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INFORMAL CARE, LABOUR FORCE PARTICIPATION AND UNMET NEEDS FOR FORMAL CARE IN THE EU-27, CROATIA AND TURKEY

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Abstract

This study seeks to estimate the effects of problems in labour force participation and unmet needs for formal care on informal caregiving. Using information for 2007 from Eurobarometer 283/Wave 67.3 for the EU-27 and the two candidate countries, Turkey and Croatia, we estimate a trivariate probit model dealing with the potential endogeneity of labour force participation problems and unmet needs for formal care. The results suggest that in the context of labour force participation problems, there is also an increased probability of observing unmet needs for formal care. Yet the effect is not homogenous for all the countries. We distinguish three groups of countries. In the first group, it is as likely that unmet needs for formal care will be observed in the context of labour force participation problems as it is vice versa. In the second group, there is a lower incidence of problems in labour force participation in the presence of unmet needs for formal care, which points to a higher degree of efficiency in the long-term care system or more protective employment regulations. And in the final group there is a high concentration of unmet needs for formal care for the dependents of informal caregivers who experience labour force participation problems; moreover, even in the absence of unmet needs, the informal caregivers still face difficulties in continuing their working lives. This evidence suggests that not only is it necessary to promote favourable conditions for working caregivers but also that shortfalls in long-term care may partially override the success of work-related policies.

JEL Codes: I11, I18, J14. Keywords: caregiver, unmet need, informal care, labour problems.



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Informal Care, Labour Force Participation and Unmet Needs for Formal Care in the EU-27, Croatia and Turkey

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1. Introduction

The accessibility of services for dependent persons depends on a multitude of factors related to the long-term care system and also to the patients themselves. On the supply side, the coverage of long-term care services, the design of public benefit packages, the volume and distribution of human resources and the existence of waiting lists can affect the degree of service accessibility (Whitehead, 1991; Guilliford et al., 2002). On the demand side, certain patient characteristics – such as age, socio-economic status, past experience with the health-care system, the beneficiary's perception and level of health literacy – can have an impact on his or her decisions to seek care (Dixon et al., 2007).

In 2009, the European Commission published a Communication entitled *Solidarity in Health: Reducing Health Inequalities in the EU*, which emphasised the importance of reducing the gaps in health and life expectancy among and within the member states (European Commission, 2009). In the context of an ageing population, it is important to promote longer working lives, higher productivity and higher employment rates. But usually, in the presence of illness or serious limitations in performing daily living activities, some family member tends to provide the necessary support. Caregiving exigencies may condition the way in which the family balances work and the provision of informal care to family members (Haddock et al., 2006). Several research studies have found significant economic costs associated with caregiving because family caregivers take more time off from work, suffer more interruptions at work owing to family matters, miss more working days and apply for more permission to take time off without pay than their corresponding peers who are non-caregivers (Stone et al., 1987; Scharlach and Boyd, 1989; Covinsky et al., 1994, Grundfeld, 1997). Caregivers may often feel obliged to miss out on career advancement and promotion opportunities because of their caregiving responsibilities (Stone et al., 1987; Gibeau and Anastas, 1989). All these negative consequences resulting from the caregiving role are not only stressful for the relatives, but may also damage the relationship between the caregiver and the care recipient, and in the end might have a negative influence on the patient's psychopathology and functioning.

Additionally, informal care provision may be in conflict with the objectives set by the Lisbon agenda of increasing female employment rates to 60% across the EU. Therefore, improving the attention received by dependent persons reduces not only the risk of social exclusion, but also the loss of human and economic capital, and can contribute to achieving the full potential of prosperity in Europe.

Although informal care is growing as a field of research, the unequivocal effect of informal caregiving on the labour supply has not yet been established. For example, Wolf and Soldo (1994) estimated a simultaneous equation model for the choice of care supply and labour force

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participation on a sample of married women, but did not find a decrease in the probability of the participation of women who looked after older relatives. On the other hand, Ettner (1995) took into account the possible endogeneity of informal caregiving and concluded that there was a significant decrease in the probability of participation when the dependent individual and the caregiver were co-residents, although this effect was smaller if they did not live in the same household. In line with this result, Koh and MacDonald (2006) also found a negative relationship between participation and the number of informal caregiving hours, although they did not control for potential endogeneity. Regarding the characteristics of caregivers, Ettner (1996) showed that the negative effect on participation was stronger for women than for men. Chang and White-Means (1995) provided evidence indicating that the largest falls in labour supply were experienced by women with low levels of education when they became caregivers, whereas Kolodinsky and Shirey (2000) stated that if the older dependent co-resided with the family, the probability of participation decreased as female caregivers grew older.

With respect to the evidence for Spain, it is necessary to refer to several studies that have used European surveys, in which Spain is usually included in the group of southern countries together with Greece and Italy. Spiess and Schneider (2002), using data from the European Community Household Panel (ECHP), observed a significant reduction in the number of weekly working hours at the time of becoming a caregiver. Viitanen (2005) took into account several aspects (specific country effects, unobserved heterogeneity and state of dependence) that had not been considered in the previous work, and concluded that middle-aged women were the group most affected in terms of labour supply. Moreover, in the case of single women, this lower participation rate provoked an increase in the probability of being under the poverty threshold during their old age. More recently, Crespo (2008), using data from Survey of Health, Ageing and Retirement in Europe (SHARE), analysed the labour supply of middle-aged women who provided informal care to older parents. Using a classification of countries with respect to social service characteristics and the extent of informal care, she found a significant negative relationship between informal care and participation probability, for both northern and southern countries. This evidence was stronger when informal care was considered an endogenous variable in the labour supply equation. Finally, one of the few studies focused exclusively on the Spanish case is that by Casado et al. (2010), who came to two significant conclusions. First, they did not observe a significant effect of caregiving on working women, but did find a significant decrease in the employment opportunities of those who were inactive or unemployed. Second, there were labour opportunity costs in cases where the dependent individual and the informal caregiver were co-residents, but not in situations where the caregiver lived outside the dependent's household.

In this study, we address the issue of informal care and the consequences for working life by incorporating the perspective of unmet needs for formal care. We consider that a need can be defined as the requirements of individuals to achieve, maintain or restore an acceptable level of social independence or quality of life (McCrone et al., 2001). Applying this concept to long-term care services, we consider that a problem of unmet need arises when a dependent individual has applied for formal care (at home, at a day-care centre or a residential home), but has not been granted the service, or receives it in neither the quantity nor quality desired. The causes of the unmet need problem are diverse – for example, insufficient coverage (staff or places), excessive costs or co-payments and an inadequate number of home-based care hours. In this sense, we hypothesise that more unmet needs for formal care lead to more adverse consequences for the caregiver, and particularly to more problems in reconciling caregiving responsibilities and a professional career.

For this purpose, we have used data from the Eurobarometer 283/Wave 67.3, *Health and long-term care in the European Union*¹ because it has the advantage of providing information about informal care, labour problems and unmet needs for formal care in the EU-27 and the two candidate countries Croatia and Turkey. We consider that this constitutes a good opportunity for exploring the similarities and differences in informal caregiving behaviour and its consequences across the EU. The scope also includes two potential countries for EU enlargement, because if Turkey and Croatia finally enter the EU, their long-term care systems will fall under the competence of the European Commission through the Employment, Social Affairs & Equal Opportunities DG. In spite of this advantage, we face certain drawbacks, because we ignore whether the events studied take place sequentially or simultaneously. First, we ignore whether someone became an informal caregiver because a dependent has unmet needs for formal care or this problem arose after the caregiver started providing informal care. Second, we ignore whether the caregiver decided to adapt his/her work schedule to caregiving exigencies at the time of becoming a caregiver or continued normally in his/her working life until it was impossible to reconcile the two roles. Third, we ignore whether the caregiver was working at the same time as providing care until an unmet need problem arose (for example, the dependent person requested more home-based care hours and the application was rejected), and as a consequence of this increase in caregiving responsibilities, the caregiver began to have labour force participation problems.

The simultaneous estimation of three probit equations for ‘being an informal caregiver’, ‘having labour problems due to caregiving tasks’ and ‘suffering unmet needs for formal care’ constitutes a simple method to deal with the endogeneity problem (Greene, 1998). Moreover, we have introduced exclusion restrictions, although the identification of a simultaneous probit model does not formally require them (Wilde, 2000), and we have also taken into account the correlation between the unobservables by explicitly estimating the correlation matrix of the residuals.

