A double sample selection model for unmet needs, formal care and informal caregiving hours of dependent people in Spain

Resumen

The tenor of this paper is to study is whether informal caregivers of dependent people with unmet needs for Home Care or Day Centers devote more caregiving hours than those caregivers whose dependent relatives do not suffer any unmet need, using information from the two waves of the Informal Support Survey (1994, 2004). Unmet needs (UN) may arise because the individual has applied for some formal care (FC), but he does not receive it, or because he is not satisfied with the quality or quantity of formal care received. We adopt the double sample selection model to estimate the underlying decision process of receiving FC and having UN, and afterwards we estimate an equation for the number of informal caregiving hours including two selectivity terms to correct the double selection problem. We also introduce a methodological innovation because we adopt the Ranking Scale of the Law of Dependency to measure the dependency degree of the individuals contained in the sample.

The interpretation of the selectivity terms confirms that caregivers of dependent people with UN and no FC devote more hours than comparable caregivers without FC and no UN, and that caregivers with FC and UN devote more hours than caregivers with UN but no FC. The number of informal caregiving hours increases with the degree of dependency and the coefficients are always higher in the regression for FC and UN as compared to the situation with UN but no FC. For the same dependency degree, informal caregivers devote more hours in 2004 than in 1994. For example, a level 2 great dependent with FC and UN implied an increase of 4.65 hours/week in 1994 and 5.64 hours/week. Informal caregivers face a double problem: first, they have to devote additional caregiving hours to compensate unmet needs, and second, their efforts show an increasing profile across time. Finally, the response to UN is not homogeneous across regions and we observe an increase of informal caregiving hours for Andalucía, Aragón, Baleares, Canarias, Extremadura, and above all, Navarra.

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A double sample selection model for unmet needs, formal care and informal caregiving hours of dependent people in Spain

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1. Introduction

The interface between formal and informal care has received increased attention from policymakers in response to the concern about changing social patterns (increased geographical mobility, higher female labor participation, smaller family size and rising divorce rates). The Council of Europe (2003) acknowledged that in many countries most healthcare budget is spent on people during their last time of life. However, this does not mean that they receive the most appropriate care to their needs. Comprehensive knowledge about patterns of healthcare services utilization for old dependent people is fairly unclear. Currently, about 32.8% of +65 years individuals[1] are limited in daily living activities due to a chronic health condition. Limitations for mobility (23.7%) and houseworking (20.3%) are the most important ones, although we observe an increase in self-caring disabilities among those older than 80 years (55.6%).

The emergence of personal unmet needs for doing daily living activities can result in a large number of negative consequences, such as, being unable of drinking or eating when the dependent is thirsty or hungry, downfalls, lack of cleanliness due to uncontrolled urination or defecation and houseworking neglect (Allen and Mor, 1997; Desai et al., 2001). Unmet needs are also associated with an increase of physician visits, use of emergency departments, increase in the likelihood of death at home and more hospitalisations (Sands et al., 2006).

Results obtained suggest that unmet needs are caused by a combination of personal, social, cultural and environmental forces (Allen, 1994; Tennstedt et al., 1994; Allen and Mor, 1997; Thomas and Payne, 1998). However, these studies present three important limitations. First off, previous studies do not usually distinguish between users and not users of services for dependent people, and in consequence, we cannot know if both groups suffer the same unmet needs level. The separation of both subsamples is fundamental because some empirical papers suggest that the willingness, needs and services degree of use are different (Mui and Burnette, 1994; Wallace et al., 1994; Andersen, 1995). Second, due to the

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[1] Disabilities, Personal Autonomy and Dependency Situation (INE; 2008).

existence of great disparities between dependent's needs and the size of the informal caregiving network, the type of unmet needs may vary among them (Yeatts et al., 1992). Finally, many investigations are based on medical reports or non-caregivers's statements, being the primary caregiver's perspective widely ignored. Nevertheless, their point of view is very valuable because they act as a linkage between the patient and social services and constitute a fundamental factor for negotiation and service usage (Bass et al., 1999; Yeatts et al., 1992). In this paper we avoid previous limitations because we focus on the subsample of dependent individuals who demand Home Care[2] or Day Centres and take into account the characteristics of the informal caregiving network as well as sociodemographic characteristics of the primary informal caregiver.

With respect to the healthcare literature related to unmet needs, the concept of "need" has been defined as "those requirements that enable individuals to reach, maintain or recover an acceptable level of social independence and quality of life" (Department of Health Social Services Inspectorate, 1991). A more practical definition considers that "need" is the "ability to benefit from social services" (Stevens and Gabay, 1991; Stevens and Raftery, 1994). One of the first definitions of "unmet need" was given by Isaacs and Neville (1976) who described elder people's unmet needs as the result of one or both of the following situations: "insufficient care to fulfil his basic requirements for food, warmth, cleanliness or security at the level at which he would have provided them for himself" and/or "when care was provided only at the cost of undue strain of relatives".

In certain cases, an unmet need is identified with the situation in which an individual with care needs does not receive any formal aid. Alonso et al (2007) considered that an "unmet need" appeared when mental patients had not received any formal attention during last twelve months. Quail et al. (2007) perceived that an unmet need could arise in two situations: (1) when the individual is currently receiving help, but he would like to receive more, and (2) when he does not receive any help, but has experienced some negative consequence due to the lack of it. Williams et al. (1997) also considered those unmet needs due to insufficient or inadequate formal attention.

The literature about unmet needs in Spain is quite scarce. Alonso et al. (2007) analyzed the prevalence of unmet needs related to mental healthcare among European adults (2.121 observations for Spain). They concluded that 3.1% of adult population suffered unmet needs. With respect to studies focused on elder population, Otero et al. (2003) investigated unmet needs using a sample of 1.135 elder people living in a

[2] Home Care includes houseworking, personal care tasks, visits, laundry and cooking.

metropolitan area of Madrid (Leganés). Their results pointed to the existence of great social inequalities in Home Care access. Personal unmet needs were particularly significant in low income households, low levels of education, living alone or with depression. Tomás et al. (2002) focused on the population older than 75 years living in the city of Zaragoza (N=351) and reached similar conclusions. Finally, Orfila et al. (1997) performed a study on 1.137 elder people living in Barcelona and observed that between 10% to 25% of interviewed suffered unmet needs and mortality and morbility rates in a 5-years horizon, for the unmet needs group, were significantly higher as compared to the rest of the sample.

In this paper, we have considered and outcome-oriented approach because it provides solid foundation for defining the concept of unmet need based upon norms that may change with social standards. This definition is in consonance with Davies (1977) who described "unmet need" as the difference between the desired and current state of well-being. The variable "receive" takes the value one when then the dependent (or his caregiver) has applied for Home Care and/or Day Centre and he receives it. The variable "unmet need" (UN) takes the value one in two situations: when the dependent individual has applied for any formal service (FC), he receives it, but considers that he is not satisfied with it (he would like to receive more hours, reports an inadequate attention level[3], the caregiver suffers an excessive burden) and second, when the dependent (or his caregiver) has applied for formal care, but he has not received it. Using the two waves of *Informal Support Survey* (IMSERSO; 1994 and 2004), that report information about Spanish older people with disabilities (+60 years) receiving informal care, the aim of this paper is to answer three questions: (1) the extend to which personal social services for dependent people (Home Care and Day Centers) are able to satisfy dependent's needs, (2) which factors are associated to the emergence of personal unmet needs, and (3) what is the effect of formal unmet needs over informal caregiving hours, because although unmet need would usually be considered a patient-specific variable, the informal caregiver's perception about dependent's unmet needs may influence the number of informal caregiving hours.

Results confirm that caregivers of dependent people who do not receive FC and suffer UN devote more caregiving hours that comparable caregivers without FC and no UN, and that caregivers with FC and UN devote more caregiving hours than caregivers without FC but UN. This result rebates the Substitution model, according to which as the level of formal care increases the amount of informal support decreases. The number of informal caregiving hours increases with the degree of dependency and the coefficients

[3] Informal cargiver's valuation of formal services received is bad or very bad.

are always higher in the regression for FC and UN as compared to the situation with UN but no FC and the distance between moderate and great dependency has increased between both waves.

The structure of the paper is organized as follows. In section 2 we explain the double selection model. In section 3 we describe the survey and the characteristics of the sample. Sections 4 and 5 comment the estimation results of the bivariate probit model for formal care and unmet needs and the effect of formal care unmet needs over informal caregiving hours, respectively. Finally, in section 6 we report some long-term care policy conclusions and perspectives of the new Law of Dependency.

2. Econometric model with double sample selection

As we have commented before, unmet needs may arise because the dependent does not receive any of the formal aid that he has applied for (Home Care and/or Day Centre), or because he is not satisfied with the quality or quantity of the formal aid received. In this decision process, there may exist a selectivity problem, whether because the appearance of unmet needs does not follow a random process or because the dependent population who receive formal care are not a random sample. In any circumstance, if the selectivity problem is not taken into account, we will obtain inconsistent estimates (Heckman, 1979). The are no studies, known to us, which consider the selection into formal care or the emergence of unmet needs ant their effect on informal caregiving hours. We adopt the double sample selection model proposed by Tunali (1986) to model the underlying decision process of receiving formal care and having unmet formal care needs, assuming simultaneity of the decisions, and their implications over the number of informal caregiving hours. The pair of decisions rules may be presented in a standard bivariate probit model (Heckman, 1979; Maddala, 1983), as Figure 1 shows:

Figure 1. Situation of the dependent people

$$Dependent_i = \begin{cases} FC_i = 1 \begin{cases} UN_i = 1 \\ UN_i = 0 \end{cases} \\ FC_i = 0 \begin{cases} UN_i = 1 \\ UN_i = 0 \end{cases} \end{cases} :$$

where the variables FC_i and UN_i take the value one when the dependent individual receives formal care and suffers an unmet need, respectively, and the value zero when the dependent individual does not receive any formal care and the informal caregiver does not inform of any unmet need. Consequently, there exists an unmet need either if the dependent individual (or the caregiver) has applied for a formal

aid but does not receive it, or because the service received has fallen below expectations. These decisions may be written as reduced form equations:

$$FC_i^* = X_i'\beta_1 + u_{ii} \qquad (1)$$

$$UN_i^* = Z_i'\beta_2 + u_{2i} \qquad (2)$$

where the variable FC_i^* measures the generosity level of social services for dependent people as the difference between the amount of services offered and the conditions required to be awarded (functional and mental disabilities, financial resources, dwelling conditions, family situation). The dependent individual receives formal care when the dependency level is higher than the threshold required ($F_i^* > 0$). The variable UN_i^* measures the difference between the expected benefit from formal care and the current provision of services. The informal caregiver will report an unmet needs problem when the expected benefit is higher than the observed level of attendance $UN_i^* > 0$. In equations (1) and (2), the vectors, X_i and Z_i represent the set of observable characteristics that affect the reception of formal care and the appearance of unmet needs, where β_1 and β_2 are the corresponding coefficients, and ε_{1i} and ε_{2i} are the residual terms, that we suppose are bivariate normally distributed with $E[u_{1i}] = E[u_{2i}] = 0$, $Var[u_{1i}] = Var[u_{2i}] = 1, Cov[u_{1i}, u_{2i}] = \rho$.

