal care (number of users related to the number of persons aged 65 and older)
4.   The support for informal caregivers (an indicator that counts support measures for informal caregivers)

This typology was used to select a representative country from every cluster of LTC systems for further analysis: Germany, the Netherlands, Spain and Poland. The characteristics of the different clusters of systems are shown in Figure 1.1.[1] Cluster 2, which includes the Netherlands, is characterised by relatively high public spending on LTC and a relatively low use of informal care. The share of private funding is low, and support for informal caregivers is high despite the relatively low use of informal care. In the cluster 2 countries, the government takes on a lot of responsibility for LTC. In all other clusters, the role of informal care is much larger. In cluster 1 (including Germany) public spending is much lower than in cluster 2, informal care use is much higher and the support for informal caregivers is just as high as in cluster 2.[2] In cluster 3 (including Spain) public spending is relatively low and private funding is high. Both the informal care use and the support for informal caregivers are high. Cluster 4 is characterised by low public spending, high private spending, high informal care use and relatively low informal care support. In these countries the state assumes little responsibility for LTC; most of the responsibility rests with the family.

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[1] The numbering of clusters has no specific meaning; it is just a label.

[2] Cluster 1 as a whole is characterised by relatively low private funding of LTC. It turned out later, when more data became available for Germany, that Germany has relatively high private funding of LTC.

Figure 1.1 A star plot of LTC system (cluster centres)
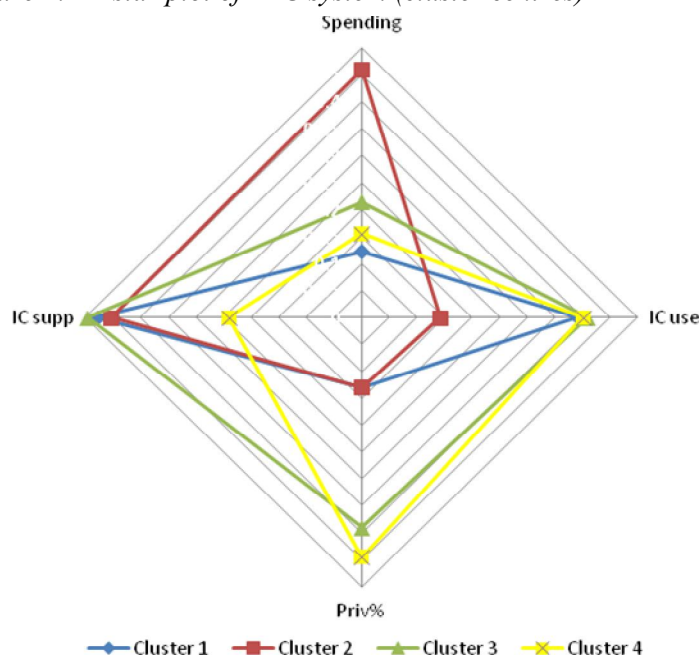
Source: Kraus et al. (2010).

The four selected representative countries play an important role in the evaluation of systems, because more aspects of performance have been analysed for them than for other countries. For the four selected countries, empirical models were developed about the need for LTC (Work Package 2, WP2) and the determinants of formal and informal care use (WP3 and WP6). Projections were made of the future number of ADL-disabled older people (WP2) and the number of informal and formal care users for the four representative countries (WP6).

This ANCIEN report starts by describing the evaluation framework that is used to assess the performance of the LTC systems. Following that, we present analyses of three aspects that are important for the assessment: the experiences of LTC users with the systems, the equity of the systems and the future financial burden of LTC systems. In addition, the report makes use of the results of previous ANCIEN work packages and of external sources. Finally, all this information is used to produce an overall systems evaluation.

The report is structured in the following way. Chapter 2 presents the performance framework. Chapter 3 discusses the literature on a subset of performance criteria: the individual outcome measures. Chapter 4 presents analyses aimed at one specific individual outcome measure that is part of the performance framework: the quality of life of LTC users. It describes the analysis of the experiences of LTC users, using the SHARE database.[3] This analysis yields indicators for the LTC-related quality

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of life of elderly persons with limitations in 13 countries. Chapter 5 concerns another performance criterion: the equity of the system. This chapter includes an analysis of equity in the four representative countries. Chapter 6 describes a third performance aspect, namely the projections for future expenditure on LTC (public and private) for the four representative countries, based on the projection models of WP6 (see Geerts, Willemé & Mot, 2012). This informs us about the future financial burden of LTC. Chapter 7 of this report describes the overall evaluation of the performance of LTC systems. It gives an overview of the available information for the ANCIEN countries, not just for the three performance aspects described above, but also for most of the other criteria in the performance framework. This chapter also includes a discussion of data problems. Chapter 7 also describes the methods for combining the information on the different scores in a final evaluation. Finally, chapter 8 concludes.

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2.   The performance framework
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2.1   Introduction

In order to determine how well LTC systems perform, we need a set of criteria. We call this set our performance framework. It is important to develop a balanced set of criteria for two reasons. First, we want to take into account all aspects that are important to the persons for whom the system is relevant (people with limitations who might need LTC, informal carers, formal caregivers, residents or citizens who play a role in funding the system). Secondly, the scores on different criteria are unlikely to be independent. The way the LTC system is organised, for example the level of public spending on LTC, will most likely affect a number of criteria. For example, individual countries and international organisations often use affordability and accessibility of the systems and the quality of the care delivered as criteria. We can expect high public expenditures to increase the accessibility of the system and the quality of care, while at the same time decreasing the affordability of the system. If we would leave out any of the relevant results affected by spending, that would bias our evaluation of a system that is characterised by high public spending. A comparable example is that of the importance of informal care. In a system with a lot of informal care, we can expect the affordability to be high, as spending on formal care can be relatively low. However, if we do not pay attention to the burden of informal caregivers, we evaluate such a system in an overly favourable way. Therefore our set of criteria should be complete.

Persons and countries differ in the weight they place on the performance of different criteria of LTC systems, where different weights represent different preferences. Within Europe, decisions on the way LTC systems are organised are usually taken at the national and/or regional level. The residents of a country or a region will have to come to an agreement about how the LTC system should be organised. For regions, these decisions may have to fit within national guidelines. In this Work Package, we want to compare the performance of different LTC systems. In order to do that, we need to use the same set of criteria with the same weights to assess all national systems. At the same time we have to keep in mind that national governments or stakeholders may have other weights in mind than the ones we use. This may mean that some of the drawbacks of their own system, as identified by our analysis, will be less important to them, or some of the advantages will be more important to them.

In section 2.2 we discuss some literature that is relevant for assessing the performance of LTC systems. In section 2.3 our performance framework is described. This concerns the set of criteria that we would ideally use to assess LTC systems. In reality it is not possible to find internationally comparable information for European countries on all aspects discussed here. The actual final evaluation of systems in this report follows a more modest approach (see chapter 7).

2.2   Relevant literature

There is a relatively limited literature that concerns the performance of LTC systems. The performance of healthcare systems has been discussed more extensively and sometimes the results were explicitly applied to LTC systems. This is the case with the well-known performance framework of the WHO (2000). We start this section by discussing the WHO performance framework, followed by a description of some other frameworks that were developed for LTC.

2.2.1   The WHO framework

A seminal work in this area is the World Health Report 2000 of the WHO: "Health systems: Improving performance". The WHO developed a performance framework and attached weights to the different criteria in the framework. The framework is summarised in Table 2.1. It values not only the overall level of criteria that is attained, but also the distribution over the population.

Table 2.1 The WHO framework for performance of health systems

Goal	Weight (%)
Health (disability-adjusted life expectancy)	
Overall	25
Distribution	25
Responsiveness	
Overall	12.5
Distribution	12.5
Fair financial contribution	25

Source: WHO (2000).

Larizgoitia (2003) pays specific attention to the evaluation of LTC systems in a later WHO report, while using the above-described performance framework. Her report cites a definition of LTC and its specific goals given by a group of experts convened by the WHO in 1999:

> [The goal of long-term care] is to ensure that an individual who is not fully capable of long-term self-care can maintain the best possible quality of life, with the greatest possible degree of independence, autonomy, participation, personal fulfilment and human dignity (p. 228, emphasis added by the current authors).

Larizgoitia (2003) applies the general WHO performance framework specifically to LTC (see Table 2.2).

Table 2.2 Application of the WHO performance framework to LTC

Principal quality outcomes of LTC	
Health dimension	
	Functional ability
	Other health status measures specific to major conditions
	Health-related quality of life
Responsiveness dimension	
	Dignity and human rights
	Autonomy, confidentiality
	Quality of basic amenities
	Access to social support networks
	Choice of provider

Source: Larizgoitia (2003).

The goal of 'health' has a different meaning in the context of LTC. The emphasis is on functional ability and quality of life. The concept of responsiveness was detailed specifically for LTC.

2.2.2 Open method of coordination

Since the ANCIEN project studies the performance of LTC systems in Europe, the goals for LTC formulated at the level of the European Union are very relevant. Within the framework of the open coordination of social protection and inclusion policies in the European Union, the European Commission (2005) mentions the following goals specifically for health and long-term care:

Ensuring accessible, high-quality and sustainable healthcare and long-term care:

1. Guarantee access for all to adequate health and long-term care and ensure that the need for care does not lead to poverty and financial dependency. Address inequities in access to care and in health outcomes

2. Promote quality in health and long-term care and adapt care to the changing needs and preferences of society and individuals, notably by establishing quality standards reflecting best international practice and by strengthening the responsibility of health professionals and of patients and care recipients

3. Ensure that adequate and high-quality health and long-term care remains affordable and sustainable by promoting healthy and active life styles, good human resources for the care sector and a rational use of resources, notably through appropriate incentives for users and providers, good governance and coordination between care systems and institutions

This set of goals is partly aimed at another level than those formulated by the WHO (2003). The WHO seems to be mostly concerned with outcomes (such as health-related quality of life), where the European Commission (2005) formulated criteria for the functioning of the LTC system (such as accessibility and sustainability). Another difference is that the European Commission (2005) also includes cost considerations in the picture.

2.2.3 The Wanless report

Wanless (2006, pp. 215-216) formulates the aims of social care systems in his review of the English social care system:

> For this Review, with a 20-year time horizon, the aims have been defined as:
>
> - To identify those needs of individuals and those who care for them that are supported (by the State)
>
> - To ensure individuals so identified can receive support, advice, etc. consistently and with confidence about its sustainability
>
> - To design and implement a system that will allocate resources to those who need them in a way that is clear and sustainable, which develops physical resources to meet expected demand, which promotes fairness, economic efficiency and choice and is consistent with the principles that emerge for the provision by individuals for their pension arrangements
>
> - To ensure the availability throughout England of sufficient diversity and quality of care to satisfy all those who need and choose to receive it

On the basis of these aims, Wanless (2006) proposes a number of tests to expose the system to, noting that these tests can give contradictory results:

- Fairness
- Economic efficiency
- Choice
- Physical resource development
- Clarity
- Sustainability/acceptability

There are at least two new aspects in the Wanless goals, compared to the goals discussed above. First, Wanless (2006) formulates as an explicit goal that the state should consider its own responsibility: it should identify those needs where support is necessary. Secondly, clarity of the system is mentioned as one of the goals.

2.2.4 The AARP Scorecard

Reinhard, Kassner, Houser & Mollica (2011) developed a framework for assessing LTC systems and applied that framework to states within the US. Although our study focuses on Europe, the goals and methods of the American Association for Retired Persons (AARP) are very relevant for our analysis.

Reinhard et al. (2011) distinguish five key dimensions of performance:

- Affordability and access
- Choice of setting and provider
- Quality of life and quality of care
- Support for family caregivers
- Coordination of LTC with medical services

The actual evaluation with the AARP State Scorecard concerns only four dimensions, because the dimension of coordination could not be measured with the available data. The other four dimensions were operationalised by selecting a number of indicators for each dimension, 25 indicators in total. For example, within the dimension of affordability and access, six indicators are used. The first is "median annual nursing home private pay cost as a percentage of median household income aged 65+" (see Reinhard, Kassner, Houser & Mollica, 2011, exhibit 2). Data problems were not restricted to the coordination dimension. Reinhard, Kassner, Houser & Mollica (2011, p. 10) state: "one of the more noteworthy 'findings' of our work on the Scorecard is how much we are not able to compare because information on quality, experiences, coordination, costs, or outcomes is simply not available".

2.3   Description of the framework

We used the literature described above to get an overview of relevant aims for LTC systems. Goals of LTC exist on different levels. We distinguish the following levels:

1. Ultimate goals: the desired outcomes of LTC systems for users, caregivers and society
2. Intermediate goals: the outcomes at the level of the LTC system that are instrumental in promoting the desired final outcomes for individuals and society
3. System characteristics: characteristics of the systems that are expected to make the system work and assist in achieving the outcomes

Below we describe for each of the three levels which goals or characteristics we selected. Together they form the complete ANCIEN performance framework that is summarised in section 2.3.4.

2.3.1   Outcomes for individuals and society

We think that the most relevant outcome for LTC users or potential LTC users is the LTC-related quality of life, that part of the quality of life that is affected by long-term care. Chapter 3 explains why we select this concept. As stated above, the LTC system does not just affect potential users but also others in society, such as informal or formal caregivers. To some extent it affects everyone in a society. LTC systems are usually at least in part publicly funded, so all citizens are affected by the financing of the system. In addition, non-LTC users may be affected because of altruistic reasons (they want elderly persons with limitations to receive good care) or because of their own future interests in case they might come to need LTC themselves. We formulate the aims for others than the LTC users as "an appropriate balance between LTC and other societal needs".

2.3.2   Outcomes at the systems level

The goals at the level of the LTC system are quality of care, accessibility of care, equity, a manageable total burden of care and improving functional ability and minimising the need for LTC. To improve the LTC-related quality of life, the system has to deliver care of good quality. Persons who need care should have access to it, at the right time, in the right place and without having to become poor to pay for their care. The funding and delivery of care should be organised in an equitable way. The total burden of care consists of two parts: the financial burden of public and private expenditures on LTC and the burden of informal care, the time spent and efforts made by informal caregivers. This total burden, as well as the two parts, should be manageable. For given outcomes, the total burden of care should be minimised, implying that the system is organised as efficiently as possible. The LTC system should support users' functional ability to the degree possible. Efforts should be made to enable people to manage without LTC if possible (e.g. by suitable housing, domotics, medical devices). However, the severity of limitations can only be affected by the LTC system itself in a limited way. Lifestyle,

prevention and the performance of the healthcare system are probably more important influences on functional ability.

2.3.3 Systems characteristics

In this section we describe four characteristics that are often mentioned as useful features to make the LTC system perform well:

1. Support for informal caregivers
2. Choice of setting and providers
3. Integration with healthcare and social services and coordination
4. Simplicity of the system and information

In many countries informal care plays an important role in the LTC system. Support for informal caregivers has several purposes. It can help them to maintain their own well-being. It can also be a help in providing informal care (for example by providing training) and it can help caregivers in combining care and labour market participation. It is to be expected that the quality of life of LTC users can be improved by having choices and being able to organise LTC the way they want. Some choices may also increase efficiency, for example the choice to stay at home in cases where that is more cost-effective. LTC systems function better with proper coordination within the LTC system and between LTC, healthcare and social services. Potential LTC users need information and advice to help them find their way around the care and support system. Information about supply and the quality of care is especially important in consumer-directed systems where competition for clients is supposed to be an important incentive for providers. The LTC system should be designed in a logical way and (potential) users should be clearly informed about funding and their (future) rights.

2.3.4 The ANCIEN performance framework

Table 2.3 summarises the performance framework described above. We distinguish 10 criteria at different levels. Chapter 7 concerns the actual evaluation of LTC systems in Europe, that is to say the application of the criteria to existing LTC systems. In principle, the framework of Table 2.3 is used in the evaluation, but for some criteria or sub-criteria no internationally comparable data could be found. This is especially the case for the assessment of European systems in all ANCIEN countries. A more detailed assessment could be made for the systems of the four selected representative countries. Criterion 10, simplicity of the system and information, is not used in the overall evaluation because of a lack of data. Criterion 6, improving functional ability and minimising the need for LTC, is discussed in detail in chapter 7, but was excluded from the final evaluation. The reason is that the extent of limitations by itself is not sufficiently representative for the performance of the LTC systems. Further details of the method of evaluation can be found in chapter 7.

Table 2.3 Goals for systems of long-term care

	Goals	**Level**
1	Quality of life and an appropriate balance between LTC and other societal needs	Outcomes for users and society
2	Quality of care	Outcome at system level
3	Accessibility of care	Outcome at system level
4	Total burden of LTC	Outcome at system level
5	Equity	Outcome at system level
6	Improving functional ability and minimising the need for LTC	Outcome at system level
7	Support for informal caregivers	System characteristic
8	Choice of setting and providers	System characteristic
9	Integration with healthcare and social services and coordination	System characteristic
10	Simplicity of the system and information	System characteristic

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3. Individual outcome measures

3.1 Introduction[4]

Chapter 2 described the performance framework for long-term care (LTC) systems. This framework includes individual outcome measures, outcomes at systems level (like the degree of equity) and systems characteristics (e.g. support for informal caregivers). This chapter focuses on the first aspect of the framework. It provides a short survey of individual outcome measures in the LTC literature. Individual outcome measures are indicators that evaluate the LTC system via the consequences of the system for individual persons with care needs. The survey discusses several of these measures and their advantages and disadvantages. Moreover, it briefly discusses which measures are available for use within ANCIEN. The survey covers both academic and policy documents.

The focus of this survey is on the outcome of LTC systems. Hence, it considers all aspects of the system and not just the quality of the provided care. Examples of studies that evaluate LTC systems are Wanless, Forder, Fernandez, Poole, Beesley, Henwood & Moscone (2006), Australian Government Productivity Commission (2011) and Dilnot, Warner & Williams (2011).

The survey only covers outcome measures for individuals with care needs. First, since the survey only covers outcome measures, it does not describe measures about the structure or process of the LTC system. Measures about the structure or process provide information such as the number of available beds per 1,000 citizens, the presence of specific equipment and whether caregivers follow specific guidelines. The focus on outcome measures finds broad support in the literature since it is the outcome that ultimately matters (see e.g. Qureshi, Patmore, Nicholas & Bamford, 1998; Wanless, Forder, Fernandez, Poole, Beesley, Henwood & Moscone, 2006; the Dutch Stuurgroep Verantwoorde Zorg, 2007 and the UK Department of Health, 2011). However, structure and process measures can be useful if they influence outcomes.[5] A disadvantage of outcome measures is that they are often more difficult to collect than structure and process measures. Second, since the survey only covers measures of the consequences of the LTC system for individuals with care needs, it does not discuss measures that describe the consequences for other individuals (like caregivers and taxpayers).

The organisation of the remainder of this chapter is as follows. Section 3.2 discusses the individual outcome measures that exist in the literature. Section 3.3 contains a brief discussion of general advantages and disadvantages of these measures. It also briefly discusses which measures are appropriate for ANCIEN.

3.2 Individual outcome measures

This section describes eight individual outcome measures that researchers and policy-makers use.

a) Health status (also known as functional ability)

Health status of individuals is the classic outcome measure. It is usually put into practice as the ability to perform (instrumental) activities of daily living ((i)ADL) and therefore called 'functional ability'. The (i)ADL scales were devised by Lawton & Brody (1969) and Katz, Downs, Cash & Grotz (1970). For applications, see e.g. Mitchell (1978) and Rosen, Berlowitz, Anderson, Ash, Kazis & Moskowitz

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[4] This chapter is a short version of Akkies (2011). "Literature review of outcome measures to compare the performance of various long-term care systems", CPB Memo, Netherlands Bureau for Economic Policy Analysis (the Netherlands), August.

[5] Some argue that structure and process measures are more important than outcome measures since outcomes are influenced by many other factors than care and care providers can more easily change structure and process measures (see e.g. Sorenson & Mossialos (2007) and references therein).

(1999). Health status has also been put into practice as the Sickness Impact Profile (Bergner, Bobbitt, Carter & Gilson, 1981). Early studies often use health status as an outcome measure of LTC (see Cotter, Salvage, Meyer & Bridges, 1998, for a discussion). However, many researchers criticise health status as an outcome measure as the LTC system does not exclusively determine the health status of individuals. Other factors, like initial health status and lifestyle, impact health status as well (see, for example, Royal College of Physicians of London and British Geriatrics Society, 1992). Therefore, many recent studies that assess LTC systems use health status as a control variable instead of an outcome variable (see e.g. Avlund, Kreiner & Schultz-Larsen, 1993).

b) Capability

Capability measures whether an individual has the opportunity to do something. It does not matter whether the individual chooses to do that thing, it only matters that the individual can choose to do the thing (Sen, 1985). An example would be whether an individual has the opportunity to be healthy. It could be that an individual prefers not to spend time on health or that the individual does not consider health important. The capabilities framework values whether the individual has the choice to be healthy. An advantage of capability as a measurement indicator is that it allows for variation in preferences. The capabilities framework differs from other measures because it does not presuppose that certain outcome measures are always appropriate.

c) Unmet needs

Unmet needs measures often indicate whether an individual currently requires additional help to perform (i)ADL (Manton, 1988). The quality of LTC is higher when a care recipient reports fewer unmet needs. Allen & Mor (1997) use a set of questions to determine whether a care recipient has unmet needs. They ask whether an individual needs help with a particular activity and if so, whether there was any time recently when the individual did not receive help with that activity. A disadvantage of the unmet needs measure may be that older people are often easily satisfied with the care they receive. Often, policy-makers and society have a higher standard (Netten, Burge, Malley, Potoglou, Brazier, Flynn & Forder, 2009). Another potential disadvantage is that the measure sometimes does not take into account how much additional help is required (Jackson, 1991). Examples of studies that apply unmet needs as an outcome measure are Greene, Lovely & Ondrich (1993), Benjamin, Matthias & Franke (2000) and Elkan, Kendrick, Dewey, Hewitt, Robinson, Blair, Williams & Brummell (2001). Some studies do not focus solely on (I)ADL, but measure all types of unmet needs in a particular domain, like physical and psychological needs (see Fernández & Forder, 2010).

d) Functioning status

Functioning status measures whether an individual has the minimum level of functioning that researchers believe society wants (potential) LTC recipients to attain (Qureshi, Patmore, Nicholas & Bamford, 1998 and Netten, Ryan, Smith, Skatun, Healey, Knapp & Wykes, 2002). This measure has a subjective component because it requires a judgment about the minimum level of functioning that society wants. The outcomes of a functioning status measure are usually descriptive accounts of the results of (not) performing ADL. For instance, the ADL eating and cooking correspond to the functioning status 'being well-fed'. Functioning status differs from functional ability. The former refers to the condition of a care recipient (for example, whether the recipient is well-fed and clean), the latter refers to the ability to perform specific tasks (such as cooking and toileting).

e) Subjective well-being

Subjective well-being measures whether (potential) LTC recipients are happy. Veenhoven (2002) argues that it can supplement other, more objective measures. A disadvantage of these measures is that the reporting style of respondents may differ substantially between individuals, countries and aged (see e.g. Bowling, 2005). Another disadvantage is that both the LTC system and many other factors impact subjective well-being.

f) Activities of Daily Living Adjusted Year

Researchers use the Quality Adjusted Life Year (QALY) measure to weigh expected life years by level of sickness. Years lived without sickness are more valuable. The QALY measure is not suitable for measuring the impact of LTC because changes are strongly influenced by factors other than LTC (Donaldson, Atkinson, Bond & Wright, 1988). The Activities of Daily Living Adjusted Year (ADLAY) measure is an adjustment of the standard QALY measure for use within LTC. It provides the gain that a person with ADL limitations lives for one year without unmet needs instead of with unmet needs. See Wanless, Forder, Fernandez, Poole, Beesley, Henwood & Moscone (2006) for an application.

g) Perception of quality of care

Kane & Kane (2001) use the perception of care quality as an outcome variable. Forder, Netten, Caiels, Smith & Malley (2007) argue that it is more accurate to ask care recipients about the quality of life since quality of care is an intermediate outcome. Even if care meets all medical standards, a care recipient can still have a low quality of life (and vice versa).

h) LTC-related quality of life

The Quality Of Life Scale (QOLS) measures the quality of life of healthcare recipients (Flanagan, 1978 and 1982). LTC-related quality of life is a similar measure that focuses on LTC and emphasises care for the elderly. The measure contains domains of the quality of life that the LTC system influences. These domains consist of several individual outcome measures. As such, the LTC-related quality of life measure combines a selection of the aforementioned individual outcome measures. Although difficult to define and measure, LTC-related quality of life is broadly accepted as an appropriate measure of LTC outcomes (see e.g. Bowling, 2005).

There exist several versions of the LTC-related quality of life measure. Examples are the Social Policy Research Unit (SRPU) measure (Qureshi, Patmore, Nicholas & Bamford, 1998), the Social Care-Related Quality of Life (SCRQoL) measure (also called the ASCOT measure; see Forder, Netten, Caiels, Smith & Malley, 2007 and the measure of Kane, 2001).[6] Table 3.1 contains the domains of these three versions. It shows that there exists a strong overlap between them. The domains contain both functioning status measures and capability measures since these two types are complementary (Netten, Burge, Malley, Potoglou, Brazier, Flynn & Forder, 2009). Functioning states are a minimum level of functioning and are therefore useful on the low end of scores in each domain. Capabilities are more than what is strictly needed and therefore used to describe the higher scores in each domain. The domains also contain unmet needs measures and subjective well-being measures.

Often researchers use weights that reflect preferences (of care recipients) to combine several measures into a single domain and several domains into a single overall value (see, for example, Netten, Ryan, Smith, Skatun, Healey, Knapp & Wykes, 2002; Darton, Forder, Bebbington, Netten, Towers & Williams, 2006 and Burge, Potoglou, Kim & Hess, 2010). In general, the preferences of LTC recipients differ widely (Degenholtz, Kane & Kivnick, 1997; Kane & Kane, 2001 and Netten, Burge, Malley, Potoglou, Brazier, Flynn & Forder, 2009). Netten, Burge, Malley, Potoglou, Brazier, Flynn & Forder (2009) argue that it is also possible to include weights chosen by researchers and policy-makers. Researchers can also use factor analysis to combine the individual parts (Bowling, 2005).

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[6] Burckhardt & Anderson (2003) present a quality of life measure for use in chronic illness groups. This measure is less useful for LTC as it does not specifically consider the elderly population.

Table 3.1 The correspondence of domains of the SPRU, SCRQoL and Kane (2001) measures

SPRU domain	Corresponding SCRQoL domain	Corresponding domain in Kane (2001)
Clean and comfortable	Personal cleanliness and comfort	Physical comfort
Presentable	-	Physical comfort
Well-fed	Food & nutrition	Physical comfort
Personal safety	Safety	Sense of safety, security & order
Clean environment	Accommodation cleanliness & comfort	Physical comfort
Keeping active	Occupation	Meaningful activity
Social contact	Social participation & involvement	Relationships
Being in control of your life	Control over daily life	Autonomy/choice
-	Dignity	Dignity
		Enjoyment
		Functional competence
		Privacy
		Individuality
		Spiritual well-being

3.3 Discussion

This literature review describes individual outcome measures that researchers and policy-makers use and their advantages and disadvantages. An important general advantage of individual outcome measures is that they capture the ultimate goal of a LTC system: improving the life of people with limitations.

In general, a disadvantage of many individual outcome measures is that the performance of an LTC system does not determine them exclusively. Other elements of society (like the healthcare system) and characteristics of individuals also play a role. This disadvantage is most prominent for measures like health status and subjective well-being. Therefore, researchers and policy-makers have to search for individual outcome measures that most accurately represent the contribution of LTC – that is, the difference between the actual outcome and the expected outcome in the absence of LTC. An alternative strategy is to correct a specific measure as well as possible for all other observed factors that play a role.

A second general disadvantage is that many individual outcome measures require some kind of a subjective judgment of either the researcher or the person in need of care. For example, in case of the unmet needs measure and subjective well-being measure, the reporting style of the respondent (what is the reference point of the respondent and is the respondent optimistic or pessimistic?) seems to play an important role.

Finally, a general disadvantage of a number of individual outcome measures is that they focus on just one aspect of the performance of a LTC system. The unmet needs measure, for instance, relies only on the need for care to assist with limitations. An example of a measure that provides a broader picture is LTC-related quality of life.

3.3.1 *What would be an appropriate measure for ANCIEN?*

The outcome of a LTC system for individual persons with care needs is an important part of the performance framework. LTC-related quality of life seems an appropriate measure for this outcome. It is suitable for all (potential) LTC users and it evaluates all aspects of a LTC system. Furthermore, it emphasises the contribution of the system and is, compared to other measures, relatively insensitive to

others factors. However, this measure is currently not available for a set of European countries. Therefore, the best alternative is to use individual outcome measures that are related to domains of the LTC-related quality of life measure. The use of several individual outcome measures can mitigate the disadvantages of a single measure and might also provide a broader picture than a single measure would provide.

The Survey of Health, Aging and Retirement in Europe (SHARE) contains a couple of individual outcome measures for people in need of care from different European countries. It contains for a wide set of persons that need care, among others, their life satisfaction, their health status, their ability to perform ADL, their unmet needs regarding these ADL (these questions are almost identical to those of Allen & Mor, 1997) and the degree to which the help they receive fulfils their needs. Moreover, SHARE also asks respondents about their social interactions and daily activities, which are part of the domains of the LTC-related quality of life measure. Hence, it is possible to study different aspects of an LTC system via SHARE. Moreover, it is also possible to address the other two aforementioned general disadvantages of individual outcome measures. First, SHARE contains many observed characteristics of individuals and therefore it is possible to correct individual outcome measures for these characteristics. Second, SHARE contains for some measures so-called 'vignettes', which make it possible to correct the individual outcome measure for the subjective judgments of respondents.

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4. The experience of LTC users
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4.1 Introduction

4.1.1 Users of LTC

This chapter is about the experience of older individuals with limitations that live at home and might be in need of long-term care (LTC). Their experience is important, because a very important goal of LTC systems is to protect or improve the quality of life. We are interested in those aspects of quality of life that can be influenced by long-term care, also called social care related quality of life (SCRQL). Netten, Burge, Malley, Potoglou, Brazier, Flynn & Forder (2009) distinguish the following aspects of SCRQL:

- personal cleanliness and comfort
- food and nutrition
- safety
- accommodation cleanliness and comfort
- occupation
- social participation and involvement
- control over daily life
- dignity

This overview shows that SCRQL includes basic aspects such as being clean and fed, as well as higher level goals like having dignity and autonomy. Ideally, we would study the impact of LTC systems in different European countries on the SCRQL. However, since internationally comparable information on this indicator is not available, we make use of less targeted but still interesting information from the Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE is a large panel of older Europeans that contains detailed information on their limitations, health problems and LTC use. Several aspects of SHARE are relevant for our analysis:

1. The probability of receiving help for older persons with limitations
2. The degree to which that help meets their needs
3. The life satisfaction (LS) of older people with and without limitations

All three aspects are discussed in this chapter. Section 4.2 discusses our conceptual framework. The data are described in section 4.3. Section 4.4 presents the analyses of the probability of receiving help for older persons. The degree to which that help meets the needs of older persons is discussed in section 4.5. Section 4.6 briefly discusses some methodological aspects. Section 4.7 is about the LS of older people with and without limitations. Section 4.8 concludes.

The part of the performance analysis that is described in this chapter, concerns the experience of individual persons with mobility limitations or limitations in instrumental or basic activities of daily living ((i)ADL limitations). Within the performance framework, this is included in the goal of quality of life for LTC users. In this way, we concentrate on the experience of potential users of long-term care, either informal or formal. In this context, by LTC system we mean not just the formal provision and financing of care, but we also include informal care. Since we use SHARE data for our analysis, we have to restrict ourselves almost exclusively to care given at home. The SHARE dataset hardly covers people that live in an institution.[7] As stated above, in the current analysis of the experience of

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[7] In most countries the sample frame only consists of private households, which means that SHARE only shows the use of permanent institutional care in as far so respondents in the panel get admitted to an institution.

LTC users we study a rather broad group of limitations. In some of the other parts of the ANCIEN project, projections were made for persons with the more severe ADL limitations who can be expected to need personal care.

4.1.2 Method

The three different aspects of the experience of LTC users were studied through micro-econometric analysis of the SHARE data. We also developed a questionnaire to ask the national partners for structured feedback on our draft results. This feedback concerned the results in general and in particular the results for their own country. Apart from commenting on the results and trying to explain some of them, the partners also answered general questions about the satisfaction with aspects of the performance of their system. These questions concerned satisfaction with the role of informal care, with the role of private funding, with the role of residential care and with the complexity of the system. The partners based their answers on research to the degree possible. Since appropriate research is not always available, they also used their own expertise. Therefore their answers contain a subjective element.

4.2 Conceptual framework

4.2.1 SHARE and the performance of LTC systems

4.2.1.1 Indicators for the quality of life in SHARE

We are interested in the impact of the LTC system on the quality of life of older persons with limitations, as that is a very important goal in the performance framework. The information in SHARE is not very precisely attuned to this research question. On the one hand we know whether people get help and to which extent it meets their needs. This can be seen as a very basic indicator for the functioning of the system: people have difficulties with for example walking, cooking, housekeeping or washing themselves, and someone helps them with these difficulties. This seems to fit in with the more *basic aspects* of SCRQL, such as personal cleanliness and comfort, food and nutrition and accommodation cleanliness and comfort. It does not tell us much about the *higher level aspects* safety, occupation, social participation and involvement, control over daily life and dignity. SHARE includes questions about life satisfaction that do take such aspects implicitly into account. However, we have to keep in mind that life satisfaction, even for persons with limitations, depends on many other aspects than just the LTC system. So an analysis of life satisfaction can only tell us something about the impact of the LTC system if we have sufficient control variables. By using information from SHARE about help and about LS, we can approach the impact of the LTC system on SCRQL from two sides, the side that covers the *basic aspects* and the side involving *higher level aspects*.

4.2.1.2 Information about (i)ADL limitations in SHARE

SHARE is not very restrictive in its definition of (i)ADL limitations. The following question is asked in wave 2:

> Please look at card 12. Here are a few more everyday activities. Please tell me if you have any difficulty with these because of a physical, mental, emotional or memory problem. Again exclude any difficulties you expect to last less than three months.

The question mentions having any difficulty with the instrumental or basic activities of daily living. Using this criterion, persons who can do these activities independently but with difficulty, are also seen as suffering from (i)ADL limitations. For some of these people not getting any help does not have to be a big problem. We have to keep this in mind in interpreting the estimation results.

4.2.2 The model

In this section, we describe the conceptual framework that we use in our analysis. This model determines our hypotheses regarding the impact of the LTC system on the quality of life of older people with limitations. It also shows the relation between personal characteristics, the country of residence, the LTC system and our variables of interest: the probability of receiving help, the sufficiency of the help (together the met or unmet needs) and the LS (see Figure 4.1).

Figure 4.1 Conceptual framework
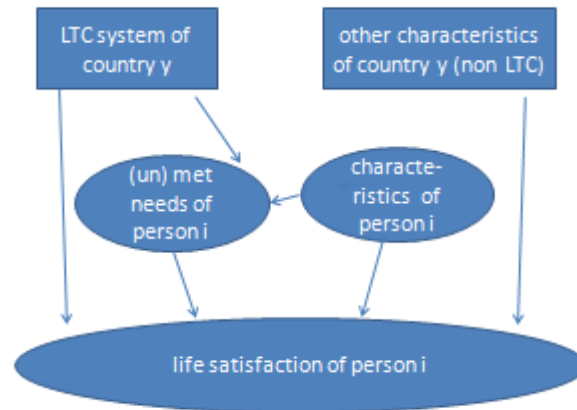
Theoretical model

The figure shows that the unmet needs of older adults with limitations (elders with limitations have unmet needs if they do not get help or if they get insufficient help) are relatively easy to explain: they only depend on the personal and family characteristics of the person and the LTC system of the country. Relevant personal characteristics to include in the model are socio-economic factors, information about limitations, chronic disorders and other health problems, and information about the possible availability of informal help (e.g. living with others and having children).

Explaining the LS is more complicated, as that does not only depend on personal characteristics, family and possibly the LTC system (mostly for those with limitations), but also on (un)met needs and the other characteristics of the country of residence. To complicate things further, it is likely that there are response scale differences among respondents on the LS question. This aspect will be discussed in section 4.7. In making a model for the LS, we have to keep in mind that limitations and the health situation may directly affect the LS: it is to be expected that someone with many limitations feels less happy than someone without limitations. But the LTC system can interact with this effect: it can mitigate the negative effect of limitations in two ways:

1. Making sure that persons have few/no unmet needs;
2. Contributing to social participation, dignity and autonomy.

In Figure 4.1, the LTC system impacts life satisfaction directly, but also through the unmet needs. Thus we could expect persons with limitations to be less satisfied with life, but the better the LTC system in a country functions, the better their loss of LS will be compensated. Apart from limitations and the LTC system, LS will also depend on personal characteristics like income, age, education and the country of residence. Countries differ not just in LTC systems but also in factors such as GDP per capita, income distribution, social structure and cohesion and culture.

4.3 Data and description

We use data from the Survey of Health, Ageing, and Retirement in Europe (SHARE) from 2006-07 (the so-called second wave). Data are collected via "face-to-face computer-aided interviews, supplemented by self-completion paper and pencil questionnaires" (www.share-project.org). Over

34,000 people older than 50 years from all over Europe were surveyed. The survey includes respondents from Austria, Belgium, the Czech Republic, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Poland, Spain, Sweden, and Switzerland. SHARE contains questions on a wide range of topics. It contains questions on, for example, physical health, psychological health, well-being, economic status, housing, demographic characteristics, and social interactions. A special feature of SHARE is that it contains vignettes to correct some questions for the reporting style of respondents. For more information on SHARE, see e.g. Börsch-Supan, Brugiavini, Jürges, Kapteyn, Mackenbach, Siegrist & Weber (2008) and the website of SHARE.[8]

Since we are only interested in older persons, we select from the SHARE sample all people that are 65 or older (about 16,000 persons). Moreover, we do not use information on people from Ireland as we cannot use some important variables for them. Our basic sample contains 45% of the SHARE respondents. Finally, the interviews took place before the (partial) implementation of a new Spanish LTC system. Therefore, our analysis considers the previous LTC system of Spain.

An important disadvantage of using SHARE data is that people in nursing homes and residential care are not included in the survey. Therefore, our study almost exclusively focuses on the part of the LTC that is provided at home. Table 4.1 shows per country the percentage of older people that receive formal care in an institution (data are not available for all countries). There exist differences between countries. The percentage is relatively high in France, Belgium, the Netherlands and Sweden. It is relatively low in Italy and Spain. It is unlikely that these differences are fully caused by differences in national health status. Hence, it is likely that the group of persons that receive home-based care (that is, the part of the population that we study) is not the same in each country. We correct as well as we can for this possible sample selection via the ample individual-specific characteristics that SHARE contains. Although it is beyond the scope of this analysis, institutional care is an important part of the LTC system.

