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Catastrophic risk associated with out-of-pocket payments for long term care in Spain

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ABSTRACT

Objectives: This study analyses the financial burden associated with the introduction of copayment for long-term care (LTC) in Spain in 2012 for dependent individuals.
Material and methods: We analyse and identify households for which the dependency-related out-of-pocket payment exceeds the defined catastrophic threshold (incidence), and the gap between the copayment and the threshold for the catastrophic copayment (intensity), for the full population sample and for subsamples based on the level of long-term care dependency and on regional characteristics (regional income and political ideology of party ruling the region).
Results: The results obtained show there is a higher risk of impoverishment due to copayment among relatively well-off dependents, although the financial burden falls more heavily on less well-off households. Our findings also reveal interesting regional patterns of inequity in financing and access to long-term care services, which appear to be explained by an uneven development of LTC services (monetary transfers versus formal services) and varying levels of copayment across regions.
Conclusions: The new copayment for long-term care dependency in Spain is an important factor of catastrophic risk, and more attention should be addressed to policies aimed at improving the progressivity of out-of-pocket payments for LTC services within and between regions. In addition, formal services should be prioritised in all regions in order to guarantee equal access for equal need.

1. Introduction

Many studies have analysed the financial burden of out-of-pocket (OOP) payments in the field of health economics, using catastrophic and/or impoverishment measures. Most literature in this respect focus on the impact of OOP payments for health care services as a whole in particular countries, especially developing countries or emerging economies in Asia or Latin America [1–4]. However, several studies have extended the scope of analysis to include relatively wealthy countries, finding that individuals living in developing, low and middle-income countries present a higher incidence of catastrophic healthcare payments [5,6].

In addition, there is an extensive body of literature on the catastrophic impact of OOP expenditure for specific components of health care, such as pharmaceuticals [7], particular treatments or interventions [8–10] or even vulnerable population subgroups such as the chronically ill [11,12] and the disabled [13–15]. However, to date little attention has been paid to the impoverishment effect of long-term care (LTC) i.e., the range of services needed by persons who are permanently dependent on help with the basic activities of daily living [16].

The nature of LTC arrangements varies significantly among countries. Sweden, Norway and the Netherlands rank among the top countries in LTC expenditure as a proportion of GDP – approximately 3% [17] – while in others, such as Spain and Italy, levels of LTC spending are low, at less than 1% of GDP, and there is a strong reliance on informal care. However, changes in the sociodemographic structure of society (with smaller households and increased numbers of single-person households) and in the patterns of rural-urban and international migration and, especially, the progressive incorporation of women (traditionally, the main carers) into the job market, are all factors likely to restrict informal care [18]. The rising demand for LTC services, due to an ageing society and a reduction in the supply of informal care, is expected to place great pressure on public budgets, especially in developed countries [16].

In 2006, long-term care legislation was enacted in Spain [19,20] in an attempt to meet the needs of a growing dependent population

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(currently, seven out of every ten dependent individuals are over 65 years old, and more than half are over 80 years old [21]). However, effective implementation of the long-term benefits in Spain has been considerably slowed down due to the economic recession as explained in more detail in Section 2.

The objective of this study is to provide evidence regarding the financial burden of care costs and the catastrophic risk associated with OOP expenditure for LTC in Spain. Long-term care spending is considered as catastrophic if the out-of-pocket expenses incurred are large relative to the resources available to the household and this disrupts the material living standard of the household. Therefore, in countries like Spain where LTC is not fully developed households face a risk of incurring large LTC expenditures when members fall into dependency care. In addition, and given the decentralized nature of Spanish LTC services, we also aim to describe the catastrophic impact of the heterogeneity in the implementation of the LTC legislation across Spanish regions.

The structure of the paper is as follows. Section 2 explains the implementation of the Spanish Long- Term Care benefits, while Section 3 describes the data and methods used. In the fourth section, we present the results of the indicators considered to quantify the catastrophic risk of the OOP payments associated with LTC services. The fifth section discusses the main policy implications of our findings and the final section summarises the conclusions drawn.

2. Spanish long-term care legislation

The 2006 Spanish Dependency Act recognises the right of disabled persons who need help carrying out basic daily living activities to receive a range of LTC services. Access to these services is in accordance with the principle of the universal nature of social benefits, which is designed to grant effectively equal and non-discriminatory for all dependents irrespective of the region in which they reside. In particular, the order of preference for beneficiaries is based on the level of care dependency and, for the same level of need, on the economic capacity of the household (composed of employment and self-employment income, capital income and wealth [22]).

