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Inequity in long-term care use and unmet need: two sides of the same coin

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Abstract

International studies have shown evidence on inequity in use of health services of different kinds, depending on the type of health care service analysed. However, equity in the access to long-term care (LTC) services has received much less attention. We investigate the determinants of several LTC services and the existence of unmet need by the disabled population using unique data from a survey conducted on the disabled population in Spain in 2008. We further measure the level of horizontal inequity using methods based on the Concentration Index, a widely used indicator of income-related inequality in health. At the time of the analysis, only those respondents with the highest dependency level were covered by the recently introduced universal LTC system, which allows us to explore whether inequities remain for this subgroup of the population. In addition, we compare results using self-reported versus a more objective indicator of unmet needs. Evidence suggests that after controlling for a wide set of need variables, there is not an equitable distribution of use and unmet need of LTC services in Spain, with socioeconomic status being an important factor in access to LTC. We find that individuals at the higher end of the income distribution utilize a relatively larger share of formal services (provided by a professional), while intensive informal care (provided by friends and family) is concentrated among the worst-off. In terms of unmet needs for LTC services, their distribution depends on the service considered as well as on whether we focus on subjective or objective measures. Interestingly, for the population covered by the new universal LTC system, inequities in most LTC services and unmet needs remain statistically significant and even increase for certain services, in particular, formal services provided by professionals.

JEL classification codes: I14, 138, J14

Key words*:* Disability, equity in utilisation, dependency, long-term care, unmet needs, Spain

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1 Introduction

A large body of literature describes the existence of inequity in health care use in most (if not all) developed countries (Van Doorslaer et al, 2004; Bago d'Uva and Jones, 2009; Devaux and de Looper, 2012). However, there is no evidence on the level of horizontal inequity in the access to long-term care (LTC) services, i.e., the range of services needed by persons who are dependent on help with basic activities of the daily living (OECD, 2005) or the level of unmet needs reported by potential users of these services.

It is well known that there are large differences in the current LTC organization and spending among European countries. For example, while half of the EU-27 countries spent less than 1% of their GDP on LTC in 2007, Sweden and the Netherlands spent around 3.5% of their GDP (Economic Policy Committee, 2009). Although the baseline is very different between countries and the evolution of the health status of their populations is uncertain, the demographic evolution of European countries in the forthcoming decades is expected to pose significant pressure on public budgets regarding pension benefits, health care and LTC costs (DG ECFIN, 2006; Economic Policy Committee, 2009). The evolution of LTC expenditures will be conditioned by several distinct factors: demographics (percentage of the population over 65), institutions (organization of the LTC system, trade-off between formal and informal care and support for the latter type of care) and health (Spillman, 2004; European Commission, 2007; Lafortune et al., 2007; Manton et al., 2007; Manton, 2008; de Meijer et al, 2011; Jiménez-Martín and Vilaplana-Prieto, 2012). Therefore, ageing of the population will not only challenge the organisation of health care systems but also imply a redefinition of LTC systems in the years to come. In this regard, identifying the barriers to access to LTC services by the subsample of the population with a health impairment is crucial. Moreover, it is likely that barriers are not distributed equally among socioeconomic groups, so people with high levels of education and financial safety experience a lower level of entry barriers than those with low levels of education and income. This could be due, among other reasons, to an inequitable geographic distribution of LTC services, to differences in the treatment of patients on the basis of socioeconomic status, or to the existence of differences in the demand of health and social care services among patients with different levels of income and education (Hurley and Grignon, 2006).

We investigate inequity in the access of various LTC services using a rich Spanish dataset representative of the disabled Spanish population. At the time of conducting the survey, Spain was characterized by very low LTC expenditures, with a strong component of private financing. We first analyse equity in the use of a series of LTC services. We find that individuals at the higher end of the income distribution utilize a relatively larger share of formal services (provided by a professional). In particular, high levels of pro-rich inequity are found for the use of community care services and some home care services of all disabled individuals, which may be related to the existence of barriers to access for poorer individuals in terms of both availability of the service (e.g., waiting lists) and costs associated to these services (Hernández-Quevedo and Jiménez-Rubio, 2011). The use of intensive informal care services appears to be disproportionately concentrated within the worse-off, with families acting as safety nets.

However, inequity regarding LTC use may not be due only to inequitable treatment of the rich/poor, but also to differences in preferences. If people with higher incomes and better education levels have a stronger preference for the use of certain LTC services, then similar LTC care consumption patterns could result (Koolman, 2007). In addition, a given amount of use does not guarantee that all health needs are satisfied. Hence, we investigate unmet need for LTC services using two alternative definitions. Measuring whether needs for long-term care are met is difficult because it has multiple dimensions, both subjective and objective, and depends in part on individual preferences and perceptions (Kemper et al, 2008). In fact, we can distinguish between normative need (defined by experts or professionals using professional standards), a person's or group's felt need (based on their own belief of need) and technical need (when existing provision is made more effective or a new kind of provision is developed) (Vlachantoni et al, 2011).

Therefore, the definition of unmet need depends on the concept of need considered. Together with self-reported measures of unmet needs for the use of several LTC services included in the survey, we consider an alternative indicator, which captures whether an individual who has at least one daily living activity (ADL) affected does not receive any care. While both self-reported and ADL-related unmet need variables have been used in several studies (Allin et al, 2010; Kemper et al, 2008; Shea et al, 2003; Tennstedt et al, 1994), this is the first study to our knowledge that compares results for both types of unmet needs measures. The empirical analysis indicates significant differences depending on the type of care considered and between the two types of indicators of unmet needs. This suggests the importance of considering complementary indicators of unmet needs whenever possible for enriching the analysis and not unduly limiting the nature and dimensions considered in this complex concept. Our results show that the more objective measure considered in the analysis has a larger level of pro-poor inequity compared to self-reported measures, suggesting self-reporting bias on the basis of the socioeconomic position.

