

# Income-rich and wealth-poor? The impact of measures of socio-economic status in the analysis of the distribution of long-term care use among older people

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## Abstract

This article aims to investigate the impact of using 2 measures of socio-economic status on the analysis of how informal care and home care use are distributed among older people living in the community. Using data from the Survey of Health, Ageing and Retirement in Europe for 14 European countries, we estimate differences in corrected concentration indices for use of informal care and home care, using equivalised household net income and equivalised net worth (as a proxy for wealth). We also calculate horizontal inequity indices using both measures of socio-economic status and accounting for differences in need. The findings show that using wealth as a ranking variable results, as a rule, in a less pro-poor inequality of use for both informal and home care. Once differences in need are controlled for (horizontal inequity), wealth still results in a less pro-poor distribution for informal care, in comparison with income, whereas the opposite is observed for home care. Possible explanations for these differences and research and policy implications are discussed.

## KEYWORDS

income, inequality, long-term care, older people, wealth

## 1 | INTRODUCTION

Older people make up for an increasing higher share of users of health and social services in Europe. However, scant attention has been paid to how long-term care (LTC) use may reflect differences in socio-economic status (SES) among older people (cf. Bakx et al., 2015), despite high user copayments and the fact that need might be inversely correlated with SES (Rodrigues, Huber, & Lamura, 2012). An important issue for the study of socio-economic differences in LTC use among older people is the choice of SES measure. Although some studies have included wealth in the analysis of socio-economic determinants of use of LTC (Bakx et al., 2015; García-Gómez et al., 2015; McCann, Donnelly, & O'Reilly, 2011), no study has contrasted the effects of income versus wealth as a measure of SES.

The rationale for using wealth as a measure of inequalities in use is that standard measures of SES (education, occupation, and income) are often considered less appropriate to assess SES in old age (Christensen et al., 2014). Occupation loses part of its salience or cannot be assessed among retired people, whereas education could reflect opportunities at earlier stages of life or gendered life courses (Arber & Ginn, 1991; Avlund, Damsgaard, & Osler, 2004). As for income, the magnitude of its variance is smaller after retirement than during the working life (Allin, Masseria, & Mossialos, 2009; Cubbin et al., 2011). Wealth may be a better SES measure for older people as it may reproduce the accumulated

**TABLE 1** LTC use and SES variables utilised in the analysis

Variable	Definition
LTC use	
Home care	Utilisation of professional or paid services in the home, including help with personal care, domestic tasks, other activities, and meals on wheels, during the 12 months previous to the interview.
Informal care	Receiving personal care or practical household help from any family member, friend or neighbour, inside or outside household, during the 12 months previous to the interview.
SES	
Equivalent household net income	Aggregation at the household level of all income components, including social benefits, adjusted for purchasing power parity and equivalised using the square root scale (Organisation for Economic Co-operation and Development, 2011).
Equivalent household net worth (wealth)	Measured as household net worth, includes all household real assets, net of any debt on them, and all household net financial assets (Christelis, 2011), adjusted for purchasing power parity and equivalised using the square root scale.

Note. LTC = long-term care; SES = socio-economic status.

effect of individuals' education, employment, and income during their lifespan more accurately (Avlund et al., 2004; Christensen et al., 2014; Schöllgen, Huxhold, & Tesch-Römer, 2010).

For LTC, one could expect wealth and income to impact on the use of home care services and informal care through different channels. Regarding home care, wealth could better reflect older people's budgetary constraints (Adena & Myck, 2014; Allin et al., 2009; Manski et al., 2012). Although the income of older people tends to be lower after retirement, accumulated wealth could be used to access services that require substantial user copayments (Allin, Masseria, & Mossialos, 2011; Geyer, Spreckelsen, & von dem Knesebeck, 2014) or that are linked to permanent negative health shocks (Poterba, Venti, & Wise, 2010). Furthermore, wealth in the form of house ownership may better capture neighbourhood effects, as home owners may live in areas with greater density of care services (Costa-Font, 2008). In both cases, the expected distribution of home care use would be more pro-rich when using wealth rather than income as a measure of SES.