In Spain, the regions are responsible for providing the cash benefits and services established by the Dependency Act. The Ministry of Health, Social Policies and Equality sets a threshold of minimum services and benefits to be allocated to those who are eligible, but above this threshold, each region may provide additional resources if it wishes. LTC beneficiaries can apply for formal health care services (if available) or monetary transfers to be used either for the private purchase of formal services or, more commonly, to subsidise informal carers (see Table 1). In-kind benefits, by their very nature, are subject to much higher levels of copayment, and thus are likely to have a stronger impoverishing impact [23]. The higher costs of provision of in kind LTC benefits, together with the insufficient supply of formal services, may explain why monetary benefits have prevailed over other LTC entitlements [20].

Table 1
Distribution of Long-Term Care entitlements (in cash vs. in kind, 2012).

			Left-wing	Conservative	Diff (p)
Political ideology	Level II	Services	34.90%	31.30%	0.000***
		Cash benefits	65.10%	68.70%	0.000***
	Level III	Services	36.70%	35.50%	0.703
		Cash benefits	63.30%	64.50%	0.000***
			GDP below average	GDP above average	Diff (p)
GDP per capita	Level II	Services	33.90%	31.80%	0.000***
		Cash benefits	66.10%	68.20%	0.000***
	Level III	Services	34.60%	38.60%	0.004***
		Cash benefits	65.50%	61.50%	0.000***

GDP: Gross Domestic Product. *** p < 1%; ** p < 5%; * p < 10%

The 2006 Act established funding for LTC services as follows: one third to be funded by the State, one third by the 17 regions (or Autonomous Communities) and one third (on average, depending on the economic capacity of the household) directly by the beneficiary. Studies have estimated that the initial out-of-pocket payment for long-term care (OOP-LTC) in Spain ranges between 8% and 21% of the cost of the service [23,24]. However, due to the severe economic recession, in 2012 various measures were taken to reduce the budget deficit and thus meet fiscal consolidation targets [25,26]. Among the cost containment measures, a new formula to calculate the OOP payments for LTC was implemented, although no previous assessment was made of its impact [22,27]. To our knowledge, only two studies have estimated the revised magnitude of the copayment, and both have obtained similar results, that this quantity now amounts to somewhat over half the total cost (a figure substantially higher than the one third of the cost of the service initially established) [28–30].

The implementation of the new LTC system was designed to be progressive, with mild dependents expected to be entitled to LTC benefits gradually over the period 2012 to 2015. Due to the economic recession, cover for persons with severe and major dependency care (levels II and III) was prioritised over that for those only moderately dependent (mostly level I), and thus the access to LTC benefits for mild dependents suffered a three year delay. However, this does not mean that persons with less severe levels of dependency care were not receiving LTC; either they were receiving care from the social services before the enactment of the Act, or these services were privately financed. In 2012 national legislation established a transparent, homogeneous formulation to calculate the copayment for individuals with granted access to LTC services –only severe and moderate dependents until 2013 – (see Tables S1 and S2 in the online Supplementary material).

3. Data and methods

3.1. Data

The data employed in this analysis were obtained from two different sources. While the socioeconomic information of dependents was based on the Spanish Disability and Dependency Survey (SDDS), conducted by the Spanish National Statistics Institute [31], OOP-LTC was calculated on the basis of information drawn from the Spanish Statistics Service of the Department of Value, Quality and Evaluation of the System for Autonomy and Dependency Care [32].

SDDS is a representative survey of the non-institutionalised disabled population living within a household in Spain. SDDS provides very detailed information not only about the health status of the disabled population but also about the use of health and long-term care services, as well as other relevant sociodemographic and economic information about the household [31].

In the initial stage of this survey, 96,000 households with 260,000 individuals were selected. In the second stage, 22,795 persons with disabilities were identified and interviewed in-depth. Persons aged six years and over are considered to be disabled by SDDS if they experience significant limitations in performing at least one of 44 specified activities, in a situation that has lasted for over one year and which originated from a health deficiency.

All analyses were performed using STATA 13.0 statistical software (StataCorp LP, College Station, TX) and computed using sampling weights already available in the survey to make the sample representative of the Spanish disabled population.