The dependent variables (FC_i^*, UN_i^*) are unobservable and latent. We only observe a binary variable that takes the value one if the dependent individual receives formal care (FC_i), and another binary variable that takes the value one if the informal caregiver perceives an unmet needs problem (UN_i).

$$FC_i = \begin{cases} 1 \; si \; FC_i^* > 0 \\ 0 \; otherwise \end{cases} \qquad (3)$$

$$UN_i = \begin{cases} 1 \; si \; UN_i^* > 0 \\ 0 \; otherwise \end{cases} \qquad (4)$$

The likelihood function of the bivariate probit model is given by (Greene, 2007):

$$\ln L = \sum_{i=1}^{N} \ln \Phi_2 \left(q_{1i} \left(X_i'\beta \right), q_{2i} \left(Z_i'\gamma \right), \rho \right) \qquad (5)$$

$$q_{1i} = \begin{cases} 1 \; si \; FC_i \neq 0 \\ -1 \; otherwise \end{cases} \; ; \; q_{2i} = \begin{cases} 1 \; si \; UN_i \neq 0 \\ -1 \; otherwise \end{cases} \; ; \; \rho^* = q_{1i} q_{2i} \rho$$

The estimation of the informal caregiving hours equation by OLS will generate inconsistent estimations if the expected value of the error term is not necessarily zero. (Lee, 1978; Heckman, 1979). Figure 2 details

the possible outcomes of the selection process, where S_j represents the set of individuals belonging to the *j-th* subsample (j=1, 2, 3, 4). S_1 corresponds to the state where the dependent does not receive any formal care and he does not suffer any unmet need; S_2 denotes the state where the dependent does not receive any formal care but he would like to, and therefore an unmet need appears; S_3 is the situation where the dependent receives formal care and is satisfied with them and S_4 denotes the situation where the dependent individual receives formal care but considers that the amount or quality of the aid receive is not what expected, and consequently there is an unmet need.

Figure 2. Possible outcomes for the selection process

		Unmet Needs (UN_i)	
		0	1
Formal care (FC_i)	0	S_1	S_2
	1	S_3	S_4

Probabilities corresponding to each one of the subsamples are expressed as follows:

$$S_1 = \Pr[FC_i = 0, UN_i = 0] = \Pr\left[FC_i^* \le 0, UN_i^* \le 0\right] =$$
$$= \Pr\left[u_{1i} \le -X_i'\beta_1, u_{2i} \le -Z_i'\beta_2\right] = \Phi_2(-\Pi_1, -\Pi_2; \rho) \quad (6)$$

$$S_2 = \Pr[FC_i = 0, UN_i = 1] = \Pr\left[FC_i^* \le 0, UN_i^* > 0\right] =$$
$$= \Pr\left[u_{1i} \le -X_i'\beta_1, u_{2i} > -Z_i'\beta_2\right] = \Phi_2(-\Pi_1, \Pi_2; -\rho) \quad (7)$$

$$S_3 = \Pr[FC_i = 1, UN_i = 0] = \Pr\left[FC_i^* > 0, UN_i^* \le 0\right] =$$
$$= \Pr\left[u_{1i} > -X_i'\beta_1, u_{2i} \le -Z_i'\beta_2\right] = \Phi_2(\Pi_1, -\Pi_2; -\rho) \quad (8)$$

$$S_4 = \Pr[FC_i = 1, UN_i = 1] = \Pr\left[FC_i^* > 0, UN_i^* > 0\right] =$$
$$= \Pr\left[u_{1i} > -X_i'\beta_1, u_{2i} > -Z_i'\beta_2\right] = \Phi_2(\Pi_1, \Pi_2; \rho) \quad (9)$$

where $\Pi_1 = X_i'\beta_1, \Pi_2 = Z_i^i\beta_2$ and Φ_2 is the bivariate standard normal density function. These probabilities will determine the structure of the informal caregiving hours equations. We have defined an equation for the logarithm of the number of informal caregiving hours for each subsample and in each equation we have included the selectivity variables to correct the double selection problem (Tunali, 1986):

$$\ln IH_{1i} = W_{1i}'\gamma_1 + \delta_{11}\lambda_{11i} + \delta_{12}\lambda_{12i} + \varepsilon_{1i} \quad (10)$$

$$\ln IH_{2i} = W_{2i}'\gamma_2 + \delta_{21}\lambda_{21i} + \delta_{22}\lambda_{22i} + \varepsilon_{2i} \quad (11)$$

$$\ln IH_{3i} = W_{3i}'\gamma_3 + \delta_{31}\lambda_{31i} + \delta_{32}\lambda_{32i} + \varepsilon_{3i} \quad (12)$$

$$\ln IH_{4i} = W_{4i}'\gamma_4 + \delta_{41}\lambda_{41i} + \delta_{42}\lambda_{42i} + \varepsilon_{4i} \quad (13)$$

where $\ln IH_i$ denotes the natural logarithm of the number of informal caregiving hours, W denotes the vector of exogenous variables that explain caregiving hours and ε_{ji} is an error term normally distributed

with zero mean $E[\varepsilon_{ji}]=0,$ and $Var[\varepsilon_{ji}]=\sigma_j^2; j=1,..4.$ Finally, δ_{11} to δ_{42} are the coefficients associated to selectivity variables λ_{11i} to λ_{42i}, which are defined as follows:

$$\lambda_{11}=-\frac{\phi(\Pi_1)\Phi\left(-\Pi_2^*\right)}{S_1};\ \lambda_{12}=-\frac{\phi(\Pi_2)\Phi\left(-\Pi_1^*\right)}{S_1}$$
$$\lambda_{21}=-\frac{\phi(\Pi_1)\Phi\left(\Pi_2^*\right)}{S_2};\ \lambda_{22}=\frac{\phi(\Pi_2)\Phi\left(-\Pi_1^*\right)}{S_2}$$
$$\lambda_{31}=\frac{\phi(\Pi_1)\Phi\left(-\Pi_2^*\right)}{S_3};\ \lambda_{32}=-\frac{\phi(\Pi_2)\Phi\left(\Pi_1^*\right)}{S_3}$$
$$\lambda_{41}=\frac{\phi(\Pi_1)\Phi\left(\Pi_2^*\right)}{S_4};\quad \lambda_{42}=\frac{\phi(\Pi_2)\Phi\left(\Pi_1^*\right)}{S_4}$$
$$\Pi_1^*=\frac{\Pi_1-\rho\Pi_2}{\sqrt{1-\rho^2}};\qquad \Pi_2^*=\frac{\Pi_2-\rho\Pi_1}{\sqrt{1-\rho^2}}$$

where $\phi(\cdot)$ corresponds to the univariate standard normal density function and $\Phi(\cdot)$ is the cumulative standard normal distribution.

3. Data

The data source for the study comes from the two waves of the *Informal Support Survey,* which was carried out by IMSERSO in 1994 and 2004. The survey was targeted to obtain information, through personal interviews at household, from informal caregivers of dependent people. The 2004 survey contains 1.504 observations, for +60 years dependent people living in Spanish households (with the exception of Ceuta, Melilla and La Rioja). The 1994 survey contains 1.702 observations for +40 adults with disabilities living in Spanish households (excluded Ceuta and Melilla)[4]. Therefore, conclusions obtained can not be applied to the fraction of institutionalised dependent people or those who only receive formal care.

3.1. Determination of the degree of dependency

We introduce an innovative approach applying the Ranking Scale mentioned in the Law 39/2006, 14th December, of Personal Autonomy Promotion and Attention to People in Dependency Situation and approved by Delegated Legislation 504/2007, 20th of April.

This Ranking Scale allows us to determine situations of moderate, severe or great dependency according to the degree of autonomy for performing daily living activities, taking into account, the need of support or supervision as well as the existence of cognitive impairments[5]. An individual has *moderate dependency*

[4] To homogenize both samples, from the 1994 survey we have dropped individuals younger than 60 years and those living in La Rioja (37 observations), leading to a sample with 1.665 individuals.

[5] The valuation is based on a questionnaire and the direct observation of the dependent candidate by a qualified professional. For the case of people with intellectual or cognitive impairment, the questionnaire will be answered by

when he needs help for daily living activities at least once a day. He suffers *severe dependency* when he needs help for daily living activities two or three times a day. And we say that an individual is a *great dependent* when he needs help several times per day, and due to the complete loss of physical, mental, intellectual or sensory autonomy, he requires permanent support. Moreover, the Ranking Scale identifies *two levels of dependency* inside each of the three degrees (moderate, severe or great)[6].

The Ranking Scale considers 47 tasks grouped in 10 activities (eating and drinking, control of physical needs, washing oneself, other physical care, dressing and undressing, keeping one's health, mobility, moving inside home, moving outside home and houseworking). The questionnaire for people who suffer mental illness or have any kind of cognitive impairment includes 6 additional tasks referred to the ability to take decisions[7]. Then, the final punctuation is the sum of the weights of the tasks for which the individual has difficulty, times the degree of supervision required and the weight assigned to that activity[8]:

$$\text{Punctuation} = \sum \text{Weight of the task performed with difficulty} * \text{Degree of supervision} * \\ * \text{Weight of the corresponding activity}$$

Table 1 of the Appendix compares the questionnaire of the Ranking Scale of de Dependency Law with the information from the survey[9]. Weights assigned to each activity and task are shown in the table,

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anyone aware of the situation of the dependent individual. The determination of the degree of dependency will take into account medical reports and the use of prosthesis.

