



Full length article

Unravelling hidden inequities in a universal public long-term care system[☆]

Joaquim Vidiella-Martin^{a,*}, Helena M. Hernández-Pizarro^{b,c}, Pilar García-Gómez^{d,e},
Guillem López-Casasnovas^{c,f}

^a Nuffield Department of Primary Care Health Sciences, University of Oxford, United Kingdom

^b Department of Business, TecnoCampus, Universitat Pompeu Fabra, Spain

^c Center for Research in Health and Economics (CRES), Universitat Pompeu Fabra, Spain

^d Erasmus School of Economics, Erasmus University Rotterdam, The Netherlands

^e Tübingen Institute, The Netherlands

^f Department of Economics and Business, Universitat Pompeu Fabra, Spain

ARTICLE INFO

JEL classification:

I14

I38

J14

Keywords:

Long-term care

Equity

Public provision

Voucher

In-kind

ABSTRACT

We study the socioeconomic horizontal inequity in the allocation of publicly subsidised long-term care (LTC) in Spain, using administrative data from the universe of applicants in Catalonia. We find that, after controlling for needs, cash subsidies for informal care are disproportionately concentrated among wealthier individuals, while the use of formal care services (home care and nursing homes) is concentrated among the less well-off. This suggests that cash benefits may inadvertently facilitate access to wealthier individuals' private care. We also find inequity in the form of provision, with in-kind services being more prevalent among the worse-off while wealthier beneficiaries are more likely to receive vouchers. While this duality in provision does not lead to significant differences in overall time to access LTC, we find that lower-income individuals wait longer for telecare, and wealthier individuals opting for in-kind nursing home care wait longer, suggesting potential differences in preferences or constraints. We find no evidence of socioeconomic inequity in the time spent navigating the administrative application process. Our findings highlight the need for policymakers to consider the potential unintended consequences of cash benefits and different forms of provision to ensure equitable access to LTC services.

Introduction

Long-term care (LTC) systems are increasingly adopting needs-based approaches to resource allocation, aiming to enhance equity and efficiency. This shift towards proportional universalism, where benefits are tied to individual needs, is particularly crucial in the face of diverse care needs and rising costs. However, the effectiveness of these needs-based systems in achieving equitable allocation of LTC resources, independent of socioeconomic status, remains largely unexamined.

In this study, we evaluate the extent to which publicly subsidised LTC in Spain, a system grounded in proportional universalism, is allocated according to needs, irrespective of income. The Spanish LTC system provides in-kind benefits and vouchers to help people access

professional LTC services and cash transfers to compensate for informal caregiving costs. It also provides medical nursing homes, nursing homes, day care centres, professional home care, and telecare. We use administrative data on the complete set of applicants for public LTC in the Northeastern Spanish region of Catalonia. Our data is unique because it includes individuals receiving formal care services (both institutionalised in a nursing home and non-institutionalised) and individuals receiving informal care (or a combination of formal and informal care at their homes). It also contains objective measures of LTC needs and socioeconomic status, which allows us to measure socioeconomic horizontal inequity in the system.

We first measure socioeconomic horizontal inequity in the use of several LTC services using the corrected concentration index, a well-established approach for studying inequalities in healthcare utilisation

[☆] The authors are thankful to Dolores Jiménez Rubio, Cristina Hernández Quevedo, Marianne Tenand, and participants at the 42nd Symposium of Spanish Economic Association (SAEe), the Spanish Health Economics Association annual meeting (Jornadas AES), and the Health Economics Ph.D. meeting at the Erasmus University Rotterdam for their useful comments and suggestions. We would also like to thank Cecilia Fabregas, Inma Palet, Nuria Claros and the rest of the team of Personal Autonomy and Disability at the Catalan Government Department of Social Rights for the help with the data. They have no responsibility for the analysis and conclusions presented in this study. Hernández-Pizarro and López-Casasnovas acknowledge financial support from the 'Obra Social La Caixa', the Agencia Estatal de Investigación (AEI; project ECO2012-37496), Fondo Europeo de Desarrollo Regional (FEDER; project ECO2017-88609-R) and Agaur (SGR-2021 SGR 00966). The usual disclaimer applies.

* Corresponding author.

E-mail address: joaquim.vidiellamartin@phc.ox.ac.uk (J. Vidiella-Martin).

while accounting for differences in need (Erreygers, 2009). Our analysis reveals a complex pattern of inequity. In line with previous evidence for Spain (García-Gómez et al., 2015), we find that cash transfers to cover informal care costs and telecare are concentrated among wealthier individuals. However, unlike previous work, we find that formal care services (home care and nursing homes) are concentrated among the less well-off after controlling for needs. These results are consistent with the possibility that individuals receiving cash transfers use these funds to access formal care services outside the public system, although further investigation is needed to confirm this hypothesis.

These results mask important differences in how formal LTC is supported (in-kind vs. voucher) across socioeconomic groups. In particular, we find that while services provided in-kind are concentrated among the worse-off, the wealthier are more likely to receive vouchers to cover LTC expenses from their preferred provider. Thus, this study also contributes to the literature on how social goods are provided. This literature has mostly focused on education and healthcare (Cave, 2001; Culyer, 1971). While there is vast evidence on the implications for efficiency of the form of provision, research on equity effects is scarce and inconclusive (Epple et al., 2017). In addition, compared with studies testing the effects of vouchers or in-kind support in education, few studies assess social and health services (Bergman et al., 2016; Blank, 2000; Emanuel et al., 2005; Hansmann, 1996) and none of these directly investigates LTC. On the one hand, vouchers may increase competition and the quality of services, reducing inequity. On the other hand, vouchers can also increase inequity if the worse-off are poorly informed on how to choose providers or have their choice restricted due to budget constraints.

This duality in the form of provision may lead to inequity in the quality of care received and waiting times. While we cannot test inequity in the quality of care, we investigate inequity in the time to access LTC services due to the beneficiary's capacity or financial constraints. The coexistence of public and private providers does not lead to significantly longer waiting times to access formal care benefits; except for telecare, with longer waiting times among the worse-off. Yet, the wealthy wait longer to access nursing homes provided via in-kind benefits. This suggests that the wealthier may choose nursing homes with longer waiting times, potentially because they can cover the costs of private nursing homes or other care while they wait for a publicly funded bed at a nursing home.

Lastly, we assess equity in the application process. One disadvantage of designing public interventions under proportional universalism criteria is that the bureaucratic process to access the benefits becomes more complex (and longer) as users' needs and financial capabilities must be assessed. In this context, the ability of applicants to wait may depend on the opportunity costs of reaching the service. This depends on the severity of the problem, the availability of affordable private alternatives for care, and the benefits of waiting for the desired option (Hillman, 2003; Laudicella et al., 2012). In contrast to previous evidence from Siciliani (2016), we find no evidence that low-income claimants wait longer to use the benefit after assessment, controlling for need.