Table 4.1 Percentage of people (65 years and older) that receive formal care in an institution

	Percentage
Austria	5
Belgium	6
Czech Republic	4
Denmark	5
France	7
Germany	4
Italy	2
Netherlands	6
Spain	3
Sweden	6

Source: ANCIEN Work Package 1.

Our Polish partners have some doubts about the representativeness of SHARE for the Polish older adults. Golinowska & Sowa (2012a) state: "SHARE data for Poland tend to over-represent the rural population. Thus interpreting results one should keep in mind that economic situation, health status and availability of long-term care facilities differ between rural and urban population. These differences might be multidimensional as i.e. female longevity is higher in rural areas while male longevity is higher in urban areas. At the same time health status of rural population is poorer on average than health status of urban population. This could have an impact on various results: mobility

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[8] This website also contains the actual questionnaire.

limitations' of the population could be overestimated, access to formal care could be underestimated and use of informal care could be overestimated."

One part of the survey that is of particular importance for our study is the part that contains questions on limitations. If a person has limitations, we consider this as an indication that a person could use LTC (i.e., that the LTC system is relevant for this person). The survey contains three types of limitations. First, it contains limitations regarding 'activities of daily living' (ADL). This category covers basic activities. The survey asks whether a person has difficulties with dressing (including putting on shoes and socks), walking across a room or getting in/out of bed (these are two separate questions in the survey, but we combine the answers in order to be consistent with other WPs in the ANCIEN project), bathing or showering, eating (such as cutting up food), and using the toilet (including getting up or down). Figure 4.2 contains for each ADL the percentage of people that indicate that they have problems with it. Second, the survey contains limitations regarding 'instrumental activities of daily living' (iADL). People are asked to indicate whether they have problems with using a map (to figure out how to get around in a strange place), preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden, and managing money (such as paying bills and keeping track of expenses). Figure 4.2 also contains the percentage of people that have problems with a specific iADL limitation. Third, the survey contains questions on limitations of respondents regarding their mobility. The mobility question asks after the following limitations: walking 100 meters; sitting for about two hours; getting up from a chair after sitting for long periods; climbing several flights of stairs without resting; climbing one flight of stairs without resting; stooping, kneeling, or crouching; reaching or extending your arms above shoulder level; pulling or pushing large objects like a living room chair; lifting or carrying weights over 10 pounds/5 kilos, like a heavy bag of groceries; picking up a small coin from a table.

Another important question from the survey is whether a person receives help to overcome his or her limitation(s). This help could be from anyone, so it includes help from a partner or children. The question is formulated as follows: "*Thinking about the activities that you have problems with, does anyone ever help you with these activities?*" This question refers to activities that have been mentioned in previous questions and where difficulties should be expected to last three months or more, concerning mobility, iADL and ADL. The question about help is only asked of respondents who state that they have one or more of these limitations. Exactly 50% of the persons in the sample with at least one limitation indicate that they receive help. We use this question as an indicator for whether a person receives LTC. Interestingly, we also know to what extent the received help meets the needs of the person. We use this information as an indicator for the sufficiency of the provided LTC. Help always meets the needs for 65% of the care recipients, it usually meets the needs for 28% of the care recipients, and it sometimes or hardly ever meets the needs for 8% of the care recipients (the categories sometimes meets the needs and hardly ever meets the needs are two separate categories, but we combine them here since very few people receive help that hardly ever meets their needs). SHARE contains, next to the indicator that we use, also other indicators for help. The questionnaire contains questions on different forms of formal home care, institutional care and informal care from inside and outside the household.[9] However, the choice of the help variable does not seem to impact our results much. Moreover, the alternative indicators are less attractive for us because they do not explicitly measure help that is provided to overcome limitations. A potential pitfall of the reported extent to which the help meets the needs is that the answers of people may depend upon personal judgments and therefore may not be directly comparable across persons. For example, it could be that expectations of people about LTC differ across countries and therefore persons may judge a certain level of help sufficient in some countries, but insufficient in other countries.

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[9] Inside the household the questions concern only personal care.

Figure 4.2 Percentage of individuals with difficulties regarding basic and instrumental ADL (unweighted)
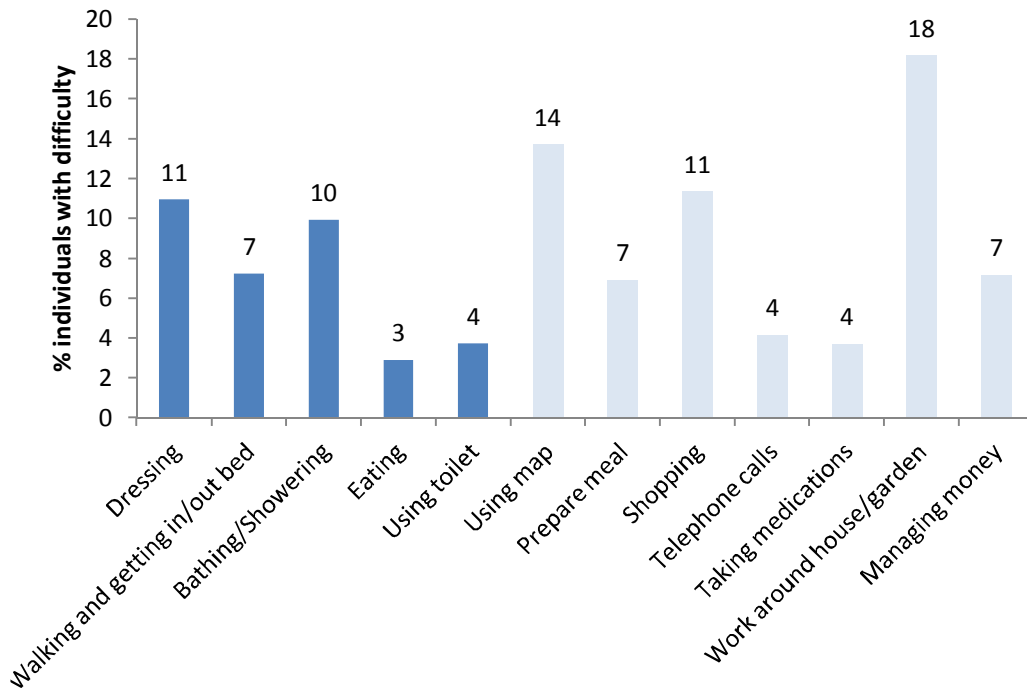
Source: SHARE, wave 2.

Figure 4.3 Life satisfaction of persons over 65 years old with and without ADL and (i)ADL limitations (unweighted)
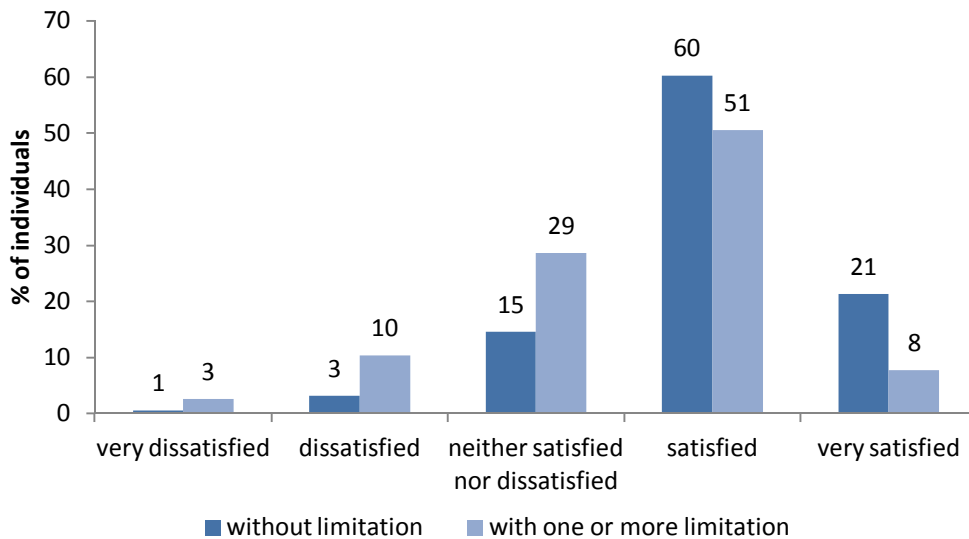
Source: SHARE, wave 2.

The final question that we mention in this section because of its particular importance to our study, is the question on self-reported life satisfaction. We use this question to derive a part of the effect of the LTC system on individuals. Although this is an imperfect measure for our purpose, it is the best measure that is available (more on this in section 4.7).

Figure 4.3 shows the distribution of the self-reported life satisfaction for people in the sample with and without ADL and (i)ADL limitations. The light-coloured bars of this figure show the distribution for people with at least one limitation. The panels show that people without limitations report on average a higher life satisfaction. The average own assessment of people without limitations is 'satisfied' (i.e., 4 on the scale 1-5), while for people with limitations the average assessment is between 'satisfied' and 'neither satisfied nor dissatisfied' (i.e., 3.5 on the scale 1-5). However, these results should be interpreted carefully as there might be differences in the reporting style of people with and without limitations. We will further elaborate on this issue (and correct for differences in reporting style) in section 4.7.

Below we present data for some of the variables of interest by country. On average two thirds of the older people have difficulties with some activities, ranging from almost half in Switzerland to more than 80% in Poland (see Table 4.2). The table shows which percentage of the elders suffers from different types of limitations (mobility, iADL, ADL). For each limitation, we calculate how many persons suffer from it by country without paying attention to the other limitations, meaning that for example persons with mobility limitations may also suffer from iADL- or ADL-limitations. Especially mobility is difficult for many people. Limitations in instrumental and basic activities of daily living are less common, but still observed rather frequently. Compared to other countries the level of all types of limitations is high in Poland and low in Switzerland. Other data sources (like the European health interview survey of Eurostat) confirm that the percentage of older people with limitations is higher in Poland than in other countries (see Golinowska & Sowa, 2012b, for an extensive discussion of disability in Poland). However, the SHARE percentage may be somewhat higher than the percentages from other sources as the Polish SHARE sample may contain relatively many people from rural areas (as explained above). In all our estimates, we include the location of the main residence of a respondent as a control variable to correct for a possible selection effect. Moreover, we estimate all specifications once for all countries and once for all countries except Poland. In all cases, the results of these two estimates do not differ much.

Table 4.2 Percentage of older people with limitations by country (weighted) and sample size

Country	Mobility (%)	iADL (%)	ADL (%)	Some limitation (%)	Sample size
Austria	63.7	29.3	15.3	64.4	726
Belgium	60.5	28.0	20.4	62.6	1405
Czech Republic	66.3	24.6	12.7	66.8	1123
Denmark	52.1	24.3	14.7	54.2	1067
France	62.7	29.9	19.4	63.7	1305
Germany	64.5	23.3	18.6	65.1	1225
Greece	74.9	34.0	12.4	76.9	1387
Italy	70.5	31.5	18.6	71.6	1479
Netherlands	51.1	23.4	13.6	53.6	1055
Poland	82.6	45.0	35.1	83.5	1019
Spain	64.1	29.4	18.9	65.1	1178
Sweden	58.9	21.9	14.6	60.6	1354
Switzerland	46.5	15.5	9.4	48.5	623

Source: SHARE, wave 2.

On average, more than half of the older people with some sort of limitation get help from someone (including people in the same household, see Table 4.3). The share of limited older people with help is relatively low in Greece and Italy and relatively high in Germany and Belgium. Of the group of people with limitations concerning instrumental or basic activities of daily living, more people get help than from the group of people with mobility limitations. Of course these groups overlap. Only one third of the persons with only mobility limitations get help (not reported here).

Table 4.3 Percentage of limited older persons that get help, by country (weighted)

Country	All limitations (%)	Mobility lim.	iADL	ADL
Austria	57.8	57.9	81.6	90.0
Belgium	60.3	60.5	86.8	84.9
Czech Republic	56.9	56.9	84.9	83.6
Denmark	51.7	50.3	87.3	86.3
France	54.5	54.3	85.7	84.9
Germany	67.7	67.5	90.0	85.9
Greece	35.6	36.3	57.9	74.4
Italy	42.2	42.3	72.3	85.5
Netherlands	57.1	56.7	83.3	81.8
Poland	46.1	46.0	69.1	68.9
Spain	46.0	45.9	72.5	78.1
Sweden	49.6	48.9	85.3	77.0
Switzerland	52.5	53.7	80.3	75.3

Source: SHARE, wave 2.

Table 4.4 Limited older persons: degree to which the help meets the needs (unweighted)

Country	All the time	Usually	Sometimes	Hardly ever	Total
Austria	66.5	25.9	6.8	0.8	100
Belgium	65.6	28.2	5.5	0.8	100
Czech Republic	62.2	32.8	4.8	0.2	100
Denmark	63.5	24.7	9.0	2.8	100
France	59.3	31.0	7.4	2.3	100
Germany	67.7	27.7	4.2	0.4	100
Greece	58.1	32.3	9.6	0.0	100
Italy	75.3	19.5	4.7	0.5	100
Netherlands	68.9	27.1	2.9	1.1	100
Poland	62.2	26.3	10.7	0.8	100
Spain	58.9	30.6	8.4	2.1	100
Sweden	64.6	25.6	8.7	1.1	100
Switzerland	78.8	18.5	2.7	0.0	100
Total	64.7	27.6	6.7	1.0	100

Source: SHARE, wave 2.

Table 4.4 shows that if older persons receive help, this help almost always meets their needs all the time or usually (together these categories cover more than 90%). In Switzerland there are very few older people for whom the help sometimes or hardly ever meets the need (less than 3%). This less satisfactory help is found for about 10% of the persons with help in Denmark, France, Greece, Poland, Spain and Sweden. In Greece the situation of older people with limitations seems rather unfavourable as the probability to get help is relatively low, and even people with help relatively often do not find the help sufficient.

Table 4.5 shows the use of informal care of older people by country.[10] The table shows two aspects: the share of older persons who receive informal help with personal care (either from inside or outside the household) and the share of persons who receive informal practical help from outside the

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[10] The share of persons using informal care is related to all older persons, not just older persons with limitations.

household (e.g. help with shopping, household chores or paperwork). SHARE does not include questions on practical help from inside the household. The question about receiving personal care from outside the household is only answered by the family respondent within the household without a question about who exactly receives this help. We assumed that all persons within the household with ADL-limitations received this help in cases where informal help with personal care from outside the household was given.

Table 4.5 Percentage of older people that uses informal care (weighted)

Country	Practical help, from outside household (%)	Personal care (%)
Austria	27.0	9.6
Belgium	30.8	7.0
Czech Republic	46.7	10.6
Denmark	29.2	4.3
France	22.5	7.3
Germany	37.1	9.0
Greece	28.5	10.1
Italy	21.8	14.6
Netherlands	28.8	3.2
Poland	28.2	16.3
Spain	17.8	14.7
Sweden	31.1	3.1
Switzerland	19.8	3.4

Source: SHARE, wave 2.

The use of practical help from outside the household is especially high in the Czech Republic (almost 47%). It is relatively low in Spain and Switzerland (less than 20%). For many countries the share is around 30%. Informal help with personal care is less frequent than practical informal help, as may be expected. Its use is highest in Poland (16%) and lowest in Sweden, the Netherlands and Switzerland (around 3%).

Table 4.6 shows the use of formal care of older people living at home. We only included care use for a period of 13 weeks or more in order to exclude temporary care not aimed at long-term problems. The use of formal personal and nursing care at home is highest in Belgium and lowest in Greece and the Czech Republic. The use of this care is relatively low in Sweden, Of course we have to keep in mind that the probability of institutionalisation for persons who need personal or nursing care may differ a lot among countries (see also Table 4.1). It is possible that less personal and nursing care at home is used in Sweden because many people who need such care live in an institution.

The use of practical home help is highest in the Netherlands and lowest in the Czech Republic. SHARE shows that older adults in the Czech Republic did get a lot of practical help in 2006 and 2007, when the survey was carried out, but this help was almost exclusively in the form of informal care. This seems to indicate that informal care acted as a substitute for formal care for this type of help in the Czech Republic. The low use of formal personal and nursing care at home does not appear to be 'compensated' to the same extent by informal care use, as the use of informal personal care is about average in the Czech Republic. Again, it may be that persons who have more severe care needs receive residential care. Holub & Hava (2011) show that 31% of the care users with the highest disability grade use only inpatient care in the Czech Republic; for care users with the lowest disability grade, this is still 9%.[11]

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[11] Golinowska & Sowa (2012c) refer to this report in their feedback on the results for the Czech Republic.

Table 4.6 Percentage of older people that use long-term formal care at home
(13 weeks or more, weighted)

Country	Personal and nursing care (%)	Home help	Meals on wheels
Austria	4.2	4.9	1.4
Belgium	6.5	12.2	3.0
Czech Republic	0.6	0.4	4.4
Denmark	5.2	14.6	4.8
France	4.7	12.8	3.0
Germany	3.6	4.7	2.7
Greece	0.5	1.3	0.3
Italy	1.0	5.4	0.2
Netherlands	3.7	16.6	3.6
Spain	1.8	5.0	0.0
Sweden	1.3	4.8	1.3
Switzerland	3.8	6.0	1.7

Source: SHARE, wave 2.

4.4   The probability of receiving help

In this section we look into differences among countries in the probability that older people with limitations receive help. If people who really need help (e.g. people with more severe limitations) get help, this means that there is some system in place to provide that help. That does not have to be a formal collectively funded system; it could also be that older people get informal help. In the latter case, of course, we have to realise that the help is not 'free': persons who provide informal help have to spend time and effort that they cannot spend on other activities (working, household tasks,[12] leisure, etc.). We want to find out to which extent older people in different countries have a different probability of getting help, after correcting for all characteristics that may affect the need for help or the availability of help in the household and family. In this way we want to determine the differences between the national LTC systems. SHARE includes a lot of information to explain the degree of (un)met needs, but naturally it is still possible that some relevant characteristics are not observed. For example, if not all relevant aspects of the health status are included, this may affect the results.

We analyse the probability of getting help for older people with limitations (mobility, iADL or ADL) by using a logit model. The explanatory variables are: information on limitations and health problems, the country in which a person resides, the household and family situation and socio-economic control factors.[13] In section 4.2.2 we describe our conceptual framework. This also guides the selection of exogenous factors. Limitations and health affect the *need for care* and, via this need, they affect the probability of actually receiving care. The household and family situation impacts the *opportunity* for receiving care, as it affects the possibilities for informal care giving. The country of residence will affect the probability of receiving help mostly via the LTC system (after correction for other relevant factors). Possibly the country of residence does not just affect the probability of getting help directly, but also through a different impact of other factors. For example, the impact of having cognitive problems may differ among countries depending on the degree to which the LTC system is attuned to

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[12] The carrying out of household tasks may also be part of informal care with iADL.

[13] We construct a cognitive function variable by a principal component analysis of four test results in SHARE (recalling words, naming as many animal species as possible, solving mathematical exercises, and knowing the correct date and day of the week). We use the first component as a measure for cognitive functioning (the eigenvalues of the first and second component are respectively 2.1 and 0.8). The first component accounts for 53% of the variance.

such problems. Another example is that the impact of income may differ because of differences in eligibility, income-dependent co-payments, etc. A number of interaction effects between country and other variables turn out to be important and are included in the specification.

The inclusion of interactions with country dummies makes the estimation results more difficult to interpret. Therefore, we report the estimation results of the logit model in a separate document with appendices that accompanies this report (Appendices, chapter 1, Table A.1). In this section, we present average marginal effects of changes in explanatory variables on the probability of receiving help. For example, the average marginal effect of living in a certain country shows the impact of the country of residence on the probability of receiving help for persons with all sort of different characteristics in the sample. The average marginal effect (AME) of living in Austria instead of Germany is calculated as follows: for each person in the sample living in Germany is assumed and the probability of receiving help is calculated. In the next step, for each person living in Austria is assumed and the probability of receiving help is calculated. The difference of these probabilities is calculated for each person and the AME is a (weighted) average of these differences over the whole sample. Another way of presenting the results is to calculate probabilities of receiving help for persons with certain characteristics. This type of results is shown in the separate document with appendices (Appendices, section 1.2).

Below, we start by discussing the impact of the health, family situation and socio-economic control variables on the probability of receiving help. We do this first for Germany and then discuss differences among countries in the impact of some of the control variables. Following that, we discuss the differences among countries after controlling for all these factors. Since we want to assess the LTC systems of different countries, we are especially interested in the impact of the country of residence on the probability of receiving help.

4.4.1 Effect of control variables

Table 4.7 reports the average marginal effects of the control variables for persons living in Germany. Important factors in determining the probability of help in Germany are age, limitations, health status and household and family situation. The probability of help is larger for persons who are older (especially the oldest age group), have a grandchild, have more severe (i)ADL limitations, have a larger number of mobility limitations and suffer from more chronic disorders. The probability of help is lower for persons who live alone. Despite the fact that information on limitations and health is included, age still seems to play an independent role affecting the probability of help in Germany and many other countries. A possible explanation is that the specification does not correct completely for health status. Alternatively, persons who decide about giving help (either formally or informally) may use age as an indicator for the health status or the necessity of help.

Table 4.8 shows differences among countries in marginal effects of the control variables.[14] The positive effect of being 80 to 85 years old on the probability of receiving help is not everywhere equally large and significant. Income only seems to play a role in Austria.[15] It is somewhat surprising that a higher income is correlated with a lower probability of receiving help. Our Austrian partners suggested the following possible explanation: "So-called 24-hour-care was only available on the grey market but was not yet legalised during the SHARE 2006 data collection (and even now we have to assume a large black market here, due to many carers from abroad not meeting the criteria for public support), so persons using this may have avoided stating this in an official questionnaire. This kind of care requires substantial private means, can hardly be financed by poorer households. This effect may have reduced the stated amount of care, compared to the true amount of care" (Kraus & Riedel, 2012). Being a woman leads to a significantly higher probability of receiving help in France, Poland and

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[14] The table only includes the control variables that have a different impact in different countries.

[15] Income as included in the specification is in thousands of euros, purchasing power adjusted and adjusted for household size.

Sweden and not so much in the other countries. The degree of urbanisation has opposite effects in Belgium and the Czech Republic on the one hand and Denmark, Italy and Poland on the other hand: in the latter countries living in a more rural area decreases the probability of receiving help; in Belgium and the Czech Republic it increases the probability.

Table 4.7 Marginal effects of control factors in Germany

	dy/dx	Std. Err.
70-75	0.05***	0.019
75-80	0.064***	0.02
80-85	0.018	0.049
>= 85	0.214***	0.032
Education middle	0.006	0.018
Education high	-0.009	0.028
Standardised income	0.001	0.001
Woman	0.047	0.037
Urbanisation	-0.015	0.012
Child(ren)	-0.012	0.062
Intensive contact with child	0.017	0.016
Living alone	-0.191***	0.042
Grandchild(ren)	0.058**	0.027
iADL at most	0.197***	0.046
1 ADL at most	0.217***	0.024
2 ADL at most	0.322***	0.038
3 or more ADL at most	0.507***	0.047
Number of mobility lim.	0.017*	0.009
Number of symptoms	-0.001	0.005
Cognitive functioning	0.013	0.015
Depression	0.038	0.044
Number of chronic disorders	0.014***	0.005

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

Somewhat surprisingly we find a weakly significant negative effect of having children in France, Denmark and Italy. Our French partners suggest as possible explanation a positive correlation between health status and having children. They remark that they find no significant relation between children and help in a slightly different analysis of French data.[16] Another possible explanation of the negative relationship is that older people with children receive less formal help in some LTC systems, because the system assumes that the children can help their parents. Living alone generally has a negative effect on the probability of receiving help, but this effect is much larger in the Czech Republic, Germany, Greece and Poland. For older people with limitations in iADL and no limitations in ADL, the probability of help is much higher than for older people with only mobility limitations (the reference group) in all countries.

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[16] Wittwer & Dufour-Kippelen (2012) state: "Nevertheless, note that we obtain no significant effect of having children with French data (Handicap-Santé-Ménage, probit models, own computation) for population 60+ with at least one (i)ADL (but of course a significant positive effect on receiving informal care)".

Table 4.8 Marginal effects of control variables on the probability of receiving help in different countries

	80-85	Standardised income	Woman	Urbanisation	Child(ren)	Living alone	iADL at most	Number of mobility lim.	Cognitive functioning	Depression
Austria	0.205***	-0.005**	-0.006	-0.006	0.022	-0.070	0.156***	0.028***	0.017	0.155***
Belgium	0.129***	0.001	0.043	0.037***	-0.027	-0.058*	0.229***	0.040***	-0.014	-0.002
Czech Republic	0.120**	0.001	0.020	0.033**	-0.022	-0.228***	0.264***	0.013	-0.022	0.065
Denmark	0.066	0.000	0.039	-0.032**	-0.122*	-0.087**	0.34***	0.032***	-0.039***	0.046
France	0.119**	0.000	0.117***	-0.014	-0.108**	-0.009	0.305***	0.029***	-0.016	0.035
Germany	0.018	0.001	0.047	-0.015	-0.012	-0.191***	0.197***	0.017*	0.013	0.038
Greece	0.096**	-0.002	-0.010	0.002	-0.026	-0.139***	0.257***	0.045***	0.032**	0.009
Italy	0.007	-0.001	0.035	-0.029***	-0.113*	0.004	0.184***	0.035***	-0.031**	0.025
Netherlands	0.118*	-0.001	0.030	-0.008	0.087	-0.024	0.232***	0.035***	-0.012	0.006
Poland	0.095**	-0.001	0.067**	-0.026**	-0.051	-0.139***	0.229***	0.025***	-0.028**	0.057*
Spain	0.092*	0.000	0.026	0.017	-0.070	-0.087*	0.239***	0.012	-0.032*	0.016
Sweden	0.113***	0.001	0.055*	0.008	-0.070	-0.047	0.379***	0.050***	-0.002	0.002
Switzerland	0.195***	0.000	0.076	0.008	0.073	-0.051	0.221***	0.040***	0.005	-0.009

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

There is some variation across countries for persons with iADL limitations: in Sweden and Denmark they have the largest probability of receiving help compared to other countries.[17] A larger number of mobility limitations increases the probability of receiving help more in some countries than in others. This is in particular an important factor in Sweden, Greece, Switzerland and Belgium. For four other countries, we find a significantly negative effect of the cognitive functioning variable: Denmark, Italy, Poland and Spain. This finding means that better cognitive functioning decreases the probability of receiving help. In these countries the help seems to be well targeted at persons with cognitive problems. The association works in the opposite direction in Greece: better cognitive functioning goes hand in hand with a higher probability of receiving help. Being depressed increases the probability of receiving help in Austria and Poland. Our Polish partners suggest that the depression scale in SHARE may also pick up other problems than actual depression.[18]

4.4.2 Country effects

The effect of living in a certain country on the probability of receiving help is shown from highest to lowest in Table 4.9. We see that the probability is highest in Germany. The probability of receiving help is significantly lower in all other countries in the sample than in Germany. This probability is lowest in Poland. In the Czech Republic, Belgium, the Netherlands, Switzerland and Austria the probability of receiving help is relatively high, although not as high as in Germany.

Table 4.9 Countries ordered by the average marginal effect on the probability of receiving help, compared to Germany

Country	dy/dx	Std. error
Germany	0	n.a.
Czech Republic	-0.06**	0.03
Belgium	-0.094***	0.027
Netherlands	-0.096***	0.036
Switzerland	-0.109***	0.039
Austria	-0.112***	0.034
Denmark	-0.153***	0.031
Sweden	-0.154***	0.031
France	-0.175***	0.031
Italy	-0.303***	0.028
Spain	-0.311***	0.037
Greece	-0.334***	0.031
Poland	-0.374***	0.036

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

The table shows that the impact of the country of residence on the probability of receiving help is more or less similar for a number of countries. Table 4.10 shows the results for the pair-wise comparisons of country average marginal effects. Using these results, we can check which groups of

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[17] By "iADL limitations at most" we mean that iADL limitations are the most serious limitation; that is to say that there are no ADL limitations.

[18] Golinowska & Sowa (2012) state: "Medically assessed depression is rare in Poland compared to other countries. The set of questions formulated in the SHARE questionnaire with respect to mental condition is very broad and positive answers could also be symptoms of other conditions (i.e. caused by hard work and tiredness) than depression itself, especially in a pessimistic (complaining) society. Studies show that labour intensity in Poland is much higher compared to other countries and pre-transformation period."

countries actually differ significantly from each other in the probability of receiving help. To do that, we need a point of reference to construct groups. We start by selecting the country with the highest probability of receiving help. Following that, we check whether there are countries where the probability of receiving help does not differ significantly. If we find such countries, we arrange them in the same group as the country with the highest probability. Among the remaining countries, we look again for the country with the highest probability and we start constructing a new group in the same way. We repeat this process till all countries are ordered in a group.

Following this approach, we find the following five different groups of countries, ordered from a higher to a lower probability of receiving help:

Group 1: Germany
Group 2: Czech Republic, Belgium, the Netherlands, Switzerland, Austria
Group 3: Denmark, Sweden, France
Group 4: Italy, Spain, Greece
Group 5: Poland

Germany is the country with the highest probability of receiving help. It differs significantly from all other countries, so Germany is in a group by itself. The Czech Republic is the country with the next highest probability of receiving help. For Belgium, the Netherlands, Switzerland and Austria, the probability is not significantly different, so we consider them part of the same group. Of the remaining countries, Denmark has the highest probability of receiving help. Sweden and France belong in the same group. Italy is the country with the next highest probability of receiving help. For both Spain and Greece the difference with Italy is not significant, so they form part of the same group. Poland is – as the one remaining country – in a group by itself.

The probability of receiving help in Spain in 2006-07 did not differ significantly from the relatively low probability in Italy and Greece. However, since the data collection for the second wave of SHARE, a large reform of the Spanish system has been introduced. Due to the economic crisis, Spain has not been able to carry out all planned reforms. But the results for the second wave of SHARE may be unnecessarily pessimistic for Spain.

4.4.3 Relation with the typology of LTC systems based on use and financing of care

We can check whether the four selected countries that should represent different LTC systems are also in different groups if we look at the probability of receiving help, even though this probability does not necessarily have to differ among types of LTC systems. We find that the four representative countries are in different groups arranged according to the probability of receiving help, at least if we follow the method as described above. However, the clustering is different in a number of respects from the typology we created earlier based on use and financing of care. For example, Germany is not in the same cluster as Belgium and the Czech Republic, but they are in adjoining groups. The Netherlands is not in the same group as Denmark and Sweden, even though these countries are in adjoining groups as well. In the above ordering, Spain is part of the same group as Italy, which is not the case in the typology based on use and financing of care.

It is not very surprising that these groups differ in some respects from the earlier typology of LTC systems based on use and financing of care. That typology was much affected by the division among formal and informal care and the expenditures on LTC. But the probability of receiving help does not necessarily have to differ a lot between more or less formalised systems and between more or less expensive systems in terms of expenditure on formal LTC. In the less formalised and less expensive systems, the probability of receiving help can still be high because of a high use of informal care. Actually, we find that the probability of receiving help is highest in Germany, a country with relatively low LTC expenditures but a large role for informal care.

Table 4.10 Pair-wise comparison of average marginal effects of living in different countries on the probability of receiving help

Country	DE	AU	SE	NL	ES	IT	FR	DK	GR	CH	BE	CZ	PL
DE		--***	--***	--***	--***	--***	--***	--***	--***	--***	--***	--**	--***
AU			ns	ns	--***	--***	--*	ns	--***	ns	ns	ns	--***
SE				+*	--***	--***	ns	ns	--***	ns	+**	+***	--***
NL					--***	--***	--**	ns	--***	ns	ns	ns	--***
ES						ns	+***	+***	ns	+***	+***	+***	ns
IT							+***	+***	ns	+***	+***	+***	--**
FR								ns	--***	+*	+***	+***	--***
DK									--***	ns	+**	+***	--***
GR										+***	+***	+***	ns
CH											ns	ns	--***
BE												ns	--***
CZ													--***
PL													

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

4.4.4 Relationship of country effects with systems' characteristics

The preceding sections reported on the differences we found among countries in the probability of receiving help for older people with limitations. Since we try to correct for all relevant covariates, these differences should tell us something about the performance of the LTC system in these countries. Looking at this one aspect, the German system seems to function better than the others. Why is that? In WP1 and in this WP we have collected information on characteristics of LTC systems. Now we want to see if we can explain the results for the probability of receiving help from these systems' characteristics by looking for significant quantitative relationships. Unfortunately, we have only 10 or 11 observations for each characteristic.[19]

We have data on seven characteristics of national long-term care systems from the ANCIEN study of Kraus, Riedel, Mot, Willemé, Röhrling & Czypionka (2010). We know the public expenditures on LTC as a share of GDP (these expenditures are corrected for differences in needs between countries), the private LTC expenditures as a share of total LTC spending, the number of informal care recipients divided by the number of formal care recipients (indicating whether the system uses more informal care or formal care), a measure for the support that informal caregivers receive (e.g. income support), the value of cash benefits (averaged for home-based care and institutional care, corrected for income differences between countries), whether access to publicly financed home-based care and formal institutional care is means-tested (e.g. whether it excludes persons with a high income) and the quality of coordination between LTC and other services (e.g. the health system). For more details on these characteristics, see Kraus, Riedel, Mot, Willemé, Röhrling & Czypionka (2010). Moreover, we have data on four additional characteristics via a questionnaire we distributed among our ANCIEN partners. We asked our partners how satisfied (on a scale from 1 to 10) the people in their country are with the role of informal care in the LTC system, the role of private funding in the LTC system, the role of residential care in the system and the complexity of the LTC system. The expert opinion of our partners is regularly based on research, but also contains a subjective element if no appropriate research was available. Since we have a very limited number of observations (namely, the number of countries), we regress the average marginal effects of living in a certain country separately on each country characteristic and a constant. This method does not tell us anything about causality, but we can see whether there is a significant correlation. As these OLS regressions use only a few

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[19] The analysis of the probability of receiving help includes 13 countries, but for some of them we have not collected system characteristics.

observations, the results may be sensitive to outliers. For that reason, we also carefully study scatter plots of the relationship between the AMEs and the variables.

Table 4.11 reports the estimation results. The probability of receiving help in an LTC system appears to have a significant negative relationship with the share of private funding and with means-testing. The relationship with the satisfaction about the complexity of the system is positive. For the other factors there is no significant correlation.

Table 4.11 The AME of country of residence on the probability of receiving help explained by country-specific characteristics

System characteristic	Coefficient	p-value	Number obs	R^2
Income and needs corrected spending	0.360	0.614	11	0.03
Share of private expenditures	-0.747***	0.009	11	0.55
Informal care use / Formal care use	-0.011	0.798	10	0.01
Informal care use	0.197	0.608	10	0.03
Formal care use	0.452	0.316	10	0.13
Support for informal caregivers	0.041	0.135	11	0.23
Importance of cash benefits	-0.162	0.340	11	0.10
Means-testing	-0.224***	0.000	11	0.81
Quality of coordination between LTC and other services	0.060	0.438	11	0.07
Satisfaction about role of informal care	0.003	0.926	7	0.00
Satisfaction about role of private funding	0.016	0.436	7	0.13
Satisfaction about role of residential care	0.038	0.127	7	0.40
Satisfaction about complexity of system	0.039*	0.061	7	0.54

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

Figure 4.4 shows on the left side the relationship between the probability of receiving help and the share of private funding. Higher private funding and a lower probability of receiving help seem to go hand in hand. It may be that fewer people get the help they need in countries with high private funding because they do not have sufficient means. However, we have to be careful in interpreting the relationship with the probability of receiving help as the private funding is measured in classes (so we are using class middles and the information is not very precise) and more recent information for Germany indicates a higher share of private funding of about 30% (see Rothgang, 2011).

The right side of Figure 4.4 shows the relation between the probability of receiving help and the existence of means-testing. In the three countries with means-testing, the probability of receiving help is much lower. These countries do not spend a lot of money on publicly financed LTC and possibly they want to target the money that they do spend at those who need it the most in their view.

The left side of Figure 4.5 concerns the relationship between satisfaction with the complexity of the system and the probability of receiving help. Again, we have to be careful with the interpretation. If we take Poland out, the relationship would be very different. Our national experts also report the satisfaction with the complexity of the system for a number of countries that are not included in SHARE. The satisfaction with the complexity is especially low in many new member states: Poland, Bulgaria, Estonia and the Czech Republic. It is also very low in England. The satisfaction appears to be higher on average in countries with more mature, well-developed and more generous systems. Maybe a more generous system does not need so many rules to find out who is eligible for publicly financed care.