[6] The first level corresponds to those individuals who can perform the activity without the direct support of a third person, whereas the second level refers to the situation where the dependent individual requires specific support. With respect to the degree of support, the Ranking Scale considers four possibilities: *supervision* (if the dependent only needs that a third person prepares the necessary elements to perform the activity), *partial physical attention* (when the third person has to participate actively), *maximum physical attention* (if the third person has to substitute the dependent individual in the execution of the activity) and *special attention* (the dependent individual suffers behaviour disorders that makes difficult the provision of the task by the third person).

[7] With the information contained in the *Informal Support Survey*, we have considered that an individual has cognitive impairment or intellectual disability when the informal caregiver has answered in the affirmative to the questions about memory problems, dementia, mental illness or Alzheimer.

[8] The tables of weights for tasks and activities distinguish four age intervals: 3-6, 7-10, 11-17, 18 and over. Given that our sample only contains individuals older than 60 years, we will use the weights attributed to the fourth interval. Additionally, individuals with mental illness or intellectual disability have another table of weights for tasks and activities that includes the activity "taking decisions".

[9] We have been obliged to adapt some questions. For example, for the activity "eat and drink" the Ranking Scale distinguishes six different tasks, but in the survey we only have information about the ability for eating (which we intuit that includes the ability of drinking). With respect to the "control of physical needs" we do not have information about the specific tasks of "dressing and undressing" and "adopting the adequate posture". For this reason, we have summed up their respective punctuations in the task "using the WC". In the activity "other personal tasks", the survey does not include information about the abilities for "combing one's hair" or "cutting one's nails", so we have synthesised all variables in one called "preening oneself". The same has happened with the activity "mobility", where we have summarized five different tasks in the ability for "going to bed/standing up". With all these simplifications, we do not intent to substitute the labour of the valuating professionals. The purpose of this exercise is to apply the legal benchmark and introduce a new way of classifying dependent people.

With respect to the degrees of support (see Table 2 of the Appendix), we have assumed that "supervision" is equivalent to the situation where the dependent can perform the activity sometimes, and consequently a third person is watching; "partial physical assistance" is equivalent to the situation where, always or often, the dependent needs

corresponding the punctuation in brackets to dependent people with mental illness or cognitive impairment. We have computed the final punctuation and attributed the corresponding degree of dependency according to the following table:

Table 1. Ranking Scale for the determination of the level of dependency

		Law of Dependency	Informal Support Survey	
		(punctuation)	1994	2004
No Dependent		<25	515 (30.93%)	538(35.79%)
Moderate	Level 1	25-39	368 (22.10%)	275 (18.28%)
	Level 2	40-49	194 (11.65%)	172 (11.43%)
Severe	Level 1	50-64	275 (16.52%)	242 (16.09%)
	Level 2	65-74	160 (9.61%)	139 (9.24%)
Great	Level 1	75-89	147 (8.83%)	124 (8.24%)
	Level 2	90-100	6 (0.36%)	14 (0.93%)
Total			1.665 (100%)	1.504 (100%)

Source: www.seg-social.es/imserso/dependencia/manualusoBVD.pdf; Jiménez and Vilaplana (2008)

From the 2004 wave, 35.79% (538) do not attain the lowest level of dependency[10], 29.71% have moderate dependency, 25.33% severe dependency and 9.17% great dependency. Comparing both waves, we appreciate a slight decrease in moderate dependency (level 1) and an increase in the percentage of individuals without any degree of dependency[11]. Figures for the other degrees are approximately the same. To validate the reliability of the estimations for the several degrees of dependency, we compare these figures with those obtained from the White Book of Dependency (IMSERSO, 2004)[See table 2 below]. Unfortunately, there is no available information for 1994, so we have been obliged to compare the Informal Support Survey (1994) with the estimations from the Disabilities, Deficiencies and Health Status Survey (DDHSS, from now on, conducted by INE in 1999). For the 2004 wave, we have performed the comparison using the forecasts for 2005 from the DDHSS.

Table 2. Comparison of the estimated degrees of dependency with the White Book of Dependency

	DDHSS (1999)		Informal Support Survey (1994)	
	65 and more years [(a)]	%	65 and more years	%
Great	141.409	9.91%	149	9.16%
Severe	304.085	20.80%	442	27.17%
Moderate	514.396	36.06%	542	33.31%
Total	1.426.432 [(b)]		1.927	

(a): Degrees of dependency from page 87 White Book of Dependency (b): Corresponds to the number of people with disabilities basic or instrumental daily living activities (page 85; White Book of Dependency):

	Forecasts for 2005 from DDHSS (1999)		Informal Support Survey (2004)	
	65 and more years [(a)]	%	65 and more years	%
Great	163.334	15.39%	137	9.45%
Severe	292.105	27.52%	365	25.19%
Moderate	371.112	34.96%	438	30.23%
Total	1.061.404 [(b)]		1.449	

help from somebody; "maximum physical assistance" corresponds to the situation where a third person has to perform all the task for the dependent, and finally, "special assistance" is applied to mentally disabled people.

[10] We have not excluded theses individuals from the econometric analysis because according to caregivers' reports, in 2004, 34.17% needed help for washing, 24.47% for shopping (for food) and 17.03% for cooking, 24.63% had Home Care unmet needs and 16.28% Day Centre unmet needs.

[11] This is an effect of the increase in the number of healthy life years at birth, from 67.7 in 1996 to 70.2 in 2003. (Eurostat. Health Indicators)

(a): Degrees of dependency from page 89 White Book of Dependency (b): Corresponds to the number of people with disabilities basic or instrumental daily living activities (page 89; White Book of Dependency):

There is a high degree of coincidence in the upper table (1999-1994) for great and moderate dependency and in the second table (2005-2004) for severe and moderate dependency. The disparity for great dependency (15.39% vs. 9.45%) could be because the forecasts for 2005 include the percentage of elder people who are institutionalized while the Informal Support Survey (2004) only considers elder people living at home.

3.2. Descriptive statistics

Table 3 of the Appendix shows the descriptive statistics for each of the combinations of the variables FC and UN. Between 1994 and 2004, for the situation FC=1&UN=1, we observe an acute increase in the percentage of dependent people who live with spouse (from 27.2% to 45.5%) and a decrease in the fraction living with son/daughter (from 38.7% to 28.9%). Attending to specific pathologies, there has been an increase in respiratory (from 8.54% to 18.05%) and osteoarticular problems (from 24.24% to 52.65%).

There group of dependents receiving 301-600€/month has increased from 23.81% to 57.19%. In aggregate terms there is no variation in the type of benefit received (around 40% correspond to retirement benefit, 30% to survival benefit and 6% to disability benefit), but we appreciate an increase in the percentage of retired individuals with FC=1&UN=1 (from 36.7% to 62.4%).

Most caregivers are women (85%) and older than 50 years old[12]. There has been a big growth in the percentage of caregivers with elementary (18.26% to 42.97%) and high school education (9.08% to 32.61%). As a consequence, there is an increase in the percentage of working caregivers (21.74% to 26.03%) and a decrease in those devoted to houseworking (49.87% to 44.15%).

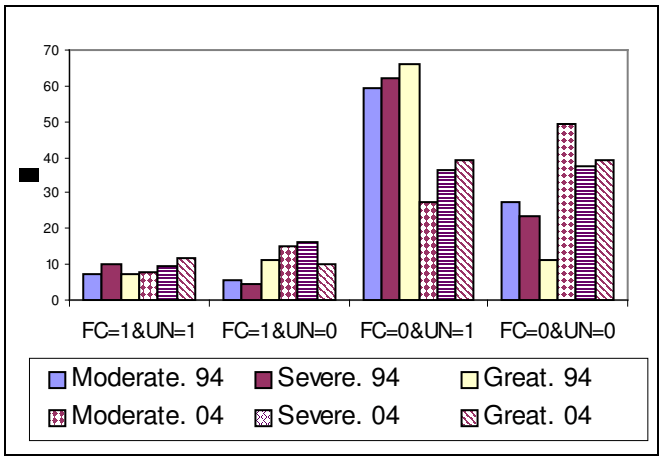
The fraction of permanent caregivers has raised when FC=1&UN=1 (from 70.9% to 83.3%) and the fraction of wilful caregivers has increased in both situations where FC=1 (from 59.8% to 68% and from 51.7% to 59%). Both facts point against a perfect substitutability between formal and informal care and may indicate a caregiver's attempt to alleviate the insufficient allocation of formal care.

With respect to the kinship between the caregiver and the dependent individual, for the situation with FC=1&UN=1 there is an increase in the participation of the spouse (from 13.8% to 21.5%) or the son/daughter (from 42.4% to 54.7%) and a decrease in the implication of son/daughter in law (from

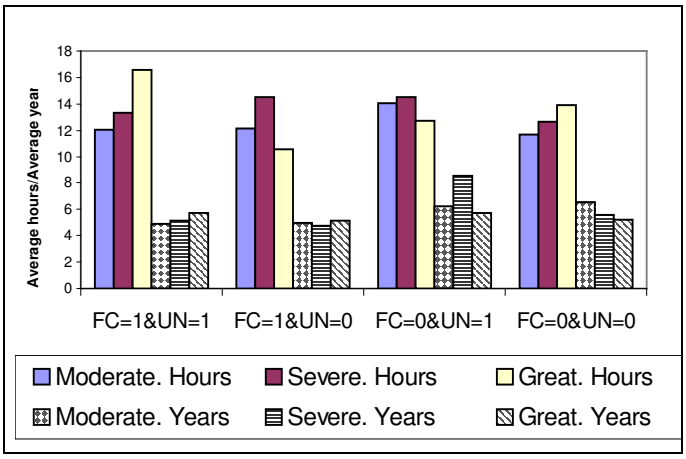
[12] There is a slight increase in caregiver's age from 51.86 in 1994 to 53.19 in 2004. We observe a higher fraction of caregivers in the intervals [50, 64] and [65,+) for the situation FC=1&UN=1 (from 36.1% to 41.2% and from 15.1% to 25.1%, respectively).