Our results contribute to the growing literature on equity in the use of LTC. García-Gómez et al. (2015) analyse inequity in LTC use and unmet needs in Spain before introducing the universal LTC system. Their results show that formal care services are pro-rich distributed (i.e., concentrated among the rich even after adjusting for differences in need), while intensive informal care provision is pro-poor distributed. In comparison, our analysis focuses on a period when the LTC system is fully implemented and includes the institutionalised population. Therefore, our estimates provide useful evidence on how the allocation of LTC public subsidies satisfies the socioeconomic horizontal inequity criterion. Rodrigues et al. (2018) and Carrieri et al. (2017) analyse equity in home care use in several European countries, including Spain, using data from the Survey of Health and Retirement in Europe

(SHARE).¹ Their results suggest that professional home care is pro-rich distributed in most countries. Carrieri et al. (2017) show that this pattern differs between the types of home care. In particular, they find personal nursing home care equally distributed but observe pro-rich inequity in paid domestic care in Continental and Southern Europe but not Northern Europe. Besides the differences in the study period, our study complements and extends this evidence in several key dimensions. First, we use comprehensive administrative data covering the universe of LTC users in Catalonia, allowing for a more complete picture of the distribution of services than survey data, which often underrepresents institutionalised individuals. Second, our data includes objective measures of LTC needs and socioeconomic status, enabling a more precise assessment of horizontal inequity. Third, we utilise administrative income data rather than self-reported income to mitigate potential reporting biases. Finally, and most notably, our administrative data allows us to examine inequities in waiting times and the application process, an important aspect of LTC access that has not been extensively studied in previous research.

Duell et al. (2017), Tenand et al. (2020b), and Duell et al. (2019) are the only examples of previous literature that include information on the institutionalised population. Duell et al. (2017) look at institutional care in the Dutch public system and find access to nursing homes to be regionally horizontally equitable, while Tenand et al. (2020b) find overall LTC use in the Netherlands to be pro-poor after correcting for need using an administrative measure. Duell et al. (2019), also using Dutch administrative data, explore regional practice variation on LTC, focusing not only on access but also on use. While income does not greatly affect practice variation, the role of co-payments helps reduce it. The Netherlands has one of the most generous public LTC systems, with short waiting lists and low levels of private formal LTC (Tenand et al., 2020b). Therefore, results from the Netherlands may not be generalisable to countries with different institutional settings.

The rest of this paper is structured as follows. The next section describes the Spanish LTC system. Section "Methodology" describes the methodology, and Section "Data" presents the data. Section "Results" discusses the results. Finally, Section "Discussion" discusses the main conclusions, policy implications, and limitations.

Institutional background

In December 2006, the Spanish government passed the Act on the Promotion of Personal Autonomy and Care of Dependent People (Act 39/2006), termed the LTC Act hereafter. With a proportional universalism basis, Spain's LTC system provides LTC benefits to cover individuals with all forms of autonomy loss irrespective of the cause or age. Before the introduction of the LTC Act, the public provision of such care was restricted to the most deprived population with no family support. In this case, meeting LTC needs remained the family's responsibility for the majority, making informal caregiving the main form of LTC in Spain (García-Gómez et al., 2015). Despite the implementation of the LTC Act, Spanish expenditure levels on LTC are still modest compared to Northern and Central European countries: in 2013, LTC expenditures amounted to 0.83% of the Spanish GDP compared to Northern European countries who usually spend more than 2.5% of GDP on LTC (Jiménez-Martín et al., 2017).

The LTC system is implemented regionally, following national guidelines. The system defines three dependency grades (moderate or Grade I, severe or Grade II, and major or Grade III), and the intensity of care depends on the level of LTC needs. LTC subsidies include formal care services (provided in-kind and via voucher) and cash transfers for

¹ Carrieri et al. (2017) use data from 2006 before the Spanish LTC system was implemented. Rodrigues et al. (2018) use data from 2013; this is shortly after the implementation of the Spanish LTC Reform, and the new system only applies to individuals choosing their benefits from August 2012.

informal caregiving. The new Spanish LTC system was implemented gradually, so the coverage was extended by a grade every two years from 2007, starting with the highest level of need. LTC subsidies are partially funded by both the national and the regional governments in Spain, 21% and 61% on average, respectively, and the beneficiary covers the rest of the cost depending on their financial capabilities.²

The system's generosity was constrained in July 2012 as part of the austerity interventions triggered by the Great Recession to contain public expenditure (BOE, 2012). In particular, the reform aimed to reduce cash benefits for informal caregiving and vouchers in favour of in-kind benefits. One of the reform changes was that a voucher could only be granted if in-kind provision was not possible. This had a limited effect due to the shortage of in-kind services (as can be observed in the IMSERSO (2017) monthly reports of the period. Part of the LTC expenditure reduction was achieved by increasing the waiting times. Informal caregiving cash transfers were especially affected, as individuals granted this kind of benefit had to wait two years from the approval date before receiving the transfer. Therefore, we expect caregiving cash transfers to be concentrated among the wealthier beneficiaries as the worse-off would be less able to wait two years to receive their benefits.

The LTC application process, illustrated in Figure A.1, is generally started by relatives of the applicant. General practitioners and social workers can inform relatives and suggest that they should apply for benefits. In the case of elderly people without relatives, social services can manage the application process on their behalf. The application process consists of two main steps. First, the needs of the applicants for LTC benefits are assessed against an official scale (BOE, 2007, 2011), which includes around 100 items to assess the performance in basic and instrumental activities of daily living. The outcome of this assessment, known as the score, determines the dependency grade. Individuals with a score below 25 are not eligible for public LTC benefits. Scores above 25 and below 50 are allocated to Grade I, from 50 to 74 to Grade II and 75 or more to Grade III. During the needs assessment, aside from direct observation, the examiners must associate the lack of autonomy in the performance with a medical diagnosis in the patient's medical records of the National Health System (Serrano-Alarcón et al., 2022). The examiners are healthcare professionals working independently in local assessment teams from social services to ensure the most objective examination. They look exclusively at LTC needs (i.e., they do not have information about the family situation, financial capabilities and/or other factors). Despite the system being designed to aim for an objective measurement of LTC needs, there is evidence of score upgrading (Hernández-Pizarro et al., 2020; Serrano-Alarcón et al., 2022). Nonetheless, both papers have shown that observable characteristics, including income, do not trigger the score adjustments.

After LTC needs are assessed, LTC subsidies are allocated. Each grade gives access to a menu of benefits from which the claimants (and/or their family) choose between formal LTC (telecare, home care, day care centres, nursing homes, medical nursing homes) and a cash transfer to compensate informal caregivers.³⁴ All types of care are available for all eligible individuals, except for nursing homes not offered to individuals assigned to Grade I. However, the number of hours of care and cash transfer amount (including voucher amount and cash transfers for informal caregivers) depend on the assigned grade. Different care

arrangements may also be combined if the claimant remains at home (e.g., day care centres can be combined with telecare or a cash transfer). Formal LTC benefits can be provided in kind (direct public provision) or privately (granting vouchers to cover the cost partially). There is a list of authorised private suppliers who have demonstrated that they meet certain quality standards. Moreover, part of the in-kind provision in nursing homes and day care centres is provided by eligible private providers (i.e., social services "rent" part of their offer, given the shortage of publicly managed care facilities). Thus, nursing homes and day care centres can have some beds and places offered publicly (in-kind) and others privately (voucher), with no difference in the quality of provision (except for the way of financing them and their price: public tariff versus private price).

In the majority of cases, supply constraints affect the choice of LTC. If the applicants prefer a benefit with a long waiting time, they can opt for another benefit. Although individuals can change the type of benefit, 78% stick to the initial choice. Finally, applicants can ask for reassessment whenever their functional capacity deteriorates. Once individuals have chosen the type of benefit, they also choose the provider. At the same time, their financial capabilities are assessed to determine the co-payment level in case of in-kind benefits or the voucher amount (depending on annual income, the value of a voucher provided for each Grade is reduced using a discount rate).