Spain provides an interesting context to study inequity in LTC. First, the pattern of inequity in several indicators related to the use of health care services in Spain is similar to that found in other European countries, i.e., for the same level of need, the number of GP visits is concentrated within the poorest individuals, as in other Mediterranean countries (Devaux and de Looper, 2012; van Doorslaer et al, 2004); while the number of specialist visits are concentrated on the more affluent individuals. Spain is one of the countries with the highest level of inequities in specialist visits (Devaux and de Looper, 2012). Second, in 2006 a new Dependency Act was approved in Spain, which recognised the universal right of the dependent population to receive services. The implementation of the new system was designed to be progressive, and at the time of our analysis, only the population with the highest level of dependency were included. We investigate if inequity in access and unmet need is reduced once we look at the subgroup of the population with universal coverage. Our results are not very encouraging as they show that beneficiaries of LTC services (major dependents) seem to experience (relatively higher) pro-rich inequity in the use and unmet needs of formal services.

Our findings will be particularly useful to countries such as Italy, Poland or Hungary, which, like Spain, have not yet implemented fully comprehensive national LTC programs and which rely heavily on informal care (Saltman et al, 2006). Third, to our knowledge, this is the first attempt to evaluate the level of income related inequity in the access to LTC (rather than health care), that is, whether disabled individuals with the same level of need that require these services experience a difference in the level of utilization or unmet needs related to their socioeconomic status.

In the next section we describe the Spanish LTC system. Section 3 describes the data and method used. In section 4, we discuss the results on the determinants of use and unmet need in LTC and the inequity in the use of several LTC services and unmet need. The last section discusses the main policy implications and concludes.

2 Institutional background

The Spanish National Health Service is universal in coverage, funded from taxes and predominantly operates within the public sector, with health competences totally devolved to regions since 2002 (García-Armesto et al, 2010). Health expenditure in Spain reached US$ 3,027 purchasing power parity (PPP) per capita and 9.54% of gross domestic product (GDP) in 2010. Most health expenditure (73.6%) is derived from public sources (mainly from taxation) (OECD Health Data, 2012).

By contrast, at the turn of the century, Spanish levels of social protection expenditure associated with LTC were extremely low compared to other European countries (Comas-Herrera et al., 2006; DG ECFIN, 2006). Coverage was not universal; a significant share of LTC expenditure was funded directly by households (dependent person and his/her family), with a high level of co-payments and a greater weight on informal care. Formal remuneration for informal caregivers was very low (almost nonexistent), and social protection was weak. The family played a dominant role as the main safety net to cover the needs of people in situations of dependency, while public sector support was secondary. Only when the family did not exist, or collapsed due to the large burden accumulated by caregivers, and when the economic capacity was not sufficient to pay for formal professional care, public social services were provided. However, demographic projections, coupled with social changes that occurred in recent decades (e.g. reduction of family size, increasing incorporation of women into the labour market) seriously threatened the future sustainability of this system (Gutiérrez et al, 2010).

In this context, at the end of 2006, the Promotion of Personal Autonomy and Assistance for Persons in a Situation of Dependency Act (Act 39/2006 of 14th December) was approved in Spain, establishing a new National System for Autonomy and Assistance for

Situations of Dependency (SAAD). The Act recognises the universal nature of social benefits and the entitlement to access them under equal conditions for all elderly or disabled people who need help carrying out basic daily living activities. Regions are responsible for the provision of benefits and services established by the Dependency Act. These responsibilities include both provision of services to dependent people and the provision of certain benefits. The Ministry of Health, Social Policies and Equality sets a threshold of minimum services and benefits that should be allocated to eligible people, depending on their degree of dependence. From these minimum thresholds, each region can provide additional resources. The most recent data show that spending on long-term care accounted for 0.8% of GDP in 2009 (OECD, 2011) with the presence of strong regional disparities (IMSERSO, 2012).

The Act defines dependency as a permanent state driven by age, illness or disability, and a dependent is defined as an individual who due to the lack or loss of physical, mental, intellectual or sensorial capabilities is in need of care or significant help to perform the basic activities of daily living or in need of other support for personal autonomy if the person has intellectual disabilities or a mental illness. Both the coverage and the timing of the implementation of the system rely on the level of dependency. The Dependency Act establishes three levels of dependency (moderate, severe and major) and citizens who apply for coverage are ranked according to an official scale (BOE, 2007). This includes objective criteria for assessing the degree of autonomy of individuals, capturing the ability to perform basic tasks of daily living and need for support and supervision for people with intellectual disabilities and mental illness. The assessment is based on a questionnaire and there is direct observation of the person who is assessed by a qualified and properly trained professional. Valued tasks are: eating and drinking, control urination and defecation, washing and other body care, dressing, health maintenance, sit, stand, move inside and outside the home, do housework, and make decisions.

A progressive and gradual implementation of SAAD was planned. In accordance with the schedule defined in the Act, in 2007 the right of people with the highest dependency level[1] to receive services was recognized. Between 2008 and 2009, people at the level of 'severe' dependency became eligible, and in 2009 and 2010, people with moderate dependency[2]. Given the large number of delays in making assessments and implementing effective service delivery or financial assistance, at the time in which the data used for the analysis was collected (November 2007-February 2008), only those with the highest degree of dependence were, in theory, covered by the Act. This does not mean that other people with less severe levels of dependency were not receiving LTC, either because they were receiving them from the social services before the enactment of the Act, or because these services were privately financed.

3 Data and methods

3.1 Data

We base our analysis in the Spanish Disability and Dependency Survey for 2008 (SDDS) conducted by the Spanish National Statistics Institute. This is a representative survey of the disabled population living within a household in Spain. 96,000 households with 260,000 individuals were selected between November 2007 and February 2008. 22,795 persons with

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[1] The Law of Dependency defines this group as those having a major dependency, i.e., when the person needs help to perform various basic activities of daily living several times a day or, due to his/her total loss of physical, mental, intellectual or sensorial autonomy, the person needs the continuous support of another person or when the person needs generalised support for his/her personal autonomy (see Gutiérrez et al, 2010).

[2] At the time of writing, moderate dependents are still excluded from universal coverage as the implementation of SAAD has been suspended due to the economic crisis.

disabilities were identified and interviewed in-depth. An individual aged at least six is considered to be disabled by SDDS if he/she has an important limitation to perform at least one of 44 selected activities that has lasted more than a year and has its origin in a deficiency.

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 (including in-kind benefits and cash transfers) and self-reported unmet needs. In addition, sociodemographic and economic information about the household is also included in the survey (INE, 2012a).