The main contributions of this work are a) the estimation of the effect of unmet needs for formal care and labour force participation problems on informal caregiving in a model dealing with the endogeneity of these variables, and b) the test for the positive influence of unmet needs for formal care on labour force participation problems. Our results show that in the context of problems in labour force participation, there is a greater probability of observing unmet needs for formal care. We differentiate three groups of countries. The first group is composed of eleven countries (Belgium, Germany, Italy, Luxembourg, Finland, Cyprus, the Czech Republic, Latvia, Lithuania, Poland and Bulgaria) for which the two events are complementary. In this situation, the caregiver cannot rely on long-term care support to alleviate the care burden, and informal care acts as a substitution for formal care. The second group is composed of seven countries (Denmark, France, Ireland, Portugal, Sweden, Estonia and Turkey) where there is a lower probability of suffering labour force participation problems in the presence of unmet needs for formal care. In this case, whether caregivers are more protected from the point of view of employment regulations or the national long-term care system is more efficient, the result is that the labour force participation of caregivers is less permeated by unmet needs for formal care. The third group is composed of eleven countries (Greece, Spain, the Netherlands, the UK, Austria, Hungary, Malta, Slovakia, Slovenia, Romania and Croatia) where there is a high concentration of unmet needs for formal care for the dependents of caregivers who experience labour force participation problems; furthermore, even in the absence of such unmet needs, their informal caregivers still face difficulties in continuing their working lives.

¹ See European Commission (2007).

The paper is organised as follows. Section 2 sets up the econometric model that guides our empirical work. Section 3 discusses the data and gives a description of informal caregivers across the EU. Section 4 reports the empirical results and the robustness analysis. Section 5 discusses the projections of the model, and finally section 6 concludes.

2. Econometric methods

Our empirical model is intended to test the effect of labour force participation problems and unmet needs for formal care on the probability of being an informal caregiver. When a dependent individual suffers a problem of unmet needs, if a family member reacts by providing the necessary amount of care, then informal care acts as a buffer, offsetting deficiencies in formal care. Independent of having labour force participation problems because of caregiving responsibilities, the emergence of unmet needs might have a significant bearing on labour participation. Therefore, inadequacies in the long-term care system can give rise to a reduction of the economic well-being of the caregiver, not only at present, but also in future years owing to the reduction in retirement benefits.

Thus our simultaneous probit model includes two endogenous, discrete variables on the right-hand side (labour problems and the existence of unmet needs in the caregiving equation, and unmet needs in the labour problems equation). This type of simultaneous model requires a coherency condition, which imposes a triangular form (Maddala, 1983; Blundell and Smith, 1994). This coherency condition establishes that the variable ‘informal caregiver’ cannot be introduced in either of the other two equations, nor in the variable ‘labour problems’ in the unmet needs equation. Of course, the degree of informal caregiving is likely to affect the emergence of problems in labour force participation (for example, in fulfilling work schedules) and it may also influence the propensity to apply for formal care and consequently the appearance of unmet needs for formal care. To account for these influences while satisfying the coherency condition, we are restricted to including all the exogenous variables influencing informal caregiving in the other two equations. Therefore, we take into account the effect of observable characteristics in equations determining the probability of informal caregiving on both labour force participation problems and unmet needs for formal care. In the same way, all the variables determining the latent variable of labour problems are included in the unmet needs equation to take into account the potential effect of having labour force participation problems on the probability of suffering unmet needs for formal care.

A potential problem arises from the fact that the unobservables influencing informal caregiving are not taken into consideration, particularly in the unmet needs equation. This would likely result in a non-negligible correlation between the error terms of the informal caregiving and the unmet needs equations. The simultaneous probit model makes sure that this correlation is explicitly dealt with, as the correlation matrix of the error terms is estimated. Consequently, the simultaneous probit model to be considered is a model in which there is one equation of interest (the probability of becoming an informal caregiver) and the other two equations are nothing but reduced forms. From this point of view, what is important in order to identify the effects of labour force participation problems and unmet needs in the informal caregiving equation is to have relevant exclusion restrictions.

To sum up, the observed variables IC , LP , UN referring respectively to informal caregiver, labour problems and unmet needs are defined as $IC = 1(IC^* > 0)$, $LP = 1(LP^* > 0)$, $UN = 1(UN^* > 0)$, where IC^* , LP^* and UN^* are latent variables influencing the probability of informal caregiving, the probability that the informal caregiver suffers labour problems and the probability of experiencing unmet needs for formal care. The system of latent variables is as follows:

$$\begin{aligned}
IC^* &= \alpha_1 X_1 + \beta LP^* + \gamma UN^* + \varepsilon_1 \\
LP^* &= \alpha_2 X_2 + \delta UN^* + \varepsilon_2 \\
UN^* &= \alpha_3 X_3 + \varepsilon_3
\end{aligned} \tag{1}$$

where X_1 is a vector of exogenous variables, including a constant, gender, age, marital status and kinship between the dependent individual and informal caregiver (each of them being a set of dummy variables); X_2 includes the same set of variables as X_1 and dummies for working before becoming a caregiver and professional situation (the occupational categories of independent professional, business proprietor or a white-collar, qualified or non-qualified worker);² X_3 includes the same set of variables as X_2 and dummies for community size (rural, small/medium-sized village, large city) and the ownership of certain durable goods (a car, personal computer (PC) and fixed telephone). Owing to the absence of information about household income, we have introduced the ownership of certain durable goods as an indicator of available financial resources, which implicitly may condition the acquisition of formal care³ (in many countries benefits are subject to means testing). At the same time, the variable for community size accounts for the effect of an insufficient coverage of social resources for dependent persons or may gather the effect of different regional policies.

As we assume that the onset of informal caregiving may be affected by unobserved characteristics simultaneously influencing the emergence of labour force participation problems and/or unmet needs, the correlation terms between the residuals of the three probits ($\varepsilon_1, \varepsilon_2, \varepsilon_3$) are all supposed to be non-zero. The vector of residuals follows a normal trivariate distribution with zero means and covariance matrix with variances normalised to 1:

$$Cov(\varepsilon_1, \varepsilon_2, \varepsilon_3) = \begin{bmatrix} 1 & \rho_{12} & \rho_{13} \\ \rho_{12} & 1 & \rho_{23} \\ \rho_{13} & \rho_{23} & 1 \end{bmatrix} \tag{2}$$

This system can be estimated by maximum likelihood. Endogeneity tests are used to test the significance of instruments used and the correlation coefficients of the residuals for each equation (see section 4.1). Furthermore, although our identification strategy allows us to deal with the endogeneity of labour force participation problems and unmet needs, the estimated effects would still be suspected of suffering from other random biases. An example is random shocks common to all individuals subjected to the same regional policy on long-term care, which are known to generate correlated effects. In our sample, the number of regions by country varies between 28 for Belgium and 4 for Slovakia and Latvia. For Spain, we have 17 regions because Ceuta and Melilla were omitted from the sample. To avoid this problem, we have built

² More specifically, *independent professional* refers to a farmer, fisherman or professional worker (lawyer, medical practitioner, accountant or architect). A *business proprietor* refers to an owner of a shop or other self-employed person or owner (full or partner) of a company. *White collar* refers to someone employed in professional occupations (doctor, lawyer, accountant, architect), in general management, as a director or in top management, middle management (junior manager, teacher or technician). A *qualified worker* refers to someone in an employed position who works mainly at a desk or in a travelling role (salesman, driver, etc.) or a service job (hospital, restaurant, police or fire services, etc.), as a supervisor or a skilled manual worker. A *non-qualified worker* refers to an unskilled manual worker or servant.

³ Several studies (Headey et al., 2007; Alessie and de Ree, 2009) have shown two important facts related to durables ownership. First, durables ownership is clearly hump-shaped over a life cycle and therefore durables consumption seems to track income over the life cycle. Second, economic well-being measured as durables consumption affects life satisfaction more than income.

clusters by regions and obtained adjusted standard errors that account for the potential dependence of residuals within regions (Wooldridge, 2003). Then, individual contributions to the likelihood can be written as follows:

$$P[IC_i, LP_i, UN_i] = \Phi_3 \left[\begin{array}{c} q_{1i}(\alpha_1 X_{1i} + \beta LP_i + \gamma UN_i), q_{2i}(\alpha_2 X_{2i} + \delta UN_i), q_{3i}(\alpha_3 X_{3i}), \\ q_{1i}q_{2i}\rho_{12}, q_{1i}q_{3i}\rho_{13}, q_{2i}q_{3i}\rho_{23} \end{array} \right]$$

$$q_{1i} = 2IC_i - 1 = \begin{cases} 1 & \text{if } IC_i = 1 \\ -1 & \text{if } IC_i = 0 \end{cases} \quad q_{3i} = 2UN_i - 1 = \begin{cases} 1 & \text{if } UN_i = 1 \\ -1 & \text{if } UN_i = 0 \end{cases} \quad (3)$$

$$q_{2i} = 2LP_i - 1 = \begin{cases} 1 & \text{if } LP_i = 1 \\ -1 & \text{if } LP_i = 0 \end{cases}$$

where Φ_3 is the trivariate normal cumulative distribution function. The likelihood function is then

$$\ln L = \sum_{i=1}^N \ln P[IC_i, LP_i, UN_i] \quad (4)$$

The computation of individual contributions requires the integration into the distribution of the vector of three error terms, which means the complex calculation of a triple integral. Simulated maximum likelihood methods have been developed to circumvent this problem. One of the simulators used is the Geweke-Hajivassiliou-Keane (GHK) simulator. The accuracy of the GHK simulator is reliable as long as the number of random draws is equal to or higher than the square root of the sample size (Cappelari and Jenkins, 2003). Given that the number of observations per country varies between 326 for Luxembourg and 971 for Germany, we have used 100 replications for each estimation, which is far above this threshold.