By December 2015, more than 1.5 million people had applied for LTC benefits in Spain. Among those, 55% were aged 80 or over, representing 31% of the 80+ cohort. Of all claimants whose LTC needs were assessed (93% of all applications), 78% were deemed eligible for LTC benefits: 23% in Grade III, 30% in Grade II, and 25% in Grade I. Moreover, 65% of those eligible had started receiving benefits (IMSERSO, 2017).

Methodology

We use concentration indices (CIs) to evaluate socioeconomic horizontal inequity in the Spanish LTC system. CIs provide a concise and widely used measure for assessing the extent to which the use of LTC services is concentrated among specific socioeconomic groups. Their interpretability and comparability make CIs a powerful tool for policymakers aiming to monitor and address inequities in resource allocation, ensuring that those with equal needs receive equal access to care. Crucially, CIs depend on the accurate measurement of both needs and socioeconomic status, which our comprehensive administrative data allows us to achieve.

We follow García-Gómez et al. (2015) by measuring horizontal inequity in LTC using the absolute version⁵ of the corrected concentration index (CCI) suggested by Erreygers (2009):

$$CCI = 8 * cov(y_i, R_i), \tag{1}$$

where y is the measure of LTC use, and R_i is the relative ranking of individuals according to socioeconomic status:

We adjust the CCI (i.e., the measure of inequality in LTC use) for the need variables (Kakwani et al., 1997) to measure horizontal inequity. We assume that y_i is a linear and additively separable function of the need (x_k) and non-need (z_p) covariates as follows:

$$y_i = \alpha + \sum_k \gamma_k x_k + \sum_p \delta_p z_p + \varepsilon_i, \tag{2}$$

where γ and δ are vectors of the estimated coefficients from a linear probability model.⁶

⁵ Most outcome variables in our analysis are binary. Measures of relative inequality would differ based on whether we express them in terms of attainment or shortfalls (use or non-use), while measures of absolute inequity are consistent with this choice.

⁶ We cannot estimate a multinomial model because the individuals in our sample can select multiple benefits.

² See Peña-Longobardo et al. (2016) for further details of the Spanish LTC system, its implementation and reform.

³ Individuals could also choose a personal assistance voucher. However, this represented less than 0.1% of the benefits (IMSERSO, 2017), and we excluded them from our analysis.

⁴ In Spain, the difference between nursing homes and medical nursing homes is the composition of the workforce and, therefore, the type of care provided. Medical nursing homes include 24/7 medical doctors and equipment to provide healthcare, generally palliative care. Moreover, in such centres, the healthcare costs are financed through the National Health System, whereas the LTC system covers hotel costs.

Then, the CCI can be expressed as (Van de Poel et al., 2012)

$$CCI = 8 * \left[\sum_k \gamma_k cov(x_i, R_i) + \sum_p \delta_p cov(z_i, R_i) + GC_\epsilon \right], \quad (3)$$

where GC_ϵ is the Generalised Concentration Index for the error term. Lastly, we compute horizontal inequity in LTC use (CHI) by subtracting the contribution of the need variables from the CCI:

$$CHI = CCI - 8 * \sum_k \gamma_k cov(x_i, R_i). \quad (4)$$

The CHI can take values between -1 and 1 . A value of 0 indicates no inequity overall. Negative values indicate that LTC use is concentrated among the worse-off, while positive values show that use is concentrated among the wealthier.

Data

Sample

We use administrative data on all LTC claimants who choose and receive benefits in Catalonia from July 2012 to December 2014, regardless of when they started their application. Catalonia represents 16% of the Spanish population, 17% of all applications, and 16% of all beneficiaries (IMSERSO, 2017). Restricting our sample to those awarded benefits after July 2012 guarantees that all individuals in our sample faced the same institutional setting –i.e., the one introduced in the 2012 Reform.⁷

Our dataset includes 106,494 individuals who had applied for public LTC benefits between 2010 and 2014. We exclude 67,789 individuals who received their first benefit or died before the 2012 reform. Next, we exclude 2318 ineligible claimants, i.e., they have either (i) a moderate dependency (Grade I) and therefore were not eligible during our observation period or (ii) an even lower level of dependency. This leaves us with 36,387 individuals. From this sample, we lose 2208 individuals because we do not observe their income, which we need to rank them based on their socioeconomic status. Further, we drop 2023 individuals because they have missing information in one of the analysis variables. Thus, our final sample consists of 32,156 individuals. This sample represents 88% of the target population (i.e., 36,387 individuals applying for benefits between 2010 and 2014 and receiving benefits after the LTC reform of July 2012).⁸

For our baseline analysis, we consider the first benefit received by claimants during our study period. The last benefit is the same as the first benefit for most beneficiaries in our sample (94.8%),⁹ either because benefits do not change or because they start after our observational period. Hence, our choice to use the first benefit is unlikely to affect the results, as individuals do not change benefits frequently and remain in the LTC system until they die.¹⁰

⁷ Individuals who received LTC benefits after 2012 may have applied to LTC benefits as early as 2010 in our sample. In robustness analyses, we restrict the sample to individuals who not only received but also applied after the 2012 reform and show that our conclusion regarding the socioeconomic horizontal equity of the LTC system remains unchanged when focusing on individuals who started their application process after the July 2012 reform.

⁸ As explained in Section “Institutional background”, in Figure A.1, income information is gathered at the moment when claimants select LTC benefits to determine the level of copayment.

⁹ This number is smaller than the 22% reported in Section “Institutional background”, as our study period only follows individuals from July 2012 to December 2014.

¹⁰ Note that beneficiaries could switch benefits over our study period. When evaluating the robustness of our results to alternative methodological choices, we focus on the last benefit they received over the study period.

Table 1
Distribution of Long-Term Care Benefits.

	All care services		In-kind		Voucher	
	(1) N	(2) Share	(3) N	(4) Share	(5) N	(6) Share
Telecare	4,151	0.13				
Informal Caregiving	19,888	0.62				
Home Care	7,603	0.24	7,259	0.95	344	0.05
Day Care Centre	4,043	0.13	3,609	0.89	434	0.11
Nursing Home	8,297	0.26	4,503	0.54	3,794	0.46
Medical Nursing Home	2,905	0.09				

Notes: the total number of observations is 32,156. Note that the sum of the shares exceeds 100 because a claimant can benefit from more than one service at a given time (see Section “Institutional background”). Percentages in columns 4 and 6 are relative to the total users of that service. Telecare and medical nursing homes are only provided in-kind; informal care is only financed via cash transfer (see Section “Institutional background”).

Variables and descriptive statistics

Table 1 shows our sample’s distribution of LTC benefits. Each outcome takes value 1 if the beneficiary receives that benefit. Informal care cash transfers are the most common LTC benefit (approximately 60% of users). The second and third most preferred subsidies are nursing home accommodation and home care, each utilised by around a quarter of beneficiaries. Other services are selected by less than 15% of beneficiaries: day care centres by 13%, telecare by around 13%, and medical nursing homes by 9%. Home care, day care centres, and nursing homes can be provided in-kind or via a voucher (used to buy care from the preferred provider). Despite the duality, home care (94%) and day care centres (89%) are predominantly provided in-kind. 46% of claimants who choose nursing home services do so via a voucher to access a private provider.