Figure 4.4 Relationship between the probability of receiving help in a LTC system and a) the share of private funding and b) means-testing
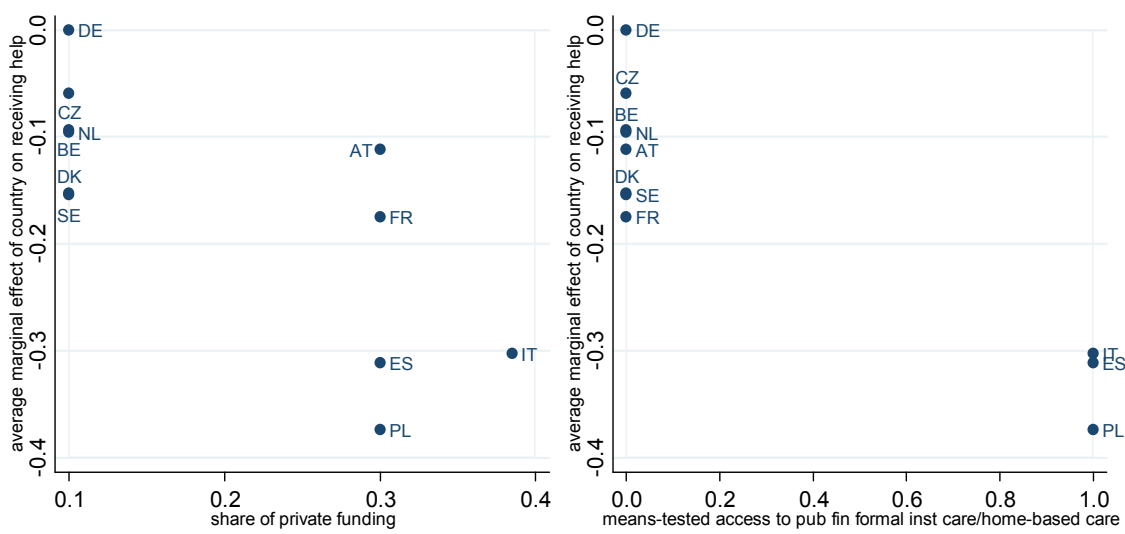
Figure 4.5 Relationship between the probability of receiving help in a LTC system and a) satisfaction with the complexity of the system and b) public expenditures on LTC
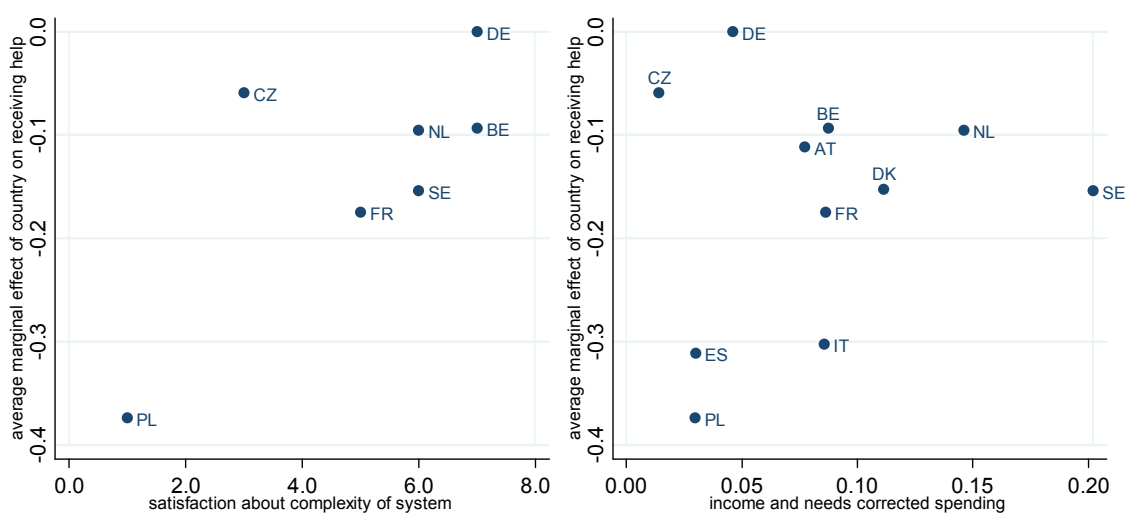
We find no significant relationship between spending and the probability of receiving help. The scatter plot on the right side of Figure 4.5 also shows the lack of a clear relationship. We see that income and needs corrected spending is the highest in Sweden, but the probability of receiving help is much higher in Germany with its low spending. In the Czech Republic spending is even lower than in Germany, but the probability of receiving help is not much lower. One way to explain this is an intensive use of informal care. In Figure 4.6 and Table 4.5 we see indeed that informal (practical) care use is high in the Czech Republic and to a somewhat lesser extent in Germany.[20] Over all these countries, no

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[20] The information on informal care use in Figure 4.6 is based on the WP1 database, filled by the national experts, while the information in Table 4.5 is based on SHARE, wave 2. Because of differences in definitions and other aspects, the information from both sources can differ. Incidentally, according to our national experts, the satisfaction with the role of informal care in the system is low in Germany, the Czech Republic and Poland, all countries with an important role for informal care.

significant relationship is found between informal care use and the probability of receiving help. For example, in Italy and Spain the informal care use is comparable to Germany (lower for practical help and higher for personal care, see Table 4.5), but the probability of receiving help is much lower. It seems likely that a combination of factors finally decides the probability of receiving help: public spending, private spending, the efficiency of the system and the use of informal care are possible determining factors.

Sweden has a medium score on the probability of receiving help for Swedish older adults with limitations living at home (that is to say, it is part of the third group of countries out of the five groups). Given Swedish public spending we might have expected a better score. However, we have to keep in mind that the use of residential care, which is not well represented in SHARE, is rather high in Sweden (see Table 4.1). Still our Swedish partner also expected a somewhat better score and suggests the following possible explanation: "The proportion of people that get help at home has during the 1990s and until 2006-2007 decreased in Sweden. These are the years that the SHARE data were collected. Since 2008 the proportion of people getting home help started to increase. This can be an explanation for the lower than expected results for Sweden."[21] Another possibility is that SHARE for some reason does not represent the Swedish situation concerning help very well.

Figure 4.6 Relationship between the probability of receiving help in an LTC system and the use of informal care
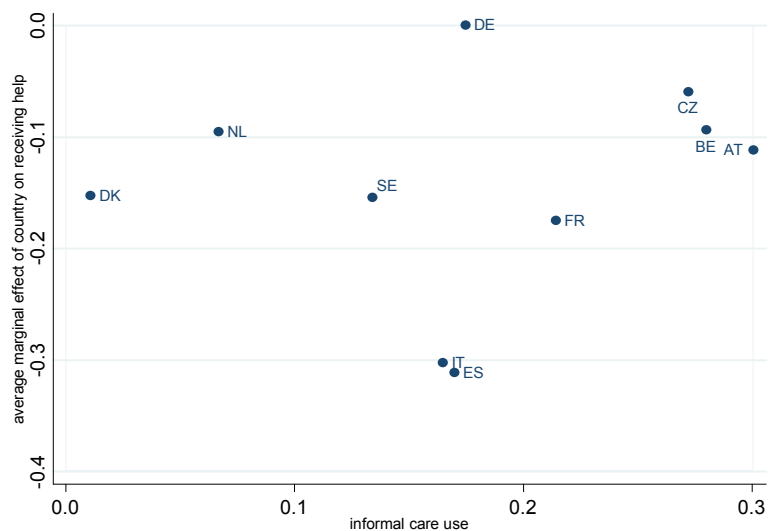
Sources: ANCIEN WP1 and WP7.

4.5   Does the help meet the needs?

The question in SHARE about getting help only asks whether there is any help *("...does anyone ever help you with these activities?"*). There is a follow-up question about the degree to which this help is sufficient:

> "Would you say that the help you receive meets your needs?" (possible answers: 1. all the time, 2. usually, 3. sometimes or 4. hardly ever).

As mentioned above, the answers to this question may be affected by the expectations that people have concerning LTC in different countries. Also, it may be that answers are influenced by gratitude and

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[21] E-mail communication from Thomas Emilsson to Esther Mot, 5 July 2012.

social desirability (e.g. answers on the sufficiency of informal care) or that response styles differ among persons with different characteristics (e.g. from different countries). Since vignettes are not available for this question, we cannot correct for differences in response style in this case. We just have to keep in mind these caveats in interpreting the results for the sufficiency of the help.

Naturally help that meets the needs only "sometimes" or even "hardly ever" is not sufficient. Fortunately only 1% of the respondents state that the help meets the need "hardly ever". For this question we want to analyse the difference among countries, in a comparable way to the question about getting help. Apart from the country, the explanatory factors are again socio-economic characteristics, household situation and limitations and health. In addition, we check whether the type of help that people receive also affects the sufficiency of the help. Since information about formal care use is not available for Poland, we only use information about the use of informal care.[22] We include two dummies: one for persons who receive informal help with personal care (either from inside or outside the household) and one for persons who receive informal practical help from outside the household (e.g. help with shopping, household chores or paperwork). For the correct interpretation of the results, we have to keep in mind that the question about the sufficiency of the help was answered by persons who have limitations (in mobility, iADL and/or ADL) and who receive some help (either formal or informal). Thus this group does not include persons without help and by using the dummies we compare the effect of different types or combinations of help. For example, for the informal personal care dummy we compare persons who receive such care, either alone or in combination with other forms of care, with persons who receive no such care but are using any other form of care (informal practical help from outside or inside the household, formal help with personal care or with practical chores, either alone or in any combination). This means that the reference group is rather mixed, thereby making the results difficult to interpret.[23] Also, when persons receive informal help with personal care, this points to the existence of ADL limitations, so this explanatory variable is not independent from the ADL variables. It turns out that this variable has the highest correlation with having three or more ADL limitations, namely 0.42. The correlation with fewer ADL limitations is lower.

We use an ordered logit model since the sufficiency of the help can take four logically ordered values. We present results for the most favourable response category: help meeting the needs all the time. The full estimation results are presented in the document with appendices (Appendices, chapter 1, Table A.2). Again, we start by discussing the impact of control variables and then go on to discuss the impact of the country of residence.

4.5.1 Effect of control variables

The marginal effects for Germany for the answer "help meets the needs all the time" can be found in Table 4.12.

Much of the variation in the sufficiency of the help is unexplained, as the pseudo R2 is low. Important determinants are health, the household and family situation, the type of help received and the country of residence. The probability that the help is always sufficient is much larger for persons with children. The probability that the help is always sufficient is generally smaller for persons living alone and persons with more chronic disorders. Persons with depression see the help as less sufficient in all countries. It is not clear to which extent this assessment may be affected by the depression.

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[22] We particularly do not want Poland to drop out of the analysis, as it is one of our four selected representative countries.

[23] Unfortunately, the only way to improve this situation is to drop Poland from this analysis.

Table 4.12 Marginal effect of control variables on "help meets the needs all the time" in Germany

	dy/dx	Std. Err.
70-75	0.006	0.039
75-80	0.049	0.036
80-85	0.012	0.04
>= 85	0.059	0.045
Education middle	-0.02	0.031
Education high	-0.008	0.053
Standardised income	0.001	0.002
Woman	-0.01	0.029
Urbanisation	0.01	0.009
Child(ren)	0.138**	0.058
Intensive contact with child	0.025	0.03
Living alone	-0.064*	0.033
Grandchild(ren)	-0.028	0.047
iADL at most	-0.007	0.033
1 ADL at most	-0.01	0.042
2 ADL at most	-0.046	0.052
3 or more ADL at most	0.052	0.052
Number of mobility lim.	-0.006	0.006
Number of symptoms	-0.009	0.007
Cognitive functioning	0.022	0.019
Depression	-0.061**	0.028
Number of chronic disorders	-0.019**	0.009
Informal personal care	0.017	0.063
Informal practical care from outside	-0.057**	0.027

The symbols *, ** and *** mean that the difference is statistically significant at respectively the 10%, 5% and 1% level.

The impact of some of the factors differs among countries (see Table 4.13). In Germany, receiving informal help with personal care does not have a large impact on the help meeting the needs all the time, but it does have a significant positive impact in France, Austria, Greece, Poland and Spain. In these countries, people who receive informal help with personal care are on average more positive about the sufficiency of the help than people who do not receive this type of care. The information about limitations does not have a significant impact; possibly it is picked up to a large extent by the dummy for receiving personal care. Receiving informal practical care from outside the household has a negative impact on the help meeting the needs all the time. Possibly this help from outside the household is not always given at the time or with the frequency that the older person with limitations would prefer.

The effect of income also differs among countries. In Austria and Spain persons with higher incomes have a smaller probability of the help meeting the needs all the time, while in Greece and Sweden the opposite holds. In most other countries income seems to have little impact. Our Spanish partners let us know that a higher income may have led to less public formal care in 2006, but this link is no longer present in the new Spanish LTC system.[24]

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[24] Jiménez-Martín & Vilaplana Prieto (2012) state: "In 2006, each Autonomous Community awarded long-term care benefits using their own system of weights, according to which, they considered not only physical and cognitive limitations, but also age, dwelling conditions and income. Therefore, it could be that people with more economic resources would receive less public formal care, and consequently, they should rely on informal and

In Germany, the impact of cognitive functioning on the probability that the help is always sufficient is not very large. However, in Austria and France, persons with better cognitive functioning have a larger probability that the help always meets their needs. Cognitive functioning may be important to be able to organise the help. If this explanation is correct, it suggests that there are shortcomings in taking care of older people with cognitive problems. In Greece, on the other hand, worse cognitive functioning is associated with more sufficient help (see also Table 4.13 with marginal effects for different countries).

Table 4.13 Marginal effects of control variables on "help meets the needs all the time" in different countries

Country	Standardised income	Cognitive functioning	Informal personal care
Austria	-0.007**	0.065***	0.294***
Belgium	0.001	0.011	-0.003
Czech Republic	0	0.025	-0.071
Denmark	-0.001	0.035	0.14
France	0.002	0.077***	0.312***
Germany	0.001	0.022	0.017
Greece	0.006	-0.067***	0.231***
Italy	0.002	0.041	0.15***
Netherlands	0.004*	-0.013	-0.12
Poland	-0.003	-0.019	0.173***
Spain	-0.002**	0.014	0.17**
Sweden	0.005*	0.03	-0.151
Switzerland	0	-0.039	0.015

4.5.2 Country effects

Table 4.14 shows the differences among countries in the probability of the help meeting the needs all the time. In Switzerland and Italy this probability is significantly larger than in Germany. In Spain the probability is significantly smaller. The other countries are more or less comparable to Germany.

Table 4.14 Countries ordered by the average marginal effect on the probability of "help meeting the needs all the time", compared to Germany

	dy/dx	Std. Err.
Switzerland	0.16***	0.056
Italy	0.132***	0.046
Netherlands	0.068	0.056
Belgium	0.042	0.039
Czech republic	0.042	0.044
Austria	0,028	0.044
Denmark	0.008	0.049
Germany	0	n.a.
France	-0.034	0.047
Sweden	-0.051	0.05
Poland	-0.057	0.06
Greece	-0.066	0.053
Spain	-0.124*	0.065

private formal care (www.imsersomayores.csic.es/documentos/documentos/libroblancodependencia/mtas-libroblancocap05-01.pdf). However, we must clarify that with the new System of Autonomy and Attention to Dependency, everybody is entitled to receive long-term care regardless of economic resources."

Table 4.15 reports the pair-wise comparison of the average marginal effects of living in different countries. We can use this information to construct groups of countries with different probabilities of the help meeting the needs all the time in the same way as we did in section 4.4. Again, we start with the country with the highest probability of the help meeting the needs all the time. This is Switzerland. For two countries the differences with Switzerland are not significant: Italy and the Netherlands. The country with the next highest probability of the help meeting the needs all the time is the Czech Republic. Many remaining countries do not differ significantly from the Czech Republic in this respect: Belgium, Austria, Denmark, Germany and France. Sweden is the country with the next highest probability of the help meeting the needs all the time. The remaining countries, Poland, Greece and Spain, do not differ significantly from Sweden.

This method produces the following groups:

Group 1: Switzerland, Italy, the Netherlands
Group 2: Belgium, Czech Republic, Austria, Denmark, Germany, France
Group 3: Sweden, Poland, Greece, Spain

Table 4.15 Pair-wise comparison of average marginal effects of living in different countries on the probability of the help meeting the needs all the time

Country	DE	AU	SE	NL	ES	IT	FR	DK	GR	CH	BE	CZ	PL
DE		ns	ns	ns	--*	+***	ns	ns	ns	+***	ns	ns	ns
AU			ns	ns	--**	+**	ns	ns	--*	+*	ns	ns	ns
SE				+**	ns	+***	ns	ns	ns	+***	+**	+**	ns
NL					--***	ns	--*	ns	--**	ns	ns	ns	--*
ES						+***	ns	+**	ns	+***	+***	+***	ns
IT							--***	--**	--***	ns	--**	--**	--***
FR								ns	ns	+***	+*	ns	ns
DK									ns	+**	ns	ns	ns
GR										+***	+**	+**	ns
CH											--**	--**	--***
BE												ns	--*
CZ													--*
PL													

The symbols *, **, and *** mean that the difference is statistically significant at respectively the 10%, 5%, and 1% level.

Three of our selected countries for different types of LTC systems end up in different groups concerning the probability of the help meeting the needs all the time. Poland and Spain, however, are in the same group concerning this aspect. Somewhat surprisingly, Sweden with its well-developed LTC system is also part of that group (together with Greece). As stated before, the question about the help meeting the needs has a more subjective character than the question about receiving help. Possibly disappointment about the changes in Swedish society had some impact on the answers of Swedish respondents. Our Swedish partner states: "The shifts towards a more market oriented society have for many people been a "traumatic" transformation, and especially for the age group that are included in the SHARE data. These are the people that were taking part and building our society during the "golden years", expecting ageing with a welfare state providing care, and now they are experiencing how their system transforms to something they do not recognize, a matter of disappointment."[25] Another surprising aspect is that Italy is in the same group as the Netherlands for the probability of the help meeting the needs all the time. In WP1 we found that the Dutch system as a whole was much more attractive to older people in need of care. A possible explanation is that people are happy with the informal care that plays a relatively large role in Italy (especially regarding informal personal care).

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[25] E-mail communication from Thomas Emilsson to Esther Mot, 5 July 2012.

4.5.3   Country results and systems' characteristics

Just as we did for the probability of receiving help, we try to explain the probability of the help meeting the needs all the time by the characteristics of LTC systems. The results are presented in Table 4.16. None of the system characteristics shows a significant relation to the probability of the help meeting the needs all the time in the different countries. The differences in the sufficiency of the help cannot be explained from what we know about the systems; in any case not with the limited number of observations that we have available. This part of the analysis is only relevant for persons with limitations who receive help. It may be that LTC systems are more of a determinant of receiving help or not, while the sufficiency of the help depends to a larger extent on more micro-level factors, such as the person who gives informal care or the quality of the specific home-care provider.

Table 4.16 The AME of country of residence on the probability of the help meeting the needs all the time explained by country-specific characteristics

System characteristic	Coefficient	p-value	Number obs.	R^2
Income and needs corrected spending	0.369	0.374	11	0.09
Share of private expenditures	-0.066	0.743	11	0.01
Informal care use / Formal care use	-0.018	0.515	10	0.05
Informal care use	-0.101	0.698	10	0.02
Formal care use	0.244	0.429	10	0.08
Support for informal caregivers	-0.018	0.292	11	0.12
Importance of cash benefits	0.062	0.547	11	0.04
Means-testing	-0.022	0.654	11	0.02
Quality of coordination between LTC and other services	0.010	0.832	11	0.01
Satisfaction about role informal care	0.003	0.835	7	0.01
Satisfaction about role private funding	0.007	0.373	7	0.16
Satisfaction about role of residential care	0.006	0.588	7	0.06
Satisfaction about complexity of system	0.008	0.426	7	0.13

4.6   Methodology and robustness checks

4.6.1   Sample selection bias

In the analysis we describe above, the probability of receiving help and the probability of that help meeting the needs are treated as independent phenomena. Yet it is possible that persons receiving help are a select group based on unobserved variables. Maybe there are factors unknown to us that influence both the probability of receiving help and the probability of that help meeting the needs all the time. For example, if someone has a sunny and optimistic character, that may increase the probability of receiving informal help. At the same time, such a person may be more likely to consider that the help meets the needs all the time. In that case, our estimation results might be biased. To check whether it is indeed acceptable to treat these two aspects independently, we estimate two variants via the Heckman model. The first variant is an ordered response model with sample selection (De Luca & Perotti, 2011). This model studies variables that are naturally ordered (in this case: the degree to which the help meets the needs) where the possibility of observation is determined by a binary selection mechanism (in this case: receiving help or not). This model can be used to estimate the correlation between the error terms in the selection equation and the equation of interest, and to check whether this correlation is significantly different from zero. This turns out not to be the case, indicating that it is no problem to analyse the two equations independently. The estimation results for the ordered response model with sample selection are reported in the companion document to this report

containing statistical appendices (ENEPRI Research Report No 117A, Appendices, Chapter 1, Table A.3).

Second, we estimate a probit model with sample selection, after having recoded the probability of the help meeting the needs in a binary variable. In this case the correlation between the error terms was also not significantly different from zero. Sample selection bias does not appear to be a problem in this analysis.

4.6.2 Heterogeneity and outliers

Poland, with its high disability level in SHARE and other sources, may be an outlier in the group of 13 countries analysed in this chapter. To check whether the presence of Poland has a large impact, we did our estimates of section 4.4 and section 4.5 again with all countries except Poland. This turned out to have little impact on the results for other countries.

4.6.3 Selection of explanatory variables

SHARE includes some variables that objectively measure aspects of health, such as walking speed and the maximum grip strength of the hands. Since we want to correct for health and limitations as much as possible in our analysis, it would seem to be a good idea to use such information in addition to more subjective estimates that respondents make of their own health situation. However, walking speed has many missing observations.[26] As we want to study differences among countries, we cannot afford to lose that many observations. The variable 'maximum grip strength' has fewer missing observations, but these turn out to be selective. Persons with many limitations have a much larger probability of a missing observation for this variable. For these reasons, we decided not to use these two variables.

4.6.4 Correlation among explanatory variables

Since we use many explanatory variables concerning health status, limitations and care use in our analyses, it is advisable to check the correlation among these variables. We do not find any correlation coefficients that are so high that we have to worry. We do indeed find that the correlation among health variables themselves and with LTC use variables is higher than the correlation among the other variables, but it is in all cases well below 0.7.[27]

4.7 Life satisfaction

In the previous section, we study whether the probability that a person receives help and the probability that this help is appropriate differs between countries. These are the two properties of the LTC system of a country that we *observe* via the SHARE data. However, a national LTC system also has many other properties that we *do not observe* via the SHARE data. Think, for example, about the control of care recipients over their daily life, the dignity of the care recipient and the bureaucracy of the system. In this section, we study the life satisfaction of people to get an idea about how national LTC systems perform on these unobserved properties. The basic idea is that the difference in life satisfaction between people for which the LTC system is relevant and other people is smaller in countries with better (unobserved) properties of the LTC system. For example, suppose that the unobserved properties of the Danish LTC system are very good and that the unobserved properties of the Dutch system are very poor. In that case, the difference in life satisfaction between people for which the LTC system is relevant and other people is larger in the Netherlands than it is in Denmark (all other things being equal).

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[26] This variable has been recorded only for persons aged 75 years and older.

[27] The highest correlation coefficient is found between non-health variables: having a child and having a grandchild, namely 0.7.

Our approach is primarily driven by the available data. First, life satisfaction, our outcome measure, is a broad measure that includes many other aspects of life than contentment with the LTC system. Hence, it is not a perfect measure of the satisfaction of people with the unobserved properties of the LTC system even if we can compare the life satisfaction of persons with and without limitations in different countries while controlling for many relevant factors. It would be better if we would have a measure that specifically emphasises the impact of LTC on life satisfaction, like 'social care-related quality of life'. Second, we have no data on LTC systems at the individual level except for the two properties of the LTC system that we use in the previous sections. For other properties, only data at the country level are available. This lack of data makes it inevitable to determine the effect of unobserved properties of LTC systems indirectly. Thus their values may be influenced by confounding factors that we have no information on (see below).

Specification

We estimate differences in the country-specific impact of the unobserved properties of LTC on life satisfaction via the following specification:

$$LS_i = \alpha + \sum_{c}^{C-1} \alpha^c \cdot Cntr_i^c + \sum_{m}^{M} \beta^m \cdot Lmtd_i^m + \sum_{c}^{C} \gamma^c \cdot Lmtd_i \cdot Cntr_i^c + \delta^1 \cdot Hlp_i + \delta^2 \cdot HlpA2_i$$
$$+ \delta^3 \cdot HlpA3_i + \sum_{v}^{V} \theta^v \cdot X_i^v + \varepsilon_i$$

Here, LS_i is the life satisfaction of person i, $Cntr_i^c$ equals 1 if person i lives in country c and 0 otherwise (there are C countries), $Lmtd_i^m$ is 1 if person i has limitation m (there are M=12 different (i)ADL limitations), $Lmtd_i$ equals 1 if person i has at least one (i)ADL limitation, Hlp_i equals 1 if person i receives (formal or informal) help because of his ((i)ADL or mobility) limitation, $HlpA2_i$ is 1 if person i receives help because of his ((i)ADL or mobility) limitation and this help usually meets the needs, $HlpA3_i$ equals 1 if person i receives help because of his ((i)ADL or mobility) limitation and this help sometimes or hardly ever meets the needs, X_i^v are the other control variables (there are V=28 of these), and ε_i is the error term. The other control variables measure, among other things, health status, demographic characteristics and social interactions. These variables might be correlated to both the life satisfaction and the variables of interest. By including these variables we prevent that the estimated relation between the life satisfaction and variables of interest depends upon differences between persons in these aspects.

In this specification, α^c measures the effect of country c on the life satisfaction of people without limitation, β^m measures the generic effect of having limitation m on life satisfaction, and the δ's measure the effect of the observed properties of the LTC system (help and the appropriateness of this help). Our main interest is the coefficient γ^c. This coefficient measures the additional effect of having a limitation in country c on life satisfaction. Since we control for help and to what degree this help is appropriate, this additional effect reflects the other (unobserved) properties of the LTC system in country c. Thus, we assume that the effect of receiving help of a certain type does not differ between countries: national differences in help are already captured by the variable that measures the appropriateness of this help.

We test whether the γ^c's differ significantly between countries. If they do, we conclude that the unobserved properties of the national LTC systems differ. We expect that the total effect of a limitation on life satisfaction is negative ($\beta^m + \gamma^c < 0$). Moreover, we expect that receiving help increases life satisfaction: $\delta^1 > 0$, $\delta^1 + \delta^2 > 0$, and $\delta^1 + \delta^3 > 0$ (the effect of respectively help that always meets the needs, help that usually meets the needs, and help that sometimes or hardly ever meets the needs is positive). However, we expect that help that is less appropriate has a smaller positive effect ($0 > \delta^2 > \delta^3$).

We stress that γ^c measures the part of the difference in the life satisfaction of people with and without limitations that is not caused by our control variables. We claim that this part mostly reflects the unobserved properties of the LTC system. Although we include the most relevant control variables in our specification, the estimated γ^c may cover factors that cause a difference in the life satisfaction of people with and without limitations, but that do not strictly relate to the LTC system (ideally, we would observe these factors and include them in our specification). We mitigate the potential impact of these factors by studying the differences between the γ^c's (and not the level of the γ^c's). If a relevant omitted factor exists and our estimate of γ^c is too low or too high, then this is not a problem if all estimated γ^c's differ in the same way from their real value (i.e., if the impact of the omitted factor is the same in all countries). However, the potential impact of possible omitted factors should be borne in mind when we interpret our results. We consider γ^c an imperfect but useful measure for the unobserved properties of LTC systems.

Unobserved characteristics could also influence our estimate of the effect of help. For example, it is quite likely that we do not fully control for health status. If the unobserved part of the health status is negatively correlated with receiving help, then the estimated effect of help is too small (as it also captures the negative effect of the unobserved bad health status on life satisfaction). However, if this would be the case, then the rank of the estimated coefficients for the different degrees of appropriateness of help could still make sense. We will further elaborate on possible pitfalls of our methodology at the end of this section.

4.7.1 Estimation: ordered probit with vignettes

We estimate our specification via ordered probit with vignettes. To have a benchmark, we also estimate the specification via standard ordered probit and OLS.

Ordered probit is appropriate since the SHARE respondents could only choose from a limited number of answers to express their life satisfaction. These alternative answers have a logical ordering (from 'very dissatisfied' (=1) to 'very satisfied' (=5)). A standard ordered probit model assumes that there exists a latent continuous life satisfaction (LS_i^*) that depends on the characteristics of individuals (in this case there are Z different characteristics Y_i^z):

$$LS_i^* = \sum_z^Z \varphi^z \cdot Y_i^z + \varepsilon_i$$

However, we do not observe the continuous life satisfaction LS_i^*. We only observe a discontinuous representation of it. What we observe is the answer a person gave in the survey (LS_i). This answer can take j different values. A standard ordered probit model states that we observe a particular answer if the value of the latent continuous variable is between certain threshold parameters:

$$LS_i = j \qquad \tau^{j-1} < LS_i^* \leq \tau^j \qquad j = 1,2,3,4,5$$

where $\tau^0 = -\infty$ and $\tau^5 = \infty$. Hence, the probability that a person chooses j is the probability that the latent variable is between τ^{j-1} and τ^j. It is possible to estimate φ^z and τ^1 to τ^4.

However, in our case a standard ordered probit estimation is probably not sufficient. It is quite likely that surveyed persons differ in the way that they fill in questionnaires. For example, it is not necessarily true that a reported value of 5 for life satisfaction means the same in all countries. Figure 4.7 contains the reported life satisfaction of people in Denmark and in the Netherlands. Denmark and the Netherlands seem to be very comparable countries and you would expect that the life satisfaction in these two countries does not differ much. However, the figure shows that there are much more highly satisfied people in Denmark than there are in the Netherlands. It is possible that this difference does not reflect a difference in true life satisfaction, but a difference in reporting style. In terms of the ordered probit model discussed above: Dutch people translate LS_i^* differently to LS_i than Danish people because their threshold parameters τ differ.

By using vignettes it is possible to distinguish the effect of true life satisfaction and the effect of reporting style on the observed life satisfaction (that is, the answer in the survey). We will only briefly discuss the intuition behind vignettes. For a more detailed discussion of vignettes see, for example, Tandon, Murray, Salomon & King (2003), King, Murray, Salomon & Tandon (2004) and Kapteyn, Smith & Van Soest (2007). The SHARE survey asks respondents two questions. The first question is: "*How satisfied are you with your life in general?*". The second question is: "John is 63 years old. His wife died 2 years ago and he still spends a lot of time thinking about her. He has 4 children and 10 grandchildren who visit him regularly. John can make ends meet but has no money for extras such as expensive gifts to his grandchildren. He has had to stop working recently due to heart problems. He gets tired easily. Otherwise, he has no serious health conditions. *How satisfied with his life do you think John is?*". The second question is the same for all persons, so any difference in the answers should only be caused by differences in the reporting style of respondents (this is the so-called 'vignette equivalence' assumption). These differences in reporting style can then be used to scale the answers of people's own assessment (this is the so-called 'response consistency' assumption: a person uses the same reporting style for both questions). The resulting scaled own assessments only differ between persons due to differences in true life satisfaction, not due to differences in reporting style.

Figure 4.7 Life satisfaction in Denmark and the Netherlands (unweighted)
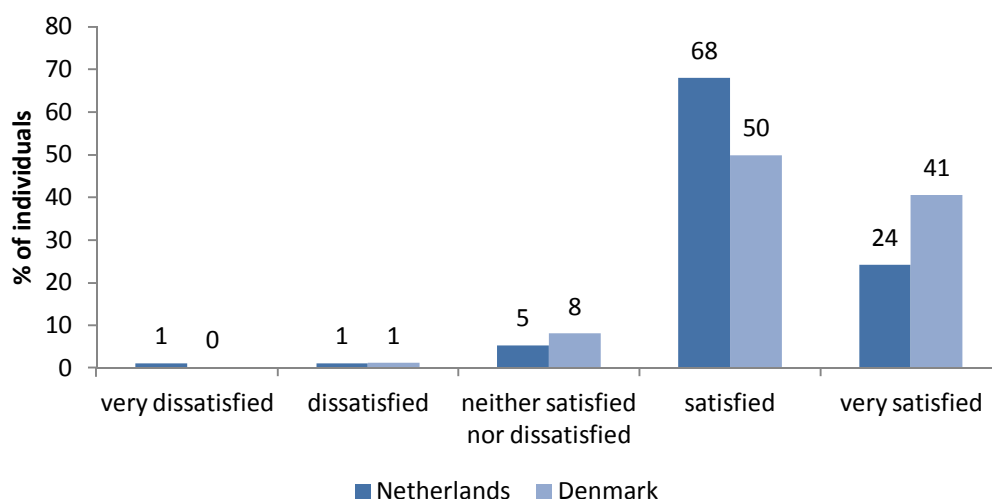
Source: SHARE, wave 2.

If we formally apply this intuition to the ordered probit model discussed above, one of the additions of vignettes to the model is that the threshold parameters τ now depend on the characteristics of individuals. Hence, the threshold parameters become individual specific. So we can estimate the effect of the characteristics of persons on both their life satisfaction and their threshold parameters. The former unravels the relation between characteristics and true life satisfaction, while the latter shows the relation between characteristics and reporting style.[28] As mentioned before, these paragraphs only cover the main intuition behind vignettes. For a more elaborate discussion we refer to the aforementioned references. For other applications of the vignette method, see e.g. Jones, Rice, Bago d'Uva & Balia (2007) and Angelini, Cavapozzi, Corazzini & Paccagnella (2011). The latter study uses SHARE data to evaluate differences in life satisfaction between countries.

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[28] Ideally, we would also correct the variables that measure whether the received help meets the needs for differences in reporting style as these variables contain a subjective judgment of respondents (see Section 3). However, SHARE does not contain a vignette for these variables.

Finally, we mention two more technical points. SHARE contains two different vignettes for life satisfaction and we use both for the estimations (see e.g. King, Murray, Salomon & Tandon, 2004). Moreover, we estimate all coefficients at once in the ordered probit model with vignettes.

A disadvantage of the vignette method is that a relatively small part of the SHARE respondents answered questions from the part of the survey on vignettes (about 3,000 persons in total; these persons are from Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Belgium, the Czech Republic and Poland). However, in the general part of the survey there is a very similar question on life satisfaction that about 14,000 persons answered (including people from Austria and Switzerland). We also estimate our specification for this larger group of respondents. For this purpose, we use the estimated relation between the (estimated) threshold parameters and the characteristics of persons from the smaller vignette sample to predict person-specific threshold parameters for persons in the large sample. We take the estimated coefficients for Germany as the country-specific coefficients for Austria and Switzerland to calculate the threshold parameters for residents of these countries. Subsequently, we explain the life satisfaction in the large sample with the help of these predicted threshold values (so in this case we do not estimate all coefficients at once). Again, we also report OLS and standard order probit estimation results as a benchmark.

The question on life satisfaction in the general part of the survey is very similar to the question in the part on vignettes. The exact question is: "H*ow satisfied are you with your life?*". Respondents could answer this question with any integer between 0 and 10. We convert these answers to a 1-to-5 scale (as the vignettes are answered on this scale). Although the questions are very similar, it is important that the answers of the same respondents to these two questions differ substantially. The correlation between the answers to the question from the general part (measured on the new scale) and the answers to the question from the vignette part is only 0.55.

4.7.2 Results

Table C.1 in the document with appendices (Appendices, section 1.3) reports the main estimation results for the vignette sample (3,087 observations). The first five columns report the results for the ordered probit model with vignettes. We start by studying the patterns in the reporting style. In columns 2 to 5, the characteristics explain the threshold parameters τ^1 to τ^4. A positive sign of a characteristic's coefficient implies that persons with a higher value for this characteristic have a relatively high value for this particular threshold parameter. Hence, these persons report a given value of true life satisfaction as a relatively low value in the survey: you could say that they report relatively 'pessimistically' (or that they have high standards). A negative sign means the opposite. Persons with relatively high values for a characteristic with a negative sign report relatively 'optimistically' (or have low standards). So, for example, living in the Netherlands without limitations has a positive coefficient across all threshold parameters. Thus, Dutch people without limitations report relatively 'pessimistically' (compared to German people without limitations, since Germany is the reference country). Similarly, living in Denmark without limitations has a negative impact on all threshold parameters. Therefore, Danish people without limitations report relatively 'optimistically' (compared to Germans without limitations). These results seem to be in line with what Figure 4.7 suggests. The table also shows that across the majority of the threshold parameters people without limitations in Sweden, Spain, Italy, France, Greece, and Belgium tend to report relatively pessimistically (compared to Germans). Other characteristics also have a significant impact on the threshold parameters. For example, persons with a high education and persons with children report relatively pessimistically. For some of these other characteristics there seems to be a straightforward explanation. The table shows, for example, that depressed people report relatively pessimistically (i.e. they have high standards).

Next we discuss the relation between life satisfaction and characteristics, taking into account differences in the reporting style of respondents. The first column of Table C.1 reports these results. We first discuss the effect of living without limitations in a certain country. The first column of Table 4.17 ranks the coefficients from high to low, indicating which countries have the most positive effect on life satisfaction and which countries the least. People without limitations are more satisfied with

life in the Netherlands, France, Sweden, Denmark and Spain than they are in Germany. And people without limitations are less satisfied with life in Greece, the Czech Republic, Poland, Italy and Belgium. These results are very similar to the results of Angelini, Cavapozzi, Corazzini & Paccagnella (2011).

Second, we discuss our main interest, the coefficients that measure the additional effect of having a limitation in country c (γ^c). If this additional effect differs significantly between countries, then the unobserved properties of the national LTC systems differ. The estimated coefficients are ranked from high to low in the second column of Table 4.17. Highly ranked countries have relatively good unobserved properties of the LTC system. The table shows that Poland, Belgium, Greece, Denmark, and Germany have relatively good unobserved properties of the LTC system, while the Netherlands, Spain, France, Italy, Sweden, and the Czech Republic have relatively unfavourable unobserved properties of the LTC system.

Table 4.17 Ranking of estimated country-specific coefficients (for the vignette sample)

Ranking of life satisfaction of people without limitation (α^c)	Ranking of additional country-specific effect of having a limitation (γ^c)
Netherlands	Poland
France	Belgium
Sweden	Greece
Denmark	Denmark
Spain	Germany
Germany	Czech Republic
Belgium	Sweden
Italy	Italy
Poland	France
Czech Republic	Spain
Greece	Netherlands

Table 4.18 contains for each country pair a test whether the difference between the countries is statistically significant. It turns out that for most country pairs there is no significant difference between the unobserved properties of the LTC system. Hence, we do not find much evidence for differences between countries. There is one exception though, the unobserved characteristics of the Polish LTC system are better than those of the German, Dutch, Spanish, Italian, French and Czech system.[29] One possible explanation for this finding is that the Polish system uses a lot of informal care and that elderly with limitations appreciate this type of care (although there may also exist disadvantages of a heavy use of informal care, like the quality of care and the burden on informal care providers). Another possible explanation is that in Poland there is a higher prevalence of limitations than in other countries (see section 4.3). It is possible that Polish people tend to report limitations soon (e.g. due to the phrasing of the question in the Polish survey or tax advantages). However, people that quickly report limitations do not have as much reason to be dissatisfied with their life as people with serious limitations and therefore the reported difference in life satisfaction between people with and without limitations may be relatively small. As a result, the unobserved properties of the LTC system may look good. We will come back to both possible explanations later on in this section. All estimation results that we present in this section do not change much if we exclude Poland. Hence, our conclusions do not depend on the inclusion of Poland in the sample.

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[29] Other studies find similar results. Smoczyńska (2010a, 2010b) shows that the quality of life of Polish people with limitations does not significantly differ from the quality of life of Polish people without limitations (except for people with higher levels of disability and people suffering from multiple diseases).

Table 4.18 Difference between the unobserved properties of the LTC system (i.e., the additional country-specific effect of having a limitation) for each pair of countries (for the vignette sample)

	DE	SE	NL	ES	IT	FR	DK	GR	BE	CZ	PL
DE											
SE	-										
NL	-	-									
ES	-	-	+								
IT	-	-	+	+							
FR	-	-	+	+	-						
DK	+	+	+	+	+	+					
GR	+	+	+	+	+	+	+				
BE	+	+	+	+	+	+	+	+			
CZ	-	+	+	+	+	+	-	-	-		
PL	+*	+	+*	+*	+**	+*	+	+	+	+*	

A '+' ('-') means that the country in the row has better (worse) unobserved properties of the LTC system than the country in the column (γ^c row − γ^c column). The symbols *, ** and *** mean that the difference is statistically significant at respectively the 5%, 1% and 0.1% level.

We use the same methodology as in the previous section to summarise Table 4.18. There exist two groups of countries:

Group 1: Poland, Belgium, Greece, Denmark, Sweden
Group 2: Germany, the Czech Republic, Italy, France, Spain, the Netherlands

Third, we discuss the effect of having an (i)ADL limitation on life satisfaction. We calculate for each limitation the total country-specific effect ($\beta^m + \gamma^c$). This number reflects how the life satisfaction of a person from country c changes if the person has limitation m instead of no limitation. The results are not reported to save space, but are available on request (although the main message is already clear from Table C.1). For none of the limitations there is a significant effect on life satisfaction for the majority of the countries. People that indicate to have problems with bathing and showering have a significantly lower life satisfaction in four countries. Other limitations are at most significant for one country. A test for the joint significance of the coefficients that measure the generic effect of having a limitation (the β^m's) strongly rejects the null hypothesis that all these coefficients equal 0.