The significance of the estimated coefficients for UN and LP and the corresponding coefficients allows us to test the relationship among IC, LP and UN (see Tables 1, 2 and 3 for interpretation).

Table 1. Relationship between IC and LP

Result	Interpretation
ρ_{12} signif. and LP signif.	LP is endogenous with respect to <i>IC</i> and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations.
ρ_{12} signif. and LP not signif.	LP is endogenous with respect to <i>IC</i> and the correlation between the two variables is driven by unobserved heterogeneity.
ρ_{12} not signif. and LP signif.	LP is exogenous with respect to <i>IC</i> and its effect is only causal.
ρ_{12} not signif. and LP not signif.	Our model is not valid.

Source: Author's compilation.

Table 2. Relationship between IC and UN

Result	Interpretation
ρ_{13} signif. and UN signif.	UN is endogenous with respect to <i>IC</i> and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations.
ρ_{13} signif. and UN not signif.	UN is endogenous with respect to <i>IC</i> and the correlation between the two variables is driven by unobserved heterogeneity.
ρ_{13} not signif. and UN signif.	UN is exogenous with respect to <i>IC</i> and its effect is only causal.
ρ_{13} not signif. and UN not signif.	Our model is not valid.

Source: Author's compilation.

Table 3. Relationship between LP and UN

Result	Interpretation
ρ_{23} signif. and UN signif.	UN is endogenous with respect to LP and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations.
ρ_{23} signif. and UN not signif.	UN is endogenous with respect to LP and the correlation between the two variables is driven by unobserved heterogeneity.
ρ_{23} not signif. and UN signif.	UN is exogenous with respect to LP and its effect is only causal.
ρ_{23} not signif. and UN not signif.	Our model is not valid.

Source: Author's compilation.

3. Data

In this paper we have used information from the Eurobarometer 283/Wave 67.3, *Health and long term-care in Europe* carried out by the European Commission in 2007. The advantage of the Eurobarometer is that it gathers information from 29 countries (27 countries of the EU, Croatia and Turkey). By comparison, the ECHP only provides information for 15 countries⁴ and although it has the advantage of being a panel, it only covered the period 1994–2001. Meanwhile, the first wave of the SHARE gathered information from 11 countries,⁵ which rose to 14 in the second wave (2006) with the addition of Israel, the Czech Republic and Poland.

The Eurobarometer 283/Wave 67.3 provides information on 28,660 individuals, aged between 15 and 100, living in 29 European countries. We have dropped individuals younger than 25 to avoid the collusion of formal education with labour force participation and caregiving responsibilities (58.80% of individuals younger than 25 are studying). We have also dropped observations for persons older than 64 because most of them are retired (86.90%) or doing housework (8.90%). The final sample has 18,711 observations, and the country sample size varies between 322 observations for Malta and 971 for Germany.⁶ In spite of all these advantages, the Eurobarometer survey also has several drawbacks. We are not able to study the relationship between the intensity of caregiving, labour force participation problems and unmet needs for formal care because information about caregiving hours is not available. Furthermore, we ignore the number of caregiving years, and whether the dependent individual and the informal caregiver are co-resident, as well as whether the informal caregiver receives support from other family members. Regarding the relationship to economic activity, we ignore whether the caregiver is the household's main breadwinner, and we only know if the caregiver has had problems at work as a consequence of caregiving tasks, but we ignore whether s/he reduced the number of working hours, applied for permission to take time off or gave up a promotion for a higher post.

⁴ The ECHP covered Belgium, Denmark, the UK, Germany, the Netherlands, Luxembourg, France, Ireland, Italy, Greece, Spain and Portugal. Austria was included in 1995, Finland in 1996 and Sweden in 1997.

⁵ The SHARE covered Austria, Belgium, Denmark, France, Germany, Greece, Italy, Spain, Sweden, Switzerland and the Netherlands.

⁶ The number of observations by country are as follows: Belgium (660), Denmark (699), Germany (971), Greece (598), Spain (602), Finland (643), France (682), Ireland (701), Italy (758), Luxembourg (326), the Netherlands (703), Austria (761), Portugal (645), Sweden (680), the UK (780), Cyprus (322), the Czech Republic (744), Estonia (565), Hungary (636), Latvia (653), Lithuania (623), Malta (351), Poland (599), Slovakia (745), Slovenia (604), Bulgaria (644), Romania (692), Croatia (684) and Turkey (630).

We have defined ‘informal caregiver’ as a binary variable that takes the value 1 when the respondent has been involved in helping another person in one of the following ways: cooking and preparing meals, shopping, cleaning and household maintenance, taking care of finances, feeding, mobility, dressing, using the toilet or bathing or showering. We derive that 5,080 individuals aged 25-64 became informal caregivers at a certain point in their lives. For all the countries surveyed, a national weighting procedure was carried out based on information about gender, age, region and size of locality using Eurostat information and that of national statistical offices. Using these sample weights we are able to extrapolate sample figures and obtain an approximation of the number of informal caregivers by age, gender and country (see Table A1 in the appendix). Approximately, there are 61 million (58.16% women and 41.84% men) informal caregivers in the EU-27, with Germany (9 million), Finland (8.6 million), Ireland (7.7 million) and Turkey (7 million) having the highest numbers of informal caregivers. Comparing the number of informal caregivers with the total population of the same age and gender, we observe that Cyprus, Malta and Belgium have the highest percentage of informal caregivers for the cohorts aged 35-44, 45-54 and 55-64, respectively. The preponderance of informal caregivers is overwhelming in some countries. For example, 53.48% of Maltese women aged 45-54 and 57.98% of Belgium women aged 55-64 are informal caregivers. For the average of the EU-27, the percentage of informal caregivers rises with age and is always higher for women (from 19.01% at age 25-34 to 38.83% at 55-64 for women and from 13.57% to 31.01% for men).

The percentage of Spanish caregivers is only above the mean of the EU-27 for female caregivers aged 25-34 and 35-44. On average, 21.30% of the Spanish population (27.00% for women and 15.66% for men) are informal caregivers. These figures are quite surprising given that Spain has traditionally been considered a country with strong family ties. Still, other authors have also found similar results. Casado et al. (2010), using data from the ECHP (1994) found a prevalence rate of 12% for women and 4% for men, and women aged 30-60 showed a prevalence rate of above 15%. On the other hand, Crespo (2008), using a sample from the SHARE (2004) of women aged 50-60 with at least one parent living, found that the proportions of caregivers in Spain, Greece and Italy were smaller than those obtained for Sweden, Denmark and the Netherlands.

Table A2 in the appendix shows labour market participation by country, age and gender. With the exceptions of Bulgaria, Cyprus, Latvia and Lithuania, the percentage of active and working persons with respect to the total population is higher among non-caregivers compared with caregivers. If we distinguish by age cohort, we observe that the share of working persons and non-caregivers with respect to working persons and caregivers is 14.87 percentage points (pp) higher for individuals aged 25-34 in Germany, 15.23 pp higher for those aged 35-44 in Luxembourg and 18.95 pp higher for those aged 55-64 in Poland. In the case of Spain, the proportion of working persons and non-caregivers is 8.83, 9.59, 6.95 and 9.05 pp higher for the four age cohorts considered, when compared with working persons and caregivers. Yet, we also observe certain divergences in the behaviour of Italy, Cyprus, Latvia, Bulgaria and Croatia, because for some age cohorts the fraction of working caregivers is higher than the fraction of working non-caregivers (for example, 10.02 pp higher in Cyprus for those aged 25-34, 12.08 pp higher in Latvia for those aged 45-54 and 5.14 pp higher in Italy for those aged 55-64).

Regarding the characteristics of informal caregivers, around 80% of European caregivers look after their parents (with a maximum of 90.84% in the Netherlands and 90.02% in Spain, and a minimum of 69.04% in Austria). In second place, around 10% of European caregivers look after their spouse (maximum 24.10% in Romania and 23.61% in Austria). The emergence of labour force participation problems because of caregiving responsibilities is 20 pp lower for male European caregivers as opposed to their female counterparts (29.54% compared with 49.68%, respectively). We observe a peculiar geographical distribution pattern for the emergence of

unmet needs for formal care. As we noted earlier, these unmet needs may arise owing to insufficient long-term care resources or because a dependent person was unable to pay the costs. With the exception of Italy, the Netherlands, Portugal, Austria, Finland, Cyprus and the Czech Republic, the share of unmet needs is higher in large cities compared with rural areas.

The ownership of durable goods can be interpreted as a sign of economic development or financial sustainability. We observe that only 17.74% of Croatian caregiver families own a PC as opposed to 93.40% of Danish families. And only 11.21% of Romanian caregiver families own a car as opposed to 94.66% of Dutch families. Finally, an individual's occupation before becoming a caregiver may be a significant factor in determining the occurrence of labour force participation problems. For example, Turkey has the highest percentage of business proprietors (10.03%) and Malta the highest share of non-qualified workers (38.70%), and we observe that the proportion of caregivers with labour force participation problems is also among the highest for these two countries (47.45% and 96.21% for Turkish men and women, respectively and 75.89% for Maltese women).