For informal care, wealth could also act as an incentive for intergenerational transfers (i.e., bequest) in return for family care (Costa-Font, 2008; Norton, 2000). Furthermore, wealth in the form of house ownership could facilitate

**TABLE 2** Descriptive statistics of the sample (60+), mean (*SD*)

	AT	BE	CZ	DK	EE	FR	DE
Less than good self-rated health (%)	35.29 (47.80)	30.45 (46.03)	47.39 (49.94)	24.54 (43.05)	76.74 (42.25)	41.18 (49.22)	44.56 (49.71)
No. of severe ADL limitations	3.90 (19.37)	3.99 (19.57)	3.80 (19.12)	2.08 (14.27)	6.47 (24.60)	3.32 (17.94)	3.83 (19.19)
No. of chronic illnesses	1.91 (1.18)	2.10 (1.25)	2.30 (1.34)	2.05 (1.24)	2.13 (1.27)	2.02 (1.21)	2.25 (1.34)
Has long-term illness (%)	50.71 (50.00)	49.80 (50.00)	54.32 (49.82)	52.40 (49.95)	75.75 (42.86)	50.00 (50.00)	62.90 (48.31)
Has poor mental health status (%)	19.94 (39.96)	27.89 (44.85)	26.44 (44.11)	16.20 (36.85)	38.73 (48.72)	34.81 (47.64)	23.29 (42.27)
Has cognitive impairment (%)	2.94 (16.88)	1.92 (13.74)	1.15 (10.68)	0.69 (8.29)	1.71 (12.96)	1.29 (11.27)	1.65 (12.74)
Age (in years), 60+	71.02 (7.71)	71.26 (8.33)	70.23 (7.41)	70.62 (7.95)	71.99 (7.82)	71.74 (8.68)	70.43 (7.62)
Female (%)	56.74 (49.55)	53.74 (49.87)	57.56 (49.43)	52.06 (49.97)	60.83 (48.82)	56.37 (49.60)	50.58 (50.00)
Completed tertiary education (%)	25.00 (43.31)	30.23 (45.93)	12.82 (33.43)	37.59 (48.45)	20.53 (40.40)	19.21 (39.40)	29.10 (45.43)
No. of household members	1.87 (0.87)	1.85 (0.70)	1.98 (0.95)	1.78 (0.56)	1.92 (0.86)	1.80 (0.68)	1.91 (0.60)
Owns house (%)	52.90 (49.92)	78.83 (40.85)	66.39 (47.24)	72.26 (44.78)	86.05 (34.65)	80.35 (39.74)	63.66 (48.11)
No. of children	2.15 (1.46)	2.22 (1.49)	2.15 (1.05)	2.31 (1.26)	1.99 (1.26)	2.30 (1.48)	2.02 (1.29)
Has daughter (%)	45.74 (49.83)	47.32 (49.94)	48.95 (50.00)	50.40 (50.00)	44.48 (49.70)	48.31 (49.98)	43.19 (49.54)
Partner lives in the same household (%)	63.58 (48.13)	68.40 (46.50)	65.52 (47.54)	72.64 (44.59)	63.23 (48.22)	63.60 (48.13)	77.66 (41.66)
Home care use (%)	13.45 (34.13)	23.00 (42.09)	8.58 (28.02)	11.39 (31.77)	12.26 (32.81)	16.98 (37.55)	11.66 (32.10)
Informal care use (%)	21.00 (40.74)	19.52 (39.64)	32.08 (46.68)	22.51 (41.77)	27.30 (44.55)	16.13 (36.79)	19.01 (39.24)
N	3,100	3,586	4,159	2,599	4,330	3,186	3,577

Note. Unless otherwise stated, figures refer to the mean. Standard deviations are shown in parenthesis. AT = Austria; DE = Germany; SE = Sweden; NL = Netherlands; ES = Spain; IT = Italy; FR = France; DK = Denmark; CH = Switzerland; BE = Belgium; CZ = Czech Republic; LX = Luxembourg; SI = Slovenia; EE = Estonia.

intergenerational cohabitation and thus informal care use. Using income instead of wealth as a SES measure could therefore overestimate the pro-poor distribution of informal care by failing to account for income-poor but asset-rich individuals who receive care from relatives.