Fourth, we discuss the effect of the observed properties of the LTC system: help and its appropriateness. Although the effect of help is never statistically significant, the coefficients do provide some useful information. Table C.1 shows that the effect of help that always meets the needs of the recipient (δ^1) is positive. Moreover, it shows that the effect of help that usually meets the needs of the recipient is smaller. And that the effect of help that sometimes or hardly ever meets the needs of the recipient is smaller than both of these ($0 > \delta^2 > \delta^3$). However, the total effect of help that usually meets the needs and the total effect of help that sometimes or hardly ever meets the needs is negative ($\delta^1 + \delta^2 < 0$ and $\delta^1 + \delta^3 < 0$), although both are not significant. As discussed before, this is probably the case because we do not perfectly control for health status. Most likely, people with more serious health problems get help sooner. Therefore, the coefficient for help may be biased downward because it partly captures the effect of these health problems on life satisfaction.

Finally, we discuss the effect of the control variables. Table C.1 reports that having more medical symptoms, being depressed, and living alone significantly decrease individuals' life satisfaction. Moreover, we find that a good cognitive functioning, a high income, having children, being a volunteer, providing care, and being actively involved in a church or political organisation increase people's satisfaction with life.

The standard ordered probit and OLS estimation results are reported in respectively column VI and VII of Table C.1. First, the table shows that the OLS and standard ordered probit methods produce similar results. Most coefficients have the same sign and the coefficients that differ statistically significant from 0 are almost the same. Second, if we compare the OLS and standard ordered probit results to the results of the ordered probit with vignettes (column I), then we see that these do not differ too much. Often coefficients have the same sign and more or less the same coefficients are significant. There are some notable differences, however. For example, people without limitations that live in Denmark have a significant higher life satisfaction according to the OLS and standard ordered probit methods. However, if we take into account that Danish people report life satisfaction relatively optimistically, this significant effect disappears. Similarly, we see that living in the Netherlands without limitations does not significantly impact life satisfaction according to the OLS and ordered probit estimates. Nevertheless, we do see that it significantly impacts life satisfaction if we correct for the pessimistic reporting style of Dutch people. However, for most characteristics the three methods point in the same direction.

4.7.3 Results for the large sample

Table C.2 in the document with appendices (Appendices, section 1.3) presents the estimation results for the large sample (14,093 persons). Remember that the dependent variable is still life satisfaction, but that the source is another question from the survey and that the answers to this question differ substantially from the answers that the same respondents gave to the question we used previously. Column I of Table C.2 reports the estimation results for ordered probit with vignettes. The used threshold parameters are based on the coefficients reported in Table C.1. First, we discuss the effect of a country on life satisfaction. Similarly to Table 4.17, the first column of Table 4.19 ranks the country-specific coefficients that measure the effect of living without limitations in a certain country on life satisfaction (the α^c's). The table shows that people without limitations are, in comparison with Germany, more satisfied with life in Switzerland, Sweden, France, the Netherlands, Denmark, Italy, Austria, and Spain. People without limitations are less satisfied with life in Poland, the Czech Republic, Greece, and Belgium. These results do not differ a lot from the results for the vignette sample that we present in the first column of Table 4.17.

Table 4.19 Ranking of estimated country-specific coefficients (for the large sample)

Ranking of life satisfaction of people without limitation (α^c)	Ranking of additional country-specific effect of having a limitation (γ^c)
Switzerland	France
Sweden	Poland
France	Belgium
Netherlands	Greece
Denmark	Denmark
Italy	Sweden
Austria	Netherlands
Spain	Spain
Germany	Switzerland
Belgium	Italy
Greece	Germany
Czech Republic	Austria
Poland	Czech Republic

Next, we discuss the coefficients that measure the additional effect of having a limitation in a certain country (i.e., the coefficients that reflect the unobserved properties of the LTC system). We rank the estimated coefficients from high to low in the second column of Table 4.19. France, Poland, Belgium,

and Greece have relatively good unobserved properties of the LTC system. The unobserved properties of the LTC system in the Czech Republic, Austria, Germany, Italy, Switzerland, Spain, and the Netherlands are relatively unfavourable. Most countries end up in the same part of the list as in the list based on the vignette sample, but there are exceptions (France, the Netherlands and Spain score better, Germany and the Czech Republic score worse). Poland, Belgium, Greece, and Denmark are on top of both lists. To see whether the differences between countries are statistically significant, Table 4.20 contains for each pair of countries a test on equality of the coefficients. In contradiction to the vignette sample, there are many significant differences in case of the large sample (remember that this estimate uses more than four times as many observations). The unobserved properties of the French LTC system are significantly better than those of all other national systems. Poland performs significantly better than all other countries except France and Belgium. Belgium scores better than all other countries except France, Poland and Greece. Greece performs better than all other countries except France, Poland, Belgium, Denmark, and Switzerland. And Sweden, the Netherlands, Spain, Italy and Denmark perform significantly better than the Czech Republic. These differences result in the following five groups of countries:

Group 1: France
Group 2: Poland, Belgium
Group 3: Greece, Denmark, Switzerland
Group 4: Sweden, the Netherlands, Spain, Italy, Germany, Austria
Group 5: the Czech Republic

The estimated effects of (i)ADL limitations on life satisfaction seem more plausible than in the estimation that uses the vignette sample. The total country-specific effect of a limitation ($\beta^m + \gamma^c$) is for all limitations for most countries negative (again, results are not reported to save space). For five limitations the negative total effects are statistically significant for at least eight countries. These five limitations are: problems with dressing, problems with walking across a room or getting in and out of bed, problems with bathing or showering, problems with using the toilet, problems with preparing a hot meal, and problems with shopping for groceries. The limitations with a significant negative impact include all ADL limitations, except problems with eating.

Table 4.20 Difference between the unobserved properties of the LTC system (i.e., the additional country-specific effect of having a limitation) for each pair of countries (for the large sample)

	AT	DE	SE	NL	ES	IT	FR	DK	GR	CH	BE	CZ	PL
AT													
DE	+												
SE	+	+											
NL	+	+	-										
ES	+	+	-	-									
IT	+	+	-	-	-								
FR	+***	+***	+***	+***	+***	+***							
DK	+	+	+	+	+	+	-***						
GR	+***	+**	+*	+*	+*	+**	-***	+					
CH	+	+	-	-	-	+	-***	-	-				
BE	+***	+***	+***	+***	+***	+***	-***	+**	+	+**			
CZ	-	-	-*	-*	-*	-*	-***	-*	-***	-	-***		
PL	+***	+***	+***	+***	+***	+***	-***	+***	+*	+**	+	+***	

A '+' ('-') means that the country in the row has better (worse) unobserved properties of the LTC system than the country in the column (γ^c row − γ^c column). The symbols *, **, and *** mean that the difference is statistically significant at respectively the 5%, 1%, and 0.1% level.

The interpretation of the effects of the observed properties of the LTC system (help and its appropriateness) does not change in comparison with the interpretation of the results obtained via the vignette sample, although the effects are now significant. There is a significant positive effect of help that always meets the needs (δ^1). Help that usually meets the needs and help that sometimes or hardly ever meets the needs have a significantly smaller effect ($0 > \delta^2 > \delta^3$). The total effect of these two latter types of help remains negative (and this is also statistically significant).

We also find similar results for the control variables with the large sample. A person's life satisfaction decreases significantly in case that person has many mobility limitations, has at least one medical symptom, has many medical symptoms, has a depression, suffers from cancer, or lives alone. We find that a person has a higher life satisfaction if that person has a good cognitive functioning, has an age between 80 and 85 years, has an age of 85 years or more, has an average level education, has a high level education, has a high income, is a woman, lives in a large town, has children, is a volunteer, provides care to others, or is actively involved in a church or political organisation.

Columns II and III of Table C.2 present the estimation results in case we use OLS and standard ordered probit. Again, OLS and standard ordered probit produce similar results as ordered probit with vignettes. Also the interpretation in Tables 4.19 and 4.20 is similar if we use these estimation results.

4.7.4 Explaining the unobserved properties of the LTC systems

Next, we relate the estimated properties of the LTC systems that were unobserved in our specifications above to a few properties of the national LTC systems on which we have data via ANCIEN. Hence, we explain the additional country-specific effect of having a limitation (that we estimated via SHARE micro-data) by country-specific macro-data from another source. This exercise helps to better understand the ranking of the unobserved properties of the LTC systems. In section 4.4, we provide information about the available macro-data.

Since we have a very limited number of observations (namely, the number of countries), we regress the additional country-specific effect of having a limitation (γ^c) separately on each country characteristic and a constant. An alternative approach could be to include the country-level variables directly in the previous (person-level) specifications (i.e., assign the same value of the variable to all persons with a limitation in a specific country). However, in that case it would not be possible anymore to estimate the country-specific effect of having a limitation (due to perfect multicollinearity). Therefore, we choose a similar two-step estimation procedure as Angrist & Pischke (2009, p. 313) describe.

Table 4.21 reports the main estimation results. We focus on the γ^c's that follows from the ordered probit with vignettes estimation method. Columns I-III report the results if we use the γ^c from the vignette sample (Table C.1, column I). The first column contains the estimated coefficient, the second column the R^2 of the regression, and the third column the number of observations. Columns IV-VI contain the same results, but for the estimated γ^c from the large sample (Table C.2, column I). Due to the low number of observations, a significance level of 10% seems sufficient. However, at this significance level there does not exist a significant relation between γ^c and any of the country-specific variables (not for the vignette sample and not for the large sample). Also scatter plots do not reveal a clear relation. Figure 4.8 and Figure 4.9 show the relation between γ^c (large sample) and the public expenditures on LTC, the number of informal care recipients divided by the number of formal care recipients, and the value of cash benefits. There does not seem to be a relation between the public expenditures and the unobserved properties of the systems. Above, we mention the heavy use of informal care as one possible reason for the high ranking of the unobserved properties of the Polish system. However, the right panel of Figure 4.8 does not show a positive relation between the unobserved properties of the LTC systems and the number of informal care recipients divided by the number of formal care recipients (although we do not have an observation of the latter variable for Poland). Figure 4.9 seems to show a negative relation, but with so few observations available we have to be careful (e.g. taking out France impacts the plot substantially).

Table 4.21 The unobserved properties of the LTC system (according to the ordered probit with vignettes method) explained by country-specific characteristics

	(I)	(II)	(III)	(IV)	(V)	(VI)
	γ^c **from vignette sample**			γ^c **from large sample**		
	Coef.	R²	**Obs.**	**Coef.**	R²	**Obs.**
Income and needs corrected spending	-1.644 (1.396)	0.148	10	0.165 (2.109)	0.001	11
Share of private expenditures	0.061 (0.756)	0.001	10	0.779 (0.976)	0.066	11
Informal care use / Formal care use	0.009 (0.070)	0.002	9	-0.061 (0.138)	0.024	10
Support for informal caregivers	-0.046 (0.060)	0.069	10	0.116 (0.077)	0.201	11
Importance of cash benefits	-0.480 (0.339)	0.201	10	-0.419 (0.494)	0.074	11
Means-tested access to publicly financed formal institutional care / home-based care	0.124 (0.178)	0.057	10	0.047 (0.250)	0.004	11
Quality of coordination between LTC and other services	0.092 (0.180)	0.031	10	-0.073 (0.231)	0.011	11
Satisfaction about role informal care	-0.098 (0.055)	0.390	7	0.106 (0.089)	0.221	7
Satisfaction about role private funding	-0.049 (0.042)	0.218	7	-0.032 (0.066)	0.046	7
Satisfaction about role residential funding	-0.084 (0.053)	0.332	7	0.017 (0.093)	0.007	7
Satisfaction about complexity of system	-0.077 (0.046)	0.356	7	-0.019 (0.082)	0.010	7

In this table, the symbols [#], *, **, and *** indicate that a variable is significant at respectively the 10%, 5%, 1%, and 0.1% level (there are no significant variables in this table).

All in all, the properties of the LTC systems that we observe via other sources cannot well explain the properties of the LTC systems that are unobserved via the SHARE data. The differences in the unobserved properties of the LTC systems that we find have to be explained by other aspect of the LTC systems like, for example, the control of people with limitations over their daily life and their dignity.

Figure 4.8 Relation between the unobserved properties of the LTC system and (left panel) the public expenditures on LTC and (right panel) the number of informal care recipients divided by the number of formal care recipients
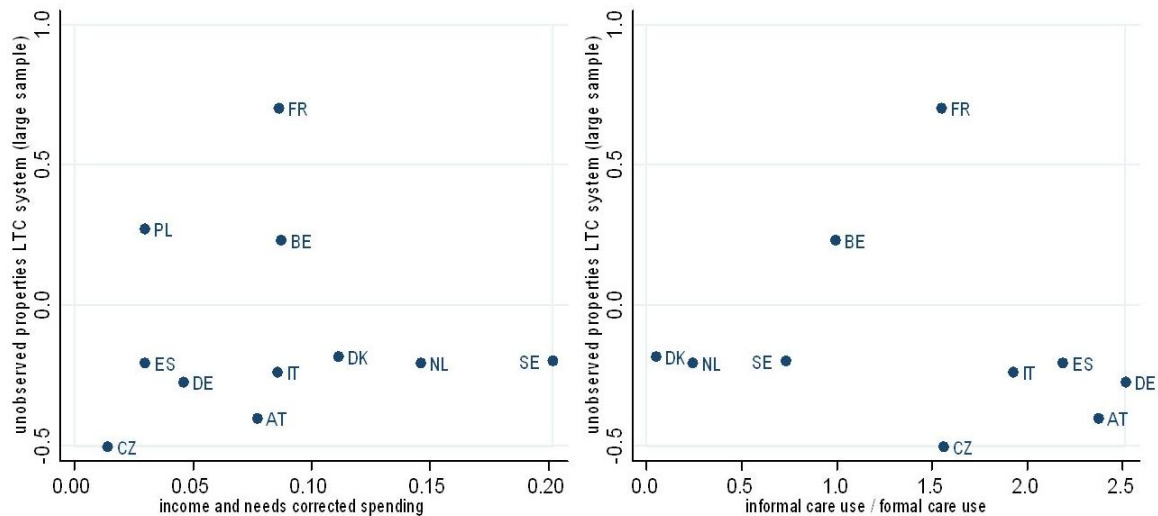
Figure 4.9 Relation between the unobserved properties of the LTC system and the value of cash benefits (measured in thousands of euros)
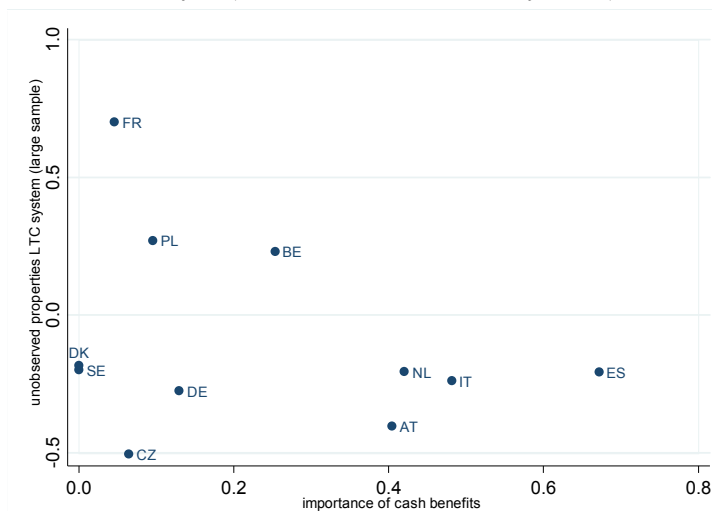
4.7.5 Discussion

In this subsection, we discuss limitations and pitfalls of our analysis. As mentioned before, the main limitations of the analysis are due to a lack of data. First, we use general life satisfaction as a measure of users' contentment with the LTC system as we have no information on 'social care related quality of life'. Second, an analysis that uses explicit measures for (parts of) the unobserved properties of the LTC systems would be more straightforward.

When we interpret our results, there are at least two possible pitfalls. First, it is possible that the unobserved properties of the LTC system affect the life satisfaction of both people that are involved in the LTC system and other people. It could be that both people with and without limitations are more satisfied with life in countries with good unobserved properties of the LTC system. For example, because people without limitations know that good LTC is available if necessary or because it increases the life satisfaction of people without limitations that others get good LTC. This would imply that the estimated difference between people with and without limitations is too small: the effect

of the unobserved properties of the LTC system is underestimated. It is also possible that people without limitations are less satisfied in countries with good unobserved properties of the LTC system. For example, because people without limitations largely pay for these unobserved properties (it is likely that persons with limitations pay fewer taxes). Hence, in this case the difference in life satisfaction between people with and without limitations is relatively small and it seems that the unobserved properties of the LTC system are good, while it is just an expensive system.

A second possible pitfall is that the difference in life satisfaction between persons for which the LTC system is relevant and other people differs between countries because of other reasons than the unobserved properties of the LTC system (i.e., the missing relevant control variables do not have the same impact in each country). We include the most relevant control variables in our specification, but we cannot exclude that there exist other relevant factors that we do not include. For example, it could be that the respect of society for limited people differs between countries. Another possible example is that some countries could have easy access to public transportation that mostly benefits people with limitations. In this case, our estimate of the unobserved properties of the LTC system also captures other differences between countries.

4.8 Conclusion

In this chapter we evaluate the effect of different national LTC systems on the experience of actual and potential LTC users. We use information on three aspects of the LTC experience as included in the internationally comparable SHARE database: receiving help, the sufficiency of the help and life satisfaction of persons with and without limitations. In analysing life satisfaction, we use vignettes to correct for differences in response style. An important caveat to keep in mind is that SHARE only includes older persons living at home. Not only do we miss information on the quality of life in institutions, we also have to consider that groups of older people living at home are not directly comparable across countries because countries differ in the rate of institutionalisation.

In Table 4.22 we present the results for the three different aspects. For the probability of receiving help and the probability of the help meeting the needs all the time, we consider the average marginal effect of living in a certain country as the most informative measure. It represents the impact that living in a country has after correction for the usual socio-economic variables, household situation, limitations and health. We take the additional country-specific effect of having a limitation (γ^c) from the estimates based on the large sample as the indicator for the unobserved properties of the LTC system.

Table 4.22 The experience of LTC users and ranking of countries

Country name	AME on help	Rank help	AME on sufficiency of help	Rank sufficiency	Unobserved properties	Rank unobserved properties
Austria	-0.112	6	0.028	6	-0.403	12
Belgium	-0.094	3	0.042	5	0.230	3
Czech Republic	-0.06	2	0.042	4	-0.506	13
Denmark	-0.153	7	0.008	7	-0.185	5
France	-0.175	9	-0.034	9	0.694	1
Germany	0	1	0	8	-0.275	11
Greece	-0.334	12	-0.066	12	0.047	4
Italy	-0.303	10	0.132	2	-0.239	10
Netherlands	-0.096	4	0.068	3	-0.206	7
Poland	-0.374	13	-0.057	11	0.270	2
Spain	-0.311	11	-0.124	13	-0.207	8
Sweden	-0.154	8	-0.051	10	-0.199	6
Switzerland	-0.109	5	0.160	1	-0.227	9

Table 4.22 shows how the countries rank on the three aspects. Ranking the countries is an accessible way of presenting the results, but we have to keep in mind that differences between countries can be small and non-significant.

Table 4.23 takes this consideration into account. This table presents the groups of significantly differing countries that we constructed in the sections above. The ordering of the groups is translated into a description of the relative position of a country. For example, for the probability of the help meeting the needs all the time, we distinguished three groups of countries. The sufficiency of the help in these three groups is indicated as high, medium and low.

Table 4.23 Relative experience of LTC users for groups of countries

Country name	Level of help	Level of sufficiency	Unobserved properties
Austria	medium high	medium	medium low
Belgium	medium high	medium	medium high
Czech Republic	medium high	medium	low
Denmark	medium	medium	medium
France	medium	medium	high
Germany	high	medium	medium low
Greece	medium low	low	medium
Italy	medium low	high	medium low
Netherlands	medium high	high	medium low
Poland	low	low	medium high
Spain	medium low	low	medium low
Sweden	medium	low	medium low
Switzerland	medium high	high	medium
Number of groups	5	3	5

The two tables show that many countries score high on some aspects and not so high on others. Germany, for example, scores very high on persons with limitations getting help, but the scores for the help meeting the needs and the unobserved properties of the LTC system are much lower. The Netherlands scores high on the sufficiency of the help, but the results are mediocre for the other aspects. Poland scores low on all aspects except the unobserved properties of the LTC system, where it scores medium high. It is important to note that Poland has a high number of people with a limitation and this may impact our results. Spain scores low or medium-low on all aspects. However, we have to keep in mind that reforms may have improved Spain's score since the data were collected in 2006-2007 (before the reform). Switzerland, Belgium and France score consistently high on all three aspects.

These three indicators for the LTC-related quality of life are meant to be one of the aspects in the overall system evaluation, together with criteria such as equity, the burden of LTC and quality of care (see chapter 7). Therefore, we would like to have some comparable quantitative indicators for the three aspects, and ideally also for the overall experience of LTC users on the three aspects. We construct comparable quantitative indicators by calculating standardised scores from the results for the AMEs and γ^c in Table 4.22. Following that, we calculate both a weighted and an unweighted average of these three standardised scores (see Table 4.24). The methodological soundness of simply combining these three aspects in one indicator is debatable. However, since we think that all three aspects are an indicator for the quality of life of LTC users and we want to pay attention to this quality of life in the overall evaluation, we proceed despite possible problems. After calculating the average standardised scores, we again standardise the result. The weighted average is calculated with a weight of 0.5 for the score on the probability of receiving help, a weight of 0.25 for the score on the probability of the help meeting the needs all the time and a weight of 0.25 for the score on the unobserved properties of the LTC system. This choice was made to emphasize that the results for the

probability of receiving help may well be the most reliable and robust of the three. The answers concerning the probability of the help meeting the needs all the time may be affected by gratitude, social desirability and different response styles and may be less indicative of the system as a whole, while the results on the unobserved properties are the end product of a complex decomposition exercise where we cannot be sure that all necessary controls are included.

Table 4.24 shows that the ranking of countries differs in a limited way between the simple and the weighted average. Belgium and Switzerland show the best overall score for LTC experience in both weighting schemes. France, Germany and the Netherlands follow directly behind, but their ordering depends on the weights. Poland, Greece and Spain score lowest with both sets of weights. The Czech Republic, Italy, Denmark, Austria and Sweden score somewhat in the middle, where the exact ordering again depends on the chosen weights.

Table 4.24 Standardised average of standardised scores for three quality of life indicators, ordered by score

Country	Simple average	Country	Weighted average
Belgium	1.36	Belgium	1.20
Switzerland	1.31	Switzerland	1.12
France	1.22	Germany	1.00
Netherlands	0.68	France	0.81
Germany	0.52	Netherlands	0.75
Czech Republic	0.06	Czech Republic	0.47
Italy	-0.02	Austria	0.14
Denmark	-0.09	Denmark	0.02
Austria	-0.14	Sweden	-0.33
Sweden	-0.61	Italy	-0.49
Poland	-0.94	Poland	-1.36
Greece	-1.24	Greece	-1.42
Spain	-2.10	Spain	-1.91

Table 4.25 reports standardised scores that are calculated in the same way as in Table 4.24, but in this case only for four selected representative countries are taken into account. Both for the unweighted and the weighted average of the three quality of life aspects, the Netherlands scores highest, followed by Germany, Poland and Spain. However, based on the weighted average, the difference between the Netherlands and Germany is very small, so it would be reasonable to say that both countries share the first place in this case.

Table 4.25 Standardised average of standardised scores for three aspects of quality of life, only for the four selected representative countries

Country	Simple average	Weighted average
Germany	0.493	0.807
Netherlands	0.851	0.815
Spain	-1.423	-1.241
Poland	0.079	-0.381

Our conclusion, mostly based on Table 4.23 that shows significant differences among countries, is as follows. Concerning receiving help with their limitations, older persons living at home are best off in Germany out of the 13 countries in our sample. Given that help is available, the sufficiency of the help is best ensured in Switzerland, Italy and the Netherlands. The unobserved properties of the LTC system are most favourable in France. An older person who considers all three aspects important,

might be best off living in Belgium or Switzerland (see Table 4.24). Out of the four selected representative countries, the Netherlands is the most attractive one if all three aspects are considered equally important (see Table 4.25). The least attractive countries from the point of view of the experience of LTC-users are Spain, Greece and Poland.

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5. Analysis of equity
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5.1 Introduction

This chapter seeks to evaluate the potential performance in terms of equity of the long-term care systems of Germany, the Netherlands, Poland and Spain by assessing whether key features of these long-term care systems promote or hinder equity. As explained in chapter 1, these four countries were chosen as representative of the four different long-term care system clusters identified in Work Package 1 of the ANCIEN project (see Kraus, Riedel, Mot, Willemé, Rohrling & Czypionka, 2010).

Cluster 1, to which Germany belongs, consists of countries in which a low level of public spending is combined with a modest share of private spending, high informal care use and high informal care support. The Netherlands belongs to a cluster of Northern European countries characterized by high public LTC spending, low private spending, low informal care use and high informal care support. Spain and the other countries of cluster 3 share the profile of cluster 1 with regard to informal care use and support, but have a much higher level of private responsibility and a somewhat higher level of public spending. Poland is allocated to cluster 4, which is characterized by a small public sector involvement, more private spending, high informal care provision but few supportive measures for informal caregivers.

The chapter starts with a brief discussion of the concept of equity in relation to long-term care. It then looks at how key features of long-term care systems perform in terms equity, by reviewing both theoretical and empirical literature. The likely implications of the presence and relative importance of such features for the equity of a care system are explored.

Finally, the chapter discusses how the long-term care systems of Germany, the Netherlands, Poland and Spain are expected to perform in terms of different aspects of equity, using macro-level information obtained from the country reports prepared as part of the ANCIEN project, as well as information from other sources, to assess the degree to which different features are present and their likely impacts.

5.2 Equity and long-term care systems

Equity is a widely accepted objective of public long-term care systems and, more generally, the welfare state system. Of course equity is not the only consideration and, as discussed in Wittenberg, Sandhu & Knapp (2002), Glendinning, Davies, Pickard & Comas-Herrera (2004), Wanless (2006) and Fernández, Forder, Truckeschitz, Rokosova & McDaid (2009), it needs to be considered alongside other performance criteria, such as the criteria discussed in chapter 2.

The relative importance of these multiple objectives will vary dependent on the national context, which will be affected by values, traditions, economic and political circumstances, etc. It is important to consider that these objectives may often contradict each other. Crucially, the pursuit of full equity may be both unaffordable and inefficient.

Equity objectives generally stress the importance of a fair distribution of resources and burdens (Österle, 2002), and equality (see, for example, Culyer, 2001). It is a multifaceted concept. This chapter focuses on two key concepts: *Horizontal equity*, which requires the like treatment of like individuals and *Vertical equity*, which requires the unlike treatment of unlike individuals, in proportion to the differences between them (Knapp, 1984; Culyer, 2001; Wittenberg, Sandhu & Knapp, 2002). These two concepts are used to interrogate how different features of care systems will affect the performance of the systems in terms of vertical and horizontal equity. Applying these two concepts to the different features that form the system separately may well result in some aspects of the system performing very differently in terms of equity. Also, while some features of a system may perform very well under, for example, horizontal equity, it is very possible that they do not perform so well in terms of vertical equity or vice-versa.

The equal treatment of like individuals and unequal treatment of unlike individuals with regards long-term care is normally assessed with reference to the needs of individuals and their resources. Equity is affected both by the ways in which revenues are raised and by how those resources are allocated. With regards the way resources are raised the main focus is on ability to pay, whereas for resource allocation, equity considerations arise both in terms of individual resources (including the ability to pay[30]) and the levels of need.

Another important consideration, particularly when discussing revenue-raising, is how the system performs in terms of *intergenerational equity*: that is, striking a fair balance between the current and future generations (see for example, Colombo et al., 2011). A key aspect of intergenerational equity is which generation or generations are bearing the costs of care. In a funded system (where funds for care are accumulated before they are needed), care is paid for by the generation who uses it. In a pay-as-you-go system, much of the care of older people is paid by younger generations of working age. There are concerns that pay-as-you-go schemes may exacerbate imbalances between the generations. The concerns arise where there are substantial differences in the relative size of the populations and where different generations have experienced different economic opportunities.

In this chapter the long-term care systems are analysed in terms of the equity implications of the way in which revenue is raised and the way resources are allocated. The focus is on the horizontal and vertical equity implications of revenue raising and resource allocation mechanisms, which are considered separately for each country. Intergenerational equity will not be discussed.

5.3   Equity and revenue-raising

According to Van Doorslaer & Wagstaff (1992, p. 389), in healthcare systems it is broadly accepted that care should be financed according to the ability to pay but delivered according to need. This principle is not as broadly accepted (at least in practice) in long-term care, in the sense that in many countries the long-term care system is not financed in a way that is consistent with this principle (see for example, Colombo et al., 2011).

With regards revenue raising, horizontal equity would require that individuals with the same resources pay the same amount of money into a long-term care scheme. Vertical equity is concerned with the extent to which the funds are raised in a way that is progressive (well-off people pay proportionally more), proportional (everyone pays an equal proportion of their resources), or regressive (well-off people pay proportionally less). The more progressive the system, the better its performance in terms of vertical equity.

The bullet points below illustrate some of the key financing-related mechanisms that are likely to affect equity with regards revenue-raising:

- Horizontal equity (those with equal resources pay the same)
  - Degree of risk pooling (in the public and private sector): affects the extent to which disabled people pay more for long-term care than non-disabled people with the same income and assets.
  - Degree of geographical variation.
  - Diagnostic/sector inequity (health vs. social care).

- Vertical equity:
  - With regards revenue-raising, it is affected by the relative weight of main sources of funds and assessment of their progressivity: taxation (direct vs. indirect, income vs. capital, national vs. local), social insurance, private funding (insurance, private savings…), and informal care.

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[30] Although ability to pay may seem mostly as a revenue raising issue, in countries with a safety-net type of systems it can exclude people from accessing the care system.

Care in any country is normally financed by a combination of revenue-raising mechanisms that have very different properties in terms of risk-pooling and redistribution. The relative importance of the different mechanisms (and their progressivity), will have a direct impact on the overall equity performance of a system. For example, the role of private income and assets in financing long-term care is very different in systems where these are used as the sole or main source of finance, compared with systems where income and assets have a relatively small role as part of co-payments paid only by the better off.

When looking at revenue-raising mechanisms in terms of equity, the key considerations are the amount of risk-pooling, the degree of coverage and the amount of redistribution involved.

5.3.1 Informal care

Informal care is the most important source of long-term care resources globally. Therefore, even if it does not involve a monetary transaction, it needs to be considered as a form of long-term care "revenue-raising", in kind.

Horizontal equity

People who need long-term care can only receive informal care as long as there are other people who are willing and able to provide it. While informal care may involve some risk-pooling and redistribution within a family or other close network, it does not involve much risk-pooling or redistribution outside this group. The relationship between need for care and receipt of informal care is entirely dependent on the availability of potential carers, which means that people with more need for care may receive less informal care compared to others who are "richer" in resources (in this case potential carers). Therefore, informal care does not perform highly in terms of horizontal equity.

Vertical equity

The costs of providing informal care are mostly born by those who provide it, although care recipients may experience indirect costs too, for example as a result of feeling that they are a burden to their carers. International evidence (Colombo et al., 2011) shows that people who provide informal care are most likely to be women, less likely to work or more likely to work less hours and face an increase in the risk of poverty. It is also important to consider that informal carers of working age who withdraw from the labour market or who reduce their working hours will be affected financially, both in the present and in the future (as a result of possible difficulties returning to the labour market, smaller pension entitlements, etc.).

In terms of vertical equity, informal care is potentially regressive as a form of financing long-term care as people with lower incomes tend to provide more informal care and so contribute proportionally more to the system (even if it is in-kind).

Therefore, systems that rely more on informal care, particularly where this is a result of lack of availability or affordability of formal care, can be considered less equitable than those where publicly-funded formal care is more available.

The relative importance of the role of informal care as a source of LTC in-kind resource in different countries is difficult to quantify. Ideally, as well as looking at the volume, we would also consider the economic costs of informal care in the different countries. An important consideration is whether informal care is provided through choice, complementing available formal care, or whether informal care is provided because formal care is either not available or unaffordable.

5.3.2 Private income, savings and assets

The equity implications of financing care via private income or assets depend very much on their role in the system. First, they may be the only source of funds for formal care as a result of the absence of any insurance and/or public system, second, they may be the only source of funding for people whose

income and assets are above a certain threshold and as a result are excluded from the public system, third, they may be used to top-up insufficient publicly funded care or, fourth, they can play a relatively small role as an income or asset dependent co-payment for care organised by the public system.

Like informal care, the financing of LTC with private income and assets involves no risk-pooling or redistribution. As discussed in Wittenberg, Sandhu & Knapp (2002) and Holdenrieder (2006), private income and savings as the main source of finance do not perform well in terms of equity.

Even where there is a publicly funded/organised system, in most countries a substantial amount of care is purchased outside the publicly organised care system, directly from care providers in the private (and sometimes "grey economy") sector. It is very difficult to obtain reliable estimates of private expenditure in directly purchased care, as this information is not routinely collected by statistical offices. The best source of information for this are likely to be surveys, but then it is often difficult to disentangle from surveys who pays for care (although efforts are being made to improve data collection in this area, see King et al., 2010).

Where private financial contributions to care are not mediated by an insurance mechanism that shares the risk between the population, or where only a very small part of the risk is covered by the public sector or partial insurance, not only will people who need care have to pay more than those who do not need care, but there will be people whose entire income and assets may be spent paying for care. While many people will not require any care (and a result will not face any expenditure), those who do need care may be faced with very high costs, particularly if they suffer from conditions that are severely disabling but have little effect on length of life (such as dementia). Estimates of the distribution of expected life time costs of care at age 65 from England by Fernandez & Forder (2011) have shown that, while about one-third of people aged 65 will face virtually no care costs at all, a small percentage of people can incur huge costs (15% will face costs of over £100,000 and 5% over 200,000), which can be deemed "catastrophic" as they can easily wipe out a persons' entire life savings and assets.

Two more key considerations are whether the means tests cover only income, or whether they also include assets (which may be in the form of housing) and whether the financial liability is limited to the persons needing care or whether their children may be liable too.

Horizontal equity

Private income and assets, particularly where they are the sole or main mechanism used to meet the costs of care are an inequitable way of funding care from a horizontal equity perspective. A key reason for this is that there is no risk-pooling, so those who need care will pay more towards it than those who do not need care. Also, in a system that relies on individual or family-based income and savings as the main source of finance, those with higher levels of income and or savings will be able to obtain more and better (formal) care than those with less financial resources, given similar care needs.

Vertical equity

Given the same level of need, especially in the absence of public funding or insurance, or very carefully designed co-payment mechanisms, those with low incomes will use a higher proportion of their incomes and assets to pay for long-term care, than those with high incomes. Therefore, from a vertical equity point of view, private income and assets can be a regressive way of funding LTC.

5.3.3 Private insurance

Horizontal equity

Private insurance involves risk-pooling and as a result there is an element of redistribution of risk between those who are insured. Therefore, it performs better in terms of horizontal equity than informal care and private income and savings (Barr, 2010). However, unless private insurance is compulsory (which would necessitate mechanisms to subsidise those who cannot afford the premiums

at market prices, as discussed in Wittenberg et al., 2002), by leaving outside the system those without enough resources to purchase insurance, it is still not very horizontally equitable.

It is also relevant to note that women have a much higher risk of needing long-term care and in principle would need to pay higher premiums than men. At the same time, women on average earn less than men over their lifetime, potentially making insurance premiums even less affordable for them (Holdenrieder, 2006). In March 2011, an EU court ruling dictated that men and women should be charged the same levels of premiums.

Typically private insurance premiums are set according to the risk profile of the purchaser, rather than according to their income and assets. Therefore, as Holdenrieder (2006, p. 142) points out, it is possible that "two individuals with the same income and capital may have to pay different contributions".

Vertical equity

Unless there is an element of redistribution (which could be enforced through a legal requirement), insurance premiums will vary according to the risk profile of the purchasers, which is likely to result in those who are better off paying lower premiums (Barr, 2010). Even if the risk profiles of those who are less-well off where the same as those who are better off, it would still be the case that, as a proportion of their income and wealth, poorer people will pay a higher proportion of their income in premiums, making this a regressive form of financing.

5.3.4 Social insurance

Horizontal equity

In principle, as in the case of compulsory private insurance, social insurance has the potential to provide good horizontal equity, depending on how resources are allocated and on whether the entire population is covered.

Vertical equity

Analysis of the redistributive effects of healthcare financing has shown that health social insurance schemes do not necessarily contribute to vertical equity in funding terms (van Doorslaer et al., 1999 and Mossialos & Dixon, 2002). There are various features of social insurance systems that will result in poor vertical equity. The first is that contributions are generally proportional to employment income and disregard income from other sources (such as capital gains, rents, see, for example, Rothgang, 2011). Those additional sources of income are more prevalent among wealthier people. The second feature is that in some countries very wealthy people are allowed to opt out of the system and buy alternative insurance. In Germany, for example, different groups of people (self-employed, civil servants, those with high levels of income) can opt out of long-term care social insurance scheme and take, instead, compulsory private insurance (Rothgang, 2011). It is likely that most of the people taking up private insurance pay lower contributions and present lower risk of needing care. This increases vertical inequity. Third, there are often maximum ceilings to contributions (as in the Netherlands, for example), which means that the very wealthy will pay a smaller proportion of their income compared to other people.

5.3.5 Taxation

Horizontal equity

In principle, as in the case of compulsory private insurance, social insurance and taxation have the potential to perform well in terms of horizontal equity, depending on how resources are allocated. Where taxes are set at local level, however, there is potential for geographical inequities if people living in different areas pay different levels of taxation.

Vertical equity

Different types of taxes have different vertical equity implications. Personal income taxes are normally progressive and redistribute income between the rich and the poor (see, for example, Verbist, 2004). There are usually higher tax rates for those with higher incomes, which means that better off people contribute a higher proportion of their income than people who are less affluent. Indirect taxes are often regressive as they are likely to affect disproportionally less well-off people (see, for example, Glennerster, 2003).

The relative importance of different sources of taxation will determine the degree to which funding care via taxes performs in terms of vertical equity.

5.4 Equity and resource allocation

Once the resources have been raised, equity will also be affected by the mechanisms that are used to allocate the resources.