Individuals were ranked according to their level of care dependency as follows: non-dependent or moderately dependent, level I; severely dependent, level II; major dependence, level III, using the official scale [33] and following Vilaplana [34]. This ranking includes objective criteria for assessing the level of autonomy of individuals, reflecting their ability to perform basic tasks of daily living and, for people with intellectual disabilities and mental illness, the need for support and supervision. The assessment is based on a questionnaire, and assumes direct observation of the dependent individual by a qualified, well-trained professional. The tasks assessed include eating and drinking, the control of urination and defecation, washing and other body care, dressing, health maintenance, the ability to sit, stand and move about inside and outside the home, to do housework, and the capacity to make decisions.

3.2. Estimating OOP payments

The OOP payment of each type of benefit was calculated in accordance with the legal definition [27] for each person. The economic cost of each service (c_i) is shown in Table S1 and calculations of OOP_i are presented in Table S2. The economic capacity of beneficiaries was calculated on the basis of income (as the SDDS provides no information on family assets), following the criteria set out in the DA. Household income has been adjusted using the OECD modified equivalence scale [35], which assigns a value of 1 to the first household member; 0.5 to each household member aged 14 or over; and 0.3 to each member aged 13 or under.

Total cost per person (Eq. (1)) and OOP payment per person (Eq. (2)) are thus obtained using weights which adjust by the probability of obtaining each service ($w_{i,j}$) for every individual with level of dependence i {i = 1, 2, 3} and region of residence j {j = 1, 2, . . ., 18} (Table S3). Probabilities were provided by the Spanish Statistics Service of Department of Value, Quality and Evaluation of the System for Autonomy and Dependence Care [32].

$$Total\ \ cost \quad per\ person_{i,j} = \sum_{i=1}^{n} w_{i,j} c_i \tag{1}$$

$$Out - of - pocket \quad payment\ \ per\ person_{i,j} = \sum_{i=1}^{n} w_{i,j} OOP_i \tag{2}$$

where c_i is the cost of each type of dependency care service (residential care, day/night centre care, home help care, cash benefit linked to formal services, cash benefit linked for family care and help to support for non-professional caregivers informal care-, cash benefit for personal assistance), and OOP_i is the out-of-pocket expenditure associated to each dependency care service (residential care, day/night centre care, home help care, cash benefit linked to formal services, cash benefit linked for family care and help to support for non-professional caregivers -informal care-, cash benefit for personal assistance).

3.3. Measuring catastrophic OOP payments

Following the approach used by Wagstaff and van Doorslaer [36], we define the dummy variable E_i, which takes a value of 1 when the OOP spending for LTC of household *i* as a proportion of the equivalent household income (x_i) exceeds the normative threshold (z_{cat}), that is when (OOP payments for $LTC_i/x_i) > z_{cat}$ and 0 otherwise. Finally, the household's OOP-LTC_i is defined as catastrophic when the expenditure incurred by the household exceeds the normative threshold. The catastrophic payment *headcount* ratio (H) quantifies the incidence of OOP expenditure for LTC and is defined as follows:

$$H_{cat} = \frac{1}{N}\sum_{i=1}^{n} E_i = \mu_E \tag{3}$$

where N is the sample size. The gap between the dependency-related OOP spending for LTC and the normative catastrophic threshold (z_{cat}) is defined as the catastrophic *overshoot* (O_i), equal to (OOP payments for $LTC_i/x_i) - z_{cat}$ if $E_i = 1$, 0 otherwise. The global average which measures the size and intensity of the gap for catastrophic payments (O_{cat}) is defined as:

$$O_{cat} = \frac{1}{N}\sum_{i=1}^{n} O_i = \mu_O \tag{4}$$

We propose a new, complementary measure, the catastrophic *absolute overshoot* (AO_i), which shows the gap or excess due to disbursement of OOP spending for LTC, equal to OOP-$LTC_i - z_{cat}{}^{*}x_i$ if $E_i = 1$, 0 otherwise. In this case, the global average represents the intensity of the gap of the catastrophic absolute payments (AO_{cat}) and is defined as:

$$AO_{cat} = \frac{1}{N}\sum_{i=1}^{n} AO_i = \mu_{AO} \tag{5}$$

The global catastrophic absolute overshoot (GAO_i) of OOP expenditure for LTC is defined as:

$$GAO_{cat} = \sum_{i=1}^{n} AO_i \tag{6}$$

Therefore, while H measures the proportion of households where a given threshold level is surpassed, O indicates the average amount by which it is exceeded. We investigate the expenditure thresholds most commonly used in research studies (z_{cat}) of 10%, 20% [37,38], 30% [36,39] and 40% [6,11]. In addition, we take into account the study by Wang et al. [15], who also focused on the disabled population, and who included a threshold of 50%.