Reflecting on these several channels, we hypothesise that the distribution of use would be relatively more pro-rich for both home care and informal care when using wealth rather than income as a measure of SES.

We provide first-time evidence on the impact different SES measures have on (a) inequalities, or unstandardised differences in use across SES, and (b) horizontal inequities in LTC use, or differences across SES after accounting for differences in needs. Our analysis focuses on older people living in the community and on two types of LTC: informal care and home care (services). For added robustness and given the significant differences in how LTC systems are organised in Europe, the empirical analysis uses comparable, cross-national data to assess whether the effect of using different SES measures holds across countries.

The findings from this study can be compared with similar research on health care, which produced different conclusions. Wagstaff and Watanabe (2003) and Van Ourti (2003) found little to no differences in health inequalities when using different SES measures. Frick and Ziebarth (2013) reported differences only for subjective health whereas Lindelow (2006) and Allin et al. (2009) found significant differences in health care use when utilising different SES measures. Unlike most health care however, LTC is not free at the point of delivery, requiring instead substantial copayments from users or their families (Colombo et al., 2011) whereas assets are often considered for the determination of eligibility for LTC in Europe (Muir, 2017). Different measures of SES could therefore be an even more salient issue in LTC.

## 2 | METHODS AND DATA

We use data from Survey of Health, Ageing and Retirement in Europe, collected during 2013 in 14 European countries (Börsch-Supan & Jürges, 2005; Malter & Börsch-Supan, 2015), and restrict the sample to individuals aged 60 years and over. To ensure sufficiently large numbers of observations for all analysed countries, we used the imputed values provided (De Luca, Celidoni, & Trevisan, 2015), maintaining in the sample only individuals who gave valid responses for use of both types of LTC considered. The two measures of SES used are equivalised household net income and equivalised household net worth (hereafter wealth; Table 1). Wealth is also equivalised as we are interested in its effect as a resource

TABLE 2 Continued

	IT	LX	NL	SI	ES	SE	CH
Less than good self-rated health (%)	49.54 (50.00)	36.42 (48.15)	31.27 (46.37)	43.13 (49.54)	49.00 (50.00)	26.11 (43.93)	17.98 (38.41)
No. of severe ADL limitations	5.83 (23.45)	3.68 (18.85)	1.49 (12.10)	3.62 (18.69)	7.28 (25.99)	1.71 (12.95)	0.99 (9.93)
No. of chronic illnesses	2.04 1.27	2.53 (1.40)	1.82 (1.15)	1.99 (1.19)	2.23 (1.31)	1.97 (1.20)	1.64 (1.00)
Has long-term illness (%)	46.59 (49.89)	47.89 (49.98)	51.69 (50.00)	48.09 (49.98)	52.90 (49.92)	52.99 (49.92)	35.25 (47.79)
Has poor mental health status (%)	37.92 (48.53)	28.32 (45.08)	16.38 (37.01)	26.95 (44.38)	33.32 (47.14)	18.13 (38.54)	17.36 (37.89)
Has cognitive impairment (%)	2.51 (15.63)	1.79 (13.26)	1.17 (10.78)	2.88 (16.72)	4.53 (20.79)	1.35 (11.54)	0.62 (7.83)
Age (in years), 60+	71.41 (7.72)	69.91 (7.79)	70.28 (7.65)	71.47 (8.23)	72.81 (8.77)	71.14 (7.74)	71.01 (7.71)
Female (%)	52.43 (49.95)	50.11 (50.03)	52.80 (49.93)	56.53 (49.58)	52.59 (49.94)	51.84 (49.97)	52.28 (49.96)
Completed tertiary education (%)	6.87 (25.30)	16.84 (37.44)	25.74 (43.73)	16.18 (36.83)	8.32 (27.62)	27.93 (44.87)	14.85 (35.57)
No. of household members	2.23 (0.95)	2.00 (0.82)	1.85 (0.55)	2.15 (1.06)	2.22 (0.90)	1.81 (0.53)	1.87 (0.63)
Owens house (%)	84.43 (36.36)	83.05 (37.54)	67.00 (47.03)	89.93 (30.11)	92.18 (26.86)	58.26 (49.32)	62.14 (48.51)
No. of children	2.06 (1.34)	1.95 (1.28)	2.39 (1.38)	1.99 (1.04)	2.40 (1.51)	2.35 (1.31)	2.07 (1.37)
Has daughter (%)	40.49 (49.09)	47.68 (49.97)	49.24 (50.00)	50.37 (50.01)	40.67 (49.13)	50.63 (50.00)	45.35 (49.80)
Partner lives in the same household (%)	75.02 (43.29)	74.95 (43.35)	76.12 (42.64)	69.28 (46.14)	76.03 (42.69)	74.44 (43.63)	73.53 (44.13)
Home care use (%)	8.43 (27.79)	16.74 (37.35)	14.65 (35.37)	3.42 (18.19)	11.88 (32.35)	7.65 (26.58)	9.77 (29.70)
Informal care use (%)	17.49 (37.99)	17.47 (37.99)	13.96 (34.66)	14.09 (34.80)	18.25 (38.63)	14.09 (34.80)	12.81 (33.43)
N	3,391	950	2,894	2,015	4,640	3,634	2,108