With regards resource allocation, it is useful to distinguish between equity of outcomes, equity in levels and mix of services relative to needs, and equity of access. As with the discussion of equity in revenue-raising, equity in resource allocation can also be considered in terms of whether the system promotes *horizontal* and *vertical equity*. Equity may be measured both in relation to care needs (comparing how the systems treat those with similar/different care needs), and means (income, assets, availability of informal care).

Resource allocation mechanisms that promote equity will ensure that individuals with equal needs/means enjoy similar outcomes/services/access, and that individuals in greater need experience bigger improvements in their outcomes (which is likely to require better access and more services).

While financial resources, are, at least in principle, relatively easy to measure, different care systems (and sometimes different regions/localities) will define 'need' differently, but typically this will include the impacts of physical and mental health status on the ability to perform activities of daily living (ADLs), such as washing, feeding and eating and, in some settings, on the ability to undertake instrumental activities (IADLs) including light housework, shopping or preparing meals. Different assessment tools will measure needs in different ways, and there is concern that the tools used in some countries do not capture adequately the needs of older people with dementia and other mental health problems. There are, of course, many other aspects of need, such as need in relation to financial situation or due to lack of potential informal carers (Österle, 2002), which may or may not be considered in different systems.

Equity of outcomes

The long-term care system's ultimate goal is to improve people's well-being, compensating for needs arising from ill-health and disability on both the person in need of care and those involved in the process of caregiving (including informal carers). Ideally LTC systems would ensure equity of outcomes. From a horizontal equity perspective this would involve achieving equal outcomes for equal levels of need and wealth.

Measuring outcomes in long-term care is difficult, although important efforts are being made to develop measures of social care outcomes (see Netten et al., 2012). As a result of the lack of information on long-term care outcomes in most countries, in practice, long-term care is more often quantified in terms of the "intermediate outputs" (Knapp, 1984), and equity is more often evaluated in terms of equity of access and equity in levels and mix of services (Österle, 2002).

Equity of access

Access to care can be defined in different ways. For clarity, the definition of 'access' used here is in line with that used by Culyer (2001, p. 280), in terms of gaining admission to the system. In terms of

long-term care access to the system would normally imply having an assessment of needs and/or resources.

In practice, this would be measured by looking at the extent to which people with the same level of needs (and resources) are able to access the system in the same way (horizontal equity). Vertical equity would be concerned with whether people with higher levels of need (or lower levels of resources) are able to access the system more easily.

Access matters, in terms of equity, because as discussed by Culyer & Wagstaff (1993), equal access may contribute to better equity of outcomes, and Hurley (2000, cited in Allin, Hernández-Quevedo & Masseria, 2009), argues that equal access matters because of the ethical notion of "equal opportunity".

There are various ways in which the care system may restrict access: costs, waiting lists, complexity, stigma, etc. Le Grand (1982) and Mooney (1983) define costs of access in terms of the money and time costs incurred in obtaining access. These costs may be incurred through out-of-pocket payments, transport costs, or the opportunity costs of time spent travelling and waiting (Van Doorslaer & Wagstaff, 1992).

Waiting lists are a common mechanism that limits access to the care system. It can also be argued that making the system complex and difficult to navigate can make system harder to enter for people with fewer resources. Stigma, concern about quality of care or lack of awareness of care entitlements may also deter people from accessing care.

Care systems have different access rules. The key aspect is who is entitled to publicly funded care. In universal systems access to the publicly funded care system is determined by need, whereas in other countries people with financial or informal care resources are excluded from the public care system. Another key consideration is that in some countries there are clear national entitlement rules, whereas in others access to care is determined according to local or regional rules (resulting in potential geographical inequities), whereas in other countries access to care is on the basis of individual-level assessments (usually following national guidelines).

Systems where the entitlement to care is based exclusively on need and do not restrict access to care according to ability to pay, availability of informal care or geography are more likely to guarantee horizontal equity, as those with the same level of need have, in principle, the same access to care.

Where access is determined by national eligibility criteria, those individuals with substantial care needs but who fall just below the entry level, are excluded from the system. From a vertical equity point of view this "cliff edge" results in the system performing less well.

Equity in levels and mix of services relative to needs

Horizontal equity would require that people with the same levels of need would obtain the same packages of care or size of benefits. Vertical equity would require that those with the highest levels of need receive proportionally higher value of benefits (or services).

The key policy aspects to consider when attempting to evaluate equity in the levels and mix of services relative to need include:

- Whether benefits or packages of care are allocated using national algorithms that match size of benefits to pre-defined levels of need, or according to professional assessments
- The extent of geographical variation
- The way in which need is defined: does it take sufficient account of harder to measure needs such as those of people with dementia?

While individual needs based assessments may raise concerns about local variations and potential for horizontal inequity (different levels of care for the same level of need) compared to national algorithms, from a vertical equity point of view, individual-level needs assessments have the potential to perform better in terms of allocating resources in proportion to the severity of need. National algorithms will inevitably have thresholds that will result in those near the top a threshold receiving

less care than those who fall in the step just above (see Glendinning, Davies, Pickard & Comas-Herrera, 2004, for a discussion).

5.5 TheLTC systems of Germany, the Netherlands, Spain and Poland from an equity point of view

With regard to revenue raising, the relative importance of the difference sources of funds, given the different performance the different sources in terms of equity, is a major determinant of the overall equity of the system.

With the data currently available it is not feasible to quantify the economic value of informal care in a comparable way across the four countries and to compare how much the system relies on it compared to the monetary sources.

It is important to acknowledge that estimates of the size of private payments at national level are not very reliable as this information is rarely collected systematically. This is particularly important with regards private payments used to fund the care of people who are not considered eligible to the public care system. In the case of Poland there were no estimates available.

Table 5.1 Revenue-raising: Percentage of people providing informal care and percentage of total LTC expenditure by source

	Germany[a]	Netherlands[b]	Poland[c]	Spain[d]
Informal care**[e]	5%	2%	7%	4%
Social insurance	57	68	57*	10
Taxation	10	24	43*	50
Private payments	31	9	n.a.	31
Private insurance	2	negligible	negligible	(0.3)

[a] *Source*: Rothgang, 2011.

[b] *Source*: Schut and Van den Berg, 2011.

[c] *Source*: Golinowska, 2010.

[d] *Source*: Gutierrez et al., 2009.

[e] Pickard, 2012.

Note: as a percentage of public expenditure only, see country section for sources.

**Prevalence of provision of informal personal care to older people by people aged 50 and over (percentages). Pickard (2012).

5.5.1 Germany

This section relies to a great extent on a description of the LTC system in Germany prepared by Schulz (2010) as part of the ANCIEN project. It is complemented with information from Rothgang (2011) and other sources.

The German long-term care system's main feature is a social long-term care insurance system (LTCI), established in 1995. The LTCI system covers almost the entire population. At the time of introduction of the system, members of the public health insurance system became members of the public LTCI system, and those who had private health insurance were obliged to buy private, mandatory LTCI (providing the same benefit packages).

It is important to highlight that the LTCI system does not cover all expenses generated due to the need for long-term care. All insurance benefits are capped and there is no coverage for people whose levels of need are below the national needs-test.

5.5.1.1 Revenue raising

How LTC funds are raised in Germany

There are two main sources of information about the relative importance of different sources of funding for long-term care in Germany. Table 5.2 shows estimates based on the information available from the System of Health Accounts (SHA). Table 5.3 is based on information available from Rothgang (2011), excluding informal care. The two sources use different definitions, which inevitably result in slightly different estimates. Broadly, they suggest that about 10% of LTC expenditure is funded with resources raised through taxation, about 30% by private payments (which include voluntary insurance benefits) and about 60% is raised by compulsory insurance (of which just under 2% relates to private compulsory insurance).

Table 5.2 Raising funds for LTC in Germany (1): System of Health Accounts

Source of funding	% of all LTC spending
Public authorities (taxation)	10.0
Statutory health insurance	8.1
Statutory LTC insurance	51.9
Statutory injury insurance	0.7
Total statutory insurance	60.7
Private compulsory insurance	1.9
Employers	2.2
Private households	25.1

Source: Own calculations, based on data from the Federal Statistical Office of Germany, National Health Accounts 2008 provided by E. Schulz (personal communication).

Table 5.3 Raising funds for LTC in Germany (2)

Source of funding	% of all spending	% of public/compulsory spending
Social insurance	56.8	82.6
Private mandatory LTCI	1.7	2.5
Social Assistance	8.3	12.1
Welfare for war victims	1.9	2.7
Out-of-pocket payments*	31.3	

*Estimated by Rothgang (2011, p. 89).

Informal care

The German system relies on informal care to a considerable extent (Schulz, 2010). According to analysis of the 2007 Eurobarometer survey data carried out as part of the ANCIEN project by Pickard (2011, p. 13) 14.5% of people aged 15 or more in Germany provide informal help to others who need it with one or Activities of Daily Living (ADL) which is higher than the ANCIEN countries average of 12%).

The German LTC system includes some important features to offer social protection for informal carers so that they have levels of social protection comparable to those enjoyed by people in the labour market. This helps mitigate some of the negative impact of caring, for example, in terms of forgone pensions contributions. Reducing the social protection opportunity costs of caring can result in a reduction of some of the inequity inherent to informal care as a form of LTC financing.

Private income and wealth

As benefits are capped, private co-payments are a substantial source of finance in the system (in the region of 25 to 30% of funding). Also, people whose LTC needs are not high enough to be covered by

the LTCI system have to meet the entirety of the costs. Schulz (2010) reports that in 2008 there were approximately 100,000 people employed outside the long-term care system as "privately financed home-helpers".

Means-tested social assistance is available to help those who cannot afford the costs of care that are not covered by the LTCI benefits. It is important to note that the means test for social assistance also takes account of the income of the adult children of the potential beneficiary.

Social insurance

Van Doorslaer et al. (1999) analysed in detail the financing of healthcare in various European countries. Their work concluded that the way funds are raised for the German health social insurance system is regressive, as a result of mostly three key elements:

- The exclusion of income other than that from work and work-related pensions (this means that people with substantial income from sources such as assets and investments pay a lower proportion of their income than those with only work income)

- The existence of a contribution ceiling

- The fact that people with very high incomes are able to opt-out and participate in a private insurance scheme with a better risk profile than that of the public system, and where the premiums are based on risk rather than income (see, for example, Zuchandke, Reddemann & Drummaker, 2012).As these elements are also present in the long-term care insurance system, it is reasonable to assume that their presence will also result in the system being regressive

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Box 5.1 Contributing to the public LTCI

The LTCI social insurance system is funded by means of salary deduction of income-based insurance contributions. The contribution rate is set by law (set at 1.95% of income since July 2008, shared equally, 0.975% between employers and employees), additionally members aged 23 and older without children have to pay a surcharge of 0.25%). There is a wage ceiling of €3,600 per month in 2008. Retirees have to pay the full contribution rate themselves.

Dependent children and spouses, whose monthly income does not exceed the contribution threshold, are insured without contributions as part of family insurance. There is comprehensive risk-pooling among the long-term care insurance providers.

In 2007 around 70 million people were insured in the statutory LTCI.

Employees who have earned more than €4,012.50 on average per month in the last three years can opt for private health and long-term care insurance. Private, mandatory LTCI involves at least the same benefits as the public LTCI, there is no health screening and children must be insured without contributions. The premiums are not based on the income of the insured person, but on the age of the person when the contract was taken out. They are the same for men and for women. In 2007 9.4 million people had LTCI with a private insurance fund.

The costs of LTC not covered by LTCI funds have to be paid by the care users. Beneficiaries in nursing homes have to pay the 'hotel costs' (room and board) themselves (on average €580). Additionally, in some Lander beneficiaries in nursing homes have to pay the investment costs of building and modernizing care facilities (an estimated €347 per month on average in 2007). Where they do not have enough means they can apply for means-tested social assistance.

The Länder have responsibility for financing investments in premises for LTC services. Some finance nursing home investment directly whereas others do this by subsidizing nursing home residents who rely or would otherwise rely on social assistance.

Source: Schulz (2010), pp. 7-8.

Private LTC insurance in lieu of social insurance

Private insurance LTC in lieu of social insurance covers, according to Arntz (2009), 9% of the population. It represents just under 2% of the total expenditure in LTC. The impact of this system on the overall equity of the compulsory LTCI system has been discussed in the section above. This is a funded scheme, whereas social insurance is purely pays-as-you-go.

Premiums are paid according to risk (mostly based on age), rather than according to income. There is no exclusion on the basis of health history and existing condition and the premium is independent of gender and health status. The premium should not exceed the contribution assessment ceiling of the social insurance system and the benefits must be at least equivalent to the social insurance system benefits (Zuchandke, Reddemann & Drummaker, 2012).

Tax funding

According to Rothgang (2011), about 30% of residents in care homes are in receipt of social assistance to help meet the costs of their care. He estimates that this represents 8% of the total expenditure in LTC. This element of funding contributes to the vertical equity of the system as funding is obtained from taxation (which is highly progressive in Germany; see Verbist, 2004).

Länder are also required to pay for the investments costs of care homes (Schulz, 2010).

Complementary insurance

According to Zuchandke, Reddemann & Drummaker (2012), 1.3 million people owned a voluntary additional insurance contract in 2008 (2.2% of all public and private LTCI members), to obtain cover for the costs of care that are not covered by the social insurance system. The market for complementary LTC insurance in Germany is expected to grow.

5.5.1.2 Resource allocation

Equity of access

Entitlement[31] to benefits is on the basis of need alone and irrespective of age, income, wealth or the availability of informal carers. Individuals who are insured in Germany yet living in another EU country are entitled to cash benefits alone.

In terms of equity of access, the German social insurance system has the potential to be very equitable in terms of horizontal equity. National eligibility criteria (see Box 5.2) ensure that, in principle, those with equal needs have the same access to care.

An important equity of access concern, however, is that the system does not cover at all those with levels of need lower than the entitlement threshold (Rothgang, 2011) and access to care for people outside the system will be determined by their levels of social support and wealth. It is estimated that in 2006 (Scheekloth & Leven, cited in Schulz, 2010) about 3 million people needed care at level 0 (defined as persons needing care but not receiving benefits from LTC insurance funds).

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[31] Since July 2008, the time to qualify for benefits since joining the scheme is two years.

Box 5.2 Assessment of needs and entitlement in Germany

In legal terms the "need for long-term care" is defined as: individuals who, due to a physical, psychological or mental disease or handicap, require a significant or major amount of help to carry out the daily and recurring activities of everyday life over a prolonged period of time, most likely for a minimum period of six months. The entitlement is based help is needed to perform at least two basic activities of daily living (ADL) and one additional instrumental activity of daily living (IADL). There are three levels of severity, according to frequency of assistance and how long it takes a non-professional caregiver to help the dependent person.

-Care level I: People needing assistance with personal hygiene, feeding or mobility for at least two activities from one or more areas at least once a day, and who additionally need help in the household several times a week for at least 90 minutes a day with 45 minutes attributable to basic care.

-Care level II: People who need assistance in at least two ADLs at least three times a day at various times and additional help in IADLs several times a week for at least three hours a day, with two hours attributable to basic care.

-Care level III: People who need assistance in at least two ADLs around the clock and additional help in an IADL several times a week for at least five hours per day, with four hours attributable to basic care.

-Hardship cases: People at care level III and in particular individuals who need assistance in ADLs for at least seven hours a day with at least two hours during the night, or who need basic care than can only be provided by several individuals together (at the same time).

The assessment of needs is carried out by the Medical Advisory Service of LTCI Funds. Assessments are done primarily by nurses and physicians who observe both the home and social environment of the person in need of care. They assess the person's health and functional status following national standards and detailed guidelines. The assessment is mostly based on ADLs and IADLs, but recent special criteria have been added for people whose competence in coping with everyday life is impaired.

While the assessment does not consider income and assets, it does take into account the family situation and home environment, including an assessment of the "stresses in caring and the stress-bearing capacity".

A report is produced to the LTCI fund, specifying the care services needed and the severity of care need. The assessment will be repeated at regular intervals to monitor changes in functional status.

Source: Schulz (2010, p. 2).

Equity in levels and mix of services relative to needs

In Germany, in principle, everyone within the same assessed needs category would have access to the same care or benefit.[32] The system has been criticised for making it difficult to give enough resources to people with more complex needs (for example, dementia). There have been various reforms to improve the allocation of services to people with complex needs that have gradually addressed these concerns. It is planned that, in the future, the criterion for assessing the need for care will not be the time needed to provide care, but rather the degree of independence in performing activities and in coming to terms with aspects of everyday life or in care settings.

In common with other care systems where care is allocated on the basis of algorithms that assign packages of care to different care needs groups, while this way of allocating resources performs well in terms of horizontal equity and gives certainty to potential care users, it does not perform as well in

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[32] In practice it is likely that there is some element of variation. Schulz (2010) also points out that the assessor may deviate from assessment tool if necessary.

terms of vertical equity, as inevitably there are differences in care needs between people in the same group and people who fall just below a needs threshold may be disadvantaged as a result (see Glendinning, Davies, Pickard & Comas-Herrera, 2004, p. 8, for a discussion).

The German social insurance system has been designed to enhance horizontal equity for the part of the risk of dependency it covers. The overall performance of the long-term care system is affected by the fact that a substantial part of the risks of long-term care are not covered by the system (either because the need threshold is high or because the benefits only cover part of the costs of care). The design of the social insurance revenue raising mechanisms and the limited responsiveness to variations within needs categories mean that vertical equity is not favoured.

5.5.2 The Netherlands

This section relies very considerably on the ANCIEN country report for the Netherlands (Mot, 2010), complemented with information from Schut & van den Berg (2011).

The public system of long-term care insurance (Exceptional Medical Expenses Act, AWBZ) was created in 1968. It covers everyone who lives in the Netherlands, and it involves care for people of any age who require chronic care.

The AWBZ covers care at home and in institutions for the elderly, care in institutions for the mentally and physically handicapped and care in institutions for chronic psychiatric patients. In 2007, home help was transferred to the municipalities under the new Social Support Act (WMO).There are means-tested co-payments for practically all LTC services. For older people using residential care co-payments may be rather high, depending on their income and other circumstances (see Box 5.3). An important feature of the Dutch LTC system is that it covers both people with low and high levels of need, offering a very high level of protection against the risk of dependency.

5.5.2.1 Revenue raising

In principle, the AWBZ is funded by social security premiums and co-payments. However, the AWBZ premiums do not to cover all the costs and part of the AWBZ expenditure is funded from taxation. In 2008, 68% of AWBZ expenditures were financed from social security contributions, 24% from taxes and 9% from user charges (Schut & van den Berg, 2011, p. 56).

Informal care

Informal care plays a smaller role in the Netherlands compared to other European countries (see, for example, Pickard, 2011; Bolin et al., 2008 and Kraus, Riedel, Mot, Willemé, Rohrling & Czypionka, 2010).

In some cases informal carers can be paid using personal budgets, which may reduce the costs associated with caring. However, the role of cash benefits in the Netherlands will become smaller because of cost control measures.[33]

Private contributions

The AWBZ offers very comprehensive coverage of the risk of needing long-term care and the level of private payment for care is relatively low. According to Schut and van den Berg (2011), 9% LTC

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[33] Recently the circumstances under which a cash benefit can be received were restricted considerably compared to the situation described in Mot (2010). In the spring of 2012, an agreement was concluded among five Dutch political parties that included a softening of these cost control measures concerning cash benefits (Begrotingsakkoord, 2013). However, the planned softening is not sufficient to restore the old situation.

revenues come from user charges, which much lower than the 30% estimated by Rothgang (2011) for Germany, and 17% for Spain (Gutiérrez, Jiménez-Martín, Vegas Sánchez & Vilaplana, 2010).

Co-payment rates increase with the level of income, which contributes to vertical equity as wealthier people pay a higher proportion of the costs. For persons with low incomes, the maximum co-payments are low.

Box 5.3 Co-payments in the Dutch LTC system

Cost-sharing differs between institutional care and non-institutional care. Outside of institutions, AWBZ beneficiaries have to pay €12.60 for each hour of care that they receive, with an income-dependent maximum. The maximum depends not just on income, but also on the number of persons in the household and whether the client is 65 or older. For single elderly persons with an income of €14,812 or less, the maximum amount of cost-sharing per four weeks is €17.20, which is less than the price of one hour of care. For the same person with a total income of €40,000, the maximum would be €307.83 for four weeks. Cost sharing for domestic help under the WMO is structured in the same way, but the local council can change some of the parameters – as long as maximum cost sharing does not exceed the AWBZ maximum, and cost sharing does not exceed the cost price of domestic help. Cost-sharing for the WMO has to be paid first.

  With regard to institutional care, there are two levels of cost-sharing: low and high. Low cost-sharing is relevant for the first six months in an institution and for a number of special situations— for example, when the client has a spouse who is still living independently. In the situation of low cost-sharing, the client has to pay 12.5% of the relevant income with a minimum of €141.20 and a maximum of €741.20 per month. In the situation of high cost-sharing, the maximum amount of cost-sharing is €1,838.60 per month. If this is too high compared to their income, the client has to pay 8.5% of the relevant income, with a reduction of 8% or 16% in 2009. This reduction was introduced in 2009 as part of new regulation (replacing an older scheme) to financially support chronically ill and handicapped persons.

Source: Mot (2010), pp. 31-32.

Social insurance

The AWBZ premium, in 2009, was 12.15% of income in the first two tax brackets (up to an income ceiling of about €32,000; see Mot, 2010, p. 30).

The presence of a ceiling above which contributions cease to increase means that, as a proportion of their income, wealthier people contribute less, which in terms of vertical equity, is likely to make the system regressive overall.

Private LTC insurance

Almost (if not completely) non-existent due to the high level of risk coverage afforded by the AWBZ.

Taxation

Taxation covers a substantial part of the AWBZ expenditure (24%, according to Schut and van den Berg, 2011). As taxation usually performs better in terms of vertical equity than social insurance, the higher the proportion of funding raised from taxation, the less regressive the overall system is likely to be.

5.5.2.2 Resource allocation

Equity of access

Access to care is obtained following an individual assessment of care needs. There is some consideration of the role of available informal carers.

Box 5.4 Assessment of needs

Every request for AWBZ care is assessed by an independent organisation, CIZ (Centrum Indicatiestelling Zorg; Centre for Care Assessment). There are no financial incentives for CIZ, in the sense that its decisions do not affect its own financial position. It should make an independent, objective and integrated assessment. A person may be eligible for AWBZ care only when one or more need factors (*grondslagen*) are present:

1. A somatic, psycho-geriatric or mental disorder or limitation;
2. An intellectual, physical or sensory disability.

The assessment procedure is the same for care in cash and care in kind. CIZ uses national standards to determine whether a person is eligible for one or more 'functions' (separate LTC services) within AWBZ care: assistance, personal care, nursing, treatment and stay in an institution, extended stay for psychiatric reasons. For each function, the amount of the necessary care is determined. Other persons in the same household are supposed to supply the "usual care" that family members give to each other. People are not eligible for AWBZ care with respect to the usual care. The effect of informal unpaid care that exceeds the usual care is more complicated: this may decrease the entitlement to AWBZ care as long as this informal care is voluntarily given and received.

Source: Mot (2010, p. 18).

Cost containment measures in the 1990s, resulted in problems with waiting lists and waiting times that were seen as unacceptably long. These problems were addressed from the year 2000 on, making extra funds available within the care system to increase the availability of services and reduce waiting times.

Equity in levels and mix of services relative to needs

An important aspect of the Dutch public care system is that the social insurance system also covers people with relatively mild care needs.

Care and cash-benefits are allocated on the basis of individual assessments of needs, following detailed guidelines (see Box 5.4), but taking into account people's individual circumstances. Some AWBZ beneficiaries can choose between care in-kind and cash reimbursement. The cash is given in the form of personal budgets.

The individual nature of the allocation of services or benefits according to individual need may result in less horizontal equity, as people with similar needs may obtain different services. Local factors (including assessor-bias) may affect the amount and type of benefits and/or services received. However, because the services and benefits are matched closely to individual needs, the system is likely to achieve higher vertical equity (that is, higher resources for those with higher levels of need), than a system based on national algorithms, where there can often be a big step between levels, resulting in those at the "top" of a low need band not receiving enough services or benefits (Glendinning, Davies, Pickard and Comas-Herrera, 2004).

Overall the Dutch system performs highly both in terms of horizontal and vertical equity, as the system offers high levels of coverage and is sensitive to individual level variations in need.

5.5.3 Spain

This section is mostly based on the ANCIEN country report for Spain by Gutiérrez, Jiménez-Martín, Vegas Sánchez & Vilaplana, (2010), complemented with information from other sources.

A citizen's right to long-term care (the "fourth pillar of the welfare system) was established by legislation passed in 2006. The act introduced a universal entitlement to long-term care for people in need of help carrying out activities of daily living.

The Act made provision for the development of a System for Autonomy and the Care of Dependency (SAAD), which involves both the national and the regional governments.

Before this, long-term care was seen mostly as a family responsibility, with the public system having a residual role and helping only when family resources were not sufficient to meet needs. The new system was developed in response to changes in family patterns and higher rates of female labour market participation. Due to the change in economic climate the system has not been implemented as originally planned in the 2006 Act and in July 2012 some elements were cut very significantly (*El Pais*, 10 July 2012). Only people with the highest levels of severity are currently covered. The Government also announced that regional governments were allowed to take up to two years to provide care or support to claimants, without the claimants obtaining any retrospective rights to care or cash payments. This way of rationing care takes no account of the levels of need or circumstances of dependent people and it is likely to result in many people with very high levels of need dying before any care is provided or funded, or being cared for instead in the health service.

5.5.3.1 Revenue raising

How LTC funds are raised in Spain

According to the System of Health Accounts, 10% of the funding used towards funding long-term care is raised via social insurance (social security contributions), 58% via taxation, 31% via private payments (including co-payments and privately purchased care), and a very small amount, 0.3% is raised from private insurance.

Table 5.4 Total Long-Term Care Expenditure by source, Spain, 2009

	Total Long-Term Care Expenditure 2009 (%)
Social insurance	10.2
Taxation	58.4
Private payments	31.1
Private insurance	0.3

Source: System of Health Accounts (http://www.msc.es/estadEstudios/estadisticas/sisInfSanSNS/pdf/ SCS_-_Datos_estadisticos.pdf).

Informal care

Informal care plays a very important role in the Spanish LTC system. An important aspect of the new LTC system has been the introduction of special pension rights for carers and cash payments that can be claimed to compensate informal carers, which as discussed in the case of Germany, may help reduce the opportunity costs to informal carers. However, the pension rights for carers were scrapped in July 2012.

Private income and savings

Despite the increased coverage since the reform, there are substantial contributions from people's income and savings. These are used to cover people whose needs are classified as being below the eligibility thresholds, and to meet co-payments, which amount to about 9% of the costs of public services. In July 2012 the co-payments were revised to include both income and assets (including housing), the percentage of co-payment will rise with the level of income and represent 5% of the estimated value of assets. This measure can potentially make the co-payment system more progressive.

In 2009, private expenditure was estimated to cover approximately 31% of the costs of long-term care (SHA, Spain), however there is much uncertainty about how much is spent on care bought in the grey market.

Social insurance

About 10% of long-term care expenditure is raised from social security contributions (paid for by employees and employers).

Private LTC insurance

About 0.3% of care revenue is raised from private long-term care insurance benefits.

Taxation

The public part of the SAAD system is financed by the national government and the autonomous regions. According to a recent official report, 39% of public care funds are covered by the national Government and 53% by the regional governments (and 9% by co-payments from care users, Ministerio de Sanidad, 2011).

The state funding should cover the "guaranteed minimum level of assistance", while the autonomous communities should provide an amount at least equal to the amount provided by the state.

While taxation on household income is progressive in Spain, it is less progressive than in the Netherlands and Germany (Verbist, 2004).

5.5.3.2 Resource allocation

Equity of access

The LTC system reform had the principles of universality, equality and accessibility at its core. In practice the state guarantees a "basic" level of cover and the rest depends on the regional government. The two year wait for access to care introduced in July 2012 means that many people assessed as needing care will die without obtaining access to the system.

There are national eligibility criteria based on need alone (see Box 5.5). There are important geographical variations in the rates of people assessed as needing care.

Box 5.5 Assessment of needs

The Act on the Promotion of Personal Autonomy and Care for Dependent Persons defines the concept of "dependency" as the permanent state in which persons that for reasons derived from age, illness or disability and linked to the lack or loss of physical, mental, intellectual or sensorial autonomy require the care of another person/other people or significant help in order to perform basic activities of daily living. In the case of people with mental disabilities or illness, the concept of "need for support for personal autonomy" is applied in order that they may attain a satisfactory degree of personal autonomy in the community.

The assessment of dependency is carried out by the autonomous administration corresponding to the applicant's residence and is valid for the whole of Spanish state territory, because this is one of the conditions that guarantee equality. The degree and levels of dependency are determined using a scale approved by the Territorial Council of the System for Autonomy and Care for Dependency.

The law distinguishes between different degrees of dependency, depending on the frequency with which help is required, which in turn establish the benefits and services that can be received. Each of the degrees of disability is split in two levels. Level one: individuals who can perform the activity without direct support from another person. Level two: individuals who need support.

The ranking scale contains eleven activities divided into a series of tasks. Each activity and task receives a weight according to the age of the applicant and whether they have mental disability or cognitive impairment. A score is produced which is used to match people to their degree and level of dependency.

Source: Gutiérrez, Jiménez-Martín, Vegas Sánchez & Vilaplana (2010, p. 5).

Equity in levels and mix of services relative to needs

The Spanish care system assigns care packages (or cash payments) to different levels of disability, in a similar way as in the German model (see Box 5.6). People classified as having moderate care needs are not currently entitled to care.

Box 5.6 Assigning services to different levels of need

Once the dependent person has been assessed people are assigned an Individual Care Plan.

The Individual Care Plan can be reviewed at the request of the individual and at regular intervals established by the Autonomous Community. The ICP determines the services ore benefits that best match the applicant's needs. This process is carried out with the participation of the beneficiary through consultation and seeking their views and, where applicable, with the family or the entity representing the dependent person.

The Law requires that the care system should provide the following services:

- Services aimed at preventing dependency and promoting personal autonomy.
- Personal alarm systems
- Home-help services (addressing the needs of the household)
- Personal care
- Adult day-care centres
- Residential care services.

If the administrations are unable to offer these services, the dependent person is entitled to receive cash benefits instead. The amount of the cash benefits depends on the degree of dependency and the economic situation of the individual. There are three types of cash benefits:

- Financial assistance to access certain care services
- Financial assistance for informal caregivers
- Financial assistance to hire personal care-givers

When the services are not available, the dependent person is entitled to receive financial benefits fixed at set amounts at national level. There are three types of financial benefits:

- Financial benefit linked to the service: granted when access to a public or subsidised care service is not available and depends on the degree and level of dependency and on the beneficiary's financial situation. The public administration supervises how these benefits are used.

- Financial benefit for care in the family setting and support for non-professional carers. In theory this benefit should only be granted on an exceptional basis, when the beneficiary is cared for in the family setting and as long as the home meets the requirements regarding co-habitation and habitability. The carer must be registered with social security and make contributions in compliance with regulations.

- Financial benefit for personalised care: this benefit would be used to hire a personal assistant, for a number of hours, to provide the beneficiary with access to education and employment, as well as help with basic daily living activities.

Source: Gutiérrez, Jiménez-Martín, Vegas Sánchez & Vilaplana (2010, pp. 6-9).

Although the entitlement system should, in principle, guarantee horizontal equity, in practice there are important regional variations, both in the degree to which people in different regions are assessed as being dependent, until recently different means-tests in different regions, and huge variation in the public and private prices of social services in different regions, which means that the purchasing power of community cash benefits varies by region (Gutierrez, Jiménez-Martín, Vegas Sánchez & Vilaplana, 2010).

The Spanish system, particularly after the cuts in July 2012, offers a low degree of coverage of the risk of dependency, which affects negatively the performance of the system in terms of equity. In particular, the two year wait rationing method will contribute to making the system more inequitable as those with private means will be able to access the care they need by self-funding, and in terms of vertical equity people with higher levels of need will need to wait as long as people with lower levels of need.

5.5.4 Poland

This section relies to a very great extent on a description of the Long-Term Care System in Poland carried out as part of the ANCIEN project by Golinowska (2010), complemented with information from other sources.

Long-term care in Poland mainly takes place in the family, with very high levels of "co-residency" compared to other countries (Reimat, 2009). The formal LTC system is in the initial stages, there is no comprehensive long-term care system. There are no national access rules to the care system, or regulation. Rather, formal long-term care is covered partly by the health sector and partly by the social assistance sector, and responsibility lies at both the national and the local level.

5.5.4.1 Revenue-raising

Public long-term care is funded from two sources: 60% from health insurance LTC services in the health sector) and 40% from general taxation (social assistance homes).

There are co-payments in both health and social care funded homes. The co-payment is higher in the social care system. In the health sector the resident pays only accommodation and board. In the social assistance system people pay 70% of their own income, the family is expected to contribute too. The family contributions are paid by families with incomes above 10% of average earnings in the economy

How LTC funds are raised in Poland:

Informal care

Informal care is the most important source of LTC in Poland. As discussed earlier, the higher the reliance on informal care or private income and savings, the less well a system will perform in terms of equity, both horizontal and vertical.

Private savings and capital

This is likely to be used for the private purchase of care (in the grey market?) and to meet co-payments.

Social insurance

Social insurance contributes to LTC funding in Poland through the health social insurance financing of "health sector" care homes.

Private LTC insurance

It appears there is no private LTC insurance in Poland at present.

Taxation

The social assistance system finances care in care homes and cash benefits for people aged 75 and over.

5.5.4.2 Resource allocation

Equity of access

Access to health-funded long-term care homes is based on an assessment of need based on the Barthel scale (40 points out of a possible 100), no account is taken of living conditions or level of income or wealth.

In the social assistance system eligibility is determined by a means-test and the family situation of the applicant (for example whether they live alone).

Care allowances are given to individuals aged 75 or more who are in receipt of old-age or disability pensions (irrespective of whether they need care). There is a special nursing allowance for those not entitled to the care allowance.

In a way care allowances are very highly equitable as they cover the entire population, and they ensure that everyone receives some support, which contributes to horizontal equity. However it does not work well in terms of vertical equity, as resources do not increase with the level of need. Also, as resources are spread over so many people, the amount is necessarily limited and only covers a very small amount of the care needs of very dependent people.

Equity in levels and mix of services relative to needs

There currently is no national care system that determines how services are allocated to those who need them. Overall, the Polish system is characterised by low level of risk coverage, great reliance on family care, and a universal cash benefit for those aged 75 or more, irrespective of need. In terms of equity, the overall performance of the system is low.

5.6 Comparative summary tables

Table 5.5 Revenue-raising

	Germany	Netherlands	Poland	Spain
Degree of risk pooling and coverage	Medium high	Very high	Low	Medium low
Progressivity	Medium	High	Low	Medium low

These are the two key aspects of the revenue raising system which impact the potential for the care system to be more or less equitable. The degree of risk pooling (or level of coverage of the dependency risk) is a key determinant of the performance of the system in terms horizontal equity. The lower the degree of risk pooling, the more likely it is that people with higher levels of need (and possibly lower levels of resources) have to contribute higher resources to their care. Countries with a low degree of risk pooling tend to rely greatly on informal care.

The degree of progressivity of the way in which resources are raised will affect the performance of the system in terms of vertical equity. Where most resources are raised as informal care, or with forms of payment that are regressive, the system will perform worse in terms of vertical equity.

Table 5.6 Resource allocation: main characteristics

	Germany		Netherlands		Poland		Spain	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
Equity of access: means vs. needs testing	High	Medium	High	High	Low	Low	Medium	Low
Equity in levels and mix of services relative to needs	High	Low	High	High	Medium low	Low	Low	Low

5.6.1 Summary

This chapter examines the different features that form long-term care systems and discusses how they can be expected to perform in terms of horizontal and vertical equity. The approach used involves looking both at how resources are raised to fund care and how they are allocated. The care systems of Germany, the Netherlands, Spain and Poland (chosen as representatives of the clusters identified by the ANCIEN project) are analysed to see how the presence and relative importance of different features are likely to affect the overall equity of the system. Of the four countries, the Netherlands performs highly in terms of equity, both horizontal and vertical. Germany's system performs well on horizontal equity but less so on vertical equity. The Spanish system's reforms of 2006 introduced new features that potentially increased the equity of the system, however the system has not been fully implemented and major cuts have undermined its potential to deliver in terms of equity. The Polish system is characterised by a very small formal care sector and universal care-related cash benefits to everyone over 75 which does not perform well in terms of vertical equity.

5.7 Conclusions

Looking at the care systems in Germany, the Netherlands, Spain and Poland, and considering how different elements of the system are likely to contribute to horizontal and vertical equity, confirms that equity is a multi-faceted concept. A formal ranking of the care systems in different countries in terms of equity could only produce meaningful results if we had reliable weights for the different aspects considered in a social welfare function. In the absence of such weights, it is only possible to produce a ranking if one country outranks another one in all relevant aspects. The comparative summary tables in this report suggest that the Netherlands would score higher than or equal to Germany on the equity dimensions considered. The same is true for Germany as compared to both Spain and Poland. Only the ordering between Spain and Poland cannot be determined in this way. Spain scores higher than or equal to Poland on all aspects except one, where Poland scores better.

As an example of multidimensionality, the German care system tends to perform much better in terms of horizontal equity than it does in terms of vertical equity, probably reflecting the values behind the introduction of the social insurance system.

On the other hand, due to its very generous public coverage of the risk of long-term care (including people with relatively low risk compared to other countries), the LTC system in the Netherlands does appear to be the most equitable of the four countries considered. Because social insurance is the main source of funds, it does not perform as well in terms of vertical equity as it would if it were more reliant in tax funding. It is, however, likely to be less regressive than the German system as there is no separate scheme for wealthy people and higher reliance in taxation.

With regards the Spanish system, the implementation of the new dependency law from 2006 has improved very considerably the coverage of the risk of long-term care for those facing higher levels or risk. However, there are substantial geographical variations and, due to budget constraints and cuts, the system is not being fully implemented, covering only those with the highest levels of needs. People with considerable care needs are excluded from the public system. Very significant cuts announced in July 2012 are likely to change very fundamentally the equity performance of the system. For example the system can take two years to grant care or benefits to people, which is likely to result in many people dying before receiving any benefits or formal care.

Poland relies very heavily on informal care, there is some provision of residential care in both the healthcare and social assistance sector, and a cash benefit for older people aged 75 or more. The low levels of coverage of the public sector mean that the system provides little coverage of the long-term care risk. As a result the system would rank low in terms of equity. The cash benefit does provide some improvement in horizontal equity, but not in terms of vertical equity.