Concentration indices (CI) were calculated to determine whether catastrophic expenditures are more concentrated among wealthier (CI > 0) or less well-off individuals (CI < 0). The CI is calculated following the method employed by Wagstaff et al. [40]:

$$CI_{Zcat} = \frac{2}{\mu} COV(y_i, w_i) \tag{7}$$

which shows that the value of the CI equals the covariance between an indicator of incidence (CI_{inc}) or intensity (CI_{int}) of the copayment (y_i) and the relative ranking of individuals according to their socioeconomic status (w_i), divided by the average of the measure of catastrophic household expenditure (μ). Then, the whole expression is multiplied by 2 to ensure that the CI ranges between −1 and +1.

In addition to the above, weighted concentration indices (WCI) are estimated to obtain a more explicit description of the pro-poor or pro-wealthy distribution of OOP spending for LTC: if OOP expenditure is concentrated in low income households, the weighted indices will show a negative sign, and their magnitude will increase (in absolute value) relative to the unweighted measures. In contrast, when it is concentrated in high income households, the weighted indices will show positive values and a lower magnitude relative to the unweighted measures. Finally, in the case of an equitable distribution of OOP payments, the weighted indices tend to be close to 0, and therefore, the weighted and unweighted measures will coincide [7].

$$H_{catw} = H_{cat}(1 - CI_{inc}) \tag{8}$$

$$O_{catw} = O_{cat}(1 - CI_{int}) \quad (9)$$

$$AO_{catw} = AO_{cat}(1 - CI_{int}) \quad (10)$$

Given the asymmetrical implementation of the Dependency Act across the Spanish regions, both in terms of funding for LTC and in the pace of implementation of this reform [20,41], we also estimated separate CIs for two geographical clusters: the regions with a GDP per capita exceeding the national average versus those where it is below the national average; and regions with a left-wing government during the period 2007–2011 versus those with a conservative one. Tables S.4.A and S.4.B in the online Supplementary material list the regions included in each category. Clustering by income is justified by previous empirical international evidence which shows that poorer countries are more likely to incur catastrophic expenses [5,6]. Regional income may influence the distribution of in kind versus formal services (and thus the level of copayments), since in Spain the poorer regions would be expected to provide fewer formal (and more expensive) services since the regions are responsible for the provision (and to a large extent the funding) of LTC services. As for the political ideology, left-wing regions are expected to have more fully-developed LTC programmes, since this issue was one of the main social promises of the newly-elected left-wing central government in 2004 (Costa-Font [41]). This is corroborated in Table 1, which shows the relative importance of LTC benefits disaggregated by GDP and ideology of the governing party.

Finally, we note that this analysis focuses only on care dependency levels II and III because the 2012 legislation [22] postponed the effective implementation of the corresponding benefit for moderate (level 1) dependents until July 2015. Hence, a significant number of persons until that date were recognised to have level I dependency care, but did not receive any benefit in this respect.

All figures are expressed in 2012 euros. To standardise the cost values used in our analysis, the monthly income of dependent persons was updated to 2012 values using the consumer prices index [42].

4. Results

4.1. Descriptive statistics

Table S5 in the online Supplementary material presents the sociodemographic characteristics of the sample used in this study. Two thirds are women (67.18% and 68.08% for level II and III, respectively) and the average age ranges from 72.95 years (SD: 18.70) for level II dependents to 75.52 years (SD: 20.03) for level III ones. Average monthly income ranges from €1,448.46 (SD: 1,071.46) for level II dependents to €1,516.46 (SD: 1,108.97) for level III ones. Widow status predominates in both long-term care dependency levels (42.33% and 48.12%, respectively), followed by married status. Separated/divorced status is the least common marital status in our study sample. The majority of the sample have a low level of education (60.27% and 66.12%, for levels II and III, respectively), and receive an earnings-related pension (86.60% for level II and 86.97% for level III). Finally, two thirds of the study sample live in a region governed by a party with a left-wing ideology while the Dependency Act was being implemented, and also around two thirds of the population live in a region where the GDP per capita is below the Spanish average.

Information about overall OOP spending for LTC and OOP spending disaggregated by political ideology and GDP per capita is presented in Table S6 in the Supplementary material. Average monthly OOP payments for LTC for level II dependents amounts to €222.35, which represents 42.75% of total costs of LTC and 18.56% of monthly household income. These values rise considerably for level III dependents, to €400.35, representing 44.99% of total costs and 30.58% of household income.