4. Empirical results

4.1 Robustness analysis

To be valid, our exclusion restrictions must verify two conditions. First, they have to be correlated with the endogenous variables 'labour problems' and 'unmet needs' they are supposed to explain. Second, they must not be correlated with the error terms of the equations they are supposed to identify.

Therefore, we have to check the relevance of our exclusions: that 'being a worker before becoming a caregiver' and 'professional situation' (a sole professional, business proprietor, white-collar, qualified or non-qualified worker) affect the probability of having labour force participation problems, and that 'community size' and 'durables ownership' (a PC, car and telephone) influence the probability of experiencing unmet needs for formal care. The second condition refers to the assumption that excluded variables, after conditioning on other covariates, have no correlation with the error term of the informal caregiving equation.

Table A9 provides a robustness analysis. Several diagnosis tests have been conducted to assess the reliability and efficiency of the IV estimator. We present the results of Hansen's J statistic (Hansen, 1982), which is an overidentification test for the validity of the instruments for models when the number of instruments exceeds the number of endogenous regressors. Second, we report the F test of joint significance of the instruments in each first-stage regression (Staiger and Stock, 1997). Third, we present two underidentification tests, namely Kleibergen-Paap LM and Wald statistics for testing if the equation is identified (Kleibergen and Paap, 2006). We also include two statistics that provide weak instrument robust inference for testing the significance of the endogenous regressors in the structural equation that has been estimated: the Anderson and Rubin test (1949) and the Stock and Wright LM test (2000). The null hypothesis in both cases is that the coefficients of the endogenous regressors in the structural equations are jointly zero, and in addition, that the presence of overidentifying restrictions is valid. Both tests are robust to the presence of weak instruments.

Our results pass the full battery of diagnostic tests (see Tables A9(i) and (ii)). First, the F test for the caregiving equation and the labour problem equation shows joint significance for the instruments. Hansen's J statistic is reported in column 2 of Table A9(i) and (ii) and for all the countries we cannot reject the null that the instruments are properly excluded. In addition, the Kleibergen-Paap LM and Wald test always reject the null hypothesis that the equation is underidentified. The Anderson-Rubin Wald and Stock-Wright LM tests easily reject the joint

significance of the endogenous regressors (weak instruments tests) in all models. Finally, looking at the partial R^2 of the instruments in the first stage regression, we can see that the instruments explain between 48% and 70% of the variation in the caregiving variable (holding other controls constant) and between 47% and 70% of the variation of the labour problems variable.

4.2 Estimation results

Tables A4 to A8 show the estimated coefficients for the trivariate probit model for the 29 countries. The correlation coefficient ρ_{12} is positive and significant for Belgium, Germany, Spain, Hungary, Latvia, Slovenia, Slovakia and Romania, indicating that the unobservables that increase the probability of caregiving also increase the emergence of labour force participation problems.

The correlation coefficient between the error terms of the labour problems and unmet needs equation (ρ_{23}) is significantly different from zero at the 5% level in Denmark, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Sweden, the UK, Cyprus, Malta, Poland, Slovakia, Slovenia and Turkey. This result shows that unmet needs for formal care is endogenous in the labour problems equation and that the coefficients estimated from a simple probit are biased. This correlation is positive, suggesting that individuals with a higher propensity to experience labour force participation problems than explained by their observed characteristics are more likely to look after a dependent individual with unmet needs for formal care.

Finally, the correlation coefficient (ρ_{13}) is positive and significantly different from zero at the 5% level in the southern countries (Greece, Spain, Italy and Portugal), some of the new member states (Bulgaria, the Czech Republic, Estonia, Lithuania, Poland and Slovakia) and one of the candidate countries (Croatia). This result suggests that the unobservables affecting the probability of becoming a caregiver are positively correlated with those increasing the probability that the dependent individual is experiencing an unmet needs problem. These countries have the common feature of no possible choice between benefits in cash and benefits in kind or no possible accumulation of both types of benefits.

Table 4. Interpretation of the results regarding the relationship between IC and LP

Result	Interpretation
$\rho_{12} > 0$ signif. and $LP < 0$ signif.	<ul style="list-style-type: none"> • Belgium, Germany, Spain, Hungary, Latvia, Slovenia, Slovakia and Romania • LP is endogenous with respect to <i>IC</i> and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations. • Being an informal caregiver increases the emergence of labour force participation problems, and individuals who are more prone to suffer such problems show a lower probability of becoming an informal caregiver.
ρ_{12} signif. and LP not signif.	<ul style="list-style-type: none"> • No country
ρ_{12} not signif. and $LP < 0$ signif.	<ul style="list-style-type: none"> • Denmark, Greece, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal, Sweden, the UK, Cyprus, the Czech Republic, Estonia, Lithuania, Malta, Poland, Bulgaria, Croatia, Turkey • LP is exogenous with respect to <i>IC</i> and its effect is only causal. • As the estimated coefficient is negative \Rightarrow individuals who are more prone to suffer labour force participation problems show a lower probability of becoming informal caregivers.
ρ_{12} not signif. and LP not signif.	<ul style="list-style-type: none"> • No country

Source: Author's compilation.

Table 5. Interpretation of the results regarding the relationship between IC and UN

Result	Interpretation
$\rho_{13} > 0$ signif. and $UN > 0$ signif.	<ul style="list-style-type: none"> • Greece, Spain, Italy, Portugal, Bulgaria, the Czech Republic, Estonia, Lithuania, Poland, Slovakia and Croatia • UN is endogenous with respect to IC and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations. • Unmet needs for formal care increase the probability of becoming an informal caregiver, but at the same time informal caregivers are not a random sample with respect to the emergence of unmet needs for formal care (a lower provision of formal care resources and stronger family ties).
ρ_{13} signif. and UN not signif.	<ul style="list-style-type: none"> • No country
ρ_{13} not signif. and $UN > 0$ signif.	<ul style="list-style-type: none"> • Belgium, Denmark, Germany, Finland, France, Ireland, Luxembourg, the Netherlands, Austria, Sweden, the UK, Cyprus, Hungary, Latvia, Malta, Slovenia, Romania, Turkey • UN is exogenous with respect to IC and its effect is only causal. • As the estimated coefficient is positive \Rightarrow unmet needs for formal care increase the probability that an individual will become an informal caregiver.
ρ_{13} not signif. and UN not signif.	<ul style="list-style-type: none"> • No country

Source: Author's compilation.

Table 6. Interpretation of the results regarding the relationship between LP and UN

Result	Interpretation
$\rho_{23} > 0$ signif. and $UN > 0$ signif.	<ul style="list-style-type: none"> • Denmark, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Sweden, the UK, Cyprus, Malta, Poland, Slovakia, Slovenia and Turkey • UN is endogenous with respect to LP and it also has a causal impact. The size of the estimates gives us an idea of the magnitude of both explanations. • UN increase the probability of suffering labour force participation problems, but also, caregivers with labour problems are not a random sample with respect to the emergence of unmet needs for formal care (for example, living in a small municipality could imply a scarcity of resources devoted to dependent persons, as well as fewer opportunities to find a more suitable job).
ρ_{23} signif. and UN not signif.	<ul style="list-style-type: none"> • No country
ρ_{23} not signif. and $UN > 0$ signif.	<ul style="list-style-type: none"> • Belgium, Germany, Greece, Spain, Portugal, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Bulgaria, Romania, Croatia • UN is exogenous with respect to LP and its effect is only causal. • As the estimated coefficient is positive \Rightarrow unmet needs for formal care increase the probability that caregivers suffer labour problems.
ρ_{23} not signif. and UN not signif.	<ul style="list-style-type: none"> • No country

Source: Author's compilation.

Summarising, we have two main results. First, having LP decreases the probability of becoming an IC. This means that if the individual thinks that reconciling a job and caregiving is going to be very tough, it is more probable that s/he will consider not becoming an informal caregiver. Second, UN positively affects the probability of becoming an informal caregiver. So there are two competing forces: if the individual perceives that social services do not perform well, s/he may feel 'obliged' to become an informal caregiver and substitute formal care. But if s/he realises that becoming an informal caregiver may jeopardise his or her job status, the individual could reassess his or her priorities.

Regarding the kinship between the caregiver and the care recipient, we observe that for all the countries the probability of becoming a caregiver increases when the care recipient is the caregiver's parent or child, and in nearly all, when the dependent is the spouse or a sibling. On the other hand, the probability of experiencing labour force participation problems because of caregiving tasks increases when the dependent individual is the caregiver's parent (17 countries), child (14 countries), sibling (8 countries) or spouse (6 countries).