It is noteworthy that this is the relevant population to investigate the determinants and inequity of LTC services and unmet needs. Contrary to health care services, the probability of use of LTC services in any given period is zero for the healthy population, and therefore the determinants of LTC use among the healthy population become irrelevant. Thus, the availability of a rich dataset both in terms of health status and use of several LTC services from a representative sample of the disabled population provides us with a unique opportunity to analyse in depth the distribution of formal and informal LTC services, as well as the existence of unmet needs.

3.2 Definition of variables

Long-term care use

A disabled person can receive long-term care either in an institution (e.g. nursing homes), the community (e.g. day care centres) or at home. We base our analysis on LTC provided in the community or at home, given that our survey does not include institutionalised individuals. The care can be provided by a professional worker (formal care) or by friends and/or family (informal care). We group all the information about LTC taking this complexity of services into account as follows (see Table 1 for detailed information of each LTC service considered).

First, we construct a set of variables that measure if the individual has received any formal service at the community level, depending on the time frame considered and the type of community service provided (community care services type 1 and type 2; see Table 1). Community care services type 1 includes services that are used less frequently (tourism and spa services for disabled, hydrotherapy services, work advice/preparation, residential care services...) and the survey asks about the use of these services during the last year. In addition, the formal services included in community care services type 2 are used more frequently (day centres, occupational centres and cultural, recreational and leisure and free time activities), and the survey asked whether these were used during the last two weeks. The different nature and different frequency of use required that these two sets of variables should be analyzed separately.

Next, we include two variables related to formal home care use: a basic definition that includes home care services mostly provided by public or non-for-profit organizations and an extended one, which incorporates additional forms of provision of home care services like services paid privately by the household (see Table 1). Last, we construct two variables that take into account if the individual receives informal care and the intensity of this type of care: i) an indicator of whether the individual has used informal care, capturing whether family members, friends and/or neighbours (non-professionals) have provided home care; ii) an indicator of intensive informal care, which reflects whether an individual receives more than four hours of informal care per day, on average.

[Insert Table 1 around here]

Unmet needs variables

An unmet need is related to the support received by a person given his/her needs, as well as the extent to which such support (formal or informal) is satisfactory from that person's perspective. This is therefore a complex concept without a perfect empirical approximation. Two different measures have been used in the existing literature: (a) respondents' subjective self-assessments of whether their needs are met and (b) respondent's reports of whether or not they receive any help with an activity in which they are limited due to disability.

In this study, we use two alternative definitions of unmet needs related to the two measures used in the existing literature. This allows us to evaluate the sensitivity of the results to the measure of unmet need used. First, we define an indicator of unmet needs if the person, while perceiving a need for care, reports not having received the service. Due to the low number of observations for each service in particular or to lack of information on unmet need for that particular service, an indicator of unmet needs is created only for three of the LTC services explained above: community care type 1, community care type 2 and home care (see Table 1). These indicators, respectively, equal 1 if the individual perceived unmet needs in the considered LTC service, and 0, otherwise.[3]

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[3] Individuals who reported unmet needs were asked about the reasons that prevented them from receiving the service. However, due to a low number of responses, we were unable to include this information in the analysis.

Secondly, we consider an alternative more objective indicator, which captures whether an individual who has at least a limitation in one basic or instrumental daily living activity[4] does not receive any care (Kemper et al, 2008; Shea et al, 2003; Tennstedt et al, 1994).

While the first definition of unmet needs considered (more subjective measure) is used extensively in cross-country analysis of equity in access to health care services (e.g. Koolman, 2007; Hernández-Quevedo et al, 2010), previous studies show that people who perceive unmet need tend to use health care services more than those who do not report unmet need, after controlling for health (Allin et al, 2010; Hurley et al, 2008). Hence, subjective unmet need may represent dissatisfaction with available LTC services rather than actual use (or forgone use) of these services. On the other hand, while the second definition (more objective measure) would be less prone to reporting bias, it may not capture those individuals receiving insufficient services, as the probability of objective unmet needs when the individual receives any type of service is zero, according to our definition.

Need variables

We follow other studies in the literature and include age, gender and health status as need variables (Bago d'Uva et al, 2009; Van de Poel et al, 2012) (see Table 1). We exploit the richness of SDDS and include a large set of health indicators. First, we construct two variables that control for the number of limitations with basic activities of daily living and the number of limitations with instrumental activities of daily living. In addition, we include a set of dummy variables to control for the presence of health problems related to mental illness, visual problems, hearing impairments, speech disorders, osteoarticular complications, nervous system illness, cancer, together with respiratory, circulatory,

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[4] The Activities of Daily Living (ADLs) are a defined set of activities necessary for normal self-care. The activities are movement in bed, transfers, locomotion, dressing, personal hygiene, and feeding.

digestive, genitourinary, endocrine and immune system illnesses, and indicators of suffering injuries, congenital malformations, rare illness and whether the individual reports having good or very good self-assessed health (with SAH equal to 0 if the individual reports fair, bad or very bad health status). We allow for a flexible age-function and construct five age-groups (16-34, 35-44, 45-64, 65-74, and 75 and older) that we interact which gender.

Socioeconomic variables

Our measure of income is net monthly household income, adjusted by household size and composition on the basis of the OECD-modified scale, which provides a weight equal to 1 to the main household individual, 0.5 to the following adult in the household and 0.3 to children. In order to transform the original categorical income variable into a continuous one, we use the average value of the ten categories in which total household income is classified in the SDDS. In addition, marital status (single, married, divorced/separated, widowed), educational attainment (no studies, primary and first stage of secondary studies, second stage of secondary studies and university studies) and activity status (employed, unemployed, pensioners and other activity – student, housewife and other) are also included as socioeconomic variables. We also control for country of birth (a dummy variable that takes value 1 if the individual was born in Spain), and for region of residence (one dummy variable for each of the 17 regions).