Table S6 also shows that regions governed by a more conservative party present higher average OOP payments, not only in absolute terms, but also as a percentage of LTC costs and relative to household income. A similar pattern is observed in the regions with the lowest GDP per capita, where LTC users bear a greater proportion of the OOP-LTC expenditure for both dependency care levels analysed.

Table A1 in the Appendix A (Supplementary data) also reveals the considerable influence of **regional characteristics**, and in particular, regional GDP and political party governing the region, in the risk of incurring catastrophic OOP spending for both levels of dependency care. The financial burden of OOP payments clustered at the regional level on the basis of these two characteristics will be analysed in more detail in Section 3.3. In addition, other **socio-demographic variables** which are also important drivers of catastrophic OOP expenditure for LTC include separated, widowed, and single individuals, especially for major dependency care, while being a female is a protective factor. Being unemployed increases substantially the risk of catastrophic OOP expenditure only for severe dependents (level II), while reducing slightly the risk of catastrophic OOP payments for LTC for major dependency care. Finally, individual income exerts a very different impact on the risk of incurring in catastrophic OOP payments for major and severe dependents. As shown in Table A1, while middle income major dependents are the group more likely to be affected by the catastrophic payments, for severe individuals it is high income individuals who are more likely to incur in catastrophic payments.

4.2. Catastrophic OOP payments for long-term care

Table 2 shows the main catastrophic OOP payment measures obtained for dependency care levels II and III for the whole sample. For example, for the 40% threshold, 38.34% of individuals with level II dependency care and 74.77% of those with level III dependency care spend over 40% of their income on OOP-LTC (*headcount,* Hcat). Specifically, our analysis reveals that, on average, level II and level III dependents exceed the 40% threshold by 6.41% and 22.29% (*overshoot,* Ocat), respectively, which translates into a monthly monetary excess of €61.28 and €93.00, respectively (*absolute overshoot,* AOcat). The overall contribution by all individuals (levels II and III) for whom the copayment exceeds 40% of their income is €85.6 million per year (*global absolute overshoot,* GAOcat). The weighted measures which are used to introduce equity value judgements into the catastrophic indices reveal that the weighted percentages of households that devote more than 40% of their income to OOP payments for LTC decrease to 35.16% and 70.85% for levels II and III, respectively (*weighted headcount,* Hcatw). In terms of the amount dedicated to OOP expenditure, the figures show an excess of 6.79% (€64.99) and 22.73% (€94.86) (on the basis of the 40% threshold), for levels II and III, respectively (*weighted overshoot,* Ocatw; *weighted absolute overshoot*, AOcatw).

These results are illustrated in Fig. S1 in the Supplementary material, which shows that for any OOP spending as a share of income, the headcount (which is shown on the x-axis at the defined threshold level) and the overshoot (the area under the payment share curve but above the threshold level) for level III dependents are always higher than for level II dependents (as the curve for level III dependents is always to the right of that for level II dependents).

Our findings also reveal a statistically significant incidence of concentration indices. Thus, for catastrophic incidence, a positive gradient is observed in the poverty measures, as the threshold level increases. This means that the probability of impoverishment is concentrated among higher income households. The opposite pattern is found for catastrophic-related intensity for level II depen-

Table 2
Incidence and intensity of Out-Of-Pocket Payments for Long-Term Care (Whole sample).

Level II	10%	20%	30%	40%	50%
Headcount (Hcat)	93.38%	73.97%	50.76%	38.34%	25.33%
Overshoot (Ocat)	24.16%	15.96%	10.26%	6.41%	4.00%
Absolute overshoot (AOcat)(€ per month)	130.02	100.61	78.28	61.28	11.28
Global absolute overshoot (GAOcat)(€ m per year)	447,369	167,563	53,395	17,398	985
Weighted headcount (Hcatw)	93.51%	74.38%	48.40%	35.16%	20.25%
Weighted overshoot (Ocatw)	25.13%	16.77%	10.88%	6.79%	4.26%
Weighted absolute overshoot (AOcatw) (€ per month)	135.22	105.70	83.02	64.99	12.02
Concentration index of incidence (CI_{inc})	**−0.001**	**−0.006**	**0.046*****	**0.083*****	**0.201*****
Concentration index of intensity (CI_{int})	**-0.040*****	**-0.051*****	**-0.061*****	**-0.061*****	**-0.066*****