As stated above, even in the absence of reliable weights for the different equity aspects, the analysis of the equity of the care system in this report suggests an ordering for the four countries considered. Only the relative ranking of Spain and Poland is problematic. The Dutch system scores highest on overall

equity, followed by the German system. The Spanish and Polish systems are both less equitable than the Dutch and German systems. The analysis provided here does not lend itself to a scientific way of ranking Spain and Poland in terms of equity, but it shows that the Spanish system dominates the Polish in most equity respects. For the purposes of the ANCIEN project work package 7 it is acceptable to assume equal weights for the different equity aspects and to conclude that the Spanish system is somewhat more equitable than the Polish system. Using this assumption the overall ranking on equity of the LTC system is: the Netherlands, Germany, Spain, Poland.

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6. Projections of LTC expenditures
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6.1 Introduction

This chapter presents results of projections of long-term care (LTC) expenditure for different care systems. The projections of LTC expenditure cover public and private spending for formal care, both at home and in residential care facilities. Projections are made up to 2060 for four countries: Germany, the Netherlands, Spain and Poland, using a standardised methodology. The countries were selected in WP1 of the ANCIEN project as representative of clusters of countries with different LTC systems (Kraus, Riedel, Mot, Willemé, Röhrling & Czypionka, 2010). The expenditure projections are based on projected future numbers of LTC users aged 65 and over made in WP 6 of ANCIEN, using a cell-based or macro-simulation model and cross-nationally harmonized data of the Survey of Health, Ageing and Retirement in Europe (SHARE). The ANCIEN care use projection model focuses on personal and nursing care. The model links estimated probabilities of using different forms of personal and nursing care (residential care, formal home care, informal care) by age, gender, disability, household composition and other relevant characteristics to projected numbers of older people divided into groups (cells) by the same characteristics (see Geerts, Willemé & Mot, 2012 for a description of the projection method and detailed projection results). To project future public and private long-term care expenditure, for each projection year projected numbers of people receiving residential and formal home care are multiplied with average costs per user. The base year expenditure data are based on estimates of age and gender profiles of LTC expenditure produced for the 2012 Ageing Report of the European Commission and the Ageing Working Group of the European Policy Committee (2012) and on total LTC expenditure data drawn from the System of Health Account (SHA) database (OECD Health Data 2011).[34] This chapter also explores the sensitivity of the expenditure projections to alternative assumptions about trends in disability, socio-demographic evolution and unit cost development. For the four countries, it also simulates future LTC expenditure using one country's demographic structure and the probabilities of care use and average user costs of another country.

The next section discusses the projection methodology and data sources. The projection results are presented in Section 6.3. The chapter ends with some conclusions in section 6.4.

6.2 Projection methodology and data sources

The projections of LTC expenditure cover public and private expenditure on formal LTC care, distinguishing between residential care and home care. For each projection year, projected numbers of care users, by five-year age category and gender, are multiplied with average costs per user.

6.2.1 Base year unit costs

Three variant estimates of base year (2010) unit costs are used. The first variant (AWG 1) consists of age (a) and gender (g) specific unit costs by home or residential care setting (s)

$$AWG\ 1 = AWG\ costs\ per\ user_{a,g,s}$$

as calculated for the 2012 Ageing Report of the European Commission and the Ageing Working Group of the European Policy Committee (2012). For some countries, these profiles may be based on a broader definition of long-term care (including household help) than the ANCIEN definition

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(personal and nursing care only) and thus on larger numbers of LTC users and a different underlying age distribution of use. Furthermore costs per user for household help are likely to be lower than costs per user for personal and nursing care, which is generally provided by more highly skilled carers. Multiplying the AWG unit costs with the estimated numbers of residential and home care users of WP6 may therefore result in an underestimation of total LTC expenditure. The second variant (AWG 2) is based on total age and gender specific LTC expenditures, used to calculate the AWG unit costs. These total costs are divided by the total base year numbers of users as estimated in WP6 of ANCIEN (Geerts, Willemé & Mot, 2012): N ANCIEN.

$$AWG2 = \frac{AWG\ total\ costs_{a,g,s}}{N\ ANCIEN_{a,g,s}}$$

Using AWG 2 estimates might on the one hand result in an overestimation of LTC expenditure as AWG estimates of total costs may not be restricted to personal and nursing care. On the other hand, costs per users for personal care or nursing care might be higher than costs per user for other services. As the AWG estimates cover public expenditure only and as AWG expenditure profiles could not be obtained for Poland, a third variant (SHA) has been calculated, based on LTC expenditure data by financing source (public or private) drawn from the System of Health Account (SHA) database (OECD Health Data 2011). Expenditure categories included in the calculation are HC.3 1 Inpatient long-term care (health) and HC.3.3 Outpatient long-term care (health). Social long-term care services (HCR.1) have not been included. The share of total expenditure for the population aged 65 and over is calculated using AWG expenditure profiles or national data (Poland). It is implicitly assumed that the proportion of LTC expenditure for the older (65 years and over) population is the same for the SHA and AWG expenditure data and for public and private expenditure. Per user expenditure by financing source (f) and setting is calculated by dividing total expenditure by financing source and setting by the total base year number of users by setting as estimated in WP6 of ANCIEN.

$$SHA = \frac{SHA\ total\ costs_{f,s} \times \dfrac{AWG\ total\ costs\ 65 + population_s}{AWG\ total\ costs\ all\ age\ categories_s}}{N\ ANCIEN_s}$$

Both AWG and SHA data are for 2009 (with the exception of the AWG data for Germany which are for 2010) and have been adjusted to 2010 (base year) price levels.

6.2.1.1 Expenditure data for Germany

AWG age and gender profiles of public expenditure for Germany are based on social long-term care insurance data. Public expenditure under social assistance schemes and other public spending is not included. Expenditure for home care includes cash benefits (and the underlying numbers of 'formal' care users residing at home include persons receiving informal care only, as these benefits can be spent on informal care only). ANCIEN base year estimates of numbers of formal home care users only include persons using formal personal care or nursing care, yielding smaller numbers of home care users than the AWG base year numbers. As a consequence, base year unit costs estimates for home care are higher under the AWG 2 and SHA variant than under the AWG 1 variant (see Table 6.1 below). Age-specific expenditures are quite similar for men and women, except for home care expenditure in AWG variant 2, which is higher for men than for women until age category 80-84. At higher ages the pattern is reversed. Furthermore, as one can see in Table 6.2, the AWG expenditure data show a rather flat age profile, which can be explained by the fact that benefit receipt is not related to age, only to level of care dependency, and that benefits are capped (see Schulz, 2010). SHA LTC expenditure data for Germany are based on long-term care insurance data, social assistance statistics and other data sources. For the estimation of private LTC expenditure, a survey conducted for the Ministry of Family Affairs, Senior Citizen, Women and Youth has been used. According to SHA, private expenditure for long-term care in Germany mainly consists of out-of-pocket expenses and, to a

much smaller extent, of private insurance costs. Private expenditure is considerable in Germany. One third of total spending per residential care user is private spending. In home care, the share of private spending is about one fifth. Unit cost estimates for residential care are highest under the SHA variant and lowest under the AWG 2 variant; unit cost estimates for home care are highest under the AWG 2 and lowest under the AWG 1 variant.

Table 6.1 Base year annual unit costs (in Euro), Germany

Age category	AWG 1		AWG 1		AWG 2	
	Residential		Home		Residential	
	Males	**Females**	**Males**	**Females**	**Males**	**Females**
65-69	15,144	15,449	6,591	6,565	14,348	15,25
70-74	15,374	15,586	6,805	6,266	15,039	15,824
75-79	15,573	15,596	7,119	5,995	15,242	15,803
80-84	15,509	15,525	7,418	5,877	14,242	14,726
85 and over	15,329	15,641	8,159	6,219	13,611	14,105
65 and over						

Table 6.1 continued

Age category	AWG 2					SHA
	Home		Residential		Home	
	Males	**Females**	**Public**	**Private**	**Public**	**Private**
65-69	16,577	5,313				
70-74	18,929	7,431				
75-79	9,362	7,933				
80-84	9,977	11,414				
85 and over	10,065	12,960				
65 and over			17,921	9,779	10,006	2,443

6.2.1.2 Expenditure data for the Netherlands

Both AWG age profiles and SHA expenditure data for the Netherlands refer to long-term nursing and personal care. The SHA LTC expenditure data for the Netherlands are based on Statistics Netherlands' Health and Social Care Accounts. Data for 2009 result from a revision of the methodology in 2011. In previous years expenditure for personal care was not included in LTC expenditure. Base year private expenditure data have been obtained from CVZ (College voor Zorgverzekeringen, see http://www.cvz.nl/zorgcijfers/awbz-baten/awbz-baten.html) as SHA does not include any recent information on private LTC expenditure for the Netherlands. The CVZ data only refer to co-payments for care provided under the public long-term care insurance scheme (AWBZ – Exceptional Medical Expenses Act) and are not differentiated by home or residential care. The AWG public expenditure data for the Netherlands are not differentiated by care setting (home and residential care) neither, whereas SHA public expenditure information is available for residential and home care separately.

AWG total LTC costs by age and gender are calibrated to match total LTC expenditure in SHA. However, the AWG number of care users (685,490 users aged 65 and over) is not restricted to users of nursing and personal care services only. It includes a much broader range of LTC service users, including users of household help, and cash benefit recipients (Statistics Netherlands reports about 483,000 older users of personal or nursing care financed by the AWBZ (Exceptional Medical Expenses Act, including cash benefit recipients). As ANCIEN base year estimates of the number of long-term care are lower than the AWG estimates (ANCIEN only includes users of formal personal

care or nursing care), estimates of base year unit costs are higher under the AWG 2 and SHA variant than under the AWG 1 variant (see Table 6.2 below).

Both AWG variants show a higher average public expenditure for men than for women until age category 85+. Compared to Germany, the age profile of public LTC expenditure fluctuates somewhat more in the Netherlands. The share of private expenditure is much lower in the Netherlands than in Germany, but private expenditure for the Netherlands might be underestimated, as the figure includes co-payments only.

Table 6.2 Base year annual unit costs (in euro), the Netherlands

AWG				
Age category	**AWG 1**		**AWG 2**	
	Males	**Females**	**Males**	**Females**
65-69	19,936	11,499	43,870	30,452
70-74	15,401	9,986	22,865	17,617
75-79	15,962	11,362	29,118	25,195
80-84	15,031	13,236	30,461	30,291
85 and over	16,329	20,996	23,419	30,758
SHA/CVZ				
Age category	**Public**		**Private**	
	Residential	**Home**		
65 and over	55,527	12,014		3,473

6.2.1.3 Expenditure data for Spain

For Spain, available AWG data only include total public expenditure by age, gender and setting, not numbers of users or per user expenditure. Therefore, for Spain variant AWG 1 could not be calculated. AWG age and sex profiles for Spain have been estimated on the basis of information provided by the Spanish department responsible for the dependency benefits and also on the basis of a survey financed by the Institute of Fiscal Studies. The AWG expenditure data include services of long-term nursing care (nursing care and personal care services) and social services of long-term care, relating primarily to assistance with IADL (instrumental activities of daily living). As ANCIEN estimates of long-term care users only include users of formal personal care or nursing care, calculating costs per user by dividing AWG total costs by ANCIEN number of users (AWG 2 variant) might, overestimate costs per user. On the other hand, costs per user for personal care or nursing care might be higher than costs per user for IADL assistance. SHA LTC expenditure data for Spain are based on National Accounts, on the Household Budget Continuous Survey and on reports from the Ministry of Labour and Social Affairs (IMSERSO, 2005, 2008). As in Germany, private expenditure for long-term care in Spain mainly consists of out-of-pocket expenses and, to a much smaller extent, of private insurance costs, and shares of private expenditure are of a similar magnitude as figures reported for Germany: about one third of total spending in residential care and about one fifth of total spending in home care. AWG 2 expenditure profiles (see Table 6.3) show much lower costs per user for males than for females, in all age categories. For home care, gender differences in unit costs are smaller, with higher costs for males in some age categories. The age profile of public LTC expenditure fluctuates, but generally unit costs are higher for persons aged 85 and over than for younger persons. Finally, it is important to note that the base year expenditure profiles and the resulting projection do not take into account potential cuts in LTC spending in Spain due to the recent economic and financial crisis.

Table 6.3 Base year annual unit costs (€), Spain

Age category	AWG 2		AWG 2		SHA			
	Residential		**Home**		**Residential**		**Home**	
	Males	**Females**	**Males**	**Females**	**Public**	**Private**	**Public**	**Private**
65-69	2,692	11,086	1,472	2,704				
70-74	3,442	15,09	2,718	2,682				
75-79	4,442	13,631	6,192	4,9				
80-84	3,43	11,108	2,653	3,801				
85 and over	8,245	16,711	5,243	4,154				
65 and over					7,381	4,101	2,804	739

6.2.1.4 Expenditure data for Poland

For Poland only SHA data are available and unit costs have been calculated for residential care only, as the projections of care use for Poland do not include home care. Public LTC expenditure in SHA is underestimated due to a lack of data on the medical component of all services delivered within homes or other facilities under social care. Public LTC expenditure also includes cash benefits. Private expenditure includes households' expenditures on LTC care, estimated on the basis of the household budget surveys results. It does not include other forms of private expenditures such as private insurance, expenditures of employers, expenditures of non-profit institutions. Total public and private expenditure for persons aged 65 and over has been estimated using information on the share of persons aged 65 and over in care and treatment facilities (ZOL) and nursing and care facilities (ZPO) (Golinowska & Sowa, 2012).

The share of private LTC expenditure in Poland is relatively low (Table 6.4).

Table 6.4 Base year annual unit costs for residential care (€), Poland

	SHA	
	Public	**Private**
Age 65 and over	2,451	368

6.2.2 Scenarios

Projections of LTC expenditure have been made under different scenarios, exploring the sensitivity of the results to assumptions regarding the evolution of disability, socio-demographic characteristics (household composition and education) and unit costs (costs per user). The base scenario uses the DELAY disability scenario. This scenario assumes that disability incidence is delayed to older ages with the same amount of time as mortality is delayed (see Bonneux, van der Gaag & Bijwaard, 2012). The base scenario further assumes no change in household composition or education by age, gender and disability. With regard to unit costs, it assumes costs to evolve in line with GDP per hour worked, reflecting the highly labour-intensive character of long-term care services. This is the base case assumption of the AWG 2012 Ageing Report and projected trends in GDP are taken from this report.

Future LTC expenditure has been simulated under eleven alternative disability scenarios. These scenarios have been developed in WP 2 of ANCIEN (see Bonneux, van der Gaag & Bijwaard, 2012). A first set of scenarios explores the effect of different relationships between the incidence of disability and mortality (bio-demographic scenarios). A second set explores the effects of two risk factors: obesity and smoking (risk factor scenarios). Furthermore, two alternative socio-demographic scenarios are formulated, one exploring the effect of household composition changes, another one exploring the effect of a higher educational level in future cohorts of older persons. A detailed description of the disability and socio-demographic scenarios can be found in Geerts, Willemé & Mot (2012). With

regard to unit cost development, two alternative scenarios are used: a first scenario assumes costs to evolve in line with GDP per capita; a second scenario assumes no rise in real average expenditure. The latter scenario allows examining the impact of changing volumes of use. The assumption of constant unit costs is quite artificial though, as long-term care services are labour-intensive and trends in unit costs of LTC are likely to depend largely on trends in earnings in the economy at large, and on trends in how the earnings of care staff are likely to rise in relation to average earnings (Comas-Herrera et al., 2003). Other factors that could impact on future unit costs are changes in the efficiency of LTC provision, for instance as a result of the introduction of new technologies, and changes in the quality of formal care services (Colombo, Llena-Nozal, Mercier & Tjadens, 2011; Comas-Herrera et al., 2003). Average expenditure will of course also be influenced by changes in the intensity (number of hours per user) of care provided. All scenarios assume that the probabilities of using residential care or formal home care, given the relevant background characteristics, remain constant over the projection period.

Table 6.5 Overview of the different LTC expenditure scenarios

	Base scenario	Alternative scenarios
Disability	DELAY	Bio-demographic scenarios
		CONST
		PREV
		CHRON
		BIOL
		Risk factor scenarios
		SMOK
		TREND
		NOSMOK
		NOSQUIT
		BM
		LEAN
		FAT
Household composition	Constant	Changing
Education	Constant	Better education
		Constant
Unit costs	Evolve in line with GDP per hour worked	Evolve in line with GDP per capita

6.3 Projection results

6.3.1 Projections of long-term care expenditure under different scenarios

This section presents projections of LTC expenditure under the base scenario and alternative bio-demographic, risk-factor and socio-demographic scenarios. It presents results for public expenditure based on AWG expenditure profiles (variant 2) (Germany, the Netherlands, Spain) and SHA expenditure data (Poland), assuming unit costs to evolve in line with GDP per hour worked. More projection results (using AWG variant 1 and SHA unit costs for all countries and using alternative unit costs scenarios, as well as projections of private expenditure) are provided in the separate companion document with appendices (ENEPRI Research Report No. 117A, December 2012, chapter 2).

The projection results show that current patterns of LTC expenditure differ considerably between the four countries. Public spending for formal home and residential care is much higher in the Netherlands than in the other countries (1.8% of GDP in total), as a result of both higher probabilities of formal care use (see Geerts, Willemé &. Mot, 2012) and higher spending per user. Public expenditure is lower in Germany and Spain (Germany: 0.4% of GDP for residential care, 0.3% of GDP for home care; Spain 0.3% of GDP for residential care and 0.1% of GDP for home care). It is very low in Poland

(0.04 % of GDP for residential care), reflecting both a very low prevalence of residential care use and a low expenditure per user.

In all four countries, a considerable increase in public expenditure for formal LTC care is projected. Under the DELAY scenario, the projected increase ranges from 127% for home care in Spain to 235% for residential care in Poland. In percentage points, the projected increase ranges from 0.1 p.p. in Poland (residential care) to 2.9 p.p. in the Netherlands (residential and home care). In relative terms, the projected increase is higher for residential care expenditure than for formal home care expenditure.

Sensitivity analyses have shown that the expenditure projections are quite sensitive to alternative assumptions about the incidence of disability and mortality. In the four countries, projected increases are lowest under the CONST scenario. This scenario assumes that mortality rates would not decrease in future years, resulting in lower numbers of older person and, hence, lower numbers of care users. Leaving the 'optimistic' and not very realistic CONST scenario out of consideration, projected expenditures still vary considerably, but even in the optimistic BIOL scenario projected increases in expenditure are large. The different BMI scenarios generally have little impact, while alternative assumptions about future trends in smoking behaviour have a larger effect. Taking account of future trends in household composition generally makes little difference; the impact of the better education scenario differs.

6.3.1.1 Projected LTC expenditure, Germany

Figure 6.1 Projected public expenditure for residential care services, Germany (€ million)

Table 6.6 Projected public expenditure for residential care services, Germany (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT
2010	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2020	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2030	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
2040	0.7	0.6	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.8
2050	0.9	0.7	1.1	1.1	0.8	0.9	0.9	1.0	1.0	0.9	0.9	1.0
2060	1.0	0.7	1.2	1.3	0.9	0.9	1.0	1.0	1.0	1.0	0.9	1.0
pp change 2010-2060	0.6	0.3	0.8	0.9	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
% change 2010-2060	167	81	215	234	129	145	164	172	172	159	153	171
diff 2060 to DELAY pp		-0.3	0.2	0.3	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0

Figure 6.2 Projected public expenditure for home care services, Germany (€ million)
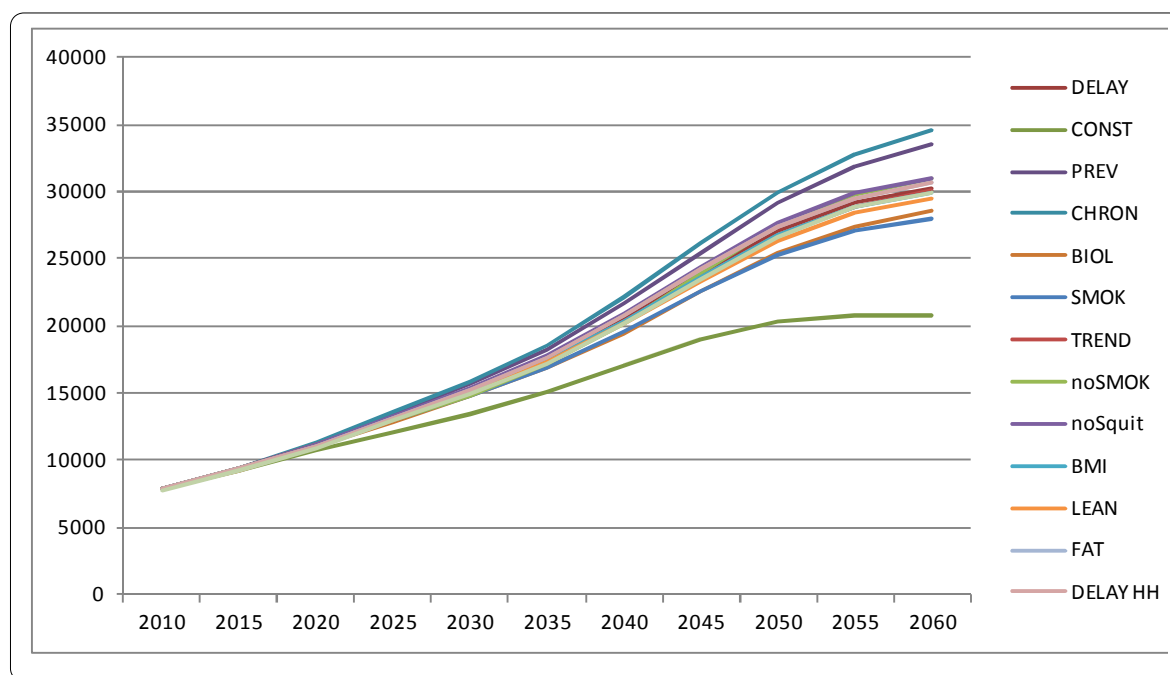
Table 6.7 Projected public expenditure for home care services, Germany (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT	DELAY HH	DELAY EDU
2010	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2020	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2030	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2040	0.6	0.5	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
2050	0.8	0.6	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.7	0.7	0.8	0.8	0.7
2060	0.8	0.5	0.9	0.9	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
pp change 2010-2060	0.5	0.2	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
% change 2010-2060	150	72	177	186	136	132	149	156	156	148	145	154	154	149
diff 2060 to DELAY pp		-0.2	0.1	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

6.3.1.2 Projected LTC expenditure, the Netherlands

Figure 6.3 Projected public LTC expenditure, the Netherlands (€ million)
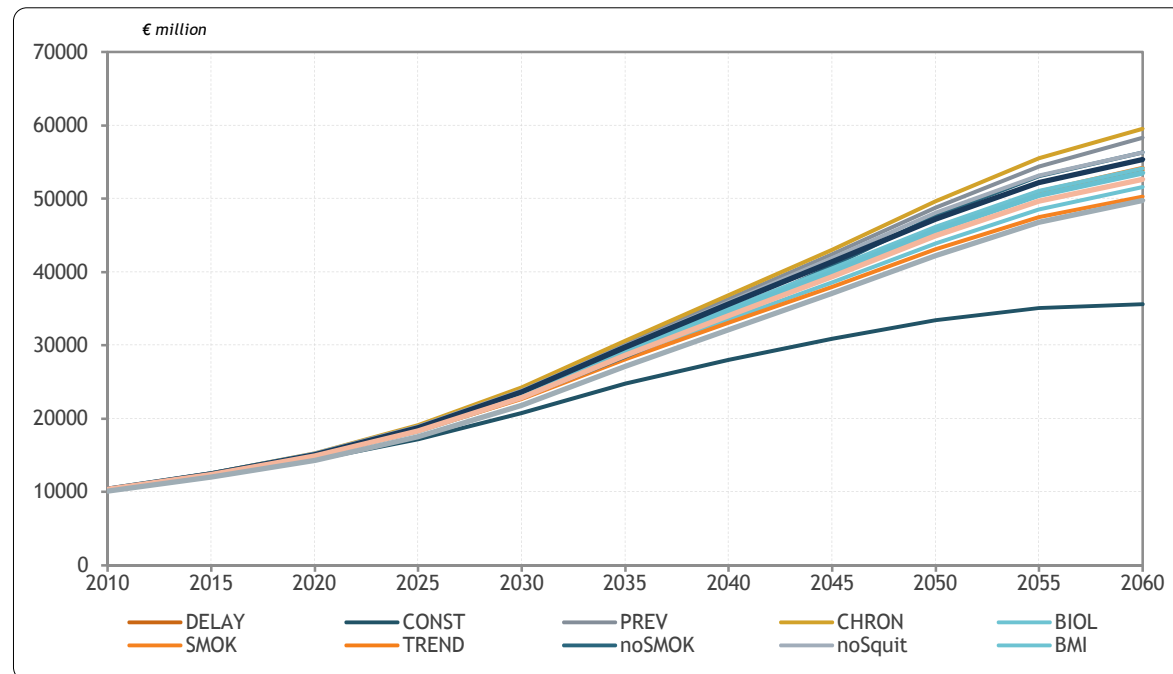
Table 6.8 Projected public LTC expenditure, the Netherlands (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT	DELAY HH	DELAY EDU
2010	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7
2020	2.1	2.1	2.2	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.1	2.0
2030	3.0	2.7	3.1	3.1	2.9	2.9	3.0	2.9	3.0	3.0	3.0	3.0	2.9	2.8
2040	3.9	3.2	4.1	4.2	3.8	3.7	3.9	3.9	4.1	4.0	3.9	4.0	3.9	3.6
2050	4.5	3.3	4.8	4.9	4.3	4.3	4.5	4.7	4.7	4.6	4.5	4.7	4.4	4.2
2060	4.7	3.1	5.0	5.2	4.5	4.4	4.7	4.9	4.9	4.7	4.6	4.8	4.6	4.3
pp change 2010-2060	2.9	1.3	3.3	3.4	2.7	2.6	2.9	3.1	3.1	2.9	2.9	3.0	2.8	2.6
% change 2010-2060	166	76	188	194	155	149	168	178	178	168	165	174	160	152
diff 2060 to DELAY pp		-1.6	0.4	0.5	-0.2	-0.3	0.0	0.2	0.2	0.0	0.0	0.1	-0.1	-0.3

6.3.1.3 Projected LTC expenditure, Spain

Figure 6.4 Projected public expenditure for residential care, Spain (€ million)
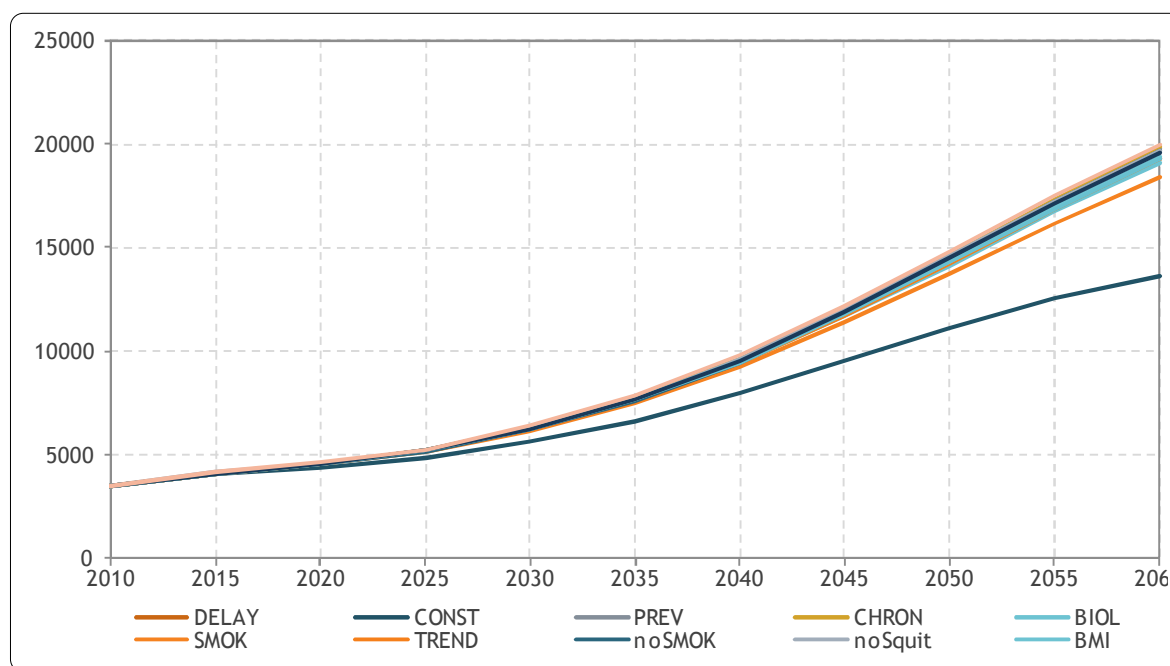
Table 6.9 Projected public expenditure for residential care services, Spain (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT	DELAY EDU
2010	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2020	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2030	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2040	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2050	0.7	0.5	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
2060	0.8	0.6	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
pp change 2010-2060	0.4	0.2	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.5
% change 2010-2060	134	66	139	141	131	124	134	138	138	135	134	137	142
diff 2060 to DELAY pp		-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 6.5 Projected public expenditure for home care services, Spain (€ million)
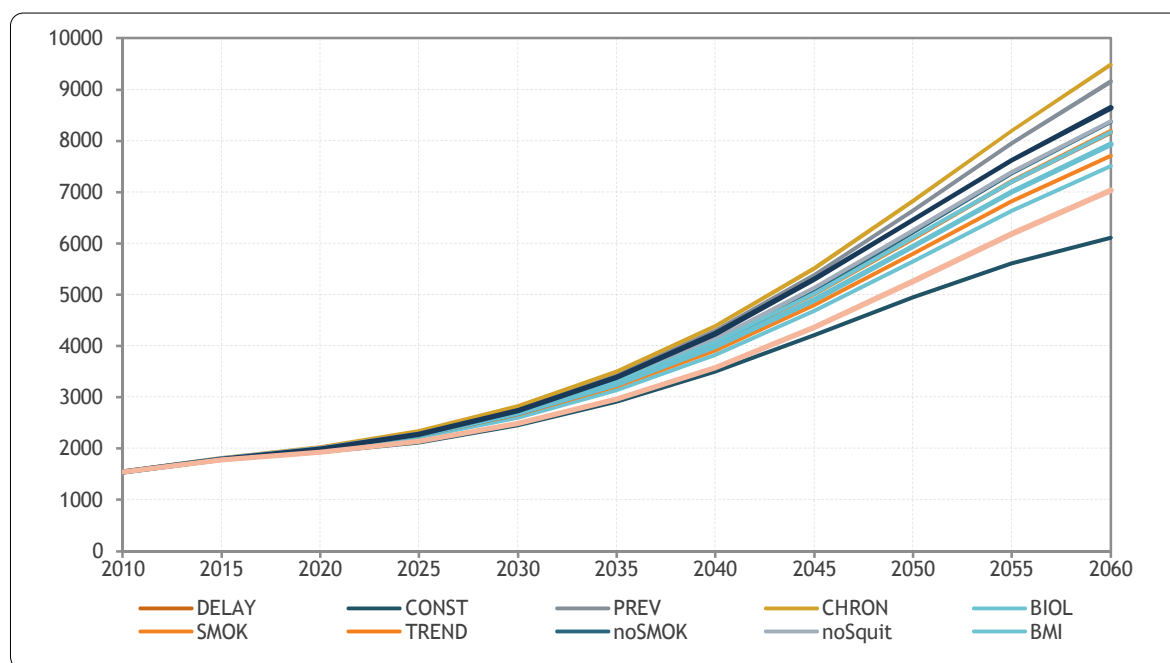
Table 6.10 Projected public expenditure for home care services, Spain (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT	DELAY EDU
2010	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2020	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2030	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
2040	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2050	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
2060	0.3	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
pp change 2010-2060	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
% change 2010-2060	127	70	155	163	109	114	128	133	133	127	121	141	95
diff 2060 to DELAY pp		-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

6.3.1.4 Projected LTC expenditure (residential care), Poland

Figure 6.6 Projected public expenditure for residential care services, Poland (€ million)
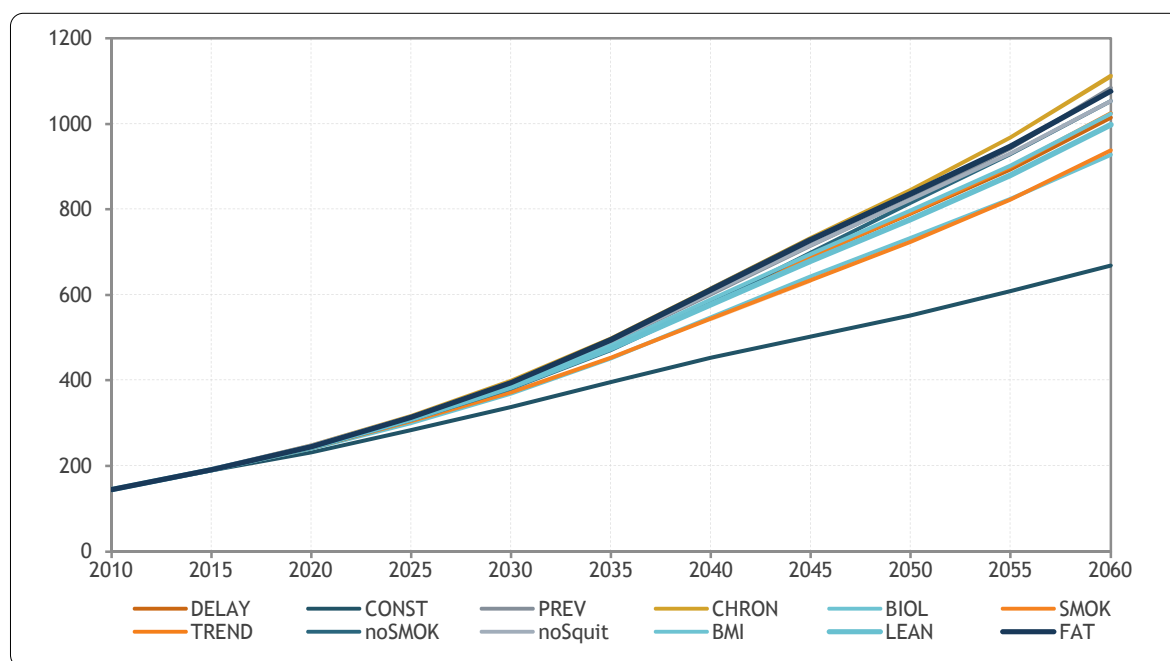
Table 6.11 Projected public expenditure for residential care services, Poland (% of GDP)

	DELAY	CONST	PREV	CHRON	BIOL	SMOK	TREND	noSMOK	noSquit	BMI	LEAN	FAT
2010	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
2020	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
2030	0.07	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
2040	0.09	0.07	0.09	0.09	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
2050	0.11	0.08	0.12	0.12	0.10	0.10	0.11	0.12	0.12	0.11	0.11	0.12
2060	0.14	0.09	0.15	0.15	0.13	0.13	0.14	0.14	0.14	0.14	0.13	0.15
pp change 2010-2060	0.10	0.05	0.11	0.11	0.08	0.09	0.10	0.10	0.10	0.10	0.09	0.10
% change 2010-2060	235	121	258	267	206	210	238	248	248	238	230	256
diff 2060 to DELAY pp		-0.05	0.01	0.01	-0.01	-0.01	0.00	0.01	0.01	0.00	0.00	0.01

6.3.2 Simulation results

For the simulations, for each of the representative countries patterns of formal care use and costs per users have been substituted to the other countries' levels. This section considers what the impact of such changes would be on a country's future long-term care expenditure. Tables 6.12 and 6.13 show the results for public and private expenditure of applying the probabilities of residential and home care use and the costs per user of the 'column countries' to the projected number of older persons by age, gender and disability of the 'row countries'. The scenario utilised for these simulations is the base scenario. Public unit costs are based on SHA data for all countries; private unit costs are based on SHA data for Germany, Spain and Poland and on CVZ data for the Netherlands.

Of course, for all countries, simulated public expenditures are highest applying the high Dutch care use probabilities and unit costs and lowest using the Polish profile. Also, as Tables 6.12 and 6.13 show, the projected expenditures are highest if applied to the Polish population structure, mainly reflecting the high prevalence of disability at older age in Poland (Bonneux, van der Gaag & Bijwaard, 2012). Simulated private expenditure is highest using the Dutch and German probabilities and unit costs. Whereas in the Netherlands, private expenditure as a percentage of GDP is high mainly because of the high prevalence of formal care use, in Germany the high private expenditure is rather due to the high private costs for residential care.

Table 6.12 Simulations of public expenditure, 2010 and 2060 (% of GDP)

	Probability and unit cost						
	Germany		**Netherlands**		**Spain**		**Poland**
2010	**Formal home**	**Residential**	**Formal home**	**Residential**	**Formal home**	**Residential**	**Residential**
Germany	0.30	0.46	0.80	2.10	0.10	0.24	0.02
Netherlands	0.18	0.24	0.47	1.33	0.06	0.16	0.01
Spain	0.34	0.60	0.90	2.50	0.11	0.25	0.02
Poland	0.56	1.11	1.45	3.61	0.19	0.34	0.04
	Probability and unit cost						
	Germany		**Netherlands**		**Spain**		**Poland**
2060	**Formal home**	**Residential**	**Formal home**	**Residential**	**Formal home**	**Residential**	**Residential**
Germany	0.73	1.26	1.79	6.99	0.23	0.57	0.04
Netherlands	0.42	0.62	1.09	4.29	0.14	0.37	0.03
Spain	0.74	1.34	1.84	7.00	0.24	0.57	0.04
Poland	1.88	3.89	4.23	15.48	0.63	1.16	0.13

Table 6.13 Simulations of private expenditure, 2010 and 2060 (% of GDP)

| | Probability and unit cost | | | | | |
| | Germany | | Netherlands | Spain | | Poland |
2010	Formal home	Residential	Total	Formal home	Residential	Residential
Germany	0.07	0.25	0.36	0.03	0.12	0.00
Netherlands	0.04	0.13	0.22	0.02	0.09	0.00
Spain	0.08	0.37	0.42	0.03	0.14	0.00
Poland	0.14	0.61	0.64	0.05	0.19	0.01
	Probability and unit cost					
	Germany		Netherlands	Spain		Poland
2060	Formal home	Residential	Total	Formal home	Residential	Residential
Germany	0.18	0.69	0.96	0.06	0.28	0.01
Netherlands	0.10	0.34	0.58	0.04	0.21	0.00
Spain	0.18	0.82	0.97	0.06	0.32	0.01
Poland	0.46	2.13	2.19	0.17	0.65	0.02

6.4 Conclusions

The projections of long-term care expenditure for Germany, the Netherlands, Spain and Poland are based on projected numbers of long-term care users from WP 6 of the ANCIEN project. These care use projections take account of trends in demography and disability and of current probabilities of using different types of LTC by age, gender, disability and other relevant characteristics.

Under the base scenario, for all four countries the proportions of GDP spent on public and private long-term care are projected to more than double between 2010 and 2060, and even treble in some cases. The base scenario assumes care costs to rise in line with AWG assumptions about trends in GDP per hour worked. It further assumes a moderate delay of disability. Sensitivity analyses have shown that even under a more optimistic disability scenario LTC expenditure is still expected to rise considerably. This is mainly due to the large projected increases in numbers of care users, driven by population ageing.