Working caregivers aged 55-64 (omitted category) tend to suffer more labour force participation problems with respect to younger cohorts, and at the same time, in certain countries (Belgium, Germany, Spain, Ireland, Austria, Cyprus, the Czech Republic, Estonia, Poland and Slovakia) the probability of becoming a caregiver increases significantly as the individual grows older. For all countries, men show a lower probability of being a caregiver, and in the case of becoming caregivers, the likelihood of men suffering labour force participation problems is less in nine countries (Denmark, Germany, Greece, Finland, Ireland, Austria, the Czech Republic, Latvia and Lithuania).

With regard to the unmet needs equation, living in a rural area or small municipality significantly reduces the probability of experiencing unmet needs for formal care in Belgium, Denmark, Sweden, the Czech Republic, Italy, Lithuania, Poland and Slovakia. All these countries share the feature⁷ that the local authorities are obliged to establish a framework and to set targets for both private and public providers of personal and practical assistance, and they are responsible for documenting and ensuring the quality of service management.⁸ For the three binary variables concerning the ownership of durable goods, having a PC is the most significant. In Ireland, Italy, Portugal, the UK, Cyprus, the Czech Republic, Hungary, Lithuania, Slovakia, Slovenia and Romania, having a PC increases the probability of unmet needs for formal care. In an effort to find an explanation for this result, we reviewed the characteristics of the long-term care systems in these countries, and we verified that the benefits in these countries are subject to a means test. Although there are other countries that use this system (Belgium, Malta, Austria, Poland and Croatia), it should be considered a possible connection between the two events.

5. Projections

Table A10 shows the projected probabilities from the three probit system. The probability of becoming a caregiver without having labour force participation problems and in the absence of an unmet needs problem (last column of Table A10) is highest in Sweden (0.8035) and Denmark (0.7843) and lowest in Turkey (0.2650). In the presence of unmet needs, however, the probability of becoming a caregiver and having labour force participation problems is higher than the probability of becoming a caregiver without experiencing such problems (first and second columns of Table A10). Turkey (0.8543) and France (0.7403) have the maximum

⁷ See the MISOCC Analysis (2009) for a detailed description of European long-term care programmes.

⁸ Long-term care systems in Estonia, Ireland, Slovenia and Malta are also regionally organised.

probability, while Hungary (0.3203) and the UK (0.4620) have the minimum. In the extreme case of Turkey, this result can be interpreted as caregivers relying first on formal care, and in the absence of satisfactory attention, subsequently reacting by becoming caregivers in spite of suffering problems participating in the labour market.

Regarding the effect of labour force participation problems (Table A11), we note that for all the countries, the projected probabilities in the first column are larger than those in the second one. That is, under the condition of labour force participation problems, unmet needs for formal care are more likely to be observed. The maximum probability is found for Malta (0.7983) and the Netherlands (0.7541), and the minimum for Sweden (0.4703) and Luxembourg (0.4890). To a certain extent, the two events are complementary, which makes it more difficult for the caregiver individually to find a solution to this predicament. We argue that if labour force participation problems were not accompanied by unmet needs for formal care, the caregiver could rely on long-term care support to alleviate the care burden. But if the caregiver has accepted the role as a consequence of a deficiency in the provision of social services for dependent persons, the informal caregiver may feel though s/he is in a blind alley. This argumentation of complementarity is confirmed by the results, because the probability of being a caregiver under the condition of no labour force participation problems is greater when there are no problems of unmet needs for formal care (third and fourth columns).

A common feature of Tables A10 and A11 is that in Sweden, there is a maximum probability of being a caregiver when there are no problems participating in the labour market, under the condition of no unmet needs for formal care (0.8035) and a minimum probability of being a caregiver if there are unmet needs for formal care, under the condition of labour force participation problems (0.4703). The fact that in 2006 Sweden devoted the largest share of GDP (3.61%) to long-term care services, which represented €1,246.88 per inhabitant,⁹ should be received with optimism, because it implies that if other countries emulated Swedish behaviour, the efficiency of their national long-term care systems would improve enormously.

Comparing $\Pr[\text{Caregiver}=1, \text{Unmet}=1 | \text{Problems}=1]$ with $\Pr[\text{Caregiver}=1, \text{Problems}=1 | \text{Unmet}=1]$, and $\Pr[\text{Caregiver}=1, \text{Problems}=1 | \text{Unmet}=0]$ with $\Pr[\text{Caregiver}=1, \text{Unmet}=1 | \text{Problems}=0]$, we can distinguish three groups of countries. First is a group of countries for which the difference between each pair of probabilities is negligible.¹⁰ Second is a set of countries (Greece, Spain, the Netherlands, the UK, Austria, Hungary, Malta, Slovakia, Slovenia, Romania and Croatia) for which the first probability of each pair is much larger than the second one. The interpretation here is that even in the absence of unmet needs for formal care, labour force participation problems are very likely, so independent of inefficiencies in the long-term care system, caregivers experience difficulties in adapting to labour conditions. Third is a group of countries (Denmark, France, Ireland, Portugal, Sweden, Estonia and Turkey) where the first probability of each pair is far lower than the second one. In these countries, in spite of a mismatch between the demands of the dependent and the level of services received, it is less likely that a caregiver's labour situation will be damaged.

Table A12 shows the probability of being a caregiver by gender. For men, it varies between 0.41 (Germany) and 0.7636 (Malta), and for women between 0.4721 (Portugal) and 0.7653 (Malta). The difference between the genders is the lowest in Malta (0.0017 pp) and Ireland (0.0173 pp), and highest in the Czech Republic (0.1434 pp) and Hungary (0.1288 pp). Several studies (Ettner, 1995; Koh and MacDonald, 2006) have shown that care duties are more often

⁹ We used data for 2006 (Eurostat, Health Statistics) because our survey corresponds to the year 2007.

¹⁰ More specifically, these are Belgium, Germany, Italy, Luxembourg, Finland, Cyprus, Czech Republic, Latvia, Lithuania, Poland and Bulgaria.

performed by women than by men. In the presence of labour force participation problems, the probabilities of becoming a caregiver are still higher for women. For men, it varies between 0.04 (Denmark) and 0.3927 (Slovenia), and for women between 0.117 (Denmark) and 0.6817 (Malta). The disparity between the genders is lowest in Estonia (0.0003 pp), Finland¹¹ (0.0169 pp) and Spain (0.0304 pp), and highest in Greece (0.4138 pp) and Malta (0.4163 pp).

Table A13 shows the probability of a working caregiver having labour force participation problems according to the caregiver's professional situation. For the five categories considered (independent professional, business proprietor, white-collar, qualified and non-qualified worker), Denmark and Germany show the lowest projected probabilities, which may be connected to certain peculiarities of their long-term care systems. In the Danish case, there is a clear division between family care and state-provided services. Home-based help mainly covers personal care and domestic tasks, whereas family care is considered a stimulation factor in helping the dependent person remain socially active. Consequently, personal care is viewed as a responsibility of the state and not of the family. In Germany, flexible working time is mostly available and the arrangement of part-time work and home-based care is widespread, especially among women. In addition, labour policies providing support to working caregivers are particularly developed in both countries. In Denmark, an individual who wishes to take care of a close relative suffering from a significant disability can be employed by the municipality where the disabled person lives. And in Germany, employees are entitled to unpaid leave for up to six months in order to take care of a relative, and their family health insurance and pension insurance continues through the long-term care insurance fund.

By contrast, Belgium exhibits one of the highest probabilities of having labour force participation problems. Two of the main drawbacks of the Belgian long-term care system are that it relies solely on benefits in cash (with no benefits in kind) and there are no specific measures to reconcile work and family life (the employee's ability to take leave for home-based care depends on the willingness of the employer). Finally, we also observe that for 11 countries,¹² individuals working as independent professionals (for example, lawyers, medical practitioners, accountants, architects, farmers or fishermen) have the highest likelihoods of experiencing labour force participation problems. By contrast, for all the countries with the exceptions of Italy, Portugal and Slovakia, non-qualified workers experience the least impact of labour force participation problems.

6. Conclusions

The objective of the present paper has been to examine how the probability of caregiving is influenced by both labour force participation problems and unmet needs for formal care. With regard to previous work, we view labour force participation problems and unmet needs for formal care as potentially endogenous variables. Therefore, we have simultaneously estimated three probit equations, relating respectively to informal care, labour force participation problems and unmet needs. Our results provide support for the hypothesis that unmet needs for formal care would affect the probability of becoming a caregiver, and in particular they would increase the likelihood of incompatibilities between caregiving responsibilities and labour force participation.

¹¹ In Finland, caregivers who have made an agreement with the municipality have the right to three free days per month. It is possible to take paid leave in order to care for a dependent person (relief service).

¹² These are Spain, the Netherlands, Austria, Sweden, Cyprus, Estonia, Lithuania, Malta, Poland, Bulgaria and Turkey.