for current household consumption, rather than as a reserve for financing future consumption (Organisation for Economic Co-operation and Development, 2013, p. 141). The final sample consists of 44,169 community-dwelling individuals.

Socio-economic inequality in access to LTC is assessed with the concentration index (CI; Wagstaff, Paci, & van Doorslaer, 1991; Wagstaff & van Doorslaer, 2000), a synthetic measure of socio-economic-related health inequality, conveniently calculated as

$$CI = \frac{2}{\mu} \text{cov}(h_i, r_i), \quad (1)$$

where  $h_i$  is the care utilisation variable,  $\mu$  is its average, and  $r_i$  denotes the fractional rank of each individual in the SES distribution. As both care utilisation variables are bounded, we calculate the CIs with the correction proposed by Erreygers (2009):

$$CCI = 4 * \mu * CI = 8\text{cov}(h_i, r_i). \quad (2)$$

The difference between concentration indices with different rank variables is estimated by employing the approach proposed by Wagstaff and Watanabe (2003). We write

$$CI_{income} - CI_{wealth} = \frac{2}{\mu} \text{cov}(h, \Delta r), \quad (3)$$

with  $\Delta r$  measuring the difference between the two rank variables ( $\Delta r_i = r_{li} - r_{wi}$ ). This formulation reveals that differences in the level of measured inequality depend not only on the two SES distributions resulting in a re-ranking of individuals but also on the covariance between the rank differences and the care utilisation variable. That is, irrespective of differences between the two fractional ranks, if these are not correlated with the care use variables, the observed socio-economic inequalities in the use variable will remain the same. Statistical significance of the difference between  $CI_{income}$  and  $CI_{wealth}$  can be tested via a modified convenient regression approach:

$$\frac{2 \text{var}(\Delta r)}{\mu} h_i = \alpha + \beta \Delta r_i + \varepsilon_i. \quad (4)$$

Finally, we present horizontal inequity indices (HI) in the use of LTC derived via the indirect need-standardisation process (Wagstaff & van Doorslaer, 2000). Using a set of need (including self-rated health, number of Activities of Daily Living (ADL) limitations, number of chronic illnesses, mental health, cognitive impairment, age, and gender) and a non-need determinants of LTC utilisation, a non-linear regression model is used to estimate the probability of an individual receiving care, had she been treated in the same way as were, on average, other individuals with equal care needs (van Doorslaer, Koolman, & Jones, 2004). If we assume  $h_i$  to be a linear and additively separable function of need ( $N_k$ ) and non-need indicators ( $Z_j$ ), as follows:

$$h_i = \alpha + \sum_k \beta_k N_{ik} + \sum_j \delta_j Z_{ij} + \varepsilon_i, \quad (5)$$

the CI can be written as the weighted average of the CIs for all included indicators (Van de Poel, van Doorslaer, & O'Donnell, 2012) and a convenient regression approach can be employed to calculate the CI of need-predicted utilisation. The HI can then be obtained by subtracting the CI for need-predicted LTC use from the CI corresponding to actual use (O'Donnell, van Doorslaer, Wagstaff, & Lindelow, 2007).