We utilise detailed information on applicants’ health status, including the degree of autonomy to perform Activities of Daily Living (ADLs), as summarised in the needs assessment score (0–100) and a detailed list of diagnoses coded using the International Classification of Disease Ninth Revision. For each individual, we also observe socioeconomic and demographic characteristics (annual personal income, age, sex, marital status, and place of residence) and the result of the LTC application process (selected care, form of provision (in-kind or voucher), and time to access the service) used as outcomes.

The independent variables can be grouped into need and non-need variables. Need variables include the score that determines the level of LTC needs, age, sex, and a detailed list of medical diagnoses (which are grouped into 10 diagnosis groups; see Table A.1 in Appendix A). Age, sex and medical diagnoses are not used to define need in the assessment system but are likely to have some impact on claimants’ requirements. Moreover, the system grants benefits based on the grades (instead of the LTC needs score). We use the continuous measure of LTC needs, the score, to give a more granulated measure of LTC needs.¹¹ The main non-need variables are income, marital status, region of residence, and year of application for LTC benefits. The beneficiary’s personal annual income is provided by the tax office, extracted from the annual income tax declaration, and refers to the year previous to the first benefit.¹² For those individuals who do not have to pay income tax, annual personal income is self-reported using bank certificates.

Table 2 shows the descriptive statistics. The first column presents the means for the whole sample, and columns (2) to (5) provide

¹¹ We run several robustness checks to evaluate the sensitivity of our results to these choices, including using the categorical version of the LTC needs score and dropping diagnostic groups.

¹² For our population, pension income is the main source of income, and it is quite common that the amount remains stable during the old age (with exception to the pension inflation adjustments).

Table 2
Descriptive statistics.

	(1) Full sample	(2) Informal Care	(3) Nursing Home	(4) Home Care	(5) Other
Need variables					
Age	78.30 (16.16)	76.40 (18.56)	82.18 (10.04)	79.28 (13.24)	80.17 (10.62)
Score	66.61 (13.62)	65.24 (13.01)	70.88 (14.03)	64.30 (13.00)	66.27 (13.73)
Grade II	0.69	0.74	0.55	0.76	0.70
Grade III	0.31	0.26	0.45	0.24	0.30
Female	0.60	0.57	0.67	0.60	0.63
DG: neurological	0.74	0.72	0.79	0.74	0.79
DG: circulatory	0.44	0.44	0.44	0.45	0.44
DG: digestive	0.05	0.05	0.04	0.04	0.04
DG: osteoarticular	0.54	0.52	0.53	0.58	0.55
DG: endocrino-metabolic	0.23	0.24	0.23	0.24	0.24
DG: eye	0.14	0.14	0.13	0.15	0.14
DG: ear	0.08	0.08	0.08	0.08	0.08
DG: respiratory	0.14	0.14	0.12	0.14	0.14
DG: genitourinary	0.23	0.23	0.23	0.23	0.21
DG: mental	0.22	0.21	0.24	0.23	0.23
DG: development	0.04	0.04	0.02	0.04	0.03
DG: malformations	0.02	0.03	0.01	0.01	0.01
DG: cancer	0.08	0.08	0.07	0.08	0.07
DG: hematological	0.03	0.03	0.04	0.03	0.03
DG: infectious	0.01	0.01	0.01	0.01	0.01
DG: dermatological	0.00	0.00	0.00	0.00	0.00
Non-need variables					
Annual income (euro)	12,359.30 (7,130.40)	12,342.56 (7,386.87)	11,835.24 (5,950.53)	12,310.60 (7,143.58)	12,515.38 (6,875.64)
Marital status: married	0.43	0.49	0.26	0.55	0.44
Marital status: single	0.11	0.10	0.15	0.08	0.09
Marital status: widowed	0.40	0.37	0.52	0.30	0.42
Marital status: other	0.06	0.05	0.07	0.06	0.06
Region: Barcelona (city)	0.20	0.16	0.18	0.36	0.25
Region: Barcelona (rest of the county)	0.28	0.27	0.31	0.26	0.31
Region: Barcelona (rest of the province)	0.22	0.25	0.19	0.20	0.18
Region: Girona	0.10	0.10	0.10	0.08	0.09
Region: Lleida	0.08	0.09	0.10	0.03	0.06
Region: Tarragona	0.08	0.07	0.09	0.05	0.08
Region: Terres de l'Ebre	0.04	0.05	0.03	0.02	0.03
Application year: 2010	0.08	0.06	0.12	0.10	0.09
Application year: 2011	0.11	0.09	0.14	0.12	0.12
Application year: 2012	0.33	0.36	0.34	0.28	0.29
Application year: 2013	0.27	0.28	0.23	0.28	0.29
Application year: 2014	0.21	0.21	0.17	0.21	0.20
Observations	32,156	19,888	8,297	7,603	10,188

Notes: the total number of observations is given in column (1), with $N = 32,156$. DG stands for diagnostic group. Note that the sum of observations across columns (2) to (5) is larger because a claimant could benefit from more than one service at the same time (see Section “Institutional background”). Standard deviations in parentheses for continuous, non-binary variables.

information for the different subsamples of users (those benefiting from informal care, nursing homes, home care and the rest of the services). Beneficiaries are, on average, 78 years old, and around two-thirds are women. Care arrangements differ by gender: while men are more likely to receive informal care, disproportionately, more women live in nursing homes. Differences in life expectancy could drive this difference: women tend to suffer from LTC needs when they are older and widowed, while men have LTC needs when they are still married (IDESCAT, 2011). The geographical distribution is representative of the Catalan territory. Finally, the most common conditions suffered by claimants are neurological, musculoskeletal, circulatory, endocrine-metabolic, genitourinary diseases and mental disorders. On average, annual income is just over €12,000, and only the richest quartile has an annual income higher than €15,000.

Fig. 1 shows the distribution of needs scores across our sample, the metric capturing the intensity of individuals’ LTC requirements according to the Spanish LTC system. As explained in Section “Institutional background”, the score has values ranging from 0 to 100. Those with scores between 50 and 74 (both included) are categorised as Grade II, and those between 75 and 100 are categorised as Grade III. Note that

as described above, our sample includes only individuals with at least a score of 50.¹³

Time to access formal LTC benefits

In addition to the choice of LTC benefit made by applicants, we observe the time elapsed from the needs assessment until receiving a formal care benefit. For every user, we measure the time in days between the assessment date and the day the individual receives the benefit (i.e., access to the first benefit). We use this delay as an indication of time to access LTC benefits. This waiting time measure does not fully capture the time taken to award LTC benefits because we do not observe the time between the submission of the initial application and the LTC needs assessment (the point at which individuals enter our dataset). However, we can observe three elements of the waiting process. First, we have the time from the assessment until the individual

¹³ Note also how, in line with the findings in Hernández-Pizarro et al. (2020), we find evidence of bunching around scores of 75, which is the threshold at which individuals receive Grade III).