12.2% to 7.8%). The fraction of caregivers who receive help from other family members has increased from 52.43% to 65.90%, with an increase in the participation of daughters (from 8.69% to 11.14%) and sons (from 5.07% to 9.63%).

Graph 1. Distribution of FC and UN according to dependency degree. 1994 and 2004 (%)



Graph 2. Average hours and years of informal caregivers who devote at least 21 hours/week. 2004



Graph 1 shows the relation between formal care and unmet needs according to the degree of dependency. The percentage with FC=1&UN=1 has increased between 1994 and 2004 for the three types of dependency, corresponding the biggest increase to great dependent (from 7.12% to 11.66%). On the other hand, the fraction with FC=0&UN=1 shows an increasing profile with the degree of dependency and in 2004 nearly 40% of great dependent people do not receive any formal service although they have applied for Home Care or Day Centre.

Graph 2 shows the average caregiving hours and years for those informal caregivers who take care at least 3 hours per day[13]. For great dependents, caregivers devote more hours when FC=1&UN=1 (16.59 hours/day), whereas for moderate and severe dependent people, informal caregivers devote more hours when FC=0&UN=1 (14.54 hours/day and 12.72 hours/day, respectively). Finally, informal caregivers of dependent people with FC=0&UN=1 show a higher number of caregiving years (8.52) with respect to an average of 5.64 years for the others situations. These facts point to an increase in the number of caregiving years in situations where the formal care provision is unsatisfactory, even in the case of longer disabilities/illnesses.

[13] We focus on caregivers providing at least 3 hours of care per day because this level of intensity is more likely to be provided to *disabled* older people than care provided at lower levels of intensity (Kemper, 1992). For 2004, we have information about the number of daily caregiving hours. Fixing a threshold in 3 hours per day, we obtain the sample of caregivers with at least 21 hours per week (1.286 informal caregivers from the initial sample of 1.504 devote at least 21 hours/week).

4. Estimation of the bivariate model: formal care and unmet needs

The variable "informal caregiving hours" (IC hours) records the number of daily caregiving hours devoted by the interviewed caregiver[14]. Thus, although we know if there are other informal caregivers, we do not know how much time is devoted to the dependent

With respect to the explanatory variables, we can bring them together in four groups. First, variables related to carerecipient characteristics: gender, sex, marital status, dwelling arrangements, pathologies, degree of dependency (obtained from the application of the Ranking Scale of de Law of Dependency), type of benefit received and dependent's monthly income. Second, caregiver's characteristics are represented by gender and sex[15], marital status, number of caregiving years, permanent and/or wilful caregiver, kinship between the dependent and the caregiver[16] and if both got on with each other before the onset of the caregiving tasks. In third place, we have considered the characteristics of the informal network, that is, if the caregiver receives help from other family member, the kinship between the primary and secondary caregivers and if there are children living with them. Finally, we have considered the possibilities offered by formal care: if the caregiver receives help from private formal help (nurse or household employee) and the characteristics of the social services (Home Care and Day Centres) [17]. We study both services and not Residential Homes because we are considering the situation of non-insitutionalized dependent people. For Home Care services, we have information (by Autonomous Communities) about the coverage index[18], the number of weekly hours, the percentage of time devoted to personal care (with respect to houseworking) and the percentage of the cost paid by the user (which is called co-payment). For Day Centres, we have information (also by Autonomous Communities) about the

[14] In 1994, survey, the number of caregiving hours is recorded in 4 intervals: less than 1, [1, 2), [2, 5) and more than 5 hours/day. In 2004 survey, the number of informal caregiving hours was recorded in the survey in the following way: less than one hour, 1 to 2 hours, 3 to 5 hours, 5 to 8 hours and more than 8 hours. For the first four intervals we have used the mean value, that is, 0.5 hours, 1, 4 and 6.5 hours. The number of observations for the first four intervals is 29, 189, 322 and 250, respectively. Those who answered a number of caregiving hours higher than 8 (607 observations), were asked to indicate exact number. Only 593 individuals indicated the number of caregiving hours (from 9 to 24). We have 121 missing observations: 107 for which we do not know the number of caregiving hours and 14 that take care more than 8 hours, but we do not know the exact number. We have created a bracket variable for these cases, which consists of making assumptions about the intensity of caregiving (Byrne et al., 2006). For the first 107 observations, using a conservative approach, we have computed the average caregiving hours assuming that the amount of care was less or equal than 8 hours (4.06 hours per day). For the others 14 observations, given that they reported a caregiving level higher than 8 hours, we have assigned the mean caregiving hours obtained from the subsample with more than 8 caregiving hours (20.18 hours). Anyway, we have tested the sensitivity of this bracketing approach. We have reestimated the bivariate probit model and the OLS regressions with the selectivity terms exlcuding those 121 observations, whose hours were imputed, and the results did not change significantly.

[15] Caregiver's age and sex may affect the demand for social services because older caregivers may also suffer disabilities that prevent them from providing the adequate level of care to the carereceiver. On the other hand, there is evidence in favour of women caregivers reporting more unmet needs than male ones (Lima and Allen, 2001).

[16] Being the partner of the care recipient may induce a higher burden ceteris paribus, but this burden may be tolerable (less need of support) because of experiencing more satisfaction if one care for his/her partner than for other person.

[17] Older people in Spain. 2004 Report. IMSERSO.

[18] Ratio between the number of users and the population 65 years and more.

coverage index, the percentage of psychogeriatric places and the co-payment. To reinforce the regional character of this services, we also include as explanatory variables, the size of municipality. Unfortunately, for some Autonomous Communities there is no available information and we have defined the corresponding observability variables[19].

Estimations of the bivariate probit for both samples are available upon request[20]. The correlation between the disturbances, given by ρ, is significant and negative, which implies that the bivariate probit provides efficient results that those dependent individuals who receive a certain amount of FC are less prone to suffer UN than others who have applied for but do not receive it at all.

Table 4 reports the mean and median of the estimated marginal effect of each explanatory variables for the probabilities of FC=0&UN=1 and FC=1&UN=1 in 1994 and 2004. For example, for computing the effect of living alone over the probability of FC=0&UN=1, the average effect has been defined as:

$$E\left[\left(FC_i = 0 \,\&\, UN_i = 1\right)_{Lives\ alone=1} - \left(FC_i = 0 \,\&\, UN_i = 1\right)_{Lives\ alone=0}\right] =$$
$$= \Phi_2\left(X_i'\beta, Z_i'\gamma; \rho\right)_{Lives\ alone=1} - \Phi_2\left(X_i'\beta, Z_i'\gamma; \rho\right)_{Lives\ alone=0} \qquad (14)$$

where $\left(FC_i = 0 \,\&\, UN_i = 1\right)_{Lives\ alone=1}$ indicates the outcome if the dependent individual lives alone and $\left(FC_i = 0 \,\&\, UN_i = 1\right)_{Lives\ alone=0}$ indicates the outcome if the dependent does not live alone. This average effect has been estimated by the sample mean or the sample mean as the difference $\Phi_2\left(X_i'\hat{\beta}, Z_i'\hat{\gamma}; \hat{\rho}\right)_{Lives\ alone=1} - \Phi_2\left(X_i'\hat{\beta}, Z_i'\hat{\gamma}; \hat{\rho}\right)_{Lives\ alone=0}$ across the sample.

Younger dependent individuals (less than 70 years) show an increase in the probability of FC=0&UN=1 by 43.25% in 1994, which has decreased to 22.77% in 2004. In 1994, many regional administrations did not award social services to dependent people younger than 65 years.

Dependent people living alone experiment an average decrease in the probability of FC=0&UN=1 of 43.64% and an average increase in the probability of FC=1&UN=1 of 14.26% (in 1994). Between both waves the effect over the first probability has diminished, although the second one has become stronger (-20.89% and 25.18% in 2004, respectively).

[19] We define four dummy variables (percentage of psychogeriatric places, percentage of co-payment for Home Care and Day Centres, and percentage of Home Care time devoted to personal care) which take the value 1 if there is information for that particular characteristic and the value 0 otherwise.

[20] Identification of the equations is achieved because the FC equation does not include certain characteristics of Home Care (cost, number of hours and co-payment) and Day Centers co-payment. On the other hand, UN equation does not include dependent's marital status, type of benefit, monthly dependent's income and number of caregiving years.

Being a great dependent reduced on average the probability of FC=0&UN=1 by 47.01% in 1994 and has decreased to 22.10% in 2004. For both waves moderate dependent experiment a lower decrease in the probability of FC=0&UN=1 than great dependent, and in 2004 differences between dependency degrees have shortened. On the other hand, being severe or great dependent increased the probability of FC=1&UN=1 by 12.54% and 25.18% in 1994 and this effect has raised to 22.33% and 35.44%, respectively, in 2004. With respect to specific pathologies, individuals suffering dementia in 1994 experienced an average increase in the probability of FC=0&UN=1 (46.31%). In 2004, we appreciate that the effect of dementia remains almost constant, and besides that osteoarticular problems present an increase in the probability FC=0&UN=1 (12.75%).

Individuals with no income or less than 300€/month have less probability of suffering FC=0&UN=1 (-42.21% and –14.08%) as compared to those with more than 300€ or 600€/month, although the effect of income differences has decreased between both waves. As regards to the awarding system applied in 1994 and 2004 (before the Law of Dependency), the economic situation as well as the number of functional or cognitive disabilities and the availability of the family were taken into account for the concession of Home Care and Day Centres.

Caregivers with more than 10 caregiving years (12 years) show a decrease of the probability of FC=0&UN=1 (35.36% and -23.25% in 1994 and 2004, respectively). In 2004, the percentage of dependent people who complement Home Care with private formal care is 37.50% (less than 2 years) and raises to 71.43% (more than 12 caregiving years).