3.3. Descriptive statistics

Table A.I of the Appendix shows descriptive statistics for the variables included in the analysis. The share of the disabled population that receives informal care is larger (45.4%) than the share that receives any of the types of formal care considered. Only 13.4% of the disabled have received community care type 1 in the last year, whilst 6.6% have received formal home care at home during the last 14 days. There are large differences in the percentage of the disabled population with unmet needs depending on the measure used. We observe that at most, 2% of the disabled population report unmet needs for any of the LTC services for which we could gather information on unmet needs, while almost 25% experience unmet needs once we use the objective measure of unmet needs, that is, for those individuals who report suffering at least one limitation in daily activities, but who did not receive any care. In the studies relying on subjective self-assessments, estimates of the prevalence of unmet need range from 20 percent among the population with activities of daily living (ADL) limitations (Desai, Lentzner, and Weeks, 2001) to 58 percent among disabled elderly who are dually eligible for Medicaid and Medicare (Komisar, Feder and Kasper, 2005). In studies using receipt of help measures, Muramatsu and Campbell (2002) report that 38 percent of persons with ADL limitations in US lack assistance. Shea et al (2003), using the 1992 Medicare Current Beneficiary Survey, report that 40 percent of the persons with at least one ADL limitation in US do not receive help. For Sweden, Shea et al (2003) report less than 4% of individuals with at least one ADL limitation that do not receive help, using 1994 data from the Aging at Home dataset.

With respect to need variables, the proportion of women in our survey is greater than the proportion of men (61% versus 39%), especially among the eldest. Most individuals are older than 75. As expected, the proportion of individuals reporting “good or very good” health (25.5%) in this survey is much lower than in other Spanish health surveys[5], and the share who suffers health problems is also larger. Osteoarticular complications (70.9%), illnesses of the circulatory system (54.0%) and mental health problems (46.7%) are the most common health related issues. The high prevalence of each of the health problems is

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[5] For instance, according to the 2009 Spanish Health Survey which covers the general population, the proportion of people reporting good or very good health is approximately 70% versus 25% (INE, 2012b).

due to the presence of co-morbidities. Individuals have on average more than one activity in which they suffer limitations, both for basic (2.1) and instrumental (3.6) activities of daily living.

The majority of respondents are Spanish born (97%), married or widowed (50% and 28%, respectively), retired (67%), with primary or first stage of secondary studies (73%), with the greatest proportion of residents from Andalusia (19%) and the lowest in La Rioja (0.5%).

3.4 Methods

This study aims to measure the level of horizontal inequity in the level of use and unmet need of LTC services using the Concentration Index (CI), one of the most commonly employed indicators of inequalities and inequities (Wagstaff and van Doorslaer, 2000). In the rest of this section, we refer to access as a general term to refer to use or unmet need.

The CI is a measure of relative income-related inequality in health (Wagstaff et al, 1989). There are several ways to express the CI algebraically. The most convenient formula for our purpose is:

$$CI = \frac{2}{\mu}\operatorname{cov}(y_i, R_i) \qquad (1)$$

which shows that the value of the CI equals the covariance between an indicator of LTC access (y_i) and the relative ranking of individuals according to their socioeconomic status (R_i), divided by the average of this measure of LTC access (μ). Then, the whole expression is multiplied by 2 to ensure that the CI ranges between -1 and +1.

Since LTC utilization is usually measured by a bounded variable[6], a normalized version of the CI such as Erreygers' (2009) corrected concentration index (CCI) is a more appropriate measure of socioeconomic-related inequality[7]. The normalization of the CI provided by Erreygers (2009) can be calculated as follows for bounded variables ranging from 0 to 1 as LTC use (van de Poel, 2012):

$$CCI = 4 * \mu * CI(y) \qquad (2),$$

where CCI is the corrected CI, μ is the average of our LTC variable, and *CI(y)* represents the conventional concentration index.

For our variables of utilization of long-term care services we are interested in measuring horizontal inequity, i.e., a measure of equality in LTC access adjusted for need variables (Kakwani et al, 1997). Assuming that y_i is a linear and additively separable function of need (x_k) and non-need (z_p) covariates as follows:

$$y_i = \alpha + \sum_k \gamma x_k + \sum_p \delta z_p + \varepsilon_i \qquad (3)$$

the CI can be written as the weighted sum of the CIs of the explanatory variables for LTC access with respect to income (Wagstaff et al, 2003), where the weights represent the sensitivity of LTC access with respect to each explanatory variable. This can be extended to the CCI as shown in equations (4) and (5) (Van de Poel et al, 2012).

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[6] For bounded variables, the CI may depend on the mean of the health variable, making comparison of populations with different mean health levels problematic (Erreygers, 2009).

[7] In addition, the CCI is the only rank-dependent inequality measure that satisfies at the same time the properties of mirror (inequality in use 'mirrors' inequality in non-use) as well as quasi-absoluteness (the CCI proposed by Erreygers is insensitive to any feasible equal addition to the use variable) (Erreygers and van Ourti, 2011).

$$CCI = 4 * \left[\sum_k \gamma \overline{x_k}\, CI_x + \sum_p \delta \overline{z_p}\, CI_z + GC_\varepsilon\right] \quad (4)$$

Where $\overline{x_k}$ and $\overline{z_p}$ represent the means of the need and non-need variables, respectively, while CI_x and CI_z are the concentration indices of these variables regarding socioeconomic status. GC_ε is the generalized concentration index for the error term which represents unexplained socioeconomic inequality, related to unobserved factors. Next, we obtain the level of horizontal inequity in access to LTC services (CHI) by subtracting the contribution of the need variables to the corrected concentration index.

$$CHI = CCI - 4 * \sum_k \gamma \overline{x_k}\, CI_x \quad (5)$$

CHI values greater than 0 indicate that there is pro-rich inequity in access to LTC services, this is, if we assume that all individuals have the same level of need of accessing those services, the actual access to LTC services would be concentrated on those individuals with the highest level of income. If the CHI equals 0, there is no inequity, while a negative CHI indicates inequity in access to LTC services in favour of worse-off individuals (Van Doorslaer et al, 2004; Masseria, 2009; Hernández-Quevedo et al, 2010).

We use the CHI to measure inequity in use to LTC, but the CCI to measure inequity in unmet needs, as it is difficult to justify that it is appropriate that individuals with different levels of need have different levels of unmet needs.

Standard errors have been obtained from a bootstrap with 500 replications. Further, we calculate the level of Horizontal Inequity in access to LTC for individuals with universal access to LTC services, that is, those individuals who are major dependents (the highest level of dependency)[8].