Level III	10%	20%	30%	40%	50%
Headcount (Hcat)	99.74%	96.47%	88.36%	74.77%	60.61%
Overshoot (Ocat)	49.29%	39.50%	30.31%	22.29%	15.90%
Absolute overshoot (AOcat)(€ per month)	259.06	178.68	126.40	93.00	35.20
Global absolute overshoot (GAOcat)(€ m per year)	760,214	405,289	180,851	68,224	14,184
Weighted headcount (Hcatw)	99.52%	95.91%	85.87%	70.85%	56.84%
Weighted overshoot (Ocatw)	49.45%	39.71%	30.62%	22.73%	16.37%
Weighted absolute overshoot (AOcatw) (€ per month)	259.84	179.57	127.66	94.86	36.26
Concentration index of incidence (CI_{inc})	**0.002*****	**0.006*****	**0.028*****	**0.052*****	**0.062*****
Concentration index of intensity (CI_{int})	**−0.003**	**−0.005**	**−0.010**	**−0.020**	**−0.030**

Hcat: proportion of households that dedicate more monthly equivalent income than threshold. Ocat: average amount dedicated above the threshold of monthly equivalent income. AOcat: average amount dedicated above the threshold of monthly equivalent income. GAOcat: global amount dedicated above the threshold of monthly equivalent income. Hcatw: weighted headcount, with weights being the concentration index of incidence. Ocatw: weighted overshoot, with weights being the concentration index of intensity. AOcatw: weighted absolute overshoot, with weights being the concentration index of intensity. *** p < 1%; ** p < 5%; * p < 10%

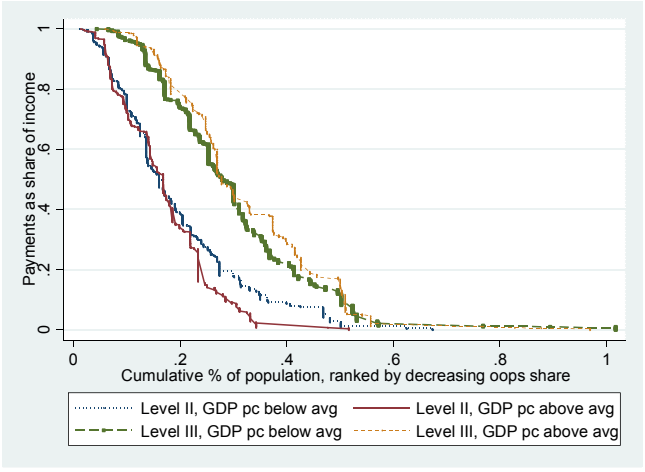

Fig. 1. Catastrophic Out-Of-Pocket Payment for Long-Term Care as proportion share of income, by cumulative % of population. Regions with below/above average GDP per capita. Levels II and III.

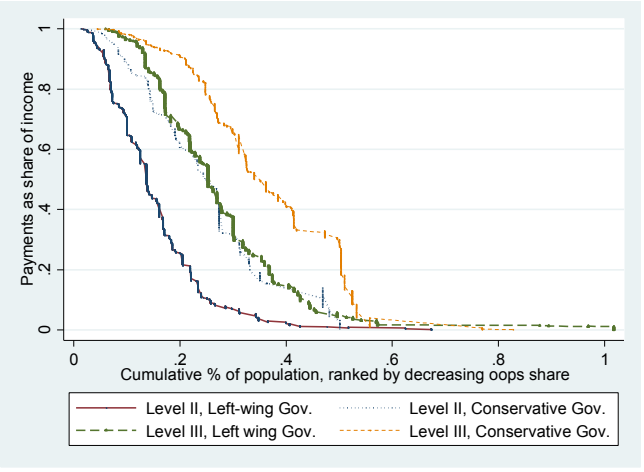

Fig. 2. Catastrophic Out-Of-Pocket Payment for Long-Term Care as proportion of income, by cumulative % of population. Regions with left-wing/conservative governments. Levels II and III.

dents, with increasing negative values, reaching the maximum level of catastrophism for dependents in category II. This result suggests that low income households bear a higher burden of impoverishment associated with OOP spending for LTC, especially those in long-term care dependency level III.

Detailed information disaggregated by cluster can be found in the online Supplementary material. Fig. 1 and Tables S7 and S8 show the results disaggregated by regional GDP per capita (below and above the average). For level III dependents, the findings reveal a substantially higher level of catastrophic payments in high income regions, while the catastrophic rates are more evenly spread across the regions for level II dependents.