For regional policy variables (non discrete variables), marginal effects and their standard errors are shown in Table 4. We observe that a higher coverage index of Home Care or Day Centres, more formal hours, a higher fraction of time devoted to personal care and more psicogeriatric places reduce both probabilities FC=0&UN=1 and FC=1&UN=1. But the cost of Home Care and the copayment increase the probability of FC=1&UN=1 with an increasing effect across time.

5. Estimation of the double selection model

Tables 5 and 6 provide the estimated coefficients of the interval regressions for the number of caregiving hours in 1994 and the OLS regressions of the logarithm of the number of caregiving hours in 2004. In 1994, only the term λ_{22} is significant and positive which denotes that caregivers of dependent with FC=0&UN=1 devote less caregiving hours than similar caregivers with FC=1&UN=1. For 2004 regressions, there are three significant selectivity terms (none of the selectivity term is significant in the

regression for FC=0&UN=0). The selectivity term λ_{21} is negative which indicates that caregivers of dependent individuals with FC=0&UN=1 have a higher probability of devoting more caregiving hours when compared to similar caregivers with FC=0&UN=0. The selectivity term λ_{31} is positive which indicates that caregivers of dependent individuals with FC=1&UN=0 devote less hours than caregivers with FC=1&UN=1. Finally, the negative sign of the selectivity term λ_{42} suggests that caregivers of dependent with FC=1&UN=1 devote more hours than similar caregivers with FC=0&UN=1.

The regression for FC=1&UN=1 in 1994 shows that male dependents receive less caregiving hours. In this situation we have observed that the percentage of sex coincidence between the caregiver and the carereceiver is lower than in the other situations (55.62% with respect to 64.37%). Sometimes, the sex of the care may be problematic for the recipient, because the dependent may feel uncomfortable to discuss needs or receive attention from a different-sex caregiver (Cordingley and Webb, 1997).

The number of informal caregiving hours increases with the degree of dependency and the coefficients are always higher in the regression for FC and UN as compared to the situation with UN but no FC. For example, a level 2 great dependent with FC and UN implied an increase of 4.65 hours/week in 1994 and 5.64 hours/week (exp(1.7303)) in 2004. The distance in caregiving hours between moderate (level 2) and great dependence (level 2) has increased between both waves: in 1994 there was a difference of 2.76 hours which has raised to 3.62 in 2004[21]. Consequently, informal caregivers face a double problem: first, they have to devote additional caregiving hours to compensate formal care UN, and second, their efforts show an increasing profile across time. Finally, attending to specific pathologies, mental illnesses show an increase in hours for the situation FC=1&UN=1 (from 2.54 to 3.22) and the coefficient for FC=0&UN=1 is significant in 2004 (1.36 hours more) but it was not in 1994.

The number of caregiving hours decreases if the dependent individual lives alone and suffer UN and the effect is bigger when some FC is received (-0.98 and –1.68 hours/week, respectively in 1994, and -1.66 and –2.04 hours/week in 2004). Elders living with a spouse (14.87 hours/day) or others (12.12 hours/day) were likely to receive substantially more care than those who lived alone (5.82 hours/day). Besides, those living alone are more than twice as likely to use private formal help (11.20% with respect to 5.82% for elderly who do no live alone).

Attending to the number of caregiving years, for both waves we observe a significant increase of caregiving hours (around 1.4 hours/week) when FC=0&UN=1 and the number of caregiving years is

[21] exp(1.7303)-exp(0.7034)

greater than 10 (or 12 for 2004). The "career of caregiving" theory (Aneshensel et al., 1995) provides a good explanation for this result, although not all caregivers follow the same "career sequence"[22]. For example, the percentage of caregivers that has been obliged to reduce leisure time or social activities is almost the same (35.19-34.36%) for the groups with less than 2 years or more than 12 caregiving years (in 2004). However the percentage of caregivers who consider caregiving as a moral obligation increases from 41.70% (less than 2 years) to 54.56% (more than 12 years). Therefore, caregivers with a long caregiving experience may be readier than others to satisfy dependent's demands.

Although the type of care provided by a specific caregiver appears related to gender-expected activity[23], in this study we observe that caregiver's gender is not significant and male and female caregivers provide similar amounts of care, which is consistent with other previous results (Stoller and Earl, 1983; McKinlay and Tennstedt, 1986). On the other hand, having a good relation caregiver-dependent (previous to the dependency relation) increased the amount of caregiving hours in all situations in 1994. In 2004, we only observe a significant effect for FC=0&UN=1 and FC=1&UN=1. But the amount of care devoted has increased. For example, a good relation for the case FC=0&UN=1 implied an increase of 0.8364 hours/week in 1994 and 1.2777 hours/week in 2004

If the primary caregiver receives help from other family member the number of caregiving hours devoted decreases by 3 hours/ week for both waves when FC=0&UN=1 and nearly 4 hours/week when FC=1&UN=1. However, we found that one person tends to provide all informal care (58.99% in 1994, 51.13% in 2004), whereas secondary caregivers are few in number[24]. This concentration of caregiving responsibilities on a nuclear family has important implications over the emeregence of family/leisure problems or the possible increase of institutionalization risk when the primary caregiver is overloaded.

The presence of children younger than 18 years old constitutes an obstacle for caregiving tasks when unmet needs are present. For the situation FC=1&UN=1, having young children decreased the amount of care by 0.2033 hours/day and 1.4241 hours/day in 2004. The kinship of the caregiver with respect to the dependent reveals that a gradient effect: first, the spouse; second, the son or daughter and in third place (in more cases in 2004) the son or daughter in law. Comparing the reception of FC between the situations of UN we observe, that the number of caregiving hours is slightly higher, which constitutes an evidence

[22] The literature usually distinguishes three major stages: the acquisition role (diagnosis and transition into the role of caregiving), the enactment role (combination of in-home care or institutional care) and the disengagement role (cessation of caregiving, bereavement and social readjustement).

[23] The percentage of men (women) who help the dependent individual is 68.74% (81.20%) for houseworking, 68.64% (81.68%) for cooking, 72.14% (62.91%) for financial management, 61.59% (51.01%) for going in public transport.

[24] For 2004, 20.15% of interviewed caregivers receive help from another family member; 14.63% from two people and 7.71% from three.

against the Substitution theory. Moreover, there may exist complementarities between the formal and informal caregivers according to the complexity of the task and the level of knowledge. The kinship between the primary and the secondary caregivers indicate that female caregivers (daughters and sisters) become more involved in the caregiving network and her dedication increases with unmet needs.

Finally, Table 7 reports the confidence intervals for the predicted number of informal caregiving hours for two different prototypes of caregiver: (1) wife aged 50 years and older and (2) daughter between 30-49 years. For any combination of FC and UN, wives provide more caregiving hours than daughters. There exist sharp regional differences in the provision of informal care. Andalucía, Aragón, Baleares, Canarias, C. Valenciana, Extremadura and Navarra show higher values than the average for Spain for the first case, and Andalucía, Baleares, Canarias, Cantabria, Castilla La Mancha, C. Valenciana, Galicia, Madrid and Navarra for the second case. In fact, Navarra constitutes a special case, with characteristics different from other regions: only 31.82% of caregivers living in Navarra do not receive additional help from other family members (50.93% in Spain); the size of the informal caregiving network is bigger (5.73 as opposed to 2.25 for Spain); 77.27% had a very good relation with the dependent individual and none of the carereceivers receive private formal care (9.44% for the rest of Spain).

6. Conclusions

This paper has analysed the informal caregiving hours gap focusing on possible selectivity bias with regard to the decision of providing formal care.. It has been often argued that in Mediterranean countries, elder people prefer to continue living at home as long as possible and Social Security systems have relied on the family as the principal source of care (Bolin et al., 2007). By contrast, Nordic countries show the highest figures for institutionalised dependent people. However, we have confirmed that selectivity bias exists, and in consequence there exists inefficiencies in the formal aid award process and in the coverage and/or intensity of the services provided. Therefore, if informal caregivers are obliged to devote more hours to the dependent individual, social services inefficiency would be, in part, responsible of the caregiver's burden.

Results indicate that caregiving hours and demand for formal care depend on characteristics of the caregiver, the carereceiver and the caregiving situation. One recommendation to improve Home Care service could be to ask dependent people (or informal caregivers) whether there are specific tasks they need help with, because asking if they would like to receive more help, in general terms, could not produce an accurate assessment of need (Farquhar et al., 1993). Thus, therapists could focus on those

aspects that enable people to maintain independence and re-integrate them into their social environment (Brown and Gillespie, 1992).

With respect to Home Care, the Law of Dependency has established the number of hourss per month attributed to each dependency degree. However, in 2004 only 20.29% of great dependent received Home Care and the average number of formal caregiving hours among those who received it was 5.87 hours/week, very far from the [70, 90] hours/month for great dependent (level 2) and [55, 70] hours/month for great dependent (level 1). The fulfillment of these objectives, will require a huge investment in monetary and professional resources, and will presumably increase the percentage in long term care expenditure with respect to GDP from 0.54% (in 2005 according to Eurostat) to 1.5% in 2015. From the point of view of the user, the level of copayment was a significant determinant for the appearance of unmet needs and in the future[25] it may be a source of disparities. As we have seen, First, each Autonomous Community has interpreted the economic capacity as income or as the sum of income and assets. Second, because they have fixed different copayment thresholds as a result of the magnitude chosen with respect to different indicators (IPREM, minimum wage, IRSC). As a result, the System of Autonomy and Dependency Attention may guarantee a minimum protection level for each individual but also create 19 regional dependency systems with different awarding criteria.

In the future we would like to tackle two questions related to unmet needs. First, estimate the shortfall in hours associated with unmet need by comparing the number of Home Care hours received by people whose needs are met with those who report unmet needs, after controlling for individual differences in the dependency degree and other demographic characteristics[26]. Second, we have shown that the number of informal caregiving hours increases to compensate formal care unmet needs, then it would be interesting to know if this decision affects the balance with other responsabilities, such as work and child care.

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[25] Each individual will contribute to finance the System according to his economic capacity, type and cost of the service (article 33) although nobody will be excluded because of his financial situation.

[26] In the Informal Support Survey, there is a high percentage of missing values (70.64%) for the variable number of Home Care hours received, among those who receive this service.

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Appendix.