4 Results

4.1. Determinants of long-term care-use

We first regress the different measures of long-term care use on the need and non-need variables used to compute all the CHIs by using a linear probability model. Estimated coefficients as well as the corresponding statistical significance are shown in Table A.II in the Appendix. Overall the estimated coefficients for the health variables show the expected sign. All the individuals in our sample have at least one long-lasting health condition. The probability of receiving community care type 1 in the last year is largest among those who report suffering from one of the sixteen chronic conditions, except for those who report having suffered injuries. However, only a few of the chronic illnesses categories are positively associated with the probability of receiving care at a day centre, occupational centre or recreational care in the last 14 days (community care type 2). These results are consistent with the view that those who report use of community services type 1 during the last year may be individuals with a more severe condition than those who report use of these services in the last 14 days. This is also confirmed by the positive coefficient of the SAH variable for community care type 2 services (see Table A.II). However, given that the survey used in this study captures long-term disabled (that is, those individuals whose disabilities would be expected to last more than one year), it may be the case that results also signal a bad redistribution of resources, with those who require periodic care not receiving it.

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[8] Estimations are based on STATA 12.0 and are computed using sampling weights already available in the survey to make the sample representative of the Spanish disabled population.

The determinants of our two measures of home care are very similar both in significance and in magnitude. We find that the probability of home care use is highest among individuals limited in basic or instrumental activities of daily living, and individuals with visual problems. Similarly, cancer, illnesses of the respiratory or the circulatory system and especially, congenital malformations and mental health problems are all conditions associated with a higher probability of informal care, whilst the probability is especially lower for individuals with osteoarticular complications.

The number of limitations with activities of the daily living (both basic and instrumental) is associated with a larger probability of receiving a LTC service, being especially large for informal care and intensive informal care, compared to the other services.

Although most of the community care is provided free of charge, income is associated with the consumption of community care. The effect is non-linear, as we find that the probability of using community care type 1 increases with income until about 8,800€/month, and decreases thereafter. Similarly, the probability of using community care in the last 14 days increases with income until about 2,150 €/month. A similar non-linear relation is found with regard to informal care, as the probability of use increases until about 2,500 €/month. On the other hand, it is worth noticing that a similar positive association is not found for intensive informal care.[9]

We find that widowed and separated individuals are less likely to receive informal care compared to married individuals, but more likely to receive home care. Single individuals

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[9] The results are very similar if we control for ln(income) instead of including a quadratic income function. Results are available from the authors upon request.

are more likely to have received community care in the last 14 days and any type of home care, compared to married individuals. The higher the educational attainment, the higher the probability of accessing formal care services such as community care (type1), home care (extended definition), and the lower the probability of receiving any type of informal care.

4.2. Inequity in long-term care use

Table 2 presents the inequity index for all measures of long-term care use for both all disabled and those disabled with universal coverage.

[Insert Table 2 around here]

Regarding the whole sample of disabled individuals, there is a clear distinction between the types of care that are pro-rich and pro-poor distributed. On the one hand, we find a positive and statistically significant CHI index for both measures of community care services (community care type 1 and community care type 2), although the services included in the first measure are more disproportionately concentrated on individuals with the highest levels of income (CHI=0.047) than the services included in the second measure (CHI=0.013). The extended measure of home care (Home Care Extended) also appears to be disproportionally concentrated among the relatively rich (CHI=0.020). The results thus reveal an interesting difference in the distribution of home care depending on the measure used. First, we find that home care (tele-assistance and home-help and personal care from social services) is not unequally distributed, once we control for the needs of the population. However, once we include all different types of home care available (Home Care extended), we find a positive and statistically significant CHI for home care. Given that in the extended version of home care the weight of private services is greater compared to the standard version of home care, the pro-rich results seem consistent. In addition, the results show that while informal care is equally distributed, there is pro-poor inequity in the use of intensive informal care (at least four hours per day). In fact, we observe the largest CHI (in absolute value) for the use of intensive informal care.

In 2008, only the group with the highest dependency level was covered by the new universal long-term care system (see Section 2). We estimate the three levels of dependency matching the variables contained in SDDS2008 with the official scale, and identified those individuals that were covered by the Law in 2008[10] to evaluate whether inequity in long-term care use remains for those individuals with universal access to these services. These results are included in Table 2.

First, it should be highlighted that the population included in this group is less than 10% of the sample of disabled individuals. The smaller sample size limits the power in our inequity estimates. However, it is worth noting that not only the significance, but also the magnitude of some of the indices gets smaller in this sample. For example, the CHI for intensive informal care use is no longer statistically significant and is one-fourth of the one for the total sample, which suggests a more equitable distribution of intensive informal care among the population with the highest needs. A similar result is found for the use of community care services type 1. In contrast, we observe a dramatic increase in the level of pro-rich inequity in the use of community care services type 2 (day centres, occupational centres and cultural and recreational activities) as well as for extended home care. This result may be driven by the existence of high waiting lists in these services in the period considered as well as to the costs associated to the access to the services, which have been

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[10] Detailed information about the official scale and the correspondence with the questions in SDDS is available from the authors upon request.

important barriers for access to LTC services for the disabled in Spain (Hernández-Quevedo and Jiménez-Rubio, 2011).

4.3 Inequity in unmet needs

Table 2 presents the inequity index for all measures of unmet need for LTC services, both subjective and objective for all individuals as well as for the subsample of those with universal access to LTC services. We use the CCI to measure inequity in unmet needs.[11]

While self-reported unmet need for type 2 community care services is concentrated among the relatively rich, self-reported unmet need for home care services and the more objective measure of unmet need in the use of LTC services are both concentrated among the relatively poor. However, the magnitude of the CCI for home care is small compared to that for the more objective measure of unmet needs. These findings reveal an interesting difference in the distribution of unmet needs depending on the measure considered. In particular, the large coefficient related to the more objective measure of unmet needs shows us the potential underestimation of horizontal inequity that could be associated with self-reported measures of unmet needs, usually included in European surveys. A plausible explanation for the difference between the objective and the subjective measure of unmet need could be that "unfounded" self-perceived unmet needs might be concentrated among relatively richer individuals, possibly due to the higher expectations of socio-economic services by this population subgroup.

[Insert Table 3 around here]

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[11] We also compute the CHI adjusting for need variables as done in previous papers interested in measuring inequity in unmet need in health care (Koolman, 2007). The results are qualitatively very similar. Results are not shown but are available from the authors upon request.