Values below zero, for both the corrected concentration index (CCI) and HI, indicate a pro-poor distribution of the use variable, whereas positive values indicate pro-rich inequality and, respectively, inequity. Descriptive statistics for the variables included in the need and non-need vectors in Equation 5 are provided in Table 2.

### 3 | RESULTS

The distribution of use of informal and of home care by different quintiles (Table 3) indicates that the SES measure used has an impact on the magnitude of the observed inequalities for either type of care. The effect of wealth on the SES gradient is however different between countries and does not always go in the same

TABLE 3 Informal care and home care use rates (%) by quintiles, 60+

	AT	BE	CZ	DK	EE	FR	DE	IT	LX	NL	SI	ES	SE	CH
<b>Informal care</b>														
SES by household income														
Poorest	30.38	25.51	33.97	30.79	34.32	25.97	31.18	19.73	19.69	18.35	20.15	19.70	24.26	19.45
2nd	25.60	24.10	39.73	29.69	39.47	19.84	23.28	24.42	23.31	15.95	15.06	28.21	14.90	15.33
3rd	21.77	19.37	34.28	23.08	25.16	11.93	17.70	23.83	23.07	14.38	13.47	20.43	13.63	14.76
4th	15.61	18.61	26.53	16.86	28.03	13.11	17.02	16.26	14.89	12.61	9.84	14.76	10.66	14.81
Richest	16.34	18.06	24.67	14.96	17.92	9.16	14.01	10.76	11.12	9.23	10.12	16.77	11.05	8.30
SES by hh wealth														
Poorest	34.51	27.51	38.89	30.91	34.47	22.78	30.85	25.03	24.42	23.19	22.52	24.30	21.83	17.96
2nd	21.94	22.03	33.49	27.59	28.70	18.14	21.44	19.60	18.14	13.27	12.39	24.39	11.95	11.64
3rd	16.35	21.97	27.82	23.47	27.30	13.14	17.95	16.12	16.91	10.93	8.46	21.10	13.52	13.71
4th	18.33	20.11	30.71	16.18	28.81	12.94	16.53	20.58	16.89	13.07	14.06	15.16	13.11	13.26
Richest	18.57	14.02	28.30	17.21	25.42	13.04	16.41	13.64	15.71	10.07	11.18	14.95	14.09	16.04
Home care														
SES by hh income														
Poorest	20.57	26.61	9.76	24.09	18.15	25.90	20.15	8.72	16.40	24.05	3.62	9.64	16.22	18.60
2nd	14.97	24.65	11.04	13.26	17.13	19.68	17.01	7.39	20.08	20.25	3.77	13.12	9.54	13.01
3rd	14.07	22.88	8.19	10.66	11.71	14.73	12.60	6.16	16.95	17.33	5.99	8.27	8.07	10.24
4th	11.25	21.78	6.75	4.70	11.65	11.45	11.42	7.38	17.84	11.65	1.35	8.27	4.38	8.54
Richest	11.76	20.18	6.98	4.03	5.53	11.56	8.22	9.63	19.10	9.14	2.75	17.03	5.65	5.47
SES by hh wealth														
Poorest	28.45	28.55	11.15	21.92	15.85	24.74	22.12	8.70	25.27	32.63	6.11	11.36	12.50	15.63
2nd	13.53	23.34	11.32	13.53	14.05	15.38	13.73	6.89	14.70	16.05	4.03	8.73	9.04	9.56
3rd	10.07	25.82	9.04	9.86	11.13	10.22	13.44	9.20	18.82	14.07	1.71	11.38	8.33	7.94
4th	10.96	16.71	5.26	7.23	13.93	14.27	9.44	7.82	18.16	11.00	1.99	11.44	6.62	8.85
Richest	9.61	21.66	5.95	4.28	9.25	18.74	10.64	6.65	13.43	8.66	3.63	13.40	7.39	13.80
N	3,100	3,586	4,159	2,599	4,330	3,186	3,577	3,391	950	2,894	2,015	4,640	3,634	2,108