As a final remark, policy-makers should encourage carers to remain in paid work, as this enables them to maintain an independent life, avoid burnout and sustain their caregiving. Many countries have put in place labour market policies that make it easier for informal caregivers to juggle working and caregiving responsibilities. We have observed that a lower probability of having labour force participation problems in certain countries (Germany and Denmark) could be associated with the implementation of measures for reconciling work and caregiving responsibilities. Nevertheless, this paper has provided evidence that these measures have been unable to generate the expected results in terms of employment rates, because if caregiving responsibilities increase over a certain threshold, the informal caregiver may not be able to fulfil both tasks. In particular, if a caregiver's overload is provoked by unmet needs for formal care, s/he may feel obliged to step down from a job or take leave from employment. On this basis, shortfalls in long-term care may partially override the success of work-related policies.

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Appendix

Table A1. Informal caregivers by age and gender (absolute figures and percentage with respect to the total population)

	% of informal caregivers with respect to total population of the same gender and age								Number of informal caregivers by age and gender							
	25-34		35-44		45-54		55-64		25-34		35-44		45-54		55-64	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Belgium	32.09	26.18	32.26	17.21	36.18	36.33	57.98	47.43	209,161	181,783	260,194	119,590	268,661	308,593	337,093	269,983
Denmark	28.17	16.89	22.55	23.62	37.38	30.37	46.05	20.96	105,772	52,683	84,778	111,141	137,929	109,424	166,045	75,376
Germany	11.03	13.57	21.43	8.67	33.51	20.36	39.95	27.79	406,393	591,302	1,483,692	465,486	1,718,882	1,316,484	1,825,981	1,224,792
Greece	19.13	16.81	24.85	15.33	40.76	43.55	47.17	40.99	124,783	131,332	218,215	123,691	270,297	267,117	280,930	219,550
Spain	20.33	5.51	25.85	16.33	29.53	21.91	34.69	24.27	686,040	217,498	888,350	532,275	879,717	617,094	852,906	570,583
France	39.03	15.44	30.88	17.06	36.56	32.42	37.58	33.07	131,937	44,000	101,499	61,649	141,324	142,063	135,790	116,942
Ireland	29.62	19.34	20.81	26.34	30.61	21.33	43.29	37.60	1,110,377	689,279	809,890	1,121,115	1,243,730	771,018	1,135,229	898,356
Italy	12.89	9.18	22.39	14.08	30.89	26.81	33.52	28.25	36,763	29,179	68,334	38,011	74,284	64,942	58,407	50,104
Lux.	11.26	15.10	15.15	13.95	24.87	16.68	29.83	27.35	429,900	642,451	774,365	693,598	905,125	547,127	1,047,539	896,164
Netherlands	18.34	16.44	22.68	24.45	28.24	18.51	44.79	23.32	5,583	4,782	9,937	10,162	8,030	6,171	10,608	5,671
Portugal	6.67	9.45	30.76	28.44	42.08	27.57	38.37	41.56	62,121	91,362	437,696	428,316	506,124	320,349	344,990	379,058
UK	17.59	9.07	26.35	11.26	29.79	15.62	37.12	28.41	96,627	51,386	164,091	74,971	183,433	89,267	184,865	133,479
Austria	8.66	17.42	12.34	4.60	25.23	18.71	23.14	13.93	64,687	108,801	77,702	34,639	177,645	118,641	129,007	68,445
Sweden	25.96	22.34	27.45	27.03	42.76	35.29	52.17	43.15	133,817	117,759	191,430	180,293	236,601	222,990	312,451	261,040
Finland	23.08	13.22	35.09	21.55	32.89	21.94	38.81	39.11	853,730	509,687	1,494,412	812,744	1,325,420	915,064	1,374,781	1,335,835
Cyprus	39.07	26.09	43.05	31.59	38.66	29.08	44.19	33.74	21,790	11,322	22,446	16,808	21,794	16,325	17,277	12,545
Czech Rep.	19.36	7.03	19.64	12.09	35.33	15.36	47.69	32.54	159,174	63,673	110,031	75,872	303,010	114,696	279,580	171,494
Estonia	29.00	27.52	33.73	30.52	34.60	34.67	40.66	33.74	21,640	20,613	24,747	17,983	30,418	24,449	29,037	17,308
Hungary	29.10	9.21	28.33	15.98	34.11	15.48	39.42	23.82	192,522	64,375	195,253	98,548	286,783	128,072	250,436	121,340
Latvia	29.66	25.35	25.08	18.13	31.98	19.64	31.58	16.51	39,630	29,612	36,225	26,303	36,937	19,139	34,370	13,067
Lithuania	27.65	17.60	22.07	27.25	35.73	25.81	47.48	21.31	69,850	46,405	53,423	58,264	90,176	57,321	99,581	33,638
Malta	22.73	8.39	21.31	15.47	53.48	49.56	43.81	38.32	5,192	2,655	5,427	4,336	17,060	11,760	10,857	9,030
Poland	19.93	14.80	24.86	14.53	30.49	26.57	43.83	31.88	585,400	407,301	507,373	332,452	1,037,108	881,930	930,808	588,437
Slovakia	13.92	13.51	23.57	15.19	39.69	29.82	37.41	26.85	49,368	52,875	98,253	55,751	155,659	120,227	97,391	57,369
Slovenia	21.02	16.16	26.53	13.69	33.90	21.56	44.39	28.51	31,247	25,459	34,248	18,184	57,483	38,466	51,702	32,222
Bulgaria	18.27	12.79	22.69	15.02	31.91	16.94	34.26	26.62	91,311	58,695	134,323	90,246	174,508	99,641	184,451	125,375
Romania	9.04	10.92	23.69	10.89	25.42	23.28	33.76	17.96	128,810	174,757	375,486	165,687	438,762	378,785	392,363	182,229
Turkey	25.27	17.04	33.84	14.78	35.81	21.13	27.07	15.42	1,421,899	993,140	1,368,511	590,607	1,113,445	699,370	543,550	289,839
Croatia	17.88	24.24	28.32	27.17	33.21	31.30	40.82	40.73	53,445	73,891	89,589	76,293	109,615	113,008	108,070	95,829
EU-27	19.01	13.57	23.87	16.71	31.71	22.64	38.83	31.01	5,853,627	4,421,025	8,661,819	5,768,116	10,726,899	7,707,156	10,574,473	7,869,432

Source: Based on information from Eurobarometer 283/Wave 67.3, *Health and long-term care in the European Union* (European Commission, 2007) and country weights representing the population aged 15+.

Table A2. Comparison of the labour market participation of caregivers and non-caregivers