Focusing on those individuals who are covered from 2008 by the Law and hence, have universal access to LTC services, our findings reveal the existence of horizontal inequity only for self-assessed unmet needs in community care services (see results in Table 2). Inequity is concentrated among the richest individuals of the population, and appears to be larger than that obtained for the whole population. It is relevant to highlight, however, that results show no evidence of horizontal inequity for the objective measure of unmet need restricted to those individuals covered by the system, which implies a good performance of SAAD regarding highly dependent individuals. As mentioned above, the positive inequity index for self-perceived unmet needs in community care may be driven by higher expectations of better-off individuals.

5 Discussion and Conclusions

The egalitarian objective defined as "equal access for equal need" is part of the policy agenda for most European countries. This implies that, for the same level of need, there should not be differences in the access to health care services by socioeconomic conditions, race or sex. In particular, horizontal equity in the access to health care services has been defined by the World Health Organization as an instrument to achieve health improvement, as well as the reduction of inequalities in health by socioeconomic status (WHO, 2000; Whitehead and Dahlgren, 2006).

Several national and regional studies have provided evidence on the equity in the use of health care services in the adult population in Europe, as well as the unmet needs of health-related services (Allin et al, 2009; Hernández-Quevedo et al, 2010). However, equity in the use of health and LTC services by the elderly and disabled population has received less attention in the literature, despite the fact that those individuals are the greatest consumers of care services and possibly, those who face more difficulties in accessing them. In Spain, 3.85 million people living in households report a disability or limitation, which implies a rate of 85.5 per thousand inhabitants (INE, 2009).

With the objective of analysing the barriers to access to LTC services, we analyse utilisation and unmet needs for these services. Results show that there is evidence of horizontal inequity in access to LTC services, both in terms of use and unmet needs of LTC. In particular, high levels of pro-rich inequity are found for the use of community care services and for the category of 'extended home care services' (see Table 1) that includes privately provided services, which may be related to the existence of barriers of access for poorer individuals in terms of both availability (e.g., waiting lists) and costs associated with these services (Hernández-Quevedo and Jiménez-Rubio, 2011). The intensive use of informal care services appears to be disproportionately concentrated on the worse-off, with families acting as safety nets. When analyzing unmet needs, the more objective measure considered in the analysis shows a larger level of pro-poor inequity compared to self-reported measures, suggesting self-reporting bias on the basis of the socioeconomic position. On the other hand, the population with universal coverage to LTC services ('major' dependents) seems to experience relatively higher pro-rich inequity in the use and unmet needs of formal services.

Unmet needs relate to the support received by a person with his/her needs, as well as the extent to which such support (formal or informal) is satisfactory from that person's perspective. Therefore, unmet needs become a complex concept that should be contextualized depending on the different groups of the population as well as the type of needs under consideration. As Vlachantoni et al (2011) pointed out, we can identify different kinds of unmet needs: (i) persons with a low level of need who receive no support; (ii) persons with a moderate level of need who fall just below the formal assessment criteria; (iii) and persons with high needs who receive formal support but who are unsatisfied by it. So, measuring whether needs for long-term care are met is a very complex challenge because it has multiple dimensions, both subjective and objective, and depends in part on personal preferences and perceptions (Kemper et al, 2008). As a reflection of these difficulties, the nature and dimensioning of unmet needs appear in the literature as two types of measures: (a) respondents' subjective self-assessments of whether their needs are met and (b) respondents' reports of whether or not they receive any help with an activity in which they are limited due to disability. In many cases, the definition of unmet need is determined by the database available for analysis, rather than pre-positioning of the authors of the work. Thus, it is not surprising that a wide variability is observed in the literature in the percentage of people with unmet needs, depending on the type of population analyzed and the concept of unmet need used (Desai, Lentzner, and Weeks, 2001; Komisar, Feder, and Kasper, 2005; Muramatsu and Campbell, 2002; Shea et al, 2003).

We use two alternative definitions of unmet needs. First, we define an indicator of unmet needs if the person while receiving support (two measures of community care and home care), considers the care received to be insufficient. Secondly, the alternative indicator covers cases where an individual who has at least one daily living activity affected does not receive any care. The empirical analysis indicates significant differences depending on the type of care considered and between the two types of indicators of unmet needs. This suggests the importance of considering complementary indicators of unmet needs whenever possible for enriching the analysis and not unduly limiting the nature and dimensions considered in this complex concept.

A limitation of the results of this study is the non-inclusion in the survey of individuals living in institutions. This implies that there is an under-representation of some vulnerable groups, in particular, those with cognitive problems (as dementia) and severe mental problems, complex needs, and communication difficulties. The inclusion of these individuals in future surveys is needed in order to obtain a full picture of the determinants of long-term care use and its distribution across the different socioeconomic groups. In addition, our results are useful as a first step to understand the association between income and the use of several long-term care services and unmet needs. However, the design of policies aimed at reducing the observed inequities in long-term care use and unmet needs should be based on evidence on the causal mechanisms behind these associations. Availability of longitudinal surveys or administrative data may help to control for some of the relevant unobserved characteristics in future research. In addition, the timing in the introduction of universal long-term care coverage could be used as an exogenous source of variation to unravel some of the causal relationships of interest.

Caution is needed when generalizing the results obtained here to other LTC systems. Differences in public and private spending for long-term care are related to the use of formal and informal services provided in different European countries. These differences depend on the income per capita of the countries but also on organizational, social and cultural elements surrounding the concept of care and on whether the family or the State is responsible for long-term care and how it should be financed. Our analysis stresses the importance of more precise data in order to analyse in more detail the main factors that contribute to the inequities identified and the nature of access to LTC. However, results obtained here may be relevant for European countries which have not yet established comprehensive national programs in LTC. Italy in Southern Europe and Poland and Hungary in Central Europe may also have important barriers to access to long-term care that are similar to those found in Spain, which might be particularly driven by the role of private funding in LTC for these countries (Saltman et al, 2006).