Note. Means were calculated using analytical weights. SES = socio-economic status; AT = Austria; DE = Germany; SE = Sweden; NL = Netherlands; ES = Spain; IT = Italy; FR = France; DK = Denmark; CH = Switzerland; BE = Belgium; CZ = Czech Republic; LX = Luxembourg; SI = Slovenia; EE = Estonia.

direction. In two countries, the SES measure has an impact on whether the use of home care is concentrated on the richest or poorest quintiles (Italy and Luxembourg). The choice of SES measure produces substantial re-ranking of individuals as the correlation between income and wealth assessed through the Spearman rho is only weak or moderate (rho values range from 0.23 in Estonia to 0.44 in Germany and France—Table S1), with income–wealth matrices showing important interquintile re-ranking of individuals according to income and wealth (Table S1).

The CCIs displayed in Table 4 show a statistically significant pro-poor concentration of informal care use for virtually all countries, regardless of the measure of SES used. As a rule, inequalities in the use of informal care are lower when individuals are ranked according to wealth (i.e.,  $CCI_{wealth}$  is lower in absolute value than  $CCI_{income}$ ), except for the Netherlands, Spain, and Belgium. Differences between CCIs were tested using Equation 4, and we found the majority of differences where  $CCI_{wealth}$  was lower in absolute value to be statistically significant. This supports the hypothesis that wealth reduces pro-poor inequality in informal care.

For home care, the CCIs are for the most part statistically significant and pro-poor across SES measures. For a few countries, the choice of SES measure impacts the statistical significance (France, Switzerland, and Slovenia) and even the sign of the CCI (Italy and Luxembourg). There is no apparent pattern regarding differences in the value of the CCIs according to choice of SES measure, with half the countries showing higher pro-poor inequality when individuals are ranked according to income. However, in all the cases where  $CCI_{income}$  is larger in absolute value than  $CCI_{wealth}$ , this difference is statistically significant. Although less evident than for informal care, the choice of SES measure also impacts inequality in use of home care, in line with our hypothesis. These results are robust to using different specifications of wealth (i.e., liquid net wealth and equivalised wealth—results available—on request) and are largely confirmed by dominance tests between wealth—and income-ranked concentration curves (Figure S1).

Once differences in need are controlled for (horizontal inequity), findings for informal care and home care diverge. Using wealth as a ranking variable (compared to using income) results in a less pro-poor concentration for informal care, but not for home care. Although HI for informal care overall continue to show a pro-poor use of informal care, using wealth as a measure of SES results in lower pro-poor inequity (except for Belgium and Netherlands) as many  $HI_{wealth}$  become statistically not different from zero. For home care, the majority of the  $HI_{income}$  are not statistically significant, but among those that are, only Spain and Italy display markedly pro-rich inequity. Where significant changes occur, the  $HI_{wealth}$  show a more pro-poor distribution of use of home care in comparison with  $HI_{income}$ , with the exception of Estonia.