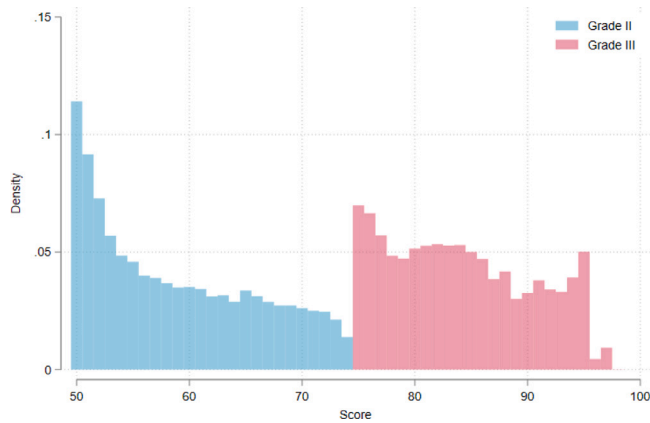


Fig. 1. Histogram of the needs score
 Notes: The figure plots the LTC needs score distribution for the individuals in our sample. The scores in blue correspond to Grade II, and the scores in red correspond to Grade III.

receives an LTC score. Second, the time elapsed between an individual obtaining a score and their choice of LTC benefit. Third, the time elapsed from the choice of benefit until the actual start of the benefit. We exclude individuals receiving informal care, as we observe when the claimant becomes entitled to informal care but not when the first payment is made. Therefore, we only have waiting times for a subsample of individuals who utilise LTC services in our sample.

Waiting times can be caused by a combination of both demand and supply factors. In particular, the waiting is a result of (i) capacity constraints induced by excess demand, (ii) individuals only applying to institutional services and professional care when their condition deteriorates, and other services are not enough, or (iii) budget constraints to cover professional care costs (cost-sharing if in-kind or remaining costs if voucher).

Table A.3 in Appendix A presents the summary statistics of the waiting times in our data. On average, a beneficiary takes 167 days (5.5 months) from the assessment date to receive their first formal LTC benefit. Most delays occur from obtaining a grade resolution (i.e., when they know whether they received Grade I, II, or III) until choosing a benefit. Table A.2 in Appendix A reports the summary statistics on the times to access different benefits.¹⁴

Preliminary evidence on the relationship between income, LTC needs, and LTC use

Before examining potential socioeconomic horizontal inequity in the access and utilisation of LTC benefits in Spain, we first evaluate the distribution of LTC needs across income groups in our sample. We do this by focusing on the average LTC need score across income quintiles.¹⁵ Figure A.4 reveals that the average score is relatively consistent across income quintiles. A marginally lower average needs score is observed in the lowest income quintile.

We also investigate the average utilisation of LTC benefits across income quintiles. Figure A.5 illustrates the share of LTC users by income quintile for each LTC benefit. In panel (a), the percentage of LTC users in our sample who use telecare is higher in the top three income quintiles (around 15% utilisation) than the bottom two (between 10

¹⁴ Note that many individuals enrol on a waiting list for their most preferred benefit and utilise a secondary service until their favoured service becomes available. We focus on the first benefit in this analysis, so the waiting times we report for highly demanded services may differ from those reported elsewhere.

¹⁵ For completeness, we begin by depicting the distribution of income across our sample in Figure A.2.

and 13%). Informal care (panel (b)) is predominantly utilised by the poorest 20% in our sample, followed by the richest 20%. Home care (panel (c)) exhibits an even distribution across income quintiles. Day care centres, nursing homes, and medical nursing homes (panels (d) to (f)) show no clear income gradient.

While these partial descriptions offer an initial glimpse into the relationship between income, LTC needs, and benefit distribution, they do not provide real insights into the degree of socioeconomic horizontal inequity within the system. There are several reasons for this. First, these graphs do not account for needs and non-needs factors simultaneously. Socioeconomic horizontal equity requires the same utilisation for the same level of needs, irrespective of non-need factors such as income. These graphs do not consider the differential LTC needs across income quintiles. Second, an analysis based solely on Figures A.4 and A.5 would treat the LTC needs score as the sole need variable and income as the only non-need variable. Our empirical analysis in the subsequent section addresses these limitations, providing a more robust evaluation of equity considerations within the Spanish LTC system.

Results

Determinants of the allocation of publicly subsidised LTC

Before evaluating the horizontal equity of the Spanish LTC system, we analyse which need and non-need factors affect the likelihood of using a particular LTC option. Table A.4 in Appendix A reports coefficients estimated using a linear probability model. Variables are categorised as need or non-need as described in Section “Variables and descriptive statistics”, in the same groups as in Table 2. Our results show that the care choice depends on the individual’s needs and non-need characteristics. The estimated coefficients of the non-need variables show the expected signs. The probability that individuals choose informal caregiving is significantly and positively associated with income, while the probability that they choose home care, nursing homes, and medical nursing homes is negatively associated with income. Regarding marital status, single and widow individuals have a higher probability of using institutional services and a lower probability of care delivered at home (informal care, professional home care, and telecare) compared to those who are married (base category). The region of residence also plays a role in the choice of care. This might be due to differences in service provision infrastructure across areas, especially nursing homes and day care centres. The probability of accessing telecare and home care is lower in all regions relative to the city of Barcelona (omitted category), and the probabilities of accessing informal care, day care centres, and nursing homes are larger in other regions compared to the city of Barcelona. This suggests that there are differences in the provision of LTC services across regions or in the preferences of individuals across regions (which could be due to differences in family structure or accessibility of the main dwelling, among other factors).

Regarding the vector of need variables, the coefficients of age, gender and need score also have the expected signs. All home care arrangements are associated with lower scores (i.e., lower needs), while higher scores are positively related to the choice of nursing home services. The estimated coefficients of the different medical categories show the expected signs, but the magnitudes and significance levels are modest. This is not surprising because LTC needs are rooted in the loss of autonomy to perform ADL, which is captured by the score, while the severity of LTC needs can differ widely among individuals with the same diagnoses.

To address concerns of multiple hypothesis testing due to family-wise error rate (FWER), we calculate Romano and Wolf’s step-down adjusted p-values (Romano and Wolf, 2005; Clarke, 2021). The results of this exercise are presented in Appendix B (Tables B.1 to B.6). This correction does not significantly alter the conclusions of our analysis.

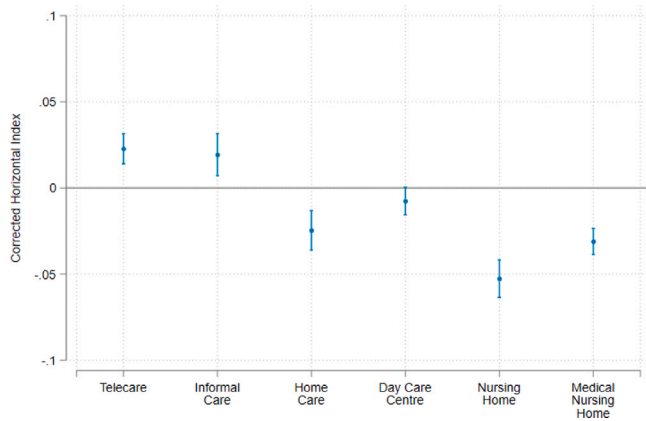


Fig. 2. Horizontal inequity in the use of LTC services

Notes: Estimated Corrected Horizontal Index (CHI) and corresponding 95% confidence intervals. Standard errors were obtained from bootstrap with 500 replications. Each marker and corresponding confidence interval results from a separate estimate of the CHI defined in Eq. (4). The total number of observations is $N = 32,156$.