To conclude, within the next decades the population of Europe will contain a much greater share of older people. Currently, there is no conclusive evidence on whether people will age in good or bad health in the future (Bonneux et al, 2012; Lafortune G et al, 2007; Manton 2008). The large baby boom cohorts will push up social services spending, but the extent and amount of such spending growth will depend on whether or not there will be a compression of morbidity and disability in the elderly (Fries et al, 2011; European Commission, 2012; DG ECFIN, 2006; Manton et al, 2007; Spillman, 2004). This means investing now in health policy efforts focused on children, youth and adults to enjoy a longer life expectancy in good health (European Commission, 2007). This involves the development of health policies beyond the health care arena and focusing on other sectors (employment, housing, environment, etc.) (Stahl et al, 2006). But it also means that research on long-term care must fill information gaps, and that coordination of health and social services should be improved to enhance the efficiency and equity in the joint provision of both types of services.

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Tables

Table 1. Labels – variables used in the analysis

VARIABLES	DEFINITIONS
LTC USE VARIABLES	
Formal service at community level	
Community care services type 1	Occupational therapy, information/advice/assessment, respite care, intepreters services in sign language and other systems of communication, residential care services, tourism and spa services for disabled, hydrotherapy services, work advice/preparation, in the last year
Community care services type 2	Day centres, occupational centres and cultural, recreational and leisure and free time activities, in the last 14 days
Formal home care use	
Using home care services	Tele-assistance, home help and personal social services
Using home care services (extended)	+ home care provided by someone living in the household or is employed in the household or by non-residents in the household (hc professionals, social services from public admin., social services from non-public orgs. or private companies)
Informal care	
Informal care use	Family, friends or neighbours (non-professional) have provided home care
Intensive informal care use	More than four hours of informal care provided per day
UNMET NEED VARIABLES	
Subjective measures	
Whether an individual while perceiving need of care reports not having received one of the following services	
Formal service at community level	
Community care services type 1	Occupational therapy, information/advice/assessment, respite care, intepreters services in sign language and other systems of communication, residential care services, tourism and spa services for disabled, hydrotherapy services, work advice/preparation, in the last year
Community care services type 2	Day centres, occupational centres and cultural, recreational and leisure and free time activities, in the last 14 days
Formal home care	
Using home care services	Tele-assistance, home help and personal social services
Objective measure	
Unmet need- objective	Whether an individual who has at least one daily living activity affected does not receive care

NEED VARIABLES	
Demographic variables	Age
	Gender
Limitations	Limitations in basic activities of daily living
	Limitations in instrumental activities of daily living
Health problems	Mental illness
	Visual problems
	Hearing impairments
	Speech disorder
	Osteoarticular complications
	Nervous system illness
	Cancer
	Respiratory system illness
	Circulatory system illness
	Digestive system illness
	Genitourinary illness
	Endocrine system illness
	Immunitary system illness
	Injuries
	Congenital malformations
Others	Rare illness
	Good or very good SAH

Table 2. CHI for long-term care use

	All disabled		Disabled with universal coverage	
	CHI	Obs	CHI	Obs
Community care type 1	0.047*** (0.007)	18,196	0.038 (0.026)	1,709
Community care type 2	0.013*** (0.004)	18,199	0.060*** (0.020)	1,712
Home care	-0.006 (0.005)	18,209	-0.011 (0.021)	1,712
Home care (extended)	0.020*** (0.006)	18,211	0.058** 0.029)	1,713
Informal care	0.005 (0.008)	16,099	0.023 (0.014)	1,714
Intensive informal care	-0.017** (0.007)	15,771	-0.004 (0.024)	1,687

Note: Bootstrapped standard errors in parenthesis *** $p < 0.1$ ** $p < 0.05$ * $p < 0.01$

Table 3. CCI for unmet need in long term care services

		All disabled		Disabled with universal coverage	
		CCI	Obs	CCI	Obs
Subjective unmet needs	**Community care type 1**	0.003 (0.003)	18,196	0.028* (0.015)	1,709
	Community care type 2	0.015*** (0.004)	18,199	0.058*** (0.021)	1,712
	Home care	-0.007*** (0.003)	18,209	0.008 (0.013)	1,712
Objective unmet needs		-0.033*** (0.009)	18,528	0.004 (0.006)	1,719

Note: Bootstrapped standard errors in parenthesis *** $p < 0.1$ ** $p < 0.05$ * $p < 0.01$

Appendix

Table A.I Descriptive Statistics

Variable	Obs	Mean	Variable	Obs	Mean
Utilization			endocrine system illness	22,201	0.162
Home care	22,143	0.061	immunitary system illness	20,995	0.010
Home care (extended)	22,150	0.122	injuries	20,925	0.195
Community care_type 2	22,134	0.040	congenital malformations	20,992	0.036
Community Care_type 1	22,128	0.138	good or very good self assesed health	22,294	0.255
Informal Care	19,830	0.454	rare illnes	20,994	0.032
			Non need variables		
Unmet need			Equiv. income	20,610	756.18
Unmet_home care	22,143	0.02	married	22,331	0.503
Unmet_community_care (14 days)	22,134	0.009	single	22,331	0.174
Unmet_community_care_(1 year)	22,128	0.021	widowed	22,331	0.280
Unmet_alternative	21,267	0.248	divorced-separated	22,331	0.043
Need variables			no studies	22,298	0.109
16-34 years old male	22,336	0.039	primary and first stage of secondary studies	22,298	0.731
35-44 years old male	22,336	0.04	second stage of secondary studies	22,298	0.107
45-64 years old male	22,336	0.11	university studies	22,298	0.054
65-74 years old male	22,336	0.073	employed	21,768	0.114
> 75 years old male	22,336	0.131	unemployed	21,768	0.031
Total male	22,336	0.394	retired	21,768	0.686
16-34 years old female	22,336	0.027	other activity	21,768	0.135
35-44 years old female	22,336	0.037	birth in Spain	22,336	0.969
45-64 years old female	22,336	0.146	Andalucia	22,336	0.189
65-74 years old female	22,336	0.115	Aragon	22,336	0.03
> 75 years old female	22,336	0.282	Asturias	22,336	0.028
Total female	22,336	0.606	Baleares	22,336	0.018
limitations in basic activities of daily living	21,687	2.141	Canarias	22,336	0.036
limitations in instrumental activities of daily living	21,420	3.591	Cantabria	22,336	0.01
mental illness	21,134	0.467	Castilla_Leon	22,336	0.068
visual problems	22,212	0.406	Castilla la Mancha	22,336	0.049
hearing impairments	22,336	0.287	Catalonia	22,336	0.135
speech disorder	22,336	0.022	Valencia	22,336	0.119
osteoarticular complications	20,992	0.709	Extremadura	22,336	0.029
nervous system illness	20,947	0.387	Galicia	22,336	0.078
cancer	20,914	0.069	Madrid	22,336	0.113
respiratory system illness	22,191	0.194	Murcia	22,336	0.034
circulatory system illness	20,931	0.540	Navarra	22,336	0.011
digestive system illness	22,183	0.092	Pais Vasco	22,336	0.045
genitourinary illness	22,200	0.173	Rioja	22,336	0.005