**TABLE 4** Inequalities and inequities in use of long-term care by income and wealth

	Informal care				
	$CCI_{income}$	$CCI_{wealth}$	$CCI_{income} - CCI_{wealth}$	$HI_{income}$	$HI_{wealth}$
Austria	-0.128*** (-5.99)	-0.109*** (-4.73)	-0.016 (-1.06)	-0.049** (-2.61)	-0.012 (-0.59)
Belgium	-0.059** (-2.67)	-0.097*** (-4.49)	0.013 (0.63)	-0.023 (-1.16)	-0.034 (-1.79)
Czech Republic	-0.118*** (-5.17)	-0.076*** (-3.16)	-0.022* (-2.37)	-0.047* (-2.30)	-0.019 (-0.87)
Denmark	-0.137*** (-6.66)	-0.128*** (-6.21)	-0.027** (-2.65)	-0.059*** (-3.09)	-0.050** (-2.60)
Estonia	-0.146*** (-8.40)	-0.064*** (-3.56)	-0.041*** (-4.90)	-0.080*** (-5.06)	-0.038* (-2.37)
France	-0.131*** (-5.27)	-0.074** (-2.98)	-0.051*** (-3.39)	-0.043* (-2.30)	-0.037 (-1.89)
Germany	-0.136*** (-7.67)	-0.115*** (-6.17)	-0.033* (-2.43)	-0.035* (-2.18)	-0.006 (-0.35)
Italy	-0.081** (-3.05)	-0.076** (-2.62)	-0.036 (-1.83)	-0.050** (-2.63)	-0.008 (-0.40)
Luxembourg	-0.076** (-2.73)	-0.065* (-2.12)	-0.040 (-1.50)	-0.031 (-1.24)	-0.008 (-0.30)
Netherlands	-0.078*** (-4.48)	-0.085*** (-4.65)	-0.012 (-0.79)	-0.032 (-1.89)	-0.037* (-2.10)
Slovenia	-0.093*** (-4.09)	-0.077*** (-3.12)	-0.030 (-1.31)	-0.023 (-1.10)	-0.008 (-0.34)
Spain	-0.063* (-2.31)	-0.093*** (-3.33)	0.009 (0.48)	0.008 (0.37)	0.030 (1.26)
Sweden	-0.103*** (-6.50)	-0.047** (-2.97)	-0.054*** (-3.88)	-0.046** (-3.06)	-0.007 (-0.49)
Switzerland	-0.076*** (-3.92)	-0.004 (-0.18)	-0.068*** (-3.27)	-0.036* (-1.97)	-0.012 (-0.60)

Note. Based on weighted data. The *t* tests are shown in parentheses. The *t* test for the CCIs and HI refers to the hypothesis that the indices are equal to zero. The *t* tests for  $CCI_{income} - CCI_{wealth}$  are calculated using Equation 4 and *t* test refers to the hypothesis that  $CCI_{income}$  is equal to  $CCI_{wealth}$ . CCI = corrected concentration indices; HI = horizontal inequity index.

\**p* < .05.

\*\**p* < .01.

\*\*\**p* < .001.

## 4 | DISCUSSION

This study sought to investigate whether different SES measures impact the distribution of informal and home care use among older people. Findings show that the choice of SES measure has a noticeable impact on inequality, although less so on inequity, with the direction of the effect depending on the type of care. The results corroborate the premise that choice of SES is relevant for distributional analysis for this age group.

Although the amplitude of the differences varies across countries, using wealth instead of income as a ranking variable resulted, as a rule, in a comparatively less pro-poor distribution of use for informal care. This seems to confirm the motivational effect of bequest (Norton, 2000, Do et al. 2013) and the higher likelihood of intergenerational households among the wealthy (de Jong Gierveld, Dykstra, & Schenk, 2012). Furthermore, assets, including housing, are often considered for determination of institutional care fees (Colombo et al., 2011; Muir, 2017; Rodrigues et al., 2012), which could offer an incentive for more affluent households to replace institutional care by informal care in order to maintain assets in the family (McCann et al., 2011). The findings also suggest that informal care may not be an inferior good for people of higher SES.

For home care, the results were more nuanced. Inequalities in use of home care were also less pro-poor with wealth as ranking variable. However, after accounting for differences in need, this was no longer the case, suggesting that wealth impacts inequity of use of home care and informal care in opposite directions. This indicates that some of the mechanisms that favour informal care use when wealth is present (e.g., intergenerational cohabitation for home owners) may depress the probability to use home care. Eligibility criteria that consider access to public support conditional on availability of informal care may also reinforce the substitution of informal and home care (Bakx et al., 2015). Yet, as the findings presented here rest on cross-sectional data, the impact of wealth on the distribution of home care use might be underestimated as a result of older users having already spent down their assets at the time of the survey: a hypothesis to research further with longitudinal data or on larger samples of new users of care. Additionally, when analysing our findings, it is important to consider the possibility for self-selection due to mortality, on the one hand, and institutionalisation on the other (van Ourti, 2003). Socio-economic differences in mortality result in lower survival to old age of people with low SES, partly reducing social class differences in LTC use in old age. Similarly, the ultimate safety net for low SES individuals is institutional care, whereas intense home care is subsidised only to a limited extent (Muir, 2017). Affluent individuals may therefore be better able to continue living in the community despite intense care