Socioeconomic horizontal inequity in LTC use

Fig. 2 presents the inequity indices for all types of LTC. The estimated CHIs for inequity and CCI for inequality are reported in A.5 in Appendix A. First, there is a clear difference between the services that are pro-poor (i.e., more commonly distributed among the poor after adjusting for need) and pro-rich distributed: nursing homes, medical nursing homes, and home care services are more concentrated among the worse-off, while telecare and informal care are pro-rich distributed. Second, the contribution of need to inequality in formal care services is pro-rich (i.e., $CCI > CHI$), while the contribution of need to inequality in care delivered by informal caregivers is pro-poor ($CCI < CHI$) (see Table A.6 in Appendix A for the contribution of need variables versus non-need variables). These differences are driven by the signs of the estimated coefficients of need variables (see Eq. (3) in Section “Methodology”). Day care centres are fairly equitably distributed across income groups.

Cash transfers for informal caregivers are concentrated among those with higher incomes. Unfortunately, there is no information on the number of informal care hours used, so we cannot test whether the sign reverses for intensive informal care as in García-Gómez et al. (2015). One plausible explanation for the pro-rich distribution of informal care is the institutional setting. Informal care is the only subsidy that provides an unconditional cash transfer. Moreover, individuals who opt for informal care must wait up to two years before receiving the benefit and do not receive compensation for the time that passes while they wait. It seems likely that only the more well-off will be able to afford informal care during these two years.

Robustness checks

We conduct six additional analyses to assess the robustness of our findings, presented in Figure A.6 in Appendix A. Each panel in the figure corresponds to a distinct analysis. In panel (a), we alter our approach by using the last benefit recorded during our study period (end of 2014) instead of the initial benefit, which is our choice in the main analysis. Only 7% of our beneficiaries change benefits over our study period. All estimated indices in panel (a) remain virtually unchanged, except for day care centres, for which we estimate a CHI closer to zero (as opposed to the 10% significance level we find in Fig. 2).

In panel (b), we exclude diagnostic groups from the needs vector and re-estimate our findings. This analysis uses a definition of LTC needs closer to that used in the Spanish LTC system (described in Section “Institutional background”), excluding diagnostic data from the

need assessment. Panel (b) reveals results nearly identical to those in Fig. 2, suggesting that our broader approach does not substantially affect the outcomes.

The robustness of our LTC needs measure is further examined in panel (c), where we explore using the categorical grades used in the Spanish LTC system instead of a continuous variable of LTC needs score. The results in panel (c) closely mirror our main findings (although the magnitudes are less pronounced) for formal care. However, the differences in informal care across socioeconomic groups after adjusting for need are no longer statistically significant. We favour the results obtained when using the need score rather than the grades because relying on grades drops potentially valuable information. There are potentially large differences in underlying health and LTC needs between two individuals with the same grade but different scores, and similarly, the differences between two individuals with scores on either side of the threshold may be small.

Turning to panel (d), we modify our age modelling by treating it as a categorical variable in five-year intervals rather than using a second-order polynomial. The outcomes of this adjustment, reported in panel (d), closely resemble those in Fig. 2.

In panel (e), we assess the influence of including marital status as a non-need variable in our baseline results (Fig. 2). By re-estimating our estimates with marital status among the need variables, panel (e) results demonstrate similarities to our baseline findings, with informal care no longer exhibiting statistical significance. This suggests that some differences in use across socioeconomic groups are driven by married individuals making different choices and differences in the socioeconomic status between married and non-married individuals.

Finally, in panel (f), we address concerns about sample selection by incorporating individuals who initiated the application process after the LTC reform of July 2012. Our baseline estimates include applicants who receive benefits after the introduction of the reform, even if they applied for LTC benefits earlier. Despite the reduction in sample size when we restrict it to those who applied after July 2012, the magnitude and significance of our baseline estimates remain, except for home care, where the estimated index remains similar, but confidence intervals become wider.

Inequity in the form of formal LTC provision

The LTC Act aimed to support claimants with public services in kind, but supply shortages (or capacity constraints) forced the introduction of vouchers that may be used to acquire services in the private sector. These vouchers can only be used with a selection of private providers who meet certain quality standards (DOGC, 2007). Social services authorities check that private providers meet these standards to guarantee the quality of care (see DOGC (2007)). All the selected providers are officially listed. In the case of nursing homes, for instance, the majority of public supply (beds offered) are managed by private providers, with only 15% belonging to public entities. Indeed, many of these private centres offer private and public services simultaneously. Individuals may receive the subsidy as a voucher or in-kind for reasons other than need, such as the amount of user contribution. This contribution may vary across forms of provision depending on the individual’s socioeconomic status. In particular, the user contribution is higher with a voucher for the worse-off: they have to pay more than 50% of the nursing home price with the highest voucher, but less than 33% as cost-sharing if the service is provided in-kind.¹⁶ Cost-sharing of in-kind services directly depends on the beneficiary’s financial capability (such that in extreme situations, the most wealthy could be forced to pay 100% of the service price).

¹⁶ For home care, the highest voucher does not cover 50% of the service cost. The highest voucher for day care centres covers a little above 50% of the cost.

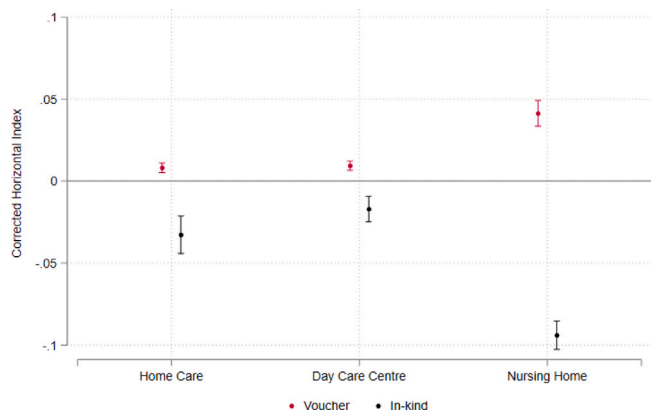


Fig. 3. Horizontal inequity in selected benefits, by type of provision (In-kind vs. Voucher)
 Notes: Estimated Corrected Horizontal Index (CHI) and corresponding 95% confidence intervals. Standard errors were obtained from bootstrap with 500 replications. Each marker and corresponding confidence interval result from a separate estimate of the CHI defined in Eq. (4). The total number of observations is $N = 32,156$. Compared to Fig. 2, we include only the three services that offer duality in the form of provision: home care, day care centres, and nursing homes. Recall that telecare and medical nursing homes are only provided in-kind, while informal care is only financed via cash transfer (see Section “Institutional background”).

We analyse inequity in the form of providing LTC services with these considerations in mind. In particular, we focus on the services that offer such duality: nursing homes, day care centres and home care. The variables ‘Nursing Home – In Kind’, ‘Day care Centre – In Kind’ and ‘Home Care – In Kind’ equal 1 if the beneficiary receives the service in-kind and 0 if the service is paid for with a voucher or the benefit is not received. Similarly, ‘Nursing Home – Voucher’, ‘Day care Centre – Voucher’, and ‘Home Care – Voucher’ equal 1 if the service is subsidised by a voucher and 0 otherwise. A claimant may receive more than one benefit simultaneously (for example, have some hours of formal care at home after going to a day care centre). As long as the claimant started receiving all their benefits simultaneously, we consider them all the first benefit. The results in Fig. 3 show inequity in provision in the three services, and the magnitude is the largest for nursing homes. In particular, nursing home use is concentrated among the financially worse-off when benefits are provided in-kind (captured by the negative values of the black markers in Fig. 3), while vouchers are more often used by the better-off. Similarly, we find duality in the distribution of home care and day care centres. Home care provided in-kind is concentrated among the worse-off. The estimated Corrected Horizontal Index for home care and day care centres via voucher is relatively small, although significant.