Table A.II. Linear probability estimates on the probability of LTC use

	Community Care (1 year)	Community Care (14 days)	Home Care	Home Care (ext)	Informal care	Intensive informal care
	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Equiv. income	0.053***	0.039***	-0.013	0.010	0.051***	0.014
Squared equiv. Income[a]	-0.003	-0.009***	0.000	0.001	-0.010	-0.040
35-44 years old male	-0.055*	-0.016	-0.007	0.007	-0.02	-0.045*
45-64 years old male	-0.080***	-0.056***	-0.003	0.01	-0.078***	-0.074***
65-74 years old male	-0.134***	-0.059***	0.002	0.01	-0.062**	-0.045*
> 75 years old male	-0.133***	-0.067***	0.023	0.071***	0.016	-0.007
16-34 years old female	-0.050	-0.032	-0.007	0.004	0.004	0.01
35-44 years old female	-0.009	-0.042**	-0.004	0.014	-0.041	-0.073***
45-64 years old female	-0.093***	-0.058***	-0.012	0.007	-0.088***	-0.119***
65-74 years old female	-0.124***	-0.054***	0.007	0.034**	-0.079***	-0.099***
> 75 years old female	-0.150***	-0.077***	0.038***	0.113***	0.008	-0.045**
limitations in basic activities of daily living	0.002	0.000	0.009***	0.013***	0.016***	0.027***
limitations in instrumental activities of	0.005***	0.003***	0.005***	0.017***	0.068***	0.060***
mental illness	0.029***	0.032***	0.009*	0.005	0.062***	0.071***
visual problems	-0.01	-0.008**	0.016***	0.016***	-0.026***	0.004
hearing impairments	-0.009	-0.003	-0.003	0.000	-0.049***	-0.002
speech disorder	0.04	0.004	0.006	0.021	-0.047**	-0.019
osteoarticular	0.018**	-0.007*	0.004	-0.004	-0.027***	-0.071***
nervous system illness	0.034***	0.014***	0.004	0.007	-0.001	-0.015*
cancer	0.040***	0	-0.003	-0.002	0.034**	0.048***
respiratory system	0.026***	-0.003	0.001	-0.002	0.031***	0.015*
circulatory system	0.015	0.005	0.010**	0.009	0.029***	0.027***
digestive system	0.050***	-0.002	0.01	-0.001	0.008	0.007
genitourinary	-0.001	0.017***	0.011	0.021**	-0.029***	-0.013
endocrine system	0.060***	0.006	-0.01	-0.015	0.027	-0.002
immunitary system	0.075*	-0.024	0.02	0.012	0.04	0.027
Injuries	-0.056***	-0.004	0.023	0.011	0.008	0.014
congenital	0.047**	0.036***	-0.021*	-0.02	0.066***	0.054***
rare illness	0.058**	0.030**	0.005	0.009	0.002	-0.023
good or very good SAH	-0.009	0.026***	-0.007	0.003	-0.019**	-0.003
single	-0.01	0.024***	0.017***	0.036***	-0.019*	0.001
widowed	-0.009	0.016***	0.021***	0.041***	-0.042***	-0.017
divorced-separated	0.005	0.001	0.035***	0.045***	-0.129***	-0.082***
primary and first stage of secondary studies	0.017*	-0.008	-0.005	0.016	-0.060***	-0.055***
second stage of secondary studies	0.035**	-0.019**	-0.007	0.031**	-0.100***	-0.099***
university studies	0.038*	-0.015	-0.004	0.050***	-0.126***	-0.109***
employed	-0.012	-0.040***	0.000	-0.014*	-0.106***	-0.046***
unemployed	0.03	-0.015	-0.024***	-0.038***	-0.060***	-0.042**
other activity (student, housewife and other)	0.002	-0.002	-0.011*	-0.006	-0.013	-0.018
birth in Spain	-0.004	-0.001	-0.015	-0.005	0.018	0.028
Aragon	0.056***	0.006	0.035**	0.045**	0.028	-0.042**
Asturias	-0.048***	-0.006	-0.009	0.013	0.01	-0.024
Baleares	0.011	0.028*	0.068***	0.057**	-0.024	-0.061**
Canarias	0.031*	0.015	0.008	-0.006	-0.027	-0.004
Cantabria	0.068***	-0.014	0.048**	0.039*	0.063**	0.061**
Castilla Leon	0.006	0.010*	-0.007	0.006	0.018	-0.040***
Castilla la Mancha	0.052***	0.013**	0.012	0.025**	0.028*	-0.047***
Catalonia	0.088***	0.031***	0.016	0.017	0.040***	-0.014
Valencia	0.036***	0.021***	-0.012*	0.015	0.014	-0.023*
Extremadura	-0.054***	0.002	0.046***	0.062***	-0.033*	-0.047***
Galicia	0.027**	-0.007	-0.021***	-0.024	0.006	-0.040***
Madrid	-0.01	0.030***	0.057***	0.062**	-0.060***	-0.050***
Murcia	0.092***	0.009	-0.004	0.02	-0.041**	-0.011
Navarra	0.031	0.005	-0.007	0.039**	-0.050***	-0.045**
Pais Vasco	0.030*	0.010	-0.002	0.045***	0.011	-0.075***

Rioja	-0.001	0.011	0.000	0.053*	0.05	0.017
_cons	0.108***	0.037*	0.002	-0.086	0.268***	0.179**
N	18196	18199	18209	18211	16099	15771

Note: *** $p < 0.1$ ** $p < 0.05$ * $p < 0.01$

[a] Equivalent income and squared equivalent income jointly statistically significant for community care (however defined) and informal care