	Non-caregivers								Caregivers							
	Active/population (%)		Working/total population (%)		Working/total population (%) (by age cohort)				Active/population (%)		Working/total population (%)		Working/total population (%) (by age cohort)			
	Men	Women	Men	Women	25-34	35-44	45-54	55-64	Men	Women	Men	Women	25-34	35-44	45-54	55-64
Belgium	82.76	68.66	71.92	58.99	75.27	79.17	73.98	21.43	77.32	64.34	71.13	53.15	72.97	75.00	81.43	31.46
Denmark	81.48	79.41	78.13	72.69	70.59	83.33	77.52	59.66	74.22	70.16	77.78	62.90	60.00	82.61	82.09	48.39
Germany	88.11	69.90	78.35	59.22	71.07	77.88	76.02	41.67	73.24	65.63	66.20	52.50	64.00	70.21	65.79	38.55
Greece	87.57	51.64	84.62	46.31	75.45	73.76	55.17	28.00	84.13	40.98	80.95	34.43	66.67	51.35	65.08	27.87
Spain	88.24	54.35	83.42	50.00	75.52	68.85	65.00	37.76	79.41	44.76	76.47	40.95	78.26	51.43	56.76	27.27
France	83.01	80.92	75.24	76.93	78.67	85.86	86.44	49.65	78.48	70.81	74.68	71.76	66.67	88.24	92.06	53.75
Ireland	81.47	76.47	75.00	70.20	81.75	85.21	77.78	33.33	69.88	67.86	66.27	60.71	73.81	83.72	73.91	34.38
Italy	86.72	62.00	81.33	57.86	78.33	68.79	67.24	45.74	75.93	56.84	68.52	62.00	78.26	63.16	58.33	64.44
Lux.	89.95	65.23	88.13	62.94	77.64	77.27	78.23	36.47	77.78	50.00	77.78	49.00	62.50	65.85	63.41	41.03
Netherlands	78.57	56.83	76.64	53.96	73.47	70.37	73.33	27.27	72.42	47.17	75.00	41.51	75.00	57.14	63.64	30.77
Portugal	87.12	74.59	85.84	74.64	82.42	87.50	82.81	57.60	82.18	70.09	73.27	72.13	87.50	84.38	84.29	51.85
UK	89.66	71.24	84.48	68.63	79.75	87.36	82.21	38.71	75.51	60.34	75.51	54.31	80.00	81.40	70.59	19.57
Austria	83.41	73.86	77.25	64.74	80.33	80.15	76.87	44.59	75.76	63.89	72.73	44.44	75.00	71.43	47.50	42.86
Sweden	89.32	89.34	87.61	86.29	93.75	92.68	89.72	74.38	88.24	83.08	85.71	74.62	69.23	88.89	94.03	70.27
Finland	84.52	64.47	76.57	57.23	71.62	74.64	70.71	42.74	79.49	64.07	75.64	51.32	57.50	77.59	66.67	40.28
Cyprus	80.22	55.56	75.82	52.14	65.12	84.78	66.67	40.32	90.24	53.01	82.93	53.01	78.26	68.97	70.97	43.90
Czech Rep.	84.58	75.87	81.25	68.89	76.88	83.04	86.90	48.00	75.00	65.69	73.08	57.66	70.37	69.23	82.14	42.50
Estonia	80.00	72.84	73.85	68.72	67.47	82.05	82.08	52.83	79.03	69.23	75.81	64.62	69.70	78.95	82.14	49.23
Hungary	72.15	62.25	65.75	51.41	80.34	74.51	67.57	19.57	57.14	53.17	54.76	38.89	58.62	68.97	53.85	19.72
Latvia	83.25	77.08	67.51	67.71	79.51	73.86	77.06	33.66	91.84	84.03	79.59	71.43	87.50	83.72	68.29	50.00
Lithuania	85.96	72.80	75.28	63.22	73.87	76.03	68.09	43.94	87.27	73.64	78.18	65.89	70.59	82.50	76.12	46.51
Malta	82.14	27.08	78.57	2669	64.71	52.24	46.94	19.67	75.00	2537	68.75	26.37	66.67	29.41	47.06	20.93
Poland	77.47	61.66	69.78	51.38	77.34	76.67	60.00	17.53	69.81	47.75	62.26	32.43	50.00	73.91	63.27	10.94
Slovakia	89.73	76.00	84.82	67.38	80.69	92.67	83.59	36.51	89.06	65.91	82.81	56.82	82.61	76.92	87.32	26.98
Slovenia	77.07	70.04	72.20	59.92	81.75	85.57	73.15	22.52	73.08	58.18	69.23	49.09	75.00	84.62	65.12	29.23
Bulgaria	85.00	75.56	66.82	63.70	73.47	79.84	80.30	29.01	85.71	67.62	71.43	53.33	50.00	73.33	75.56	42.37
Romania	80.51	69.18	75.45	63.44	80.50	89.86	65.47	30.91	76.92	64.29	75.00	60.71	75.00	84.38	71.74	28.21
Turkey	80.89	14.88	69.78	10.38	39.13	42.64	34.07	22.99	78.26	10.48	71.74	4.84	31.67	12.77	23.68	20.00
Croatia	82.14	68.03	73.81	47.21	66.94	74.07	60.71	22.92	80.00	61.02	74.67	50.00	80.65	76.19	62.96	36.36
EU-27	83.93	68.60	77.50	61.96	77.13	79.86	74.93	39.45	79.30	62.99	74.23	54.79	70.79	74.75	72.53	39.45

Source: Based on information from Eurobarometer 283/Wave 67.3, *Health and long-term care in the European Union* (European Commission, 2007).

Table A3. Characteristics of informal caregivers

	Kinship between dependent and caregiver (%) (a)				Labour problems due to caregiving (%) (b)		Unmet needs for formal care (Home care/daycare centres/res. homes) (%) (c)				Durables ownership (%) (d)			Professional situation before becoming a caregiver Working caregivers aged 25-64 (%) (e)				
	Spouse	Parent	Children	Sibling	Men	Women	Total	Rural area/village	Small/mid-size town	Large town	PC	Car	Fixed phone	Independent professional	Business prop.	White collar	Qual. worker	Not qualified
Belgium	7.21	81.46	3.06	8.26	25.07	47.99	37.31	32.08	43.25	46.96	79.40	87.76	73.02	2.00	2.36	13.89	55.35	26.40
Denmark	8.88	83.38	3.42	4.32	22.19	31.15	55.82	60.43	46.31	63.64	93.40	79.04	84.21	1.22	3.09	18.03	58.39	19.26
Germany	7.24	83.75	5.06	3.95	36.15	51.95	46.88	39.91	49.81	48.54	76.73	81.88	89.03	0.91	2.76	26.54	55.59	14.20
Greece	6.19	87.04	3.36	3.41	22.84	71.80	33.22	31.63	30.01	35.22	40.46	80.56	81.88	8.62	7.59	1.85	63.66	18.28
Spain	7.27	90.08	0.68	1.97	38.28	63.98	38.16	31.61	31.72	57.00	59.38	78.93	69.51	1.23	2.08	1.57	61.70	33.42
France	11.16	79.32	5.94	3.58	24.78	27.56	49.43	36.39	53.59	54.78	85.32	87.04	38.82	7.13	4.49	19.53	58.48	10.38
Ireland	6.80	80.65	5.08	7.47	27.18	40.49	44.87	46.64	41.89	46.93	74.08	85.63	81.72	1.25	7.85	14.27	70.04	6.59
Italy	14.14	73.00	7.92	4.94	37.98	50.95	50.58	57.03	48.91	46.40	71.91	85.31	79.90	1.15	2.78	10.83	61.99	23.25
Lux.	10.92	84.23	2.05	2.79	28.56	57.40	49.61	19.55	52.74	45.76	63.88	86.23	57.50	3.58	1.23	3.90	55.82	35.48
Netherlands	6.64	90.84	0.00	2.52	19.85	63.40	21.79	24.07	22.93	13.74	85.63	94.66	94.66	1.15	4.12	2.38	70.31	22.03
Portugal	11.59	80.72	2.73	4.97	20.49	34.43	48.54	49.02	51.76	41.41	95.73	83.04	97.59	3.05	5.29	20.89	62.37	8.40
UK	10.64	81.21	5.10	3.04	36.68	56.98	40.47	32.46	42.37	49.70	68.31	86.37	58.95	2.13	1.34	26.24	58.81	11.48
Austria	23.61	69.04	5.14	2.21	42.81	62.96	36.20	44.00	30.84	26.54	50.93	69.26	49.84	7.25	5.28	5.52	60.03	21.93
Sweden	9.57	86.11	3.68	0.63	17.89	28.72	43.52	44.64	37.08	50.54	92.58	88.91	98.50	1.38	3.90	20.13	59.26	15.33
Finland	10.97	77.50	7.59	3.93	31.84	53.53	51.55	62.11	44.28	55.38	75.63	75.96	85.77	0.90	7.38	20.27	39.26	32.20
Cyprus	13.99	79.08	2.63	4.30	31.72	54.69	51.15	41.08	57.72	0.00	63.86	92.85	87.04	0.94	1.12	15.81	68.36	13.77
Czech Rep.	6.91	84.76	5.44	2.90	28.19	54.15	45.51	45.06	47.61	40.06	62.25	81.68	28.47	4.62	6.02	14.99	64.36	10.00
Estonia	6.16	82.26	6.85	4.73	32.55	44.82	50.62	49.33	52.41	50.23	69.31	60.44	54.62	0.50	0.48	11.11	67.56	20.34
Hungary	12.94	78.89	7.14	1.03	48.75	61.45	26.58	30.45	17.77	30.78	44.06	47.21	42.42	3.50	2.78	9.11	55.61	29.00
Latvia	8.98	77.11	8.64	5.27	18.16	36.36	36.20	32.05	30.15	45.63	41.22	44.14	39.57	1.02	1.12	6.08	84.86	6.92
Lithuania	10.27	80.53	4.84	4.36	19.78	45.36	40.56	29.30	42.14	46.75	46.15	58.73	36.04	1.36	0.45	15.50	60.53	22.16
Malta	17.29	71.71	4.86	6.14	32.56	75.89	23.78	20.90	31.92	21.90	67.54	88.30	94.85	0.90	1.82	13.84	44.74	38.70
Poland	9.19	82.39	4.70	3.73	32.36	64.96	33.39	28.41	37.29	34.58	58.45	61.81	64.30	8.10	3.47	7.89	68.65	11.89
Slovakia	10.78	80.22	6.45	2.55	34.24	52.51	55.81	52.74	52.59	72.39	57.45	68.14	44.50	1.01	1.35	17.76	63.84	16.04
Slovenia	18.42	74.64	3.94	2.99	37.02	48.13	34.01	35.04	30.79	37.16	71.47	93.49	80.75	7.77	1.29	20.25	58.58	12.11
Bulgaria	14.36	75.01	3.77	6.86	41.93	50.81	35.63	28.00	30.06	43.30	29.58	48.79	65.92	1.47	1.81	9.00	72.25	15.46
Romania	24.10	70.25	3.80	1.85	36.26	49.83	32.41	25.33	29.50	47.97	17.24	11.21	40.79	6.18	1.45	2.19	72.88	17.30
Turkey	15.21	75.38	6.07	3.33	47.45	96.21	40.56	32.68	43.29	46.49	17.74	30.46	70.88	6.42	10.03	12.66	56.20	14.68
Croatia	9.76	79.91	5.02	5.31	32.96	49.78	34.08	33.67	33.72	34.81	56.40	78.34	88.46	1.00	1.25	13.41	74.87	9.47
EU-27	9.93	81.63	4.48	3.96	29.54	49.68	42.31	38.95	42.84	46.26	64.63	73.68	66.61	2.70	3.40	14.03	61.22	18.65

(a) The survey grouped other relatives (cousin, niece, nephew and grandchildren), friends and neighbours in the same category but were omitted in this table due to their marginal significance.