The concentration indices for catastrophic incidence for less well-off regions for dependency care levels II and III show a positive magnitude, which increases with the threshold level. For wealthier regions, the magnitude of catastrophic incidence is positive for the highest threshold levels only for severe dependents; no significant pattern was observed for major dependents. Regarding intensity, in less well-off areas, the impoverishment effect is concentrated among high income individuals (although this effect was found only for level III dependents), while for wealthier regions it is the low income individuals whose LTC payments constitute a greater share of their income.

Finally, the analysis disaggregated by political ideology of the party governing the region is shown in Tables S9 and S10. These descriptive statistics reflect higher levels of catastrophism in the cluster of conservative ideology regions compared to the left-leaning ones. This is also illustrated in Fig. 2, which shows that for any OOP payments level as a share of income, and for both long-term care dependency levels analysed, the catastrophic headcount and overshoot are considerably higher in regions led by conservative governments.

The concentration indices used to weight the absolute headcount and overshoot measures and to introduce value judgments reveal certain differences in the concentration of catastrophic payments according to the type of region. For catastrophic incidence, the higher income households in left-wing regions bear the greater burden of OOP spending for LTC. However, the low income house-

holds in left-wing governed areas must dedicate a larger share of their financial resources to LTC services, in levels II and III. Nevertheless, left-leaning regions are subject to lower levels of catastrophism, in both long-term care dependency levels analysed, even after adjusting the equity indices for the pro-wealthy distribution of the OOP payments for LTC.

The disaggregation of the results on the basis of the geographical clusters + by regional GDP per capita, on the one hand, and by the ideology of the party governing the region, on the other, revealed important differences in the allocation of LTC benefits: poorer regions and those ruled by left-wing parties are associated with higher levels of catastrophism related to OOP-LTC, which are borne disproportionately by wealthier individuals. The impoverishment effect seems to be particularly strong for richer major dependents in less well-off regions, and for poorer major and severe dependents in better-off regions. These results may be partly explained by the unequal geographical distribution of LTC in Spain, since in regions with greater resources and those governed by progressive parties, in-kind LTC benefits (which are subject to higher levels of copayment) are more prevalent than financial ones. In addition, the copayment levels vary considerably across regions (see Table S6 in the online Supplementary material).

Interestingly, while richer regions are subject to higher levels of catastrophism than poorer ones, the relatively low copayments incurred by individuals in left-wing regions may account for the considerably smaller number of households affected by catastrophic LTC payments in these regions, despite their having slightly more highly developed formal LTC services.

5. Discussion

To our knowledge, this is the first study to analyse the financial effect and the level of catastrophism associated with LTC expenditure using a restricted sample of disabled and chronically ill people who need help to carry out the basic activities of daily living.

Our results show that the OOP payments for LTC services introduced in Spain in 2012 is a major financial burden for the Spanish dependent population, with the proportion of the charge paid by the individual being particularly high for services relative to cash benefits, and as discussed below, for some types of regions. According to our findings 59,389 level II dependents (14.46%) and 87,609 level III ones (31.43%) must devote more than 40% of their income to OOP-LTC. These magnitudes are in line with those obtained by Wang et al. [15] for chronically ill people living in rural (22.03%) and urban areas (30.57%) in China, and considerably higher than those found for Korean individuals with moderate and severe disabilities (11.1% and 13.0%, respectively) [43]. In addition, the amount by which the catastrophic OOP payments exceeds the 40% threshold in Spain is 8.58% and 10.54%, for levels II and III of disability. These figures, too, are similar to those found for health care expenditure in a sample of Chinese rural and urban chronically ill individuals (7.60% and 5.08%, respectively) [15].

The concentration of catastrophic expenditure for LTC among richer individuals and wealthier regions in Spain found in this study is appears to be in line with the findings of previous research, which has reported that beneficiaries of LTC services (with major care dependency) seem to experience pro-rich inequity in the use of formal services. This might be explained by the fact that wealthier individuals are the main recipients of formal LTC services in Spain. However, unmet needs related to formal services, together with the use of intensive informal care services, appear to be disproportionately concentrated among the worse-off, with families acting as safety nets [44].

There are considerable geographical differences in the allocation of LTC benefits: poorer regions and those ruled by left-wing parties are associated with higher levels of inequity related to OOP spending for LTC, which fall especially on wealthier individuals. The impoverishment effect seems to be particularly strong for richer major dependents in less well-off regions, and for poorer major and severe dependents in richer regions. These results may be partially explained by the unequal geographical distribution of LTC services and OOP associated to these services in Spain, since in better-off regions and in those with socialist governments, in-kind benefits for LTC, which are subject to higher levels of copayment, are more prevalent than cash transfers.