Table 1. Comparison between the Task Table of the Ranking Scale contained in the Law of Dependency and the information from the Informal Support Survey

Ranking Scale (Dependency Law)		Informal Support Survey	
1. Eat and drink	17.8 (10)	**1.** Eat and drink	17.8 (10)
Use artificial nutrition or hydration		Eating	1
Open bottles and cans	0.10		
Cut the meat up	0.25		
Use utensils (fork, spoon, knife)	0.25		
Keep a glass with the hand	0.15		
Approximate a glass to the mouth	0.15		
Drink	0.10		
2. Control of physical needs	14.8 (7)	**2.** Control of physical needs	14.8 (7)
Go to the appropriate place	0.20	Using the WC	0.55
Dressing and undressing	0.15	No information	-
Adopt the adequate posture	0.20	No information	-
Cleaning oneself	0.20	Refuses cleaning	0.20
Urination control	0.10	Needs nappies for uncontrolled urination	0.10
Defecation control	0.15	Needs nappies for uncontrolled defecation	0.15
3. Washing oneself	8.8 (8)	**3.** Washing oneself	8.8 (8)
Washing hands	0.15	No information	-
Washing the face	0.15	No information	-
Washing lower part of the body	0.35	Refuses bathing	0.65
Washing upper part of the body	0.35	Bathing /Having a shower	0.35
4. Other personal tasks	2.9 (2)	**4.** Other personal tasks	2.9 (2)
Combing one's hair	0.30	No information	-
Cutting nails	0.15	No information	-
Washing one's hair	0.25	No information	-
Brushing teeth	0.30	Preening oneself	1
5. Dressing up	11.9 (11.6)	**5.** Dressing up	11.9 (11.6)
Putting on shoes	0.15	No information	-
Button up	0.15	Button up	0.3
Dressing upper part of the body	0.35	Dressing	0.7
Dressing lower part of the body	0.35	No information	-
6. Keeping one's health	2.9 (11)	**6.** Keeping one's health	2.9 (11)
Applying oneself therapeutic measures	0.25	Going to the doctor	0.25
Avoiding indoors risks	0.25	Having accidents	0.5
Avoiding outdoors risks	0.25	No information	-
Distress call	0.25	Distress call	0.25
7. Mobility	7.4 (2)	**7.** Mobility	7.4 (2)
Sit down	0.15	No information	-
Lie down	0.10	No information	-
Stand up	0.20	No information	-
Change posture from a sitting position	0.25	No information	-
Change posture from bed	0.30	Going to bed/Standing up	1
8. Moving inside home	12.3 (12.1)	**8.** Moving inside home	12.3 (12.1)
Movements related to self-care	0.50	No information	-
Movements not related to self-care	0.25	Being disorientated indoors	0.50
Access to all settings of the rooms	0.10	No information	-
Access to all household rooms	0.15	Walking inside home	0.50
9. Moving outside home	13.2 (12.9)	**9.** Moving outside home	13.2 (12.9)
Going outside the house/building	0.25	Refuses going outside home	0..25
Walking around the house/building	0.25	No information	-
Walking short distances	0.10	No information	-
Walking long distances	0.15	Being disorientated outdoors	0.5
Using means of transport	0.25	Using public transport	0.25
10. Houseworking	8 (8)	**10.** Houseworking	8.0 (8)
Cooking	0.45	Cooking	0.45
Go shopping (for food)	0.25	Go shopping (for food)	0.25
Cleaning the house	0.20	Piles up useless objects	0.20
Washing the clothes	0.10	Other houseworking tasks	0.10
11. Taking decisions	(15.4)	**11.** Taking decisions	(15.4)
Self-care activities	0.30	Forgets medication/Eats forbidden foods	(0.30)
Mobility activities	0.20	Moving	(0.20)
Houseworking	0.10	Unable to find belongings	(0.10)
Personal relationships	0.20	Verbally/Physically aggressive	(0.20)
Use of money	0.10	Managing funds	(0.10)
Use of public services	0.10	Doing businesses	(0.10)

Source: www.seg-social.es/imserso/dependencia/manualusoBVD.pdf; Jiménez and Vilaplana (2008).
Variables in brackets are only applied to mental patients.

Table 2. Comparison between the information about the degree of support of the Ranking Scale contained in the Law of Dependency and the Informal Support Survey

Support coefficient	0.9	0.9	0.95	1
Law of Dependency	Supervision	Partial Physical Assistance	Maximum Physical Assistance	Special Assistance
Informal Support Survey	Sometimes can do the activity by himself. A third person is watching	Can not do the task by himself. Needs help from a third person. (Frequency: Always or Often)	Can not do the task by himself. A third person has to do it for him. (Frequency: Always or Often)	Mental illness

Source: www.seg-social.es/imserso/dependencia/manualusoBVD.pdf; Jiménez and Vilaplana (2008).

Table 3. Descriptive statistics (using sample weights)

	1994				2004			
	FC=0 UN=0	FC=0 UN=1	FC=1 UN=0	FC=1 UN=1	FC=0 UN=0	FC=0 UN=1	FC=1 UN=0	FC=1 UN=1
Dependent's characteristics								
Male	0.315	0.302	0.228	0.296	0.284	0.309	0.281	0.450
Age								
60-69	0.112	0.123	0.133	0.146	0.081	0.125	0.116	0.091
70-79	0.360	0.303	0.330	0.358	0.322	0.301	0.338	0.319
80-89	0.415	0.453	0.434	0.398	0.450	0.399	0.464	0.484
90 and older	0.113	0.121	0.103	0.098	0.147	0.175	0.082	0.106
Marital status								
Single	0.064	0.067	0.031	0.080	0.051	0.053	0.040	0.132
Married	0.303	0.345	0.285	0.315	0.322	0.333	0.424	0.449
Widowed	0.625	0.575	0.671	0.578	0.607	0.596	0.516	0.386
Separated	0.003	0.010	0.000	0.000	0.017	0.019	0.019	0.033
Dwelling arrangement								
Lives alone	0.126	0.118	0.184	0.194	0.170	0.152	0.150	0.166
Lives with couple	0.266	0.276	0.184	0.272	0.317	0.335	0.386	0.455
Lives with a relative of the same generation	0.074	0.081	0.099	0.048	0.042	0.035	0.043	0.047
Lives with a son/daughter	0.418	0.377	0.409	0.387	0.367	0.343	0.370	0.289
Pathologies								
Mental illness	0.473	0.577	0.538	0.669	0.314	0.403	0.349	0.446
Cancer	0.020	0.021	0.012	0.007	0.059	0.065	0.053	0.064
Respiratory problems	0.105	0.085	0.082	0.050	0.190	0.212	0.116	0.283
Osteoarticular problems	0.234	0.262	0.272	0.246	0.550	0.545	0.481	0.516
Cardiovascular problems	0.282	0.260	0.287	0.280	0.340	0.317	0.286	0.295
Degree of dependency								
Moderate. Level 1	0.249	0.233	0.216	0.218	0.209	0.149	0.148	0.194
Moderate. Level 2	0.110	0.126	0.126	0.154	0.114	0.134	0.141	0.111
Severe. Level 1	0.153	0.185	0.097	0.244	0.144	0.192	0.137	0.217
Severe. Level 2	0.086	0.106	0.094	0.134	0.068	0.129	0.130	0.101
Great. Level 1	0.058	0.121	0.175	0.069	0.074	0.115	0.060	0.099
Great. Level 2	0.003	0.000	0.028	0.037	0.007	0.011	0.000	0.043
Receives benefit								
Retirement benefit	0.449	0.443	0.416	0.367	0.408	0.430	0.428	0.624
Survival benefit	0.326	0.311	0.301	0.309	0.389	0.368	0.331	0.205
Disability benefit	0.062	0.062	0.140	0.082	0.064	0.075	0.067	0.051
Monthly dependent's income								
Less 300€	0.622	0.626	0.606	0.671	0.212	0.196	0.138	0.120
301 € - 600 €	0.250	0.246	0.290	0.136	0.524	0.621	0.570	0.611
More 600 €	0.028	0.025	0.010	0.028	0.079	0.076	0.095	0.134
Caregiver's characteristics								
Male	0.152	0.176	0.138	0.174	0.155	0.163	0.199	0.101
Age								
Less 40	0.210	0.178	0.235	0.205	0.166	0.156	0.202	0.128
40-49	0.256	0.235	0.292	0.283	0.246	0.248	0.267	0.209
50-64	0.357	0.376	0.282	0.361	0.387	0.368	0.329	0.412
65 and older	0.177	0.211	0.192	0.151	0.201	0.229	0.202	0.251
Marital status								
Married	0.739	0.786	0.712	0.695	0.756	0.768	0.730	0.797
Single	0.196	0.128	0.220	0.170	0.163	0.144	0.149	0.119
Widowed	0.041	0.053	0.043	0.076	0.042	0.060	0.050	0.049
Separated	0.022	0.026	0.026	0.041	0.039	0.027	0.062	0.035
Children living at household	0.772	0.814	0.687	0.764	0.685	0.672	0.699	0.611
Number of caregiving years								
Less 2 years	0.216	0.258	0.242	0.339	0.340	0.388	0.399	0.356
2-5 years (2-4 years)	0.260	0.237	0.288	0.265	0.195	0.146	0.186	0.250
6-10 years (5-12 years)	0.198	0.221	0.189	0.177	0.354	0.359	0.294	0.328
More than 10 years (+12 years)	0.319	0.277	0.281	0.211	0.111	0.107	0.121	0.066
Permanent caregiver	0.780	0.749	0.798	0.709	0.749	0.781	0.761	0.833
Wilful caregiver	0.618	0.558	0.598	0.517	0.641	0.538	0.680	0.590
Kinship caregiver respect to dependent								
Spouse	0.153	0.164	0.088	0.138	0.137	0.157	0.146	0.215
Son/Daughter	0.532	0.533	0.553	0.424	0.560	0.612	0.552	0.547
Son/Daughter in law	0.134	0.126	0.115	0.122	0.117	0.104	0.100	0.078
Kinship other caregivers respect to primary caregiver								
Spouse	0.142	0.144	0.138	0.177	0.152	0.180	0.133	0.153
Daughter	0.096	0.097	0.077	0.122	0.122	0.090	0.096	0.131
Son	0.058	0.058	0.023	0.034	0.072	0.111	0.119	0.139
Brother	0.048	0.030	0.031	0.029	0.051	0.053	0.063	0.039
Sister	0.160	0.130	0.095	0.108	0.142	0.150	0.116	0.142
Private formal care	0.029	0.029	0.041	0.000	0.063	0.066	0.114	0.162
Previous good relation dependent-caregiver	0.527	0.452	0.567	0.357	0.588	0.542	0.657	0.577
Preference for informal care	0.716	0.728	0.725	0.646	0.697	0.645	0.702	0.586
Size of municipality								
Until 2.000	0.106	0.132	0.097	0.124	0.099	0.098	0.065	0.020
2.001-10.000	0.187	0.187	0.198	0.164	0.189	0.187	0.212	0.179
10.001-50.000	0.264	0.248	0.273	0.216	0.201	0.223	0.247	0.227
50.000-1.000.000	0.346	0.317	0.329	0.337	0.195	0.206	0.201	0.264
Capitals of province	0.097	0.117	0.103	0.158	0.317	0.287	0.275	0.310
N	387	812	87	106	663	379	202	110

Table 4. Marginal effects for the probabilities of FC=0&UN=1 and FC=1&UN=1.