The chapter also highlights the huge differences in LTC expenditure between the four countries. In the Netherlands, the level of public spending on residential care was about 1.3% of GDP in 2010 and it is projected to rise to about 4.3% of GDP in 2060. Current and projected public spending on residential care is much lower in Poland: 0.04% of GDP in 2010 and 0.13% in 2060.

If growing demand for LTC will be partially met by formal care services, all four countries will be confronted with rising LTC expenditures. Whether this will be sustainable depends on many factors, not in the least on trends in GDP and on the long-term consequences of the current financial and economic crisis. Rising pressures on public financing also need to be considered in relation to trends in other spending categories such as health, pensions and education.

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7.   Overall evaluation of performance
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7.1   Introduction

The aim of this chapter is to analyse the performance of different long term care (LTC) systems across Europe. To the extent possible, it brings together information on all dimensions of the performance framework that is described in chapter 2. The analysis in this chapter is based on the results of other work packages of the ANCIEN FP7 project and other elements of the current work package (WP7). We provide assessment following a performance framework; that is we evaluate the performance of the different LTC systems along several dimensions. The rationale for this approach is that there is no single indicator that could capture the performance or efficiency of a LTC system in itself. In this chapter we summarise available results for the following goals of the LTC systems: quality of care, improving functional ability and minimising the need for LTC, accessibility of care, total burden of care, support for informal caregivers and choice of setting and providers. These evaluations are based on system level data. Two separate studies of ANCIEN work package 7 provide a detailed analysis of the quality of life of LTC users and of the equity aspects of care (see chapters 4 and 5). The goals 'integration with healthcare and social services and coordination' and 'simplicity of the system and information' are not discussed here, because we do not have sufficient information. Possibly the evaluation of quality of life and quality of care partly captures the aspects of integration and simplicity/information.

Ideally we would provide the complete performance analysis for the wide range of European countries included in the ANCIEN project. However, due to data limitations, several countries cannot be covered concerning some of the dimensions of the evaluation framework. In those cases we focus on representative countries, basically Germany, the Netherlands, Poland and Spain. These countries were identified as representative of four clusters of LTC systems by Kraus et al. (2010). Germany represents countries with LTC systems oriented towards informal care and high support for informal caregivers. The Netherlands is representative for generous LTC systems which are oriented towards formal care with good accessibility. Spain represents LTC systems oriented towards informal care with high private financing. Finally, Poland represents countries with low public spending on LTC, low informal care support, and where informal care seems to be a necessity.

In the rest of this chapter we analyse the performance of the LTC systems step by step along the specified dimensions of performance. In section 7.8 we provide an overall evaluation of the different systems.

7.2   Quality of care

High quality of LTC is essential in order to achieve general satisfaction among the users, and to improve their quality of life. The quality of care in itself also has several dimensions. We can distinguish the effectiveness, safety, responsiveness of the care, and also the dimension of coordination, including the timeliness, continuity and integration of the provided care. It is difficult to measure all the aspects of quality, and especially difficult to find comparable indicators across countries. In this section we follow two approaches to provide comparable indicators on the quality of care. The first approach is based on the data collected in work package 5 of the ANCIEN project, and the second approach is based on the Eurobarometer data. These approaches complement each other, as the focus is on different aspects of quality. In addition, we also refer to results on nursing home quality from the SHELTER project.

The first approach uses the data collected in work package 5; details about the data are provided by Dandi et al. (2012).[36] This approach focuses on the quality evaluation structure in the countries covered by the survey. Therefore WP5 yields extensive information on national quality indicators collected, but it is more difficult to find internationally comparable information on the quality of care level. Using the information on the existing number of policies that pertain to quality dimensions (overall 16 variables), a score can be obtained on the intensity of LTC quality policy in each country. The variables containing quality dimension were weighted by the corresponding factor loadings in Dandi et al. (2012), and, finally, the so-obtained values were rescaled to the 0-100 range, with 100 corresponding to the highest quality policy score.[37] These results are presented in the first column of Table 7.1, with the scores normalised to the 0-100 scale. The main advantage of this approach is that the number of policies is immediately comparable across countries. However, it is important to keep in mind that these results reflect the quality of LTC only if a higher number of quality policies implies higher quality. This assumption is questionable if the higher number of policies is the result of existing problems with LTC quality. Therefore it is important to extend the analysis of quality with a focus on the value of the available quality indicators, not just on the number of indicators.

Table 7.1 Quality indicators

	Quality score (0-100)	Eurobarometer quality (1-4)	
	Policies	**At home**	**Nursing homes**
SE	96.9	2.94	2.92
FR	75	3.08	3.06
UK	71.9	2.83 (GB)	2.70 (GB)
LV	68.8	2.52	2.56
ES	64.1	2.8	2.74
NL	62.5	2.92	2.79
EE	56.3	2.51	2.43
FI	56.3	2.72	2.74
DE	56.3	2.82	2.58
SK	56.3	2.53	2.52
HU	50	2.5	2.56
IT	46.9	2.39	2.46
AT	43.8	2.95	2.81
SI	15.6	2.82	2.75
PL	12.5	2.38	2.28

Source: ANCIEN WP 5 data, as described by Dandi et al. (2012), and Eurobarometer 67.3

The above indicator of the quality policies can be complemented with the information available in the Eurobarometer 67.3 survey. The European Commission conducts the Eurobarometer survey twice a year, collecting information on the public opinion in the European Union. The country specific sample size is around 1,000. Apart from the standard topics, the survey also addresses various special topics. The Eurobarometer 67.3 survey is titled "Health care Service, Undeclared Work, EU Relations with its Neighbour Countries, and Development Aid", and it also provides information on the observed quality of LTC services. Among others, the respondents were asked to evaluate the quality of specified health services, including care services for dependent people in their home, and the quality of nursing

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[36] The results based on ANCIEN Work Package 5 were provided us by Georgia Casanova, Roberto Dandi and Roberto Naranek. We are grateful for their collaboration.

[37] Details on the methodology are available from Georgia Casanova (geo.casanova@gmail.com) and Roberto Naranek (naranek@libero.it).

homes.[38] This survey was conducted during May - June 2007. The advantage of using this data set is that it provides a general measure of the quality of LTC services for a wide range of European countries. The main drawback is that this is a subjective measure, and differences across countries might reflect different responding styles instead of differences in the quality of services.

We report the average of the reported indicators in the last two columns of Table 7.1 for those countries which are also covered by the data collected in the ANCIEN work package 5. The indicators are scaled so that 1 corresponds to very bad quality, and 4 corresponds to very good quality. Based on these indicators only a relatively small variation can be observed in the quality of services across the analysed countries. The average of the reported quality of the two types of LTC services is close to each other for all of the countries. According to these statistics, the quality of services is generally low in the new member states, whereas it is relatively high in Austria, Germany, France, the Netherlands and Sweden. Although the statistics reported in the first and last two columns of the table are based on very different approaches, those indicators still have positive correlation with correlation coefficients of 0.4 (care at home) and 0.5 (nursing homes).

Frijters et al. (2012) also provide indicators on the quality of nursing homes in eight countries: the Czech Republic, Finland, France, Germany, Italy, Israel, the Netherlands and the United Kingdom. Their study is part of the SHELTER project. The SHELTER data collection in Europe started in autumn 2009 and was finished early 2011. The SHELTER data sample consists of nursing home patients from 59 private and public long term care facilities. The aim was to recruit on average 500 residents per country. Based on the available information, Frijters et al. rank the overall quality of nursing homes in the analysed eight countries. According to this ranking, institutions in the UK have the lowest quality, the Dutch institutions are ranked as the fourth, the German as the fifth. In their study the average quality is found to be the highest in the Czech Republic. Although these results are based on a relatively low number of nursing homes, these still reflect that focusing purely on the quality policies can be misleading when assessing the quality of LTC services.

7.3   Improving functional ability

One goal of the LTC systems is to improve functional ability and minimise the need for LTC. However, the prevalence of ADL limitations depends on several other factors, apart from the efficiency of LTC. It is strongly affected by demography, by the overall healthcare system, by the individuals' behaviour, and so on. In this sense we can consider the health infrastructure in a country (interaction of prevention, healthcare and LTC) more efficient if the ratio of people having ADL limitations is lower. In this section we take a step towards identifying the effect of LTC systems in determining the need for care. In fact, what we do is decompose the effect of demography from the rest of the influencing factors. We have to keep in mind that LTC is only one part of these remaining factors.

The following analysis is based on the work of Bonneux et al. (2012). They provide projections on the numbers of elderly care-dependent persons in Germany, the Netherlands, Spain and Poland. Bonneux et al. find that in a given country the main determinant of the future number of disabled elderly is the demographic structure of the population. In particular, the ageing of the large baby boom cohorts plays an important role. Risk factors, such as obesity and smoking, have little influence. Because of the demographic compositions, they predict the largest relative increase in the number of disabled by 2040 for the Netherlands, and the smallest for Germany.

In this decomposition exercise we compare the influencing role of demography not with that of individual risk factors, but with the role of the other country specific factors which include also the

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[38] The survey question is stated as "Thinking now about your own experiences of healthcare services in (OUR COUNTRY) and those of people close to you, please tell me if you think the quality of each of the following is very good, fairly good, fairly bad or very bad?"

role of the LTC system. We do this with the help of simulations: we predict the number of disabled people in a given country using the demographic structure of this country, but the age-specific prevalence rates of another country. The input of this simulation is the same as for the report of Bonneux et al. (2012). We use the "delay" scenario, i.e. we assume that the delay of the age, gender and country specific prevalence rates are comparable to the delay of mortality. This is the baseline scenario of Bonneux et al. (2012). The demography projections are based on the EUROPOP2008. (Except for the projections for the whole population, where we use EUROPOP2010 numbers, as available online from the Eurostat.) So as to maintain comparability with the results of Bonneux et al. (2012), we look at disability only for the population aged 65 and older. Thus we implicitly assume that the prevalence rate of disability at younger ages is negligible. We present predictions for year 2040.

Table 7.2 shows the predicted ratio of people with ADL limitations within the 65+ age group. The numbers on the diagonals reveal that the predicted disability rate is the highest in Poland, whereas the lowest in the Netherlands. The differences in the demographic compositions play little role in the differences in the predicted disability rates within this age group. Whichever demographic structure we apply, Poland fares the worst, whereas the Netherlands the best. Thus the cross country differences in the predicted disability rates are not due to the different demographic structures within the aged 65+ group, but due to other factors, among others to the LTC systems.

Table 7.2 2040 prevalence rate within the 65+ population

Males		Prevalence			
		DE	ES	NL	PL
	DE	**0.19**	0.19	0.13	0.34
Demography	ES	0.17	**0.17**	0.12	0.32
	NL	0.18	0.19	**0.13**	0.34
	PL	0.18	0.18	0.13	**0.33**
Females		Prevalence			
		DE	ES	NL	PL
	DE	**0.23**	0.28	0.21	0.43
Demography	ES	0.22	**0.26**	0.19	0.41
	NL	0.23	0.27	**0.21**	0.43
	PL	0.23	0.28	0.21	**0.43**
Total		Prevalence			
		DE	ES	NL	PL
	DE	**0.21**	0.24	0.17	0.39
Demography	ES	0.2	**0.22**	0.16	0.37
	NL	0.21	0.23	**0.17**	0.38
	PL	0.21	0.24	0.17	**0.39**

What about the predicted increase in the number of disabled? Not surprisingly, this increase is influenced by demography much more. As Table 7.3 reveals, in all countries the number of disabled is predicted to roughly double by 2040. The simulations show that this increase could be much higher or lower, depending on the demographic composition. For example, combining the Polish prevalence rates with the demography of the Netherlands would imply a huge increase in the predicted number of disabled. Applying the German and Dutch prevalence rates implies the lowest increase in the number of people living with disabilities, whereas the Dutch demographic composition leads to the highest simulated increase, and the Polish to the lowest.

Table 7.3 Growth rate of the number of disabled (aged 65+) from 2008 to 2040

Males		Prevalence			
		DE	ES	NL	PL
	DE	**1.9**	1.91	1.33	3.44
Demography	ES	1.9	**1.94**	1.31	3.57
	NL	3.32	3.35	**2.32**	6.06
	PL	1.19	1.2	0.83	**2.19**
Females		Prevalence			
		DE	ES	NL	PL
	DE	**1.45**	1.72	1.29	2.67
Demography	ES	1.42	**1.68**	1.24	2.66
	NL	2.09	2.48	**1.86**	3.86
	PL	0.97	1.16	0.87	**1.8**

Finally, we also analyse the ratio of disabled (aged 65+) and the predicted number of total population. This indicator provides some insight on the burden of LTC need on the total population. Table 7.4 shows these simulation results. Again, Poland is predicted to fare the worst, where around 10% of the total population is predicted to have ADL limitations by 2040. According to the simulations, this high ratio is basically due to the high age-specific prevalence rates, i.e. to factors other than demography. However, a demographic structure such as Germany has would make the situation even worse.

From these decomposition exercises we can conclude that holding the demographic composition the same across the countries, the Polish system implies the highest disability ratio for the future, whereas the Dutch system the lowest. In terms of the predicted disability rate, the German system is estimated to be somewhat more efficient than the Spanish one. Again, these differences are due not only to the LTC systems, but also to the overall country specific characteristics, apart from demography.

Table 7.4 2040 prevalence rate within the total population

Males		Prevalence			
		DE	ES	NL	PL
	DE	**0.06**	0.06	0.04	0.1
Demography	ES	0.04	**0.04**	0.03	0.08
	NL	0.05	0.05	**0.03**	0.08
	PL	0.04	0.04	0.03	**0.07**
Females		Prevalence			
		DE	ES	NL	PL
	DE	**0.08**	0.1	0.07	0.15
Demography	ES	0.07	**0.08**	0.06	0.12
	NL	0.07	0.08	**0.06**	0.12
	PL	0.07	0.08	0.06	**0.12**

7.4 Accessibility

The goal of accessibility implies that ideally everyone who has need for care should have access to it. The accessibility also has more dimensions: the access should be on time, without geographical disparities, and without differences across income groups. In this section we analyse the utilisation rates of the different types of LTC services. These can be considered as composite indicators of accessibility, as these cannot reveal the sources of variation in utilisation rates, e.g. if the differences are due to the insufficient number of providers, to large geographic disparities in accessibility, or to some other factors. Nevertheless, a higher ratio of utilisation can indicate better accessibility on

average. The source of the data used here is again the data collected by the IHS as part of the ANCIEN first work package.

The survey provides information on the number of people aged 65+ utilising the three types of LTC services, and also on the number of people aged 65+ who are considered to be in need of care (including lower levels of care). Figure 7.1 shows the ratio of users to those in need of care. We present these statistics only for those countries for which the user statistics for all three types of care are available. Overall, the utilisation rate (sum of the three service types) is the highest in Finland and Sweden, whereas the lowest in Hungary. The total utilisation rate is also relatively high in Denmark and Germany – the accessibility of formal home based services is among the highest ones in Denmark, and the accessibility of informal care is among the highest ones in Germany. Thus there is a large variation in the accessibility (and demand) for the different types of care.

Figure 7.1 Ratio of care users and people in need of care, aged 65+
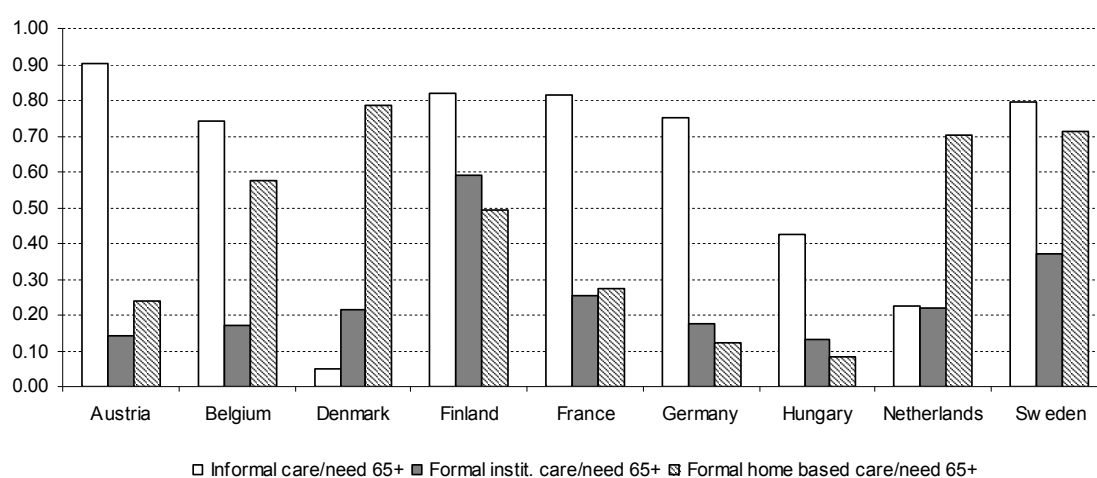
Source: IHS data, ANCIEN WP1.

As the number of people in need might be measured with noise, we also relate the number of users to the total population aged 65+, using the Eurostat statistics. These results are shown in Figure 7.2. The general pattern across the countries is similar to the utilisation relative to people in need. This second set of indicators shows the highest overall utilisation rate in Belgium, and the lowest in Denmark and Germany. However, these differences can be due not only to differences in accessibility, but also to differences in the level of need.

Kraus et al. (2010) construct an alternative indicator of accessibility, which is the sum of means testing and entitlements (where entitlement refers to the legal right to receive certain benefits). Entitlement implies that everyone who fulfils the eligibility criteria must be granted services, thus it can reduce the uncertainty about access to LTC. Accessibility is considered to be higher if there is no means testing in either institutional or home-based care and there are entitlements to both types of care. We rescale the accessibility indicator of Kraus et al. (2010) to the 0-4 scale. Score 0 corresponds to means-tested access in both institutional care and home based care, and no entitlement to either type of care. The other extreme is 4, which corresponds to no means testing and to entitlement to both types of care. Based on this alternative indicator, the accessibility of LTC services is relatively high in all of the analysed countries, being the lowest in England and in Romania. A limitation of this indicator is that it might not always reflect the actual availability of services - for example, people may be entitled to LTC but might not have access due to insufficient supply.

Figure 7.2 Ratio of care users and population aged 65+
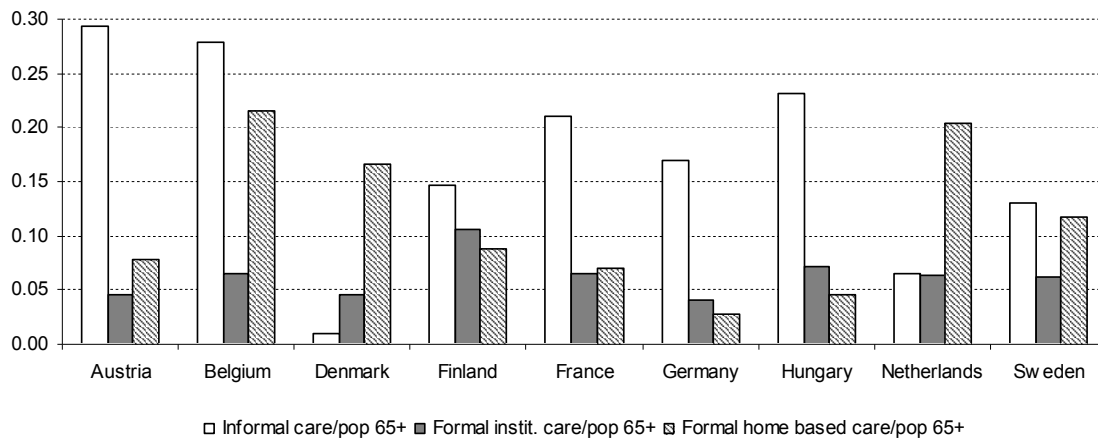
Source: IHS data, ANCIEN WP1 and Eurostat.

Figure 7.3 Accessibility indicator, based on means testing and entitlement
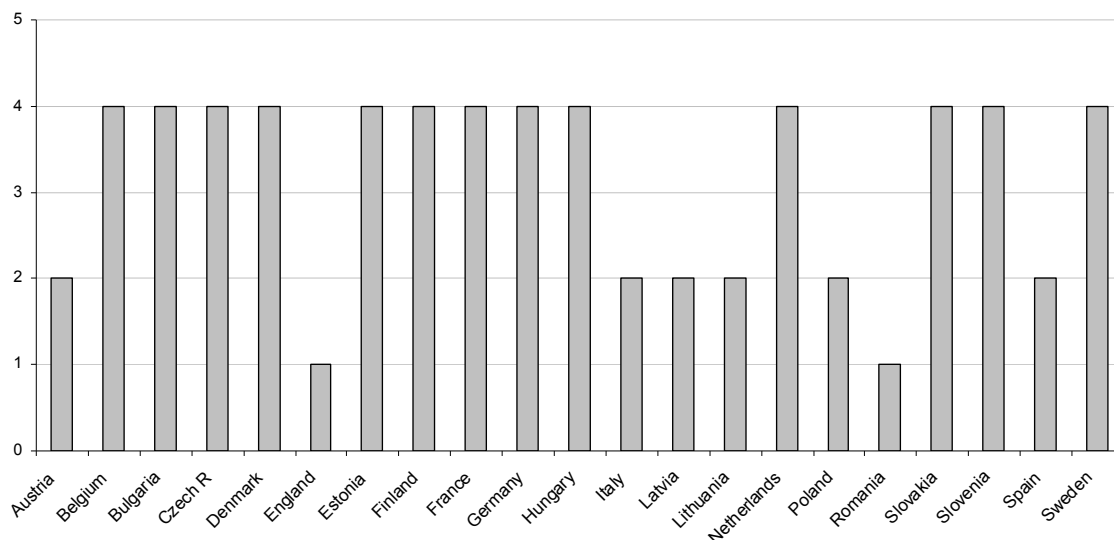
Source: Kraus et al. (2010).

7.5 Burden of long term care[39]

A good LTC system should ensure that the burden of LTC is manageable, now and in the future. One aspect of a manageable burden is financial: the financing of the system should be robust, and the total expenditures on LTC (public and private) should be affordable. For the future this could be captured e.g. by the predicted share of LTC expenditures in GDP. A second aspect of the total burden is the current and predicted burden of informal care giving. A third aspect is that a sufficient supply of care can be ensured also for the future. This means that the number of users should not expand too rapidly relative to the available supply of care. This depends on the development in supply of formal and informal care as well as the development in the demand for care. Thus this goal is closely related to

[39] We are thankful to Joanna Geerts (FPB) who provided us the simulation results of this section.

the goal of limiting the problems with ADL, discussed in section 7.3, as the demand for care is strongly influenced by the prevalence of ADL difficulties.

In this section we analyse aspects of the burden of care with the help of simulations. The simulation results presented in this section build on the projections of Geerts, Willemé & Comas-Herrera (2012). We start by discussing the projected future use of care in section 7.5.1. This is followed by a discussion of the current and future financial burden in sections 7.5.2 and 7.5.3, respectively. Section 7.5.4 discusses the burden of informal care giving.

7.5.1 Use of care

Geerts, Willemé & Comas-Herrera (2012) provide projections on the number of LTC users for the four representative countries, Germany, the Netherlands, Poland and Spain. They base their projections on a macro simulation model, and analyse different scenarios. In this model the first step is the projection of population by age, gender and disability level. This is based on the work of Bonneux et al. (2012). The second part of the model projects the number of users of different types of LTC. The details on the projection methodology and data sources are described by Geerts, Willemé & Comas-Herrera (2012). They find that the number of care users is expected to increase in all four countries within the next 50 years, but the composition of the projected use of care differs across the countries, the residential care use increasing the most in the Netherlands, whereas the informal and formal home care use increasing the most in Spain.

The simulation exercise that we do here is similar to the exercise of section 7.3. We predict the number of LTC users in the analysed four countries, where we use the demographic structure of one country, and the probabilities of care use of another country. LTC utilisation is predicted only for people aged 65 and above. Due to data limitations, for Poland only the number of users of residential care can be predicted. The aim of this exercise is again to decompose the effect of demography from all the other factors, where the other factors include the effect of the LTC systems. The population forecast by age, gender and disability level is based on the "delay scenario" of Bonneux et al. (2012), which assumes that disability incidence is delayed to older ages with the same amount of time as mortality is delayed. Here we present the predictions for year 2040.

Table 7.5 shows the utilisation rates within the 65+ population. The demographic structures of Germany, the Netherlands and Spain lead to similar predictions, whereas using the Polish demography the predicted rates of utilisation are considerably higher. This difference is rather due to the higher disability rates in Poland than to the Polish age composition. It can be also seen that the variation across the service types are mainly due to factors other than the different demographic structures. For example, the relatively high prevalence of residential care use in the Netherlands remains no matter which country's demographic structure we apply.

Table 7.5 2040 utilisation rate within the 65+ population (row country: demography)

Probability country									NL	PL
	DE			ES						
	Formal home care	Informal care	Resi-dential care	Formal home care	Informal care	Resi-dential care	Formal home care	Informal care	Resi-dential care	Resi-dential care
DE	**0.053**	**0.168**	**0.046**	0.053	0.149	0.049	0.115	0.045	0.078	0.007
ES	0.051	0.17	0.049	**0.054**	**0.149**	**0.047**	0.114	0.048	0.075	0.007
NL	0.045	0.161	0.034	0.046	0.127	0.047	**0.101**	**0.037**	**0.072**	0.006
PL	0.078	0.203	0.094	0.086	0.237	0.058	0.156	0.072	0.119	**0.013**

Next, we take a look at the predicted growth rates of the number of LTC users (Table 7.6). These indicators are the highest for the Netherlands, which can be explained by the age structure of the Dutch population. This is in line with the results presented in Table 7.3. The differences in the country

specific utilisation rates make little difference in the predicted growth of users. Thus, while the ratio of users is only weakly dependent on the age, gender and disability composition of the population, and depends strongly on the rest of the factors (among others the LTC systems), the growth rate in LTC users is determined strongly by the demographic composition.

Table 7.6 Growth rate of the number of users from 2010 to 2040 (row country: demography)

Probability country										
	DE			ES					NL	PL
	Formal home care	Informal care	Resi - dential care	Formal home care	Informal care	Resi - dential care	Formal home care	Informal care	Resi - dential care	Resi - dential care
DE	**1.69**	**1.51**	**1.71**	1.62	1.62	1.65	1.62	1.41	1.94	1.59
ES	1.79	1.86	1.75	**1.8**	**1.77**	**1.87**	1.77	1.71	1.92	1.73
NL	2.03	1.92	2.08	2.03	2.02	2.07	**2.06**	**1.79**	**2.39**	1.99
PL	2.06	1.87	2.21	2.08	1.95	2.1	1.82	1.59	2.59	**1.99**

Finally, similarly as in section 7.3, we relate the number of users to the predictions on the total population (using again the EUROPOP2010 projections for the total population). These calculations are presented in Table 7.7. The ratio of LTC users within the total population is influenced both by the demographic composition and by the other factors, including the LTC institutions. Comparing these two influencing factors, the demographic structure has a somewhat weaker influencing role. In terms of residential care use Poland has the lowest projected rate, which is due to the low prevalence of residential care in the Polish LTC system. On the other hand, the relatively high ratio of informal care use in Germany is partly due to the German population structure, and partly due to the generally widespread use of informal care there.

Table 7.7 2040 utilisation rate within the total population (row country: demography)

Probability country										
	DE			ES					NL	PL
	Formal home care	Informal care	Resi - dential care	Formal home care	Informal care	Resi - dential care	Formal home care	Informal care	Resi - dential care	Resi - dential care
DE	**0.017**	**0.055**	**0.015**	0.017	0.048	0.016	0.038	0.014	0.025	0.002
ES	0.014	0.047	0.014	**0.015**	**0.042**	**0.013**	0.032	0.014	0.021	0.002
NL	0.012	0.043	0.009	0.012	0.034	0.013	**0.027**	**0.01**	**0.019**	0.002
PL	0.02	0.05	0.023	0.021	0.059	0.014	0.039	0.018	0.03	**0.003**

The simulations presented in this subsection show that future utilisation rates of LTC services are heavily influenced by factors other than the age, gender and disability specific population projections. Informal care use is predicted to be high using the German and Spanish probabilities of care use, no matter which country's population structure we apply. Nevertheless, applying the Polish population structure leads to the highest projections. The residential care use is predicted to be the highest using the Dutch utilisation rates, again irrespective of the population structure. The growth rate of the number of LTC users, however, is influenced strongly by the demographic structure. In this aspect the Netherlands is predicted to face the highest increase in utilisation. This indicates a potential shortage of caregivers in the future ("care-gap").

7.5.2 Current financial burden

In this section we analyse the public sources spent on LTC, and the need for private financing. We focus here on the current statistics, and we also discuss here the funding structure of LTC services. We

again use data from the WP 1 of the ANCIEN project, as there are few other comparable data on expenditures on LTC.[40] For example, the Eurostat provides information on expenditures on nursing and residential care facilities, but this information is missing for many countries, out of the four representative countries this is available only for Spain. The OECD provides statistics only on the expenditures on long-term nursing care. Instead of these statistics, we also use statistics on public LTC expenditures from the Ageing Working Group (AWG).[41]

We have information on the composition of LTC funding, and on the expenditures on LTC services. These statistics are reported in Table 7.8. The total (public plus private) expenditures as a share of GDP are relatively small in all countries. According to this indicator, the Dutch and the Swedish systems are the most expensive. This can be due to a higher rate of utilisation of LTC services or to a less efficient provision of a similar amount of services. The classification provided by Kraus et al. (2010) shows that these two countries are characterised by generous LTC systems oriented towards formal care. On the other hand, this indicator is lower in countries where informal care is more widespread, as the opportunity costs of informal care provision are not captured by the indicator of aggregate expenditures. These statistics are in line with the AWG statistics on the public LTC expenditures.

Table 7.8 Indicators of affordability

	Total expend. on LTC, % GDP	Public expend. on LTC, % GDP (AWG)	Financial contributions on LTC (% total)		
			social insurance	taxes	private
	%	%	%	%	%
Austria	1-1.5	1.30	0	61-80	21-40
Belgium	1.5-2	1.50	41-60	21-40	1-20
Czech Rep.		0.20	61-80	21-40	1-20
Denmark	1.5-2	1.70	1-20	81-100	1-20
Estonia	0-0.5	0.10	41-60	21-40	1-20
Finland	1.5-2	1.80	1-20	61-80	21-40
France	1-1.5	1.40	41-60	21-40	21-40
Germany	1-1.5	0.90	81-100	1-20	1-20
Hungary	0.5-1	0.30	1-20	61-80	21-40
Italy	1.5-2	1.70			
Latvia	0-0.5	0.40	21-40	21-40	1-20
Netherlands	2-	2.10	61-80	1-20	1-20
Poland		0.40			21-40
Romania		0.00			21-40
Slovakia	0-0.5	0.20	41-60	21-40	1-20
Slovenia	1-1.5	1.10	41-60	21-40	21-40
Spain	0.5-1	0.50		41-60	21-40
Sweden	2-	3.50	1-20	81-100	1-20
England	1.5-2	0.80	1-20	61-80	21-40

Source: Data collected by IHS (ANCIEN WP 1) and AWG.

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[40] We are grateful to Markus Kraus and Monika Riedel at IHS (Vienna) for providing us the requested data. We also use data provided by the IHS in Sections 7.4 and 7.7.

[41] These statistics were provided to us by Esther Mot (CPB).

As the second part of Table 7.8 shows, in all countries the major part of LTC expenditures is financed by public sources, either by taxes or by social contributions. Higher reliance on private sources might indicate lower accessibility of LTC, unless there is a proper compensation scheme for the poorer individuals. Thus the analysis of equity issues in chapter 5 complements the information inherent in the financing structure. There is no clear pattern across the countries on the reliance on private funding, and the ratio of private sources is found to be uncorrelated with the ratio of total expenditures within GDP, based on the reported indicators.

7.5.3 Predicted financial burden

We measure the future financial burden by the predicted expenditures on residential and formal home care relative to GDP in 2040. If the expenditures are predicted to increase much faster than the GDP, then that can indicate future financial problems. We do not consider here the financing side of the systems, and simply assume that a LTC system with higher expenditures relative to GDP is financially less affordable in the future. Table 7.9 and Table 7.10 show the predicted public and private expenditures. These projections are produced by multiplying the projected numbers of care users with average costs per user. The base year unit costs are based on data from the Ageing Working Group of the European Policy Committee and System of Health Account (SHA) database of the OECD. Details on the methodology are provided in chapter 6. As before, we disentangle the effect of demographic factors from the rest of the influencing factors. Thus we apply the population structure of the "row country", but use the usage probabilities and unit costs of care of the "column country". Again, these simulations are based on the "delay" bio-demographic scenario of Bonneux et al. (2012), and it is assumed that the unit costs of care evolve in line with the GDP per hour worked, reflecting the highly labour intensive character of LTC services. Missing simulation results in the tables are due to the lack of appropriate data.

Table 7.9 2040 public LTC expenditures as percentage of GDP (row country: demography)

Usage and unit cost country						
	DE		**ES**		**NL**	**PL**
	Formal home care	**Residential care**	**Formal home care**	**Residential care**	**Formal home care**	**Residential care**	**Residential care**
DE	**0.6**	**0.932**	0.191	0.467	1.526	4.794	0.035
ES	0.497	0.854	**0.165**	**0.383**	1.285	3.885	0.03
NL	0.391	0.532	0.126	0.339	**1.014**	**3.325**	0.028
PL	1.231	2.64	0.427	0.762	2.829	10.01	**0.087**

Based on Table 7.9, the projected Dutch public expenditures on residential and formal home care are the highest among the four analysed countries. However, the simulated expenditures are considerably higher if the Polish demographic structure is applied to the usage rates and unit costs. The predicted public expenditures in the Netherlands are high because of the high utilisation of formal LTC services, but still these expenditures are predicted to be only around 4.3 percentage of the GDP due to the relatively favourable demographic structure of the country.

The predicted private expenditures on residential and formal home care (Table 7.10) are lower than the public expenditures, but the pattern of the differences among the countries is similar to the public expenditures. The main difference is that the predicted total private expenditures relative to GDP are similar with using the German or the Dutch usage rates and unit costs. Again, applying the Polish demographic structure strongly increases the predicted expenditures.

Table 7.10 2040 private LTC expenditures as percentage of GDP (row country: demography)

Usage and unit cost country						
	DE			**ES**	**NL**	**PL**
	Formal home care	**Residential care**	**Formal home care**	**Residential care**	**Total**	**Residential care**
DE	**0.146**	**0.508**	0.05	0.23	0.741	0.005
ES	0.121	0.526	**0.044**	**0.213**	0.614	0.005
NL	0.095	0.29	0.033	0.188	**0.501**	0.004
PL	0.301	1.441	0.112	0.423	1.444	**0.013**

Although due to the lack of appropriate data we do not have predictions for the expenditures on formal home care in Poland, based on the available evidence we can still assume that those expenditures are of similarly small magnitude as the expenditures on residential care. Based on these considerations the Netherlands is estimated to face the highest expenditures on formal LTC within the next thirty years, followed by Germany, Spain, and Poland. The Polish demographic structure increases the predicted expenditures to a high extent, but this demographic effect still leaves the public and private expenditures small in Poland, mainly due to the small usage rates.

7.5.4 Burden of informal caregiving

The analysis of predicted expenditures on LTC misses the costs of informal care giving. If the expenditures on formal care are relatively low, it does not necessarily imply that the total burden of care is indeed manageable. It might be the case that the burden of caregiving falls on the informal caregivers, and the increasing demand for care can still undermine the sustainability of the system. It is a difficult task to provide monetary estimates for the financial burden (opportunity cost) of informal caregiving. In this section we present some other indicators which provide information on the current burden of informal caregiving and on the future prospects of informal care systems.

The Survey of Health, Ageing and Retirement in Europe (SHARE) provides some crude measures on the hours spent on informal care. Using these measures, Bolin, Lindgren & Lundborg (2008) estimate the average of weekly hours of informal caregiving in the countries covered by the first wave of SHARE. We repeat their results in Table 7.11. These statistics are conditional on caregiving, and indicate that caregiving in terms of weekly hours is the most intensive in the Mediterranean countries.

Table 7.11 Informal care hours

	Weekly hours of informal care given, if nonzero				Weekly hours of informal care received, if nonzero (for users of home care)	
	Males		**Females**			
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Austria	4.57	12.85	4.75	6.91		
Denmark	2.25	4.42	2.68	6.08		
France	3.02	6.15	3.74	5.12		
Germany	6.7	14.7	6.59	11.23	34.04	55.86
Greece	4.88	9.52	10.2	13.9		
Italy	4.99	12.25	15.38	26.38		
Netherlands	3.76	15.84	4.8	6.5	17.24	34.38
Spain	3.76	6.35	11.72	26.46		
Sweden	1.65	2.12	2.43	4.36		
Switzerland	2.27	5.19	2.5	4.94		

Source: Bolin, Lindgren and Lundborg (2008), Table 3 and AdHOC data from I. Carpenter.

The Aged in Home Care (AdHOC) project also collected information on the hours of informal care, but not from the supply side but from the demand side perspective. The information concerns persons who use formal home care. Iain Carpenter kindly provided us descriptive statistics on the average weekly hours of home care received in Germany and the Netherlands. We present these statistics in the second part of Table 7.11. The actual hours of care received vary strongly with the amount of ADL limitations and cognitive impairments the patients have. Conditional on receiving home care, the hours of care in Germany are about twice as much as in the Netherlands. Further information on the AdHOC project is provided by Carpenter et al. (2004).

As we do not have a suitable indicator on the monetary value of informal care, we quantify the burden of informal caregiving by the projected demand for informal caregivers. Pickard & King (2012a) in Table 7-3 report the predicted necessary number of informal caregivers, assuming constant ratios of caregivers to care users. These predictions are not available for Poland. As caregivers are typically aged 50 and above, we relate the demand for caregivers to the predicted 50+ population in 2040, using the EUROPOP2010 predictions.[42] We report these numbers in Table 7.12. The relative demand for informal caregivers is much lower in the Netherlands than in Germany and Spain. This is in line with the heavy reliance of the Dutch LTC system on formal care.

We also generate an alternative indicator of the demand for informal caregivers, in order to obtain a comparative indicator for Poland as well. Here we use the data on the number of informal caregivers in 2010, as reported by Pickard & King (2012b), Table 5-6. We assume that the ratio of informal caregivers relative to the disabled people aged 65 and above remains constant. Using the projections of Bonneux et al. (2012) (DELAY scenario) on disabilities, we can thus generate an estimate of the future number of caregivers needed. In the last column of Table 7.12 we present the ratio of the so predicted number of caregivers relative to the predicted 50+ population in 2040. Although it is a crude projection on the need for caregivers, the generated predicted ratios are relatively close to the ratios presented in the second column. The generated relative burden of informal caregiving is slightly overestimated for Germany and the Netherlands and underestimated for Spain, compared to the estimations based on Pickard & King (2012a).