In poorer regions and in those with more left-wing governments, the overall number of households subject to catastrophic LTC payments is considerably lower (for all of the thresholds considered) than in wealthier regions and those governed by conservative parties. This could be explained, among other aspects, by the substantially lower copayments required of dependents in these regions, either because formal services are replaced by cash benefits in certain regions (mainly poorer ones, where in-kind benefits are more common) or because the level of copayments required of dependents for the same services is considerably lower in some regions (such as those with left-wing governments).

In addition to the regional differences associated to the catastrophic risk of OOP payments for LTC, which were also found to be relevant in previous studies of catastrophic health spending (e.g. Kronenberg and Pita [45]), other socio-demographic variables were found to be important drivers of catastrophic OOP expenditure for LTC, in particular marital status. This is probably explained by the high reliance of Spanish dependents on their family members as the main carers.

This study presents some limitations. Firstly, due to insufficient data, the copayments analysed are not derived from actual figures but are estimated on the basis of the probability of using specific services in each region (see Table S3 in the online Supplementary material). The second limitation is that we were unable to include information about household wealth, which is taken into account to calculate the economic capacity, and subsequently, the copayment for LTC services. In addition, and also due to lack of data, we were not able to take into account in our analysis the formal services privately paid by families or the forgone earnings due to informal care. Another limitation of our paper is that we hypothesise that a household's entire budget is available for LTC expenditure. However, a more sensitive approach to measure catastrophic payments for LTC would be to consider the household's capacity to pay for care dependency by adjusting LTC spending by household's basic needs, such as food and shelter [46]. Finally, while the 2008 Spanish Disability and Dependency Survey was taken as the basis for the socio-demographic characteristics of the dependent population, the copayment for LTC services was calculated according to the 2012 Dependency Act. Nevertheless, the results should not be greatly affected by this lag in the data sources, since the evolution in the prevalence of disability tends to remain unchanged over time [28]. For instance, in Spain the prevalence of disability amounted to 6.2% in 1999 and 6.5% in 2008, while that of long term care increased only from 4.4% to 5.1% in the same time period [47].

6. Conclusions

OOP expenditure for LTC is an important financial burden for the dependent population [14,48], increasing the risk of catastrophic expenditure for this population group [45,49,50]. In particular, the findings of this paper reveal a greater impoverishing risk due to copayment for wealthier dependents, while the financial effort associated with copayment falls most heavily on less well-off households. Inequity in the use of formal services favouring the rich has been documented in previous studies [20,44]. In this paper, we

specifically measure the catastrophic impact of care dependency copayments. We also report interesting regional differences in the access to LTC, which could be attributed to differences both in the expansion of formal LTC for dependents and to the varying levels of copayment requirements faced by dependents in different areas of Spain.

Our results suggest that more attention should be addressed towards policies aimed at improving the progressivity of the OOP payments expenses incurred to pay for LTC services, both within and between regions. In addition, the geographically uneven distribution of in-kind and in-cash benefits for LTC should be addressed by policymakers, and formal services should be prioritised nationwide in order to guarantee equal access for equal need.

Finally, in the light of our results and those of previous studies highlighting the concentration of formal LTC services among the relatively wealthier individuals, and the prevalence of monetary benefits over in kind services in Spain [20,44], higher levels of funding and more efficient bureaucracy might be necessary in order to alleviate the long waiting lists and unmet needs faced by dependents. In fact, the gap between demand and supply of LTC services seems to have widened over time, with an increasing number of individuals in a 'dependency limbo', i.e., situations in which dependents die, officially recognised as dependents but without receiving effective benefits. Many of the findings of this study are very relevant to other countries which, like Spain, have highly decentralised but not fully comprehensive care dependency services (such as Italy, Hungary or Poland).

An interesting avenue for future research would be to assess the catastrophic risk associated with the LTC copayments using more recent data. In addition, while our study fills a gap in the literature by providing evidence of the financial burden of LTC entitlements from a European country, it would be insightful to compare the financial burden incurred by the Spanish dependent population with that observed in other European or OCDE countries for which comparable data could be obtained. Finally, it would be interesting to study the potential "bed-blocking" effect associated with the lack of adequate cover of LTC services or insufficient coordination of health and social care programmes in Spain, which may lead to the unnecessary use of hospital care use reported in previous studies.

Conflict of interest statement

Authors of this manuscript have no conflicts of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.healthpol.2019.03.016.

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