	1994				2004			
	FC=0&UN=1		FC=1&UN=1		FC=0&UN=1		FC=1&UN=1	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Age								
60-69	0.4325	*0.4503*	-0.0501	*-0.0486*	0.2277	*0.2280*	-0.0545	*-0.0514*
70-79	-0.1160	*-0.1369*	-0.0237	*-0.0331*	-0.1171	*-0.1281*	-0.0271	*-0.0379*
80-89	-0.2608	*-0.2783*	-0.0111	*-0.0184*	-0.2016	*-0.2004*	-0.0081	*-0.0244*
90 and +	-0.4584	*-0.5730*	0.2578	*0.2510*	-0.2865	*-0.2768*	0.4559	*0.4523*
Marital status								
Married	-0.1996	*-0.5223*	-0.0283	*-0.0349*	-0.0928	*-0.2173*	-0.0067	*-0.0303*
Widow	0.1028	*0.4819*	0.0169	*0.0257*	0.0510	*0.1881*	-0.0074	*0.0222*
Separated	-0.5732	*-0.5875*	-0.0713	*-0.0568*	-0.2863	*-0.2848*	-0.0694	*-0.0579*
Single	-0.4978	*-0.5792*	-0.0599	*-0.0527*	-0.2649	*-0.2801*	-0.0619	*-0.0548*
Lives alone	-0.4364	*-0.4552*	-0.1426	*-0.1457*	-0.2089	*-0.2275*	-0.2518	*-0.2501*
Pathologies								
Mental illness	0.4631	*0.4543*	0.0507	*0.0496*	0.4587	*-0.4501*	0.0584	*0.0508*
Respiratory problems	-0.4885	*-0.4808*	-0.0627	*-0.0540*	-0.1637	*-0.1459*	-0.0442	*-0.0471*
Cancer	-0.5576	*-0.5855*	-0.0701	*-0.0567*	-0.2618	*-0.2785*	-0.0646	*-0.0556*
Osteoarticular problems	-0.3013	*-0.3242*	-0.0358	*-0.0406*	0.1275	*0.1296*	-0.0027	*0.0187*
Cardiovascular diseases	-0.3045	*-0.3112*	-0.0339	*-0.0404*	-0.1023	*-0.1241*	-0.0316	*-0.0404*
Degree of dependency								
No dependent	-0.1571	*-0.1514*	-0.0227	*-0.0459*	-0.0310	*-0.0587*	-0.0341	*-0.0412*
Moderate dependent	-0.1845	*-0.2122*	-0.0228	*-0.0279*	-0.0847	*-0.0846*	-0.0336	*-0.0401*
Severe dependent	-0.2560	*-026269*	0.1254	*0.1348*	-0.1163	*-0.1264*	0.2233	*0.2390*
Great dependent	-0.4701	*-0.4722*	0.2518	*0.2493*	-0.2210	*-0.2652*	0.3544	*0.3513*
Receives benefit								
Retirement benefit	-0.0607	*-0.4408*	-0.0152	*-0.0208*	-0.0416	*-0.1829*	0.0028	*-0.0222*
Disability benefit	-0.5095	*-0.5827*	-0.0558	*-0.0508*	-0.2545	*-0.2756*	-0.0631	*-0.0554*
Survival benefit	-0.2144	*-0.5259*	-0.0286	*-0.0342*	-0.0838	*-0.2147*	-0.0346	*-0.0411*
No benefit	-0.3830	*-0.5633*	-0.0432	*-0.0451*	-0.2131	*-0.2674*	-0.0505	*-0.0498*
Monthly income								
No income	-0.4521	*-0.5755*	-0.0500	*-0.0483*	-0.2173	*-0.2723*	-0.0517	*-0.0501*
Less 300€	-0.1408	*-0.1584*	0.0189	*0.0304*	-0.1706	*-0.2514*	-0.0542	*-0.0522*
301-600€	0.3053	*0.3300*	-0.0435	*-0.0456*	0.1318	*0.1334*	0.0130	*0.0272*
>600 €	0.5510	*0.5849*	-0.0680	*-0.0562*	0.2568	*0.2733*	-0.0525	*-0.0513*
Size of municipality								
≤2.000	0.4705	*0.4750*	-0.0558	*-0.0497*	0.2644	*0.2803*	-0.0669	*-0.0568*
2.001-10.000	0.3330	*0.3517*	-0.0422	*-0.0439*	0.2410	*0.2691*	-0.0523	*-0.0493*
10.001-50.000	0.3281	*0.3585*	-0.0420	*-0.0419*	0.1846	*0.2045*	-0.0410	*-0.0442*
50.000-1.000.000	0.2019	*0.2328*	-0.0260	*-0.0360*	0.1975	*0.2019*	-0.0436	*-0.0472*
Capitals of province	0.2099	*0.2015*	-0.0370	*-0.0153*	0.1098	*0.0908*	-0.0290	*-0.0270*
Number of caregiving years								
Less 2 years	-0.2674	*-0.2423*	-0.0235	*-0.0249*	-0.0840	*-0.0947*	-0.0158	*-0.0311*
2-5 years (2-4 years)	-0.2852	*-0.2654*	-0.0315	*-0.0387*	-0.1282	*-0.1288*	-0.0233	*-0.0248*
6-10 years (5-12 years)	-0.3616	*-0.3590*	0.1485	*0.1467*	-0.2183	*-0.2171*	0.1410	*0.1400*
+ 10 years (+12 years)	-0.3536	*-0.3484*	0.1493	*0.1492*	-0.2325	*-0.2331*	0.1573	*0.1571*
	FC=0&UN=1		FC=1&UN=1		FC=0&UN=1		FC=1&UN=1	
	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Home Care								
Coverage index	-0.0458	-2.65	-0.1832	-2.81	-0.0514	-2.60	-0.1478	-2.58
Copayment							0.0535	3.01
Cost/hour			0.0181	2.41			0.0770	2.70
Hours/month			-0.0232	-2.41			-0.0273	-2.95
Time to personal care							-0.1071	-2.67
Day Centre								
Coverage index	-0.0346	-3.18			-0.2988	-2.78	-0.0742	-2.72
Copayment							0.0505	2.35
% psycogeriatric places					-0.1963	-2.39	-0.0501	-2.35

For the number of caregiving years, figures between brackets correspond to 2004.

Table 5. Interval regressions for the number of informal caregiving hours. 1994

	FC=0 UN=0		FC=0 UN=1		FC=1 UN=0		FC=1 UN=1	
Male (dependent)	-0.2489		-0.0115		0.3630		-1.4475	**
Dependent's age								
70-79	-0.1726		-0.6611	*	0.3868		-1.1564	
80-89	-0.3356		-0.0912		1.9951	***	-0.3322	
90 and +	0.7017		0.2295		5.2428	***	0.7674	
Lives alone	-0.5280		-0.9844	***	-0.4431		-1.6867	*
Pathologies								
Mental illness	0.8618	**	0.3045		0.6763		2.5456	***
Cancer	1.2726		-0.5089		4.6041		10.3994	
Respiratory problems	0.1105		-0.1447		1.6235		-1.4273	
Osteoarticular problems	-0.1599		0.0083		-1.0992	*	-0.1627	
Cardiovascular disease	-0.2630		-0.3573		0.1154		2.0583	***
Degree of dependency								
Moderate. Level 1	-0.2180		0.0054		1.0301	***	1.9169	
Moderate. Level 2	0.5784		0.6181		1.3176	***	1.8891	**
Severe. Level 1	0.4931		1.6739	***	1.8758	***	3.4032	**
Severe. Level 2	1.4201	***	2.5008	***	2.6425	***	4.2650	**
Great. Level 1	1.8537	***	2.8779	***	2.7766	**	4.5977	**
Great. Level 2	2.0491	**	3.1479	***	2.9504	**	4.6551	**
Male (caregiver)								
Caregiver's age								
40-49	0.3256		0.0303		-0.5594		1.4924	**
50-65	1.2669	***	0.4725		-0.4751		2.2191	***