Table 7.12 Predicted demand for informal caregivers in 2040

	Number of caregivers needed[a]	Caregivers needed per 50+ population[a]	Caregivers per 65+ disabled population[b]	Caregivers per 50+ population[b]
				constant ratio care giver/disabled
		%	%	%
DE	2,386,199	7.04	47.04	7.14
NL	132,971	1.94	17.64	2.07
PL	.	.	26.82	5.92
ES	1,843,730	8.10	56.01	7.77

Sources: [a] Pickard and King (2012a) and own calculations; [b] Own calculations, based on Pickard (2012b) and Bonneux et al. (2012).

7.6 Support for informal caregivers

In this section we provide some results on how much support the different LTC systems provide for the informal caregivers. Part of the LTC services are provided informally, typically by family members. The extent of the prevalence of informal caregiving varies across the countries. In addition, the burden on the caregivers also varies. Thus it can be considered as a goal of LTC systems to

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[42] Eurostat website (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database).

minimise the burden on the informal caregivers, e.g. through supporting the provision of care, or through helping with the combination of caregiving and labour market participation.

Vilaplana Pietro (2011) analyses jointly the unmet needs in formal care, provision of informal care, and labour problems of the informal caregivers. The data used is the Eurobarometer EB67.3 survey. She takes into account the simultaneous determination of the three analysed variables, and provides evidence that unmet needs increase the probability of becoming a care giver, and also increase the likelihood of facing labour market problems. She also shows that these effects are not homogenous across the European countries. Occupation specific probabilities reveal that highly skilled workers are more likely to suffer labour market problems due to caregiving in all countries.

Our aim here is to provide some indications on the labour market consequences of informal care giving. First, we present descriptive statistics on labour market probabilities due to care giving, based on the Eurobarometer EB67.3 data. The number of caregivers with labour force participation problems as a consequence of caregiving tasks is divided by the total number of working caregivers. As Vilaplana Pietro (2011) discusses, the emergence of labour force participation problems because of caregiving responsibilities is on average 20 percentage points lower for male European caregivers than for female caregivers. The gender and country specific statistics are presented in Table 7.13.

Table 7.13 Percentage of caregivers with labour force participation problems as a consequence of caregiving tasks relative to the number of working caregivers

	Men	Women
Austria	42.81	62.96
Belgium	25.07	47.99
Bulgaria	41.93	50.81
Croatia	32.96	49.78
Cyprus	31.72	54.69
Czech Rep.	28.19	54.15
Denmark	22.19	31.15
Estonia	32.55	44.82
Finland	31.84	53.53
France	24.78	27.56
Germany	36.15	51.95
Greece	22.84	71.8
Hungary	48.75	61.45
Ireland	27.18	40.49
Italy	37.98	50.95
Latvia	18.16	36.36
Lithuania	19.78	45.36
Luxemb.	28.56	57.4
Malta	32.56	75.89
Netherlands	19.85	63.4
Poland	32.36	64.96
Portugal	20.49	34.43
Romania	36.26	49.83
Slovakia	34.24	52.51
Slovenia	37.02	48.13
Spain	38.28	63.98
Sweden	17.89	28.72
Turkey	47.45	96.21
UK	36.68	56.98
EU-27	29.54	49.68

Source: Vilaplana Pietro (2011), Table A3.

Table 7.13 shows that relatively low ratios of working caregivers have labour market problems in Denmark, Latvia, Portugal and Sweden. The low probability of labour problems can be due to flexible

labour market conditions (e.g. part-time working time), or to the restriction of informal caregiving to less severe cases. On the other hand, this ratio is comparatively high in Austria, Malta, Spain and Turkey.

Chapter 3 of Colombo et al. (2011) also highlights the potential negative consequences of informal caregiving in the sense that it can have negative labour market consequences, and can lead to worsening physical and mental health of the care giver. The authors propose flexible working hours, employment support programmes and practical help to carers as potential solutions for mitigating the burden on caregivers. They also point out that the accessibility of formal care is also an influential factor in the burden on informal caregivers.

We repeat here the results of Colombo et al. (2011) related to mental health problem. This complements the analysis on the labour market consequences of informal caregiving. The reported statistics are based on the British Household Panel Survey (BHPS), and the Survey of Health, Ageing and Retirement in Europe (SHARE).

Table 7.14 Prevalence of mental health problems and composite indicator of support

	Mental health problems		Ratio of carers/non-carers	Support to carers (0-5)
	Carers	**Non-carers**		
	%	**%**		
Austria	40	30.2	1.33	3
Belgium	50.3	37.4	1.35	4
Bulgaria				0
Czech R.	46.6	34.3	1.36	2
Denmark	39.4	27.5	1.43	3
Estonia				3
Finland				3
France	52.2	43.4	1.2	5
Germany	42.9	33.3	1.29	3
Greece	44.8	31.1	1.44	
Hungary				0
Ireland	34.6	30	1.15	
Italy	48.9	48	1.02	0
Lithuania				4
Netherlands	40.2	31.4	1.28	3
Poland	73.4	62.3	1.18	1
Romania				4
Slovakia				3
Slovenia				5
Spain	55.8	46	1.21	3
Sweden	32.6	31.3	1.04	2
Switzerland	28.3	29.1	0.97	
UK	23.1	18.8	1.23	2 (England)

Sources: Colombo et al. (2011), http://dx.doi.org/10.1787/888932401254 and Kraus et al. (2010).

Table 7.14 shows that the probability of having mental health problems is higher among the caregivers in all of the analysed European countries, except for Italy, Sweden and Switzerland, where the differences between the carers and non-carers are minor. This suggests that informal caregiving can indeed lead to mental health problems on the side of the caregivers. The differences in the prevalence rates are the highest in Denmark, Greece, the Czech Republic, Belgium and Austria, thus there are no clear geographical patterns in these differences. Colombo et al. (2011) also show that mental health problems are more likely to occur if the provision of informal care is more intensive.

Finally, Kraus et al. (2010) also provide an indicator of support, based on the sum of benefits for informal care recipients, income support for informal caregivers and other benefits for informal caregivers. We rescale this variable to the 0-5 scale, with a higher value corresponding to more support to the caregivers. These statistics are reported in the last column of Table 7.14. According to this indicator the support is the strongest in France and Slovenia, and the weakest in Bulgaria, Hungary and Italy.

The indicators of labour market difficulties among men or women (Table 7.13) and of the support to caregivers (Table 7.14, last column) are consistent with each other in the sense that there is a negative correlation between these (-0.43 for men and -0.35 for women). There is no such consistent relationship between the support indicator of Kraus et al. (2010) and the indicator of mental health problem among the carers, suggesting that the more formal measures of support cannot capture the actual mental consequences of caregiving on the carers.

7.7 Choice

Regarding the choice of care, we can consider the performance of a LTC system to be better if the users are able to choose to a higher extent who will give the care, and where and how the care is organised. More flexibility in choice can allow the users to select services that correspond to their needs. Pursuing this aim, on the other hand, can contradict some other aims of the LTC systems, such as affordability or sustainability.

The choice of care has several dimensions, including the option to stay in the own home if possible, the possibility to choose providers, including the option to hire family members as caregivers, choices on transportation, etc. Due to limited availability of comparable data, here we consider only two dimensions: whether recipients can choose the provider freely, and whether benefits in cash are available. The source of these indicators is the data collected in the first work package of ANCIEN.

The first dimension that we consider is the choice of provider; that is whether care recipients can choose the provider freely at institutional care and at formal home care. This information is provided in the first two columns of Table 7.15. As the table shows, in most of the countries there is free choice of provider. As for formal home care, the only exception is Finland. The limited choice of provider is somewhat more prevalent in institutional care: there is limited choice in Denmark, Finland, Italy and Spain.

The second dimension that we have information on is the availability of benefits in cash. In particular, we know from the same data collection whether in a given country there are benefits in cash available, and if yes, then whether those are available both for institutional care and formal home care. We scale this indicator on the 0-2 scale, 0 corresponding to no cash benefits, 1 to cash benefits in one of the service types, and 2 to cash benefits in both service types. Receiving the benefits in cash rather than in kind allows the LTC user to choose freely among the available services, thus the choice options become wider. If an assessment is required then that can indicate that the allocation of the benefits might be more efficient in the sense that there is no undue provision of LTC benefits. We know from the same data collection that except for Estonia and France, if there are benefits in cash available then an assessment is required for that.[43] It can be also seen that this source for higher choice is not available in Bulgaria, Denmark, Hungary, Romania and Sweden.

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[43] The categorisation of Poland is not straightforward. In Poland people aged 75 or above receive some cash benefits. These can be considered as cash benefits without assessment, although the age restriction might be viewed as a form of assessment.

Table 7.15 Indicators of freedom of choice

	Can care recipients choose the provider freely?		Availability of benefits in cash (0-2)
	Institutional care	**Formal home care**	
Austria	Yes	Yes	2
Belgium	Yes	Yes	2
Bulgaria	Yes	Yes	0
Czech Republic	Yes	Yes	1
Denmark	No	Yes	0
Estonia	Yes	Yes	2
Finland	No	No	2
France	Yes	Yes	1
Germany	Yes	Yes	1
Hungary	Yes	Yes	0
Italy	No	Yes	2
Latvia	Yes	Yes	1
Lithuania	Yes	Yes	1
Netherlands	Yes	Yes	1
Poland	Yes	Yes	1
Romania	Yes	Yes	0
Slovakia	Yes	Yes	1
Slovenia	Yes	Yes	2
Spain	No	Yes	2
Sweden	Yes	Yes	0
England	Yes	Yes	2

Source: Data collected by IHS (ANCIEN WP 1).

7.8 Conclusions and overall evaluation

In this chapter we analysed the performance of LTC systems in Europe, building on the results of the ANCIEN project. We provided indicators on several dimensions of performance. In many cases the analysis was restricted by the availability of data: it is difficult to quantify all the dimensions of performance, and even if quantitative indicators are available then those are not always comparable across countries. As a summary, we select a representative set of performance dimensions, and evaluate the LTC systems of the four representative countries along these selected dimensions. This can provide an overall overview on the relative performance of the various types of LTC systems in Europe. Due to the complex nature of the LTC systems, such an overall evaluation exercise is necessarily based on a set of simplifying assumptions. An important simplification is that we have to make assumptions on the weights of the different performance dimensions in the overall evaluation. Therefore the overall numerical evaluation of the performance of the LTC systems should be considered only as indicative. Even though we did our best in quantifying the dimensions of performance, more emphasis should be put on the main differences between the countries, rather than on the exact values of the performance indicators.

When selecting the performance dimensions we follow two basic aims. First, these dimensions should clearly reflect the performance of the LTC systems. Thus we exclude the ability dimension here, as that is strongly influenced by other factors than the LTC system itself. Second, the selected dimensions should be sufficiently independent from each other, but cover the main aspects of the LTC systems. For example, accessibility is omitted since that is closely related to the equity and total burden of care. The support given to informal caregivers is also not considered here, as the cost of such support is not captured by the available indicators. Based on these considerations, we summarise the performance of LTC systems along the following five dimensions: the quality of life of (potential) LTC users, the quality of services, total burden of care, equity of care, and choice. The first two

selected dimensions capture the quality of care, where the first is an outcome at the level of the final user, whereas the second is rather an outcome at systems' level. The efficiency of a system can be considered to be higher if the quality of care relative to the total burden is higher.

As our final aim is to give an overall evaluation of the performance of the LTC systems, the indicators of the selected five dimensions have to be comparable. It is not possible to directly aggregate the indicators of different performance categories. Therefore apart from reporting again the indicator values, we also standardise them. The standardised values have mean of zero and standard deviation of one. In addition, we also ensure that higher values always imply better performance, thus after standardisation we also reverse the sign of the total burden indicator.

The evaluation of the LTC systems according to the quality of life of (potential) LTC users is based on the analysis of chapter 4. In the upper part of Table 7.16 we show the three results that we use in this evaluation exercise: the average marginal effects (AME) of living in a certain country on the probability of receiving help, the AME of living in a certain country on the probability of the help meeting the needs all the time, and the estimated coefficients for the unobserved system properties. Then we generate a standardised score for the representative four countries in the following way: we standardise the three indicators, take the average, and then rescale this average so that it has standard deviation of one (and mean of zero).[44] As quality indicator we select the quality score based on the quality evaluations reported in the Eurobarometer data, taking the average of the country specific mean evaluation of home care and nursing home quality. The equity of care in the representative countries is ranked based on the analysis presented in chapter 5. Again, the equity of LTC is in itself multidimensional. We quantify the equity of care by attaching values to the categories provided in chapter 5: 1 - low equity, 2 - medium low, 3 - medium, 4 - medium high, 5 - high or very high. Then we take the average of the so generated indicators of equity in revenue raising and resource allocation, these numbers are reported in the upper part of Table 7.16. The standardised score is generated by taking the average of these two generated indicators of equity and standardising the so obtained score. The evaluation of LTC systems according to the total burden of caregiving is also based on two indicators. First, we use the simulation results provided in section 7.5.3, considering both the public and private expenditures on formal LTC in 2040. Second, we also consider the ratio of the projected number of caregivers based on the current supply and future need. We arrive at the standardised score of total burden in a similar way as for the quality of life indicator: we standardise these indicators, then reverse the sign and calculate the average of the so obtained score, finally we rescale these values so that the standard deviation equals one - this number serves as the standardised indicator of total burden of care giving, with higher value corresponding to better performance. Finally, as an indicator of choice we simply add up the available information on the freedom of choice of providers and on the availability of benefits in cash. A country ranks the highest if the providers both in home care and institutional care can be chosen freely, and if benefits in cash are available for both service types. This gives a choice score of 3 for all four representative countries, thus we cannot differentiate the four representative countries according to this dimension. The equal value across the countries implies a standard deviation of zero, thus these indicators cannot be standardised. Due to the equal values, omitting this category from the final ranking does not influence the results.

Table 7.16 shows the original and standardised scores of the representative countries. As for the standardised scores, a higher number reflects better performance according to the specified indicators. In the last part of the table we present the average scores for the representative countries. We take a simple average of the standardised scores. According to this analysis the performance of the Dutch system is estimated to be the best, followed by the German and Polish systems, and the Spanish system is estimated to fare the worst. The table also reveals some trade-offs. For example, the quality

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[44] With this approach we give equal weight to the three aspects of quality of life. We chose this approach as we lack a clear indication related to how these aspects should be weighted. The similar consideration holds for the two aspects of total burden of caregiving.

of life and the quality of care are high among the Dutch LTC users without strong dependence on informal care and private financing. However, the Dutch system is expensive in terms of public financing, and uses a lot of formal care. On the other hand, Germany seems to have a more affordable system in terms of expenditures on formal care with relatively high quality of life among the LTC users, but this system relies strongly on the services provided by informal caregivers.

If the burden of informal caregiving is omitted from the overall evaluation then Germany performs relatively better, and Spain performs better than Poland. Thus our results are sensitive to the inclusion of the aspect of the burdens of informal care giving.

Table 7.16 Evaluation of LTC systems based on the representative indicators

	Quality of life			Quality of care (1-4)	Equity (1-5)		Total burden		Choice (0-4)
	AME on help	AME on help meets needs	Unobserved properties		Revenue raising	Resource allocation	Formal (%GDP)	Informal (% 50+)	
DE	0	0	-0.275	2.699	3.5	3.5	2.186	7.14	3
NL	-0.096	0.068	-0.206	2.855	5	5	4.84	2.07	3
PL	-0.374	-0.057	0.27	2.33	1	1.25	0.1	5.92	3
ES	-0.311	-0.124	-0.207	2.772	2	1.5	0.805	7.77	3

Standardised values (higher score - better performance)

	Quality of life	Quality of care	Equity	Total burden	Mean score	Mean score. burden of informal caregiving excluded
DE	0.494	0.151	0.374	-1.044	-0.006	0.23
NL	0.851	0.825	1.229	0.106	0.753	0.385
PL	0.078	-1.442	-0.98	1.324	-0.255	-0.361
ES	-1.423	0.466	-0.624	-0.382	-0.491	-0.255

An alternative way to evaluate the relative performance of LTC systems is based on multi-criteria decision methods.[45] These methods differ from the simple "additive" approach used above in that they are based on dominance relationships between subjects (LTC systems of countries) and for each relevant dimension (performance indicator). Biggiero & Laise (2003) provide an example of an algorithm based on an "outranking" method along these lines, and it is their method we have used here. It can be briefly summarised as follows (the reader is referred to the original article for a detailed discussion): A country "dominates" another country in a dimension when it scores higher on the corresponding indicator, in which case it is assigned a "1" (otherwise "0"). The individual dominance indicators per dimension (0/1) are combined into one dominance value defined as a weighted sum using weights assigned to the dimensions. Overall dominance of one country over another is achieved when the composite dominance value exceeds a chosen threshold. When this threshold is chosen to be 0.5 (50%), this amounts to choosing a winner in a pair-wise comparison by simple "majority rule": the accumulated "votes" in favour of a country, weighted by their importance, determine the outcome.

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[45] This evaluation exercise was performed by Peter Willemé. The application of the outranking method was suggested by Roberto Dandi.

The final result of this algorithm is a full set of bilateral dominance indicators, gathered in a square "outranking matrix".

Applying this method to the scores in Table 7.16 results in the outranking matrix presented in Table 7.17. The entries in this matrix are zero or one, indicating whether (1) or not (0) the "row country" outranks the "column country".

Table 7.17 Outranking matrix computed for representative countries: a value 1 indicates that the row country outranks the column country

	DE	NL	PL	ES
DE		0	1	0
NL	1		1	1
PL	0	0		0
ES	0	0	0	

The matrix in Table 7.17 was obtained using the scores in Table 7.16, equal weights for the four performance indicators and a threshold value of 0.5. The results are comparable with, but not identical to, the ranking obtained from the simple average scores in Table 7.16: the Netherlands outranks the other three countries, Germany outranks Poland, while Spain is outranked only by the Netherlands. This results in the following final ranking: (1) the Netherlands, (2) Germany, and (3) Poland and Spain. It is interesting to note that Spain and Poland end in a "draw": neither country dominates the other. This indeterminacy is a consequence of the multi-criteria character of the method, which allows a country to dominate another in some dimensions, but to be dominated by that same country in others. In terms of the performance indicators, Spain outperforms Poland in terms of quality of care and equity, but is dominated by Poland in terms of quality of life and total burden.

The indeterminacy of the multi-criteria decision method is, in our opinion, not a drawback: it recognises the fact that with multiple dimensions, it is possible to have conflicting dominance (or outperformance) relationships between subjects.

We finish our analysis with some cautionary remarks. Although our overall evaluations are based on a rich set of available indicators, it is important to keep in mind the limitations of the comparisons. We had to face a series of measurement problems, especially in terms of the quality of LTC services, and the support provided to the informal caregivers. We do not know the correct weights for the different dimensions of performance, since we do not know the preferences. Moreover, even if the numerical results are reliable those do not imply that for example the Dutch system, which has a good performance, would have a similarly good performance when implemented in another country.

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8. Review and conclusions

8.1 The concept of performance

Performance of LTC systems is a multi-dimensional concept. We distinguished five important goals of LTC systems, one ultimate goal at the level of final users of LTC and society, three intermediate goals at the level of the LTC systems and one desirable systems' characteristic (see chapter 2):

1. Quality of life of LTC users and an appropriate balance between LTC and other societal needs
2. Quality of care
3. A manageable total burden of care (consisting of the financial burden of formal care and the burden of informal care)
4. Equity
5. Choice of settings and providers

An important notion is that although these goals represent different dimensions, there are clear trade-offs among them. One very important trade-off is that improving the quality or equity is likely to make the total burden of care higher, unless there are efficiency gains to be made.

8.2 Overview of the analysis

In order to compare the performance of national systems we need internationally comparable information on the results for the five goals. For the first goal we need to know about the quality of life of LTC users or potential LTC users.[46] This information is based on an analysis of the experience of LTC users, using the SHARE database. This analysis yields indicators for the LTC-related quality of life of elderly persons with limitations in 13 countries. These indicators were used to construct scores for the quality of life-goal (see chapter 4 of this report). For the second goal, quality of care, we use information from ANCIEN work package 5 and external sources. Chapter 7 gives an overview of the available information on quality of care, accessibility of care and the total burden of care. The third goal, a manageable total burden of care, has two dimensions: the financial burden of formal care and the burden of informal care giving. To assess the financial burden we use results from ANCIEN work package 1 and ANCIEN projections of future LTC expenditures. These projections are described in chapter 6. Information about the burden of informal caregiving can be found in the results of ANCIEN work packages 3 and 6 and from external sources such as Colombo et al. (2011). Scores for the fourth goal are based on an analysis of equity in the four representative countries (Germany, the Netherlands, Spain and Poland) that is described in chapter 5 of this report. Information about the fifth goal, choice, is based on results of ANCIEN work package 1.

In summary, for many of these goals the information we use, is based on analyses within the ANCIEN project. Some of the underlying analyses are included in this report, while others are described in previous ANCIEN WPs.

Chapter 7 of this report describes the overall evaluation of the performance of LTC systems. It gives an overview of the available information for the ANCIEN countries, not just for the five goals described above, but also for most of the other criteria in the performance framework: support for informal caregivers, accessibility of care and improving functional ability. This chapter also includes a discussion of data problems. It is, generally speaking, difficult to collect internationally comparable information. This turned out to be especially difficult for the quality of care, since countries tend to formulate different national indicators. This implies that nationally collected information is incomparable. Furthermore, chapter 7 describes the methods for combining the information on the different scores. Combining the scores on four dimensions (choice is excluded here) in one final score

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[46] The balance between LTC and other societal needs is considered in a partial way; that is to say, we consider the total burden of LTC at the fourth goal, but do not analyse the relative importance of other societal needs.

necessitates the use of weights for the different goals. Such weights would ideally be based on large international surveys to determine the relative preferences in different countries. Unfortunately such information is not available. We made the simplifying assumption to use equal weights for all dimensions. In addition, a multi- criteria decision method was used as an alternative way of combining the information on the dimensions (see chapter 7).

8.3 Performance in the four representative countries

The information about the performance of the LTC systems is more complete for Germany, the Netherlands, Spain and Poland, than for the other countries included in the ANCIEN project. This is because modelling of long-term care needs and long-term care use was restricted to these four countries.[47] Even though we would have liked to have better and more complete information even for these countries, we could carry out a more or less complete evaluation. The results on four key performance dimensions are summarised in Figure 8.1.

Figure 8.1 Standardised performance scores of LTC systems on 4 dimensions
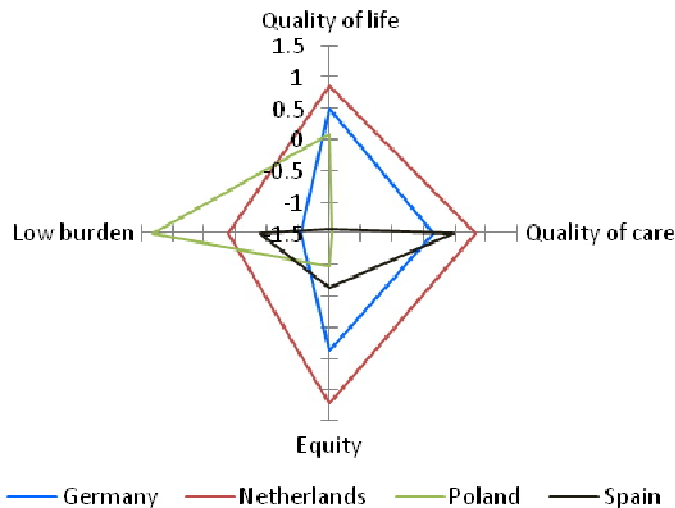
The Dutch system has the highest scores on all dimensions except the total burden of care, where it has the second best score after Poland. The Dutch score on total burden is based on a relatively very high future expenditure on formal care combined with a low burden of informal caregiving (see chapter 7).[48] In the performance of the Dutch system we see to some extent the trade-off in action between the total burden of care and the other dimensions: equity and quality can be relatively high because the Netherlands spends a lot on publicly financed formal care. The high reliance on formal care, combined with the ageing of the large post-war baby boom generation in the Netherlands, leads to high expenditure projections compared to other countries. However, the total burden of care is lower than in Germany and Spain because of the relatively low use of informal care.[49] Over the four dimensions taken together, the Dutch system seems to score relatively well.

The German system has somewhat lower scores than the Dutch on all four dimensions. For quality of life and equity the German system ends up in the second place after the Dutch system. Here we should

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[47] In some cases it was even restricted to three countries because the necessary data for Poland were not available.

[48] The score for expenditure is based on projected expenditures in 2040.

[49] This is under the assumption that the financial burden of care and the burden of informal caregiving have equal weights.

keep in mind that these dimensions themselves are multidimensional. For example, on the important aspect of older persons receiving help with their limitations, Germany has the best score, whereas the Netherlands scores better on the help meeting the needs all the time and Poland scores best on unobserved properties of the LTC system that affect the quality of life. These underlying results are described in detail in chapter 4. The German system is somewhat less equitable than the Dutch mainly because of the large role of informal care and the exclusion of people with lower care needs from the publicly financed system (see chapter 5). Remarkably, the German system has the least favourable score of the four systems on the total burden of care. The financial burden in Germany is a lot lower than in the Netherlands, but still considerably higher than in Spain and Poland, while the burden of informal caregiving in Germany is comparable to the high burden in Spain. Even though Germany carries the highest burden of LTC according to our scores, it does not have the best results on quality and equity. One of the reasons is that the high burden consists for a considerable part of the burden of informal care giving, and this is a less equitable way of organising the LTC system.

The Polish system excels in having a low total burden of care. Naturally, considering the relation among the dimensions, this is likely to have a negative impact on other dimensions of performance. In Poland, we see a clear trade-off between the burden of care and the other dimensions. The Polish system scores lowest on quality of care and equity and best on the burden of care. Concerning indicators of quality of life for LTC users it ends up in the third place, because of the good unobserved properties of the Polish LTC system. The probability of receiving help with limitations is rather low in Poland, while at the same time the level of disability is high compared to other countries.

The Spanish system has few extreme scores. It scores lowest on indicators for quality of life of LTC users, but we have to keep in mind that results may have changed since the data collection for the second wave of SHARE because of the partial introduction of a new LTC system in Spain. Recently, the economic and financial crisis led to large budget cuts on publicly financed LTC. Concerning quality of care the Spanish system takes the second place. For equity and the total burden of care the Spanish system ends up in the third place.

If we just take a simple average over the four key dimensions, we see that the Netherlands scores first, despite the high total burden of care. It is followed by Germany in the second place, Poland in the third place and Spain in the fourth place.

Naturally, we cannot conclude from these overall scores that every country would be better off by implementing the highest scoring system. This is not just because the weights are unknown and preferences differ among countries, but also because a system as a whole is unlikely to be transferable to other countries. Its functioning will depend in part on a shared history and culture in a country and specific institutions. It is more reasonable not to attempt to copy other national systems, but to be inspired by them, especially concerning aspects where they score well. The lessons learned from other systems can be used, for example, to fine-tune aspects of a national system that are seen as unsatisfactory within the country itself.

Suppose for example that the Netherlands is worried about the high projected formal care use and the high projected public expenditure. The Netherlands could try to learn from the German system, as Germany is comparable to the Netherlands in many respects and still public expenditure on LTC is much lower. Our analysis shows that the probability of receiving help for elderly with limitations is even higher in Germany than in the Netherlands. So, how is this possible? First, the analysis in this project has taught us that Germany knows much stricter thresholds for being eligible for publicly financed help than the Netherlands, in terms of the severity of limitations. Secondly, private funding is much higher in Germany and the role of informal care is much larger for personal care. So Dutch policy makers could consider whether they also would like to introduce some form of thresholds or more private funding and how that would work out in the Netherlands. Some of the questions could be whether the role of informal care could be increased, to what extent and what drawbacks and advantages this might have.

8.4 Policy considerations

A number of lessons emerge from our research. The first lesson is that differences in the projected *level* of LTC use among countries are to a large extent determined by different patterns of care use and -to a smaller extent- by differences in disability levels. Demography plays a limited role. Among the four representative countries, we see that the prevalence of disability among elderly persons is especially high in Poland (39% in 2040) and relatively low in the Netherlands (17% in 2040) (see chapter 7). This difference has little to do with the composition of the populations over age and gender. If Poland would have the most favourable demographic composition in 2040, that of Spain, the disability rate in Poland would still be 37% (instead of 39%) according to the simulations. If the Dutch population was as disabled as the Polish is according to SHARE, care use in the Netherlands would be at least 50% higher in 2040. The Netherlands on the other hand, has the most intensive care use pattern for formal care. The differences with Poland are especially large. Residential care use in Poland in 2040 would be almost 10 times as high if the Polish population would follow the Dutch care use pattern (11.9% of the elderly population instead of 1.3%). If the Dutch population with its Dutch demography and disability would follow the Polish care use pattern, residential care use would almost vanish in the Netherlands (from 7.2% to 0.6% in 2040). In the case of Poland and the Netherlands the impact of the care use pattern is much larger even than the impact of the considerable differences in disability level. The results show that differences in LTC use among countries can only be explained to a very limited extent by demography. The impact of the disability level is much larger, but still modest compared to the large impact of the care use pattern.

A second lesson is that whereas demography is not much of a determinant of the *level* of care use, demographic developments are indeed important determinants of the *growth* in the future need for LTC. In countries where ageing plays an important role, the demand for LTC will increase considerably in any case, even when future elderly are going to be healthier than the current elderly. This is simply the effect of the way the population is divided over different age categories, while the probability of becoming disabled is age-dependent. Using Poland and the Netherlands again as an example, we see that the number of elderly disabled women in Poland is projected to increase by 180% in 2040. However, if the Polish prevalence rates would be combined with the Dutch demography with its large baby boom, the increase would be 386% (more than twice as much). The other way round, if the lower Dutch prevalence rates would be combined with the Polish demography, the increase in disabled elderly women would be 87% (instead of 180%). Both demography and prevalence rates have an important impact on the growth of disability.

Thirdly, where organisation of LTC is concerned, many roads lead to Rome. Countries have organised their LTC systems in vastly different ways, even countries that are quite comparable in economic development.[50] Some of the ways to organise LTC are more equitable but more expensive in terms of public expenditure. Others are both less expensive and less equitable. Very different ways of organisation can lead to the same results for aspects of performance such as the probability of older persons with limitations receiving help.

A very important difference among countries can be found in the role of informal care. This role ranges from almost being the only source of LTC (as in Poland) to being relatively unimportant though still playing an important role in the absolute sense (as in the Netherlands, Denmark and Sweden). Another important difference is the role of private funding. The underlying difference is in the division of responsibility among the state on the one hand and the individual or the family on the other hand. In the Netherlands, Denmark and Sweden a large part of the responsibility is borne by the state. This means high public spending, low private spending and a relatively high use of formal care. In many other countries the individual or family has more responsibility. This leads to more informal care and more private funding. In some countries the state responsibility is restricted to being a safety

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[50] Examples are the Netherlands and Germany: both countries have public insurance for LTC, but the systems are still very different.

net for those with severe limitations who have no informal caregivers and insufficient private means. The English LTC system is an example of this. Choices on this continuum have a large effect not only on public expenditure but also on the fairness of the system. With informal care and private funding, risk sharing is limited, so the funding of the system is less equitable. Family members have to supply informal care (or pay for private care) because they have someone near them who needs it, independent of their capacity to contribute to funding of care. And for elderly persons with limitations, their chances of receiving help depend to a lesser extent on their needs and to a larger extent on the coincidence of having access to informal carers or not or being able to pay for private care.

Thus more publicly oriented LTC systems tend to be more equitable, but there is a price to be paid. Because such systems depend more on public funding, the financial burden is generally higher and may increase a lot when ageing plays an important role. This is what will happen in the Netherlands if the care use pattern stays the same. Not only does the Netherlands have a publicly oriented system, we also see that the use of expensive residential care is relatively high and -more importantly- there was a large post war baby boom in the Netherlands that is going to need LTC in the not too distant future. The price for equity given this pattern of ageing is that future financial affordability is likely going to be a problem. However, we should not conclude that countries with a large dependence on informal care are safe from future problems with the sustainability of their LTC system (see below).

A fourth lesson from WP6 of the ANCIEN project is that both formal care oriented and informal care oriented systems will find it a challenge to ensure a sufficient supply of long-term care in the future with ageing populations. The projections for the four representative countries have shown that the supply of informal care will not increase as fast as the potential use of informal care.[51] In Spain an especially large gap between the necessary and available number of informal caregivers would open up by 2060 (see Table 8.1). The relatively slow projected increase in the supply of informal care in the four countries is mostly due to the projected trends in intergenerational care. These trends are driven by underlying demographic trends in the numbers of persons aged 50 to 64. The projections of informal care supply in WP6 take into account developments in age, gender and marital status of caregivers. Possibly other developments in society will have an additional negative effect on informal care supply, much of which is still provided by women. A larger labour market participation of women and children living further from their parents may increase the care gap.

Table 8.1 Development of informal care gap (% changes over time)

Country	Period	Supply to meet demand (at constant ratio caregivers to care-users)	Supply at constant probabilities of providing care
		%	%
Germany	2010-2040	50.7	29.5
	2010-2060	50.9	25.3
Netherlands	2010-2040	79.5	51.5
	2010-2060	65.6	39.4
Spain	2010-2040	76.9	56.0
	2010-2060	140.2	40.1

Source: Pickard & King (2012b), Table 7.3.

WP6 also produced projections for the formal care gap. These are summarised in Table 8.2, where the assumption is used that a constant fraction of the workforce will be employed in providing personal and nursing care for older persons with limitations. Under this assumption, the supply of formal care workers will decrease in every country, while the supply that would be necessary to meet demand will increase by more than 90% to almost 150% depending on the country. We have to keep in mind that

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[51] Pickard & King (2012a) make projections of the number of people aged 50 and over who provide regular personal care to an older person in Germany, the Netherlands, Spain and Poland.

there is no inherent reason for the fraction of the workforce employed in personal and nursing care to remain constant. It may well be possible to increase the share of LTC workers in the total workforce, but the projected necessary increases are considerable and will certainly take efforts.

Table 8.2 Development of formal care gap (% changes over time, 2010-2050)

Country	Supply to meet demand (at constant ratio of care workers to care-users)	Supply at constant fraction of workforce
Germany	94.4	-19.3
Netherlands	145.8	-3.4
Spain	129.8	-15.1
Poland	129.5	-19.9

Source: Geerts & Willemé (2012).

A final lesson to be learned from the analysis in this WP is that it is rather difficult to compare LTC systems. One important reason is a lack of internationally comparable data. If countries consider it important to learn from each other's systems, collection of comparable data would have to get more attention. This is especially the case for data on the quality of care. Another difficulty with comparing systems is that these systems are clearly multidimensional and the weights for the different performance dimensions are unknown. Research into these weights, especially internationally oriented research, would be very useful.

Overall, we can conclude that information about other national systems can provide inspiration for adapting a country's own system. Using the performance framework, policy makers can identify the weak points of their own system and in the next step, select some countries where the LTC system scores well on those dimensions. They can see how those countries manage to score better on those particular aspects and this may inspire them to improve their own system. Sometimes other countries have found unexpected 'solutions' for certain problems. But policy makers would still have to consider carefully how well the solutions found in other countries, would work in their own country and which trade-offs are involved.

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ANCIEN

Assessing Needs of Care in European Nations

FP7 HEALTH-2007-3.2-2

L aunched in January 2009, ANCIEN is a research project financed under the 7th EU Research Framework Programme. It runs for a 44-month period and involves 20 partners from EU member states. The project principally concerns the future of long-term care (LTC) for the elderly in Europe and addresses two questions in particular:

1) How will need, demand, supply and use of LTC develop?

2) How do different systems of LTC perform?

The project proceeds in consecutive steps of collecting and analysing information and projecting future scenarios on long-term care needs, use, quality assurance and system performance. State-of-the-art demographic, epidemiological and econometric modelling is used to interpret and project needs, supply and use of long-term care over future time periods for different LTC systems.

Work Packages. The project started with collecting information and data to portray long-term care in Europe (WP 1). After establishing a framework for individual country reports, including data templates, information was collected and typologies of LTC systems were created. The collected data form the basis of estimates of actual and future long term care needs in selected countries (WP 2). WP 3 builds on the estimates of needs to characterise the response: the provision and determinants of formal and informal care across European long-term care systems. Special emphasis is put on identifying the impact of regulation on the choice of care and the supply of caregivers. WP 6 integrates the results of WPs 1, 2 and 3 using econometric micro and macro-modelling, translating the projected needs derived from WP2 into projected use by using the behavioral models developed in WP3, taking into account the availability and regulation of formal and informal care and the potential use of technological developments.

On the back of projected needs, provisions and use in European LTC systems, WP 4 addresses developing technology as a factor in the process of change occurring in long-term care. This project will work out general principles for coping with the role of evolving technology, considering the cultural, economic, regulatory and organisational conditions. WP 5 addresses quality assurance. Together with WP 1, WP 5 reviews the policies on LTC quality assurance and the quality indicators in the EU member states, and assesses strengths, weaknesses, opportunities and threats of the various quality assurance policies. Finally WP 7 analyses systems performance, identifying best practices and studying trade-offs between quality, accessibility and affordability.

The final result of all work packages is a comprehensive overview of the long term care systems of EU nations, a description and projection of needs, provision and use for selected countries combined with a description of systems, and of quality assurance and an analysis of systems performance.

Principal and Partner Institutes

CEPS is responsible for administrative coordination and dissemination of the general results (WP 8 and 9). The Belgian Federal Planning Bureau (FPB) and the Netherlands Bureau for Economic Policy Analysis (CPB) are responsible for scientific coordination. Other partners include: German Institute for Economic Research (DIW); Netherlands Interdisciplinary Demographic Institute (NIDI); Fundación de Estudios de Economía Aplicada (FEDEA); Consiglio Nazionale delle Ricerche (CNR); Universitá Luiss Guido Carli-Luiss Business School (LUISS-LBS); Institute for Advanced Studies (IHS); London School of Economics and Political Science- Personal Social Services Research Unit (PSSRU); Istituto di Studi e Analisi Economica (ISAE); Center for Social and Economic Research (CASE); Institute for Economic Research (IER); Social Research Institute (TARKI); The Research Institute of the Finnish Economy (ETLA); Université de Paris-Dauphine-Laboratoire d`Economie et de Gestion des organisations de Santé (DAUPHINE- LEGOS); University of Stockholm, Department of Economics; Karolinska Institute-Department of Medecine, Clinical Epidemiology Unit ; Institute of Economic Research, Slovak Academy of Sciences (SAS-BIER); Center for Policy studies (PRAXIS). Most of the ANCIEN partners are members of the European Network of Economic Policy Research Institutes (ENEPRI).

For more information, please visit the ANCIEN website (www.ancien-longtermcare.eu) or the CEPS website (www.ceps.eu).