The differences in the form of provision could translate into differences in the quality of care or waiting times, which might be correlated with individuals’ socioeconomic status. Unfortunately, we cannot test whether there is inequality in the quality of care. Some facts suggest there are not large differences in the quality of nursing home care, the service with the largest horizontal inequity by type of provision. First, a voucher does not provide access to the universe of private providers but only those meeting certain quality criteria. Second, only 15% of the beds provided in-kind are in public institutions, while the remaining 85% are privately managed (Departament de Treball, 2016). In most cases, the same centre provides private (with or without vouchers) and in-kind services simultaneously. Regardless of who is the main payer (the government in case of in-kind provision of nursing homes and the user for those financed via a voucher), the care received in a centre is the same for all residents (e.g., same meals, same professionals, same space). As not all the beds in private institutions would be occupied by private users, private entities have incentives to provide public services. While this limits the possibility of cream-skimming by

nursing home providers, there will likely be inequalities in the time to access a nursing home for (at least) two reasons. The supply of in-kind services is fixed, whereas private services eligible for vouchers have fewer capacity constraints. This could translate into large differences in waiting times. In addition, a voucher together with annual income may not be enough to cover full nursing home costs, so financial constraints can play an important role in the time needed for lower socioeconomic groups to access a nursing home. In the next section, we assess the existence of a socioeconomic gradient in the time to access the different services, with a special focus on nursing homes.

Inequity in the time to access formal LTC benefits

We first compute the horizontal inequality index (HI) as the outcome variables are not bounded between 0 and 1. We compute the HI for the time to access the different services as follows:

$$HI = CI - \frac{\sum_k \gamma_k \mu_{x_k} CI_x}{\mu_y} \tag{5}$$

where CI stands for concentration index and is defined as $CI_y = \frac{2cov(y_i, R_i)}{\mu_y}$, and μ_y corresponds to the sample mean of y .

We plot these results in panel (a) of Fig. 4. Waiting times for telecare are higher among the poor after correcting for need, while waiting times for other benefits are equitably distributed.

The duality in the form of provision can be one of the channels masking differences in waiting times for some benefits. Analogously to the above analysis, we explore whether there are inequalities in the time to access by the form of provision (in-kind vs voucher) in the three services with dual provision. The estimated indices in Fig. 4 (panel (b)) show that our findings of socioeconomic horizontal equity in times to access to home care and day care centres remain when looking at in-kind and voucher provision separately. However, we observe that the better-off wait disproportionately longer to access in-kind provision of nursing homes.

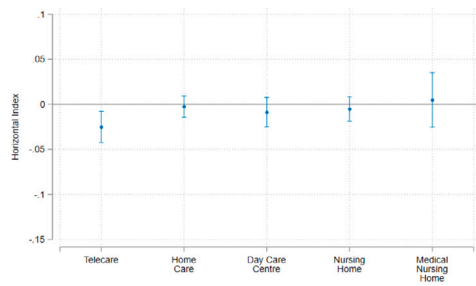
Finally, we compute the total waiting time for the first LTC benefit in Fig. 5, excluding individuals choosing informal caregiving as we do not observe the date they start receiving the cash transfer (see Section “Time to access formal LTC benefits”). Overall, waiting times in the public LTC system seem equitably distributed in our sample. Literature studying waiting times (Siciliani, 2016) has shown that some inequalities in waiting time may arise ‘within’ the system: better-off individuals may navigate better into the system than worse-off individuals. Hence, we explore whether the system suffers from this type of inequality. To pinpoint where these differences in time to access may emerge, we look into the different steps of the process and calculate the inequity indices for time between (i) the assessment and grade resolution, (ii) grade Resolution and choice (selection of the type of benefit) and (iii) choice and receipt of the benefit (see Fig. 5).¹⁷ We do not find evidence of inequalities at any stage. However, our sample size is smaller in this analysis, excluding the 62% of the beneficiaries choosing informal caregiving. This is an important caveat to our results.

Discussion

This study examines the allocation of publicly subsidised long-term care (LTC) services in Spain, investigating whether individuals with equivalent needs receive equal care, regardless of socioeconomic status. Using administrative data on the universe of applicants to the LTC system in Catalonia, we complement existing survey-based evidence by including institutionalised individuals and objectively assessed needs. Our results reveal a pattern of unequal distribution: cash subsidies for

¹⁷ Note that we cannot estimate if there are differences in the time applicants wait to be assessed, as we do not have information on the exact timing of the application.

(a) By LTC benefit



(b) By LTC benefit and form of provision

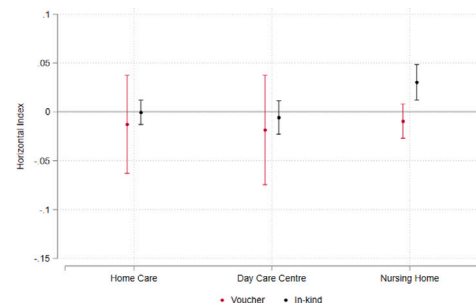


Fig. 4. Horizontal inequity in the time to access the benefit

Notes: Estimated Horizontal Index (HI) and corresponding 95% confidence intervals. Standard errors were obtained from bootstrap with 500 replications. Each marker and corresponding confidence interval results from a separate estimate of the HI defined in Eq. (5). Note that, as detailed in Section “Inequity in the time to access formal LTC benefits”, we use the HI instead of the CHI because waiting times are not bounded between 0 and 1. In panel (b), we include only the three services that offer duality in the form of provision: home care, day care centres, and nursing homes. Recall that telecare and medical nursing homes are only provided in-kind, while informal care is only financed via cash transfer (see Section “Institutional background”). The sample used to calculate these estimates ($N = 12,267$) is smaller than the full sample reported in Tables 1 and 2 because we do not observe waiting times for individuals with informal caregiving, as explained in Section “Time to access formal LTC benefits”.

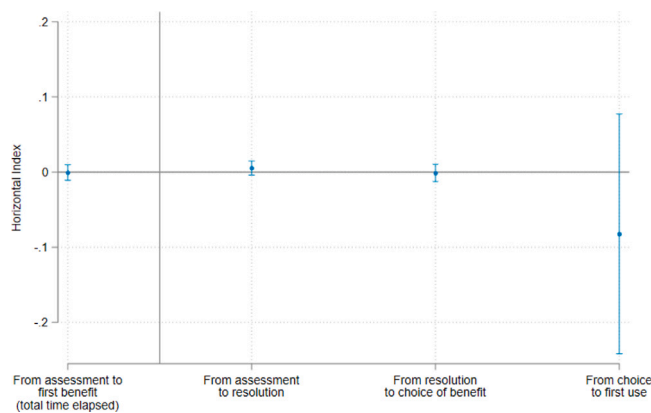


Fig. 5. Horizontal inequity in waiting times in the LTC application process.