65 and +	1.1666	*	1.4578	***	-0.8607		1.5083	
Caregiver's marital status								
Married	-0.4239		-0.3892		0.0794		0.1982	
Widowed	-1.0858		-0.8931		-2.2696	*	1.7594	
Separated	-0.8903		-0.8464		0.7542		-2.8086	
Children +18 years living at home	-0.0247		-0.0516	***	-0.4929		-0.2033	***
Number of caregiving years								
2-5 years	0.4908		0.3774		0.6252		-0.7706	
6-10 years	0.8497	*	0.8343	**	-0.6927		0.7948	
More than 10 years	0.7834	*	1.4007	***	0.1237		-0.0015	
Permanent caregiver	0.2894		-0.1454		-0.5523		-0.7688	
Wilful caregiver	-0.4210		-0.8256	***	1.2949	**	0.9240	
Receives help from other family member	0.0420		-3.0017	***	-3.0569	***	-3.8728	***
Previous good relation	0.7972	*	0.8364	**	1.9250	***	0.9966	**
Size of municipality								
2.001-10.000	0.6323		0.5826	*	2.0399	***	0.9854	
10.000-50.000	1.3283	***	0.2077		-1.8092	***	2.5270	***
>50.000 & capitals of province	0.2190		0.6346	**	1.6958		1.6384	**
Private formal care	-0.3270		-0.2337		0.6914			
Kinship caregiver respect to dependent								
Spouse	0.8342	***	1.8930	***	0.9583	**	2.6736	***
Son/Daughter	0.5358	*	0.7555	*	0.6396	*	1.2598	**
Son/Daughter in law	-0.7244		1.2804	***	0.9975		1.1083	
Kinship other caregivers respect to primary caregiver								
Spouse	0.0488		0.0172		3.2709	***	0.2790	
Daughter	-0.0629		2.4238	**	2.1937	**	2.9607	**
Son	0.4068		0.0917		5.3153		2.5659	
Brother	1.2279		0.6123		9.2028		0.9880	
Sister	-0.7960		0.4123		1.9067	**	2.1231	**
Selectivity terms								
λ11	-0.7416							
λ12	0.2352							
λ21			1.5874					
λ22			5.4899	***				
λ31					-1.0713			
λ32					0.5549			
λ41							-1.3434	
λ42							2.6421	
Constant	3.1448	***	2.6565	***	6.3276	**	2.6259	***
N	387		812		87		106	
(Maximum Likelihood) R^2	0.298		0.211		0.687		0.576	

Omitted variables: age 60-69 (dependent), no degree of dependency, younger than 40 (caregiver), single (caregiver), less than 2 caregiving years, size of municipality less than 2.000 inhabitants. Sample weights used. Clusters by Autonomous Communities. (* p<0.10; ** p<0.05; *** p<0.01).

$R^2_{Max.\ likelihood} = 1 - \left[\frac{L(M_C)}{L(M_F)}\right]^{2/N}$ where $L(M_C)$ is the likelihood of the restricted model (only constant) and $L(M_F)$ is the likelihood of the full model.

Table 6. OLS regressions for the logarithm of the number of informal caregiving hours. 2004

	FC=0 UN=0		FC=0 UN=1		FC=1 UN=0		FC=1 UN=1	
Male (dependent)	0.0826		0.1710		0.0356		-0.1941	
Dependent's age								
70-79	-0.1143		-0.2363		-0.2634		-0.1075	
80-89	-0.0198		-0.2788		-0.3638		0.2756	
90 and +	-0.0777		-0.2578		-0.2668		-0.0041	
Lives alone	-0.4018	***	-0.5108	***	-0.2298		-0.7143	**
Pathologies								
Mental illness	0.2272	*	0.3097	**	0.0657		1.1696	***
Cancer	0.2134		0.1309		-0.5530	**	0.9432	**
Respiratory problems	0.0655		0.1710		-0.0646		-0.4836	*
Osteoarticular problems	0.1535	*	-0.0656		-0.1223		-0.1719	
Cardiovascular disease	0.0821		-0.1344		-0.1090		0.2167	
Degree of dependency								
Moderate. Level 1	0.0475		-0.0406		0.1621		0.0953	
Moderate. Level 2	0.2100	*	0.5228	**	0.4903	**	0.7034	**
Severe. Level 1	0.0738		0.7706	***	0.8365	**	1.4380	**
Severe. Level 2	0.6102	*	1.0886	**	1.1710	**	1.5219	**
Great. Level 1	0.6565	**	1.2945	**	1.2854	**	1.7171	**
Great. Level 2	0.7487	**	1.3350	*	1.2901	***	1.7303	**
Male (caregiver)								
Caregiver's age								
40-49	0.2076		-0.0042		-0.3034		0.1956	
50-65	0.3248	*	0.2900	**	-0.1152		0.4855	
65 and +	0.4580	**	0.2025		0.0532		0.4695	
Caregiver's marital status								
Married	-0.0486		-0.4195	**	0.0505		-0.9768	**
Widowed	-0.3576		-0.1405		-0.6076		-1.0376	
Separated	-0.2108		-0.0880		-0.7853	**	0.2150	
Children +18 years living at home	-0.0045		-0.1449	***	0.1096		-0.3522	***
Number of caregiving years								
2-4 years	0.1240	**	0.1254		0.1689		0.2115	
5-12 years	0.0647		0.1837		0.2344		0.4525	**

>12 years	0.2823	**	0.3094	**	0.2555		0.5094	
Permanent caregiver	0.0700		-0.0437		0.0127		-0.3169	**
Wilful caregiver	-0.0894		0.0993		-0.1527		0.1456	
Receives help from other family member	-0.0139		-1.0652	**	-0.0554		-1.3398	**
Previous good relation dependent-caregiver	-0.1859		0.2451	**	0.0091		0.3410	**
Size of municipality								
2.001-10.000	0.0719		0.1880		0.5544		0.2540	
10.000-50.000	0.0823		0.0958		0.4177	*	0.2556	
>50.000 & capitals of province	0.1698		0.2774		0.4401		0.0599	
Private formal care	-0.1754		-0.1075		-0.2949		0.5098	**
Kinship caregiver respect to dependent								
Spouse	0.3938	**	0.4757	***	0.4079	*	1.1914	***
Son/Daughter	0.1876	**	0.3115	**	0.2533	**	0.6992	**
Son/Daughter in law	0.0377		0.0311	**	0.9275	***	0.7020	**
Kinship other caregivers respect to primary caregiver								
Spouse	0.0569		0.2169		0.5932	*	0.1148	
Daughter	-0.0361		0.5005	**	0.4020	**	0.6778	**
Son	0.0751		0.2067		0.3709		-0.7090	
Brother	-0.0207		0.0201		0.2631		-0.0641	
Sister	0.0338		0.1797		0.4827	**	0.5707	**
Selectivity terms								
λ11	0.3170							
λ12	-0.2348							
λ21			-0.9381	*				
λ22			0.2844					
λ31					0.8656	*		
λ32					-0.4169			
λ41							0.4612	
λ42							-1.2316	***
Constant	1.3255	***	2.0342	***	0.1116	***	2.7515	***
N	663		379		202		110	
R^2	0.2352		0.2794		0.4506		0.6283	

Omitted variables: age 60-69 (dependent) no degree of dependency, younger than 40 (caregiver), single (caregiver), less than 2 caregiving years, size of municipality less than 2.000 inhabitants. Sample weights used. Clusters by Autonomous Communities. (* p<0.10; ** p<0.05; *** p<0.01).

Table 7. Confidence intervals (95%) for the predicted number of caregiving hours in 2004

(a) Caregiver: dependent's wife, aged 50 years and older (11.17% of the sample)

	FC=0 UN=0		FC=0 UN=1		FC=1 UN=0		FC=1 UN=1	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Andalucía	9.709	10.145	10.946	11.416	10.132	10.811	10.946	11.416
Aragón	9.039	9.401	11.110	11.629	8.249	8.856	11.110	11.629
Asturias	6.771	7.072	8.738	9.252	6.478	6.869	8.738	9.252
Baleares	12.692	13.130	13.864	14.373	11.576	12.183	13.864	14.373
Canarias	8.755	9.102	8.667	9.090	11.404	12.037	8.667	9.090
Cantabria	6.904	7.066	8.586	9.004	4.009	4.340	8.586	9.004
C. Mancha	8.393	8.682	9.013	9.327	9.481	10.128	9.013	9.327
C. León	8.692	9.052	8.891	9.293	7.517	8.002	8.891	9.293
Cataluña	7.569	7.974	8.902	9.326	6.327	6.763	8.902	9.326
C. Valenciana	8.894	9.244	9.586	10.047	10.317	11.066	9.586	10.047
Extremadura	8.570	8.891	11.854	12.186	7.871	8.374	11.854	12.186
Galicia	8.503	8.836	9.331	9.824	8.665	9.286	9.331	9.824
Madrid	8.197	8.613	7.669	8.066	6.836	7.328	7.669	8.066
Murcia	8.104	8.468	9.373	9.804	7.202	7.754	9.373	9.804
Navarra	8.631	8.919	16.430	17.219	9.698	10.143	16.430	17.219
País Vasco	7.024	7.289	7.228	7.573	6.471	6.889	7.228	7.573
ESPAÑA	8.699	9.083	9.634	10.097	8.800	9.433	10.430	11.502

(b) Caregiver: dependent's daughter, aged 30-49 years (22.47% of the sample)

	FC=0 UN=0		FC=0 UN=1		FC=1 UN=0		FC=1 UN=1	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Andalucía	9.709	10.145	10.946	11.416	10.132	10.811	10.946	11.416
Aragón	9.039	9.401	11.110	11.629	8.249	8.856	11.110	11.629
Asturias	6.771	7.072	8.738	9.252	6.478	6.869	8.738	9.252
Baleares	12.692	13.130	13.864	14.373	11.576	12.183	13.864	14.373
Canarias	8.755	9.102	8.667	9.090	11.404	12.037	8.667	9.090
Cantabria	6.904	7.066	8.586	9.004	4.009	4.340	8.586	9.004
C. Mancha	8.393	8.682	9.013	9.327	9.481	10.128	9.013	9.327
C. León	8.692	9.052	8.891	9.293	7.517	8.002	8.891	9.293
Cataluña	7.569	7.974	8.902	9.326	6.327	6.763	8.902	9.326
C. Valenciana	8.894	9.244	9.586	10.047	10.317	11.066	9.586	10.047
Extremadura	8.570	8.891	11.854	12.186	7.871	8.374	11.854	12.186
Galicia	8.503	8.836	9.331	9.824	8.665	9.286	9.331	9.824
Madrid	8.197	8.613	7.669	8.066	6.836	7.328	7.669	8.066
Murcia	8.104	8.468	9.373	9.804	7.202	7.754	9.373	9.804
Navarra	8.631	8.919	16.430	17.219	9.698	10.143	16.430	17.219
País Vasco	7.024	7.289	7.228	7.573	6.471	6.889	7.228	7.573
ESPAÑA	8.699	9.083	9.634	10.097	8.800	9.433	10.430	11.502