TABLE 4 Continued

	Home care				
	CCI <sub>income</sub>	CCI <sub>wealth</sub>	CCI <sub>income</sub> – CCI <sub>wealth</sub>	HI <sub>income</sub>	HI <sub>wealth</sub>
Austria	–0.079*** (–4.21)	–0.129*** (–6.49)	0.034 (1.64)	0.002 (0.10)	–0.014 (–0.91)
Belgium	–0.052* (–1.99)	–0.067** (–2.85)	–0.005 (–0.26)	0.017 (0.75)	0.017 (0.86)
Czech Republic	–0.035* (–2.38)	–0.053*** (–3.56)	0.010 (0.42)	–0.009 (–0.69)	–0.025* (–1.96)
Denmark	–0.165*** (–10.23)	–0.135*** (–8.46)	–0.072*** (–4.35)	–0.054*** (–4.08)	–0.052*** (–3.88)
Estonia	–0.100*** (–7.91)	–0.047*** (–3.59)	–0.061*** (–4.46)	–0.044*** (–3.90)	–0.023* (–1.98)
France	–0.123*** (–4.85)	–0.034 (–1.31)	–0.070*** (–6.10)	–0.022 (–1.05)	–0.007 (–0.35)
Germany	–0.100*** (–5.94)	–0.084*** (–4.73)	–0.046* (–2.37)	0.003 (0.26)	0.020 (1.49)
Italy	0.008 (0.51)	–0.010 (–0.64)	0.005 (0.22)	0.031* (2.00)	0.026 (1.86)
Luxembourg	0.019 (0.62)	–0.061* (–1.96)	0.061 (1.88)	–0.014 (–0.50)	–0.066* (–2.48)
Netherlands	–0.134*** (–6.85)	–0.171*** (–8.21)	–0.022 (–1.37)	–0.025 (–1.52)	–0.071*** (–4.21)
Slovenia	–0.014 (–1.25)	–0.028* (–2.01)	0.003 (0.08)	–0.011 (–1.02)	–0.009 (–0.70)
Spain	0.029 (1.14)	0.029 (1.17)	0.022 (0.87)	0.076*** (3.35)	0.067** (3.02)
Sweden	–0.084*** (–6.06)	–0.044*** (–3.16)	–0.091*** (–4.33)	–0.014 (–1.18)	0.005 (0.41)
Switzerland	–0.091*** (–4.96)	–0.019 (–0.91)	–0.065** (–3.00)	–0.021 (–1.26)	0.028 (1.49)

needs (Breeze, Sloggett, & Fletcher, 1999). This selection effect could lead to underestimating differences by showing use of home care to be less pro-rich.

For researchers, the findings present two key messages. First, income and wealth seem to have different effects and impact distribution of use through different channels, depending on the type of care and whether or not differences in need are accounted for. Wealth should be used as a SES measure when analysing informal care use; otherwise, the pro-poor distribution of this type of care could be exacerbated. Choice of SES measure seems to be less of an issue for inequity in home care, although the effect of wealth is contrary to that observed in the case of informal care. Which measure of SES to choose should therefore be informed by a theoretical framework that offers guidance as to the channels through which income and wealth impact use. Such a framework is, at least for LTC, still missing. Second, empirical findings and rationales from health care do not fully translate to LTC—namely, that the more pro-rich distribution of use of types of health care requiring high out-of-pocket payments (e.g., dental care) is observed with wealth (Allin et al., 2009), reiterating the different nature of LTC.

From a policy standpoint, although the distribution of informal care is less unequal with wealth, it is still markedly pro-poor, suggesting a limited scope for using assets tests for the determination of eligibility or copayments for home care, at a time when such policy is in place or being discussed in a number of countries (Colombo et al., 2011; Muir, 2017). The findings also suggest that the observed targeting of home care services to the less affluent seems to hold when using both income and wealth and that most countries manage to target their services to the poor—except for Italy and Spain.

The findings of this article highlight the need to devote more attention to the analysis of socio-economic gradients in the use of different types of LTC among the old, an issue that is thus far under-researched, despite its timeliness.

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## CONFLICT OF INTEREST

The authors confirm that they have no conflict of interest concerning the research reported in this study.

## ETHICAL APPROVAL

No prior ethical approval required.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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