(b) Caregivers with labour force participation problems as a consequence of caregiving tasks with respect to the total number of working caregivers.

(c) Percentage of caregivers whose care recipients have suffered unmet needs for formal care, and the distribution of unmet needs by size of municipality (the classification used is the same as that in the survey; there is no information regarding the number of inhabitants)

(d) Percentage of caregivers owning certain durable goods with respect to the total number of caregivers

(e) Professional situation (occupational category) of caregivers who were working at the time of becoming caregivers with respect to total working caregivers

Source: Based on information from Eurobarometer 283/Wave 67.3, *Health and long-term care in the European Union* (European Commission, 2007).

Table A4. Estimated coefficients of the trivariate probit system (countries 1-6)

	1) Belgium		2) Denmark		3) Germany		4) Greece		5) Spain		6) Finland	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Eq. Caregiver												
Unmet needs	0.3820	2.57	0.2022	2.36	0.9163	1.78	0.0189	2.03	0.5064	3.23	0.5378	2.47
Labour problems	-0.8673	-2.24	-0.0035	-2.02	-0.0325	-2.23	-0.1463	-1.74	-0.3575	2.03	-0.2867	-1.94
Male	-0.2226	-1.89	-0.4174	-3.25	-0.2064	-1.81	-0.2386	-2.25	-0.3857	-3.82	-0.2960	-2.70
Age 25-34	-0.0373	-0.20	0.0730	0.53	0.0004	0.00	-0.1446	-0.75	0.3266	1.58	0.1599	0.58
Age 35-44	-0.4664	-2.47	0.1209	0.64	-0.1990	-1.98	-0.4197	-1.62	-0.2532	-1.95	-0.0231	-0.12
Age 45-54	-0.4224	-2.52	0.1110	0.52	-0.0494	-0.38	-0.2367	-1.06	0.3168	1.55	-0.0189	-0.11
Married	-0.2744	-0.36	0.0419	0.07	0.0580	0.59	0.2872	1.43	-0.5024	-1.71	0.2454	1.09
Single	-0.5686	-0.74	0.1919	0.25	0.2831	1.05	0.2328	1.57	-0.4769	-1.15	0.1111	0.70
Widow	-0.2477	-0.25	-0.0827	-0.16	-0.2384	-0.60	-0.1727	-0.79	-2.2088	-2.35	2.0871	2.83
Care recipient: spouse	1.0660	2.73	2.4230	4.40	1.8564	13.08	3.6048	2.34	2.0847	3.81	2.0067	3.22
Care recipient: child	1.0676	3.56	1.9999	3.21	2.4075	3.63	2.7686	2.78	0.9732	2.10	1.7740	4.28
Care recipient: parent	1.6531	8.87	1.5300	22.70	1.8668	5.06	2.8073	11.32	2.1619	8.58	1.6082	6.34
Care recipient: sibling	1.7505	5.31	1.3458	4.47	1.7894	3.69	2.3549	3.75	1.1529	2.34	1.2680	4.38
Constant	-1.4416	-1.13	-1.2202	-1.78	-0.9555	-2.82	-1.1508	-3.47	-1.3255	-4.15	-0.8435	-2.10
Eq. Labour problems												
Unmet needs	0.4197	2.61	0.5483	2.35	0.0824	3.12	1.2764	3.48	1.4140	2.61	0.1098	3.08
Male	-0.2042	-0.74	-0.5326	-3.36	-0.3636	-1.64	-0.9010	-3.06	-0.0965	-0.85	-0.4540	-2.32
Age 25-34	-0.2943	-0.81	-2.1303	-5.93	-0.4525	-1.72	-1.6167	-2.84	-1.0106	-2.72	-1.3304	-2.34
Age 35-44	-0.2512	-0.59	-0.6646	-1.05	-0.2606	-1.14	-0.9666	-4.03	-1.0645	-3.11	-0.9519	-2.34
Age 45-54	-0.4361	-2.18	-0.5034	-1.31	-0.2811	-0.90	-0.3472	-1.57	-1.0857	-3.57	-0.4651	-2.14
Married	-0.4856	-1.39	-1.0037	-0.40	0.0453	0.20	-0.6625	-1.54	-0.3877	-1.96	0.1423	0.37
Single	0.5115	0.96	-0.2586	-1.43	0.6017	2.15	-0.9799	-2.06	5.219	4.41	-0.3746	-0.76
Widow	-1.1490	-2.93	3.788	3.47	0.3088	0.57	0.4355	0.96	4.5296	4.45	0.1080	0.23
Care recipient: spouse	-0.0479	-0.12	-0.1781	-0.24	0.2459	0.53	-0.3495	-0.99	0.0033	0.01	0.1144	0.17
Care recipient: child	-0.4991	-2.11	-3.6212	-3.17	-1.3247	-1.96	-0.8668	-1.93	-0.3338	-0.69	0.2005	0.05
Care recipient: parent	0.0930	0.25	0.0155	-1.04	0.7838	2.15	-0.0804	-0.30	0.6070	1.32	0.4710	0.85
Care recipient: sibling	-2.5362	-2.69	-0.1056	-0.30	0.3807	0.68	3.3212	3.25	-0.3602	-1.16	-0.0274	-0.74
Working before caregiver	-3.4267	-6.60	-3.0205	-4.15	-3.0259	-10.56	-2.7276	-6.17	-0.8806	-1.78	-1.1762	-2.79
Professional (1 person)	0.5247	0.81	-0.3317	-1.15	-0.3628	-1.42	-3.9249	-3.95	-3.5736	-3.45	0.0573	0.18
Business proprietor	0.5664	1.58	0.4048	4.11	0.0142	0.08	-0.2887	-1.43	-0.5891	-1.24	-0.1875	-0.65
White collar	0.1301	0.33	0.5202	1.58	-0.1526	-0.79	-0.7970	-2.62	0.0156	0.06	0.0275	0.10
Qualified worker	0.1914	0.46	0.5938	4.20	-0.1120	-0.67	0.0854	0.35	-0.5192	-1.61	-0.3088	-1.23
Constant	1.8987	2.95	-0.6118	-6.61	-1.5666	-3.49	2.5873	5.56	0.3694	0.65	-0.3346	-0.72
Eq. Unmet needs (*)												
Rural community	-0.4635	-2.09	-0.1010	-1.35	0.2279	0.92	-0.1933	-1.03	-0.7446	-1.20	-0.0319	-0.11
Small city	-0.3422	-1.80	-0.2468	-2.38	0.2311	1.18	0.0464	0.34	-0.4193	-2.82	0.1871	0.87
Has a personal computer	-0.0431	-0.33	-0.0059	-0.02	-0.2045	-2.15	0.0024	0.02	-0.1658	-0.95	-0.0942	-0.42
Has a car	0.1082	0.53	-0.0268	-0.16	-0.1579	-0.90	-0.2666	-1.54	-0.3004	-1.41	0.1134	0.83
Has fixed telephone	-0.1021	-0.89	0.1147	0.59	0.2116	1.42	0.2084	1.20	-0.0966	-0.66	-0.0331	-0.30
Constant	-0.5013	-0.95	-1.2740	-2.42	-1.1627	-3.55	-1.5093	-3.58	-0.0502	-0.12	-1.2845	-4.19
ρ_{12}	0.3837	3.06	0.1190	1.32	0.2321	3.30	0.2426	1.55	0.4679	1.95	0.3177	0.62
ρ_{13}	0.0120	1.03	0.4435	1.35	0.9116	0.89	0.6716	2.66	0.6589	3.42	0.7597	0.72
ρ_{23}	0.0005	1.00	0.0598	3.34	0.0558	1.14	-0.1337	-1.33	0.5817	1.06	0.2657	3.33
N	660		699		971		598		602		643	
Log pseudolikelihood	-709.86803		-686.59854		-816.22481		-434.37742		-567.84947		-680.22163	
LR Test	26.7721		28.5012		33.5099		25.6734		21.4567		20.4401	
$\rho_{12}=\rho_{13}=\rho_{23}=0$	(0.0000)		(0.0000)		(0.0000)		(0.0001)		(0.0001)		(0.0001)	
Wald Test $\chi^2(13)$	182.59 (0.0000)		175.23 (0.0000)		197.89 (0.0000)		180.81 (0.0000)		176.10 (0.0000)		178.85 (0.0000)	

Omitted variables: women, age 55-64, separated/divorced, care recipient, other relative or friend, not working at the time of becoming a caregiver, not a qualified worker. Estimation by simulated maximum likelihood (Hammersley sequence for the GHK simulation and Davidson-Fletcher-Powell technique for the computation of the log likelihood in each trial). Using weights corresponding to the population aged 15+ for each country and clusters by region (except for Malta). The number of rows is equal to the