Notes: Estimated Horizontal Index (HI) and corresponding 95% confidence intervals. Standard errors were obtained from bootstrap with 500 replications. Each marker and corresponding confidence interval results from a separate estimate of the HI defined in Eq. (5). Note that, as detailed in Section “Inequity in the time to access formal LTC benefits”, we use the HI instead of the CHI because waiting times are not bounded between 0 and 1. The sample used to calculate these estimates ($N = 12,267$) is smaller than the full sample reported in Tables 1 and 2 because we do not observe waiting times for individuals with informal caregiving, as explained in Section “Time to access formal LTC benefits”.

informal care and telecare are concentrated among higher-income individuals, while lower-income individuals predominantly utilise formal care services such as home care and nursing homes.

Our finding that cash transfers for informal care are concentrated among wealthier LTC users contrasts with previous evidence for Spain, which generally found informal care, particularly at intensive levels, to be pro-poor distributed (García-Gómez et al., 2015; Ilinca et al., 2017). Several factors may explain this discrepancy. First, our sample differs in key aspects: it covers a period with a more generous public LTC system, includes institutionalised individuals, lacks information on private care supplementing public subsidies, and focuses on the population eligible for public support. Second, we can only observe the extensive margin of informal care, while information on intensity would be more informative. Future research should investigate whether the distribution of care types alters when considering the full range of private and public options, including privately-funded institutionalised

care and the intensity of informal care.¹⁸ We cannot rule out the possibility that some individuals use the cash benefits they receive for informal care to pay for formal care outside the public system. This could enhance equity if this alternative consumption frees up resources of a public system to be used by less well-off individuals (Besley and Coate, 1991). Yet, this also has negative equity effects in the long run if there is a ‘secession of the wealthy’; i.e., if the support for the public system decreases with the availability of private options (Costa-Font and Jofre-Bonet, 2008). Similarly, other individuals may complement home care services with unpaid informal care.

We also identify inequity in the form of formal care provision. While in-kind services are concentrated among lower-income individuals, higher-income individuals are likelier to receive vouchers for LTC expenses from their preferred provider. This difference is observed across all services available in-kind and via voucher but is most pronounced for nursing homes. This may lead to other inequalities. First, one could be concerned about potentially different times to access. This could be driven by either demand (mainly through budget constraints) or supply constraints, as cost-sharing is higher with vouchers for low-income individuals compared to in-kind provision while waiting times are shorter via voucher. We find socioeconomic horizontal equity in the time to access different LTC services, except for telecare with larger times to access for the worse off. Yet, the better-off wait longer to access nursing homes via in-kind. This result suggests that those with higher financial capability wait longer to access their preferred nursing home rather than taking the more rapidly available services. These findings warrant a cautious interpretation, as 38% of the sample excluded from the time-to-access analysis (those opting for publicly financed informal care) exhibit a relatively higher income level, potentially introducing selection bias and limiting the generalisability of the results.

We find little evidence of socioeconomic inequity in waiting times at different stages of the application process, except for potentially long wait times from choice to first use, though estimates for this stage are imprecise due to a smaller sample size. However, these findings must be interpreted cautiously as our analysis excludes recipients of informal care (62% of LTC subsidies). In addition, our estimates for

¹⁸ A recent report commissioned by the Spanish Ministry of Health reported that between 42% and 80% of total spending on nursing homes came from the public system, either via in-kind benefits or vouchers (Associació Catalana de Recursos Assistencials (ACRA) and Spanish Ministry of Health, 2022). Notwithstanding, the report’s authors warn about the difficulties of obtaining reliable data to measure spending in institutionalised care in the country.

the inequity in the last part of the process (from choice to first use) are very imprecise, given the smaller sample size. Further research should explore the role of budget constraints and information asymmetry in navigating the application process.

Our analysis has four main limitations. First, we rank individuals by annual income, not accounting for wealth. While the elderly population, especially widows, are quite homogeneous regarding annual income (low variance in their main source of income, i.e., old-age or survivors pension), the group is more heterogeneous in wealth (real estate properties).¹⁹ Research has considered wealth in addition to income. For example, [Rodrigues et al. \(2018\)](#) compare inequity in LTC by wealth and income using data from the Survey of Health and Retirement in Europe (SHARE) and find that the inequity in the use of home care in Spain remains unchanged if wealth is used instead of income and that informal care becomes more pro-poor distributed. Similarly, other measures of socioeconomic status, such as the income of the children or even education, may provide a more comprehensive measure. This is a matter that requires further exploration.

Second, we only measure inequity in public LTC use and do not consider other sources of inequity that could occur when trying to meet LTC needs. First, there could be socioeconomic differences in the likelihood of applying for public LTC benefits if better-off individuals have better access to or knowledge about the system's functioning. For example, [Tenand et al. \(2020a\)](#) find inequity at the eligibility stage in the Netherlands based on applicants' background, particularly if they are migrants. Similarly, we do not observe how applicants cover their LTC needs while waiting for their subsidy.²⁰ Similarly, we do not observe whether (and how) claimants complement their public subsidies with other private formal or informal care options. We acknowledge that our results should be considered most appropriately as an estimate of the inequity in allocating public resources used in LTC care and not as an overall assessment of inequity in LTC use. Similarly, the existing evidence based on survey data for the non-institutionalised population may provide a biased picture if individuals from different socioeconomic groups differently favour specific services, as our results suggest. The availability of better-linked survey and administrative data at the population level will be crucial in future research to fully understand how private and public options interact and fully identify any unjust differences in the allocation of resources.

Third, while we identify differences in service utilisation and provision type across socioeconomic groups, we cannot assess differences in care quality. Further analysis is needed to assess the progressiveness of the financing system, as the costs for the government and the individual are different depending on the form of provision and the socioeconomic status of the recipient.

Fourth, we use data from the first years of the reformed LTC system. As of 2024, the LTC system has undergone several changes. For example, individuals' wealth is now also considered when evaluating their financial capability to access LTC benefits, whereas in our study period, only income was considered. Additionally, individuals in Grade I are now entitled to benefits. Moreover, benefit generosity has increased as government pressure to reduce public spending has decreased. These subsequent modifications may have altered the distribution of resources and waiting times across socioeconomic groups. Further research should aim to understand better the role of the different policy parameters in shaping inequities in LTC use.

Despite these limitations, our findings offer valuable insights into inequities in Spain's public provision of LTC benefits. As many European governments grapple with reforming their LTC systems amidst ageing populations, understanding the degree of inequity is crucial. The

use of policies that distribute subsidies on a needs basis is not enough to ensure equity in the access to LTC if families with more economic resources can better use and navigate through the system ([Heckman and Landersø, 2021](#)). Our results suggest that policymakers should account for the potential unintended side effects of differences in the forms of provision utilised. Specifically, the impact of changes in co-payments on the use of LTC, the quality of its services, and its waiting times should not be disregarded when designing such policies.

CRedit authorship contribution statement

Joaquim Vidiella-Martin: Writing – review & editing, Methodology, Formal analysis, Data curation, Conceptualization. **Helena M. Hernández-Pizarro:** Writing – original draft, Supervision, Data curation, Conceptualization. **Pilar García-Gómez:** Writing – review & editing, Validation, Methodology. **Guillem López-Casasnovas:** Writing – review & editing, Funding acquisition, Conceptualization.

Declaration of competing interest

none

Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jjeoa.2024.100527>.

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¹⁹ This is discussed in [Saez et al. \(2019\)](#).

²⁰ This is relevant because over 100,000 claimants were waiting in 2015 for a benefit already approved ([Jiménez-Martín et al., 2017](#)), and our data shows that 32% of eligible claimants died while waiting for a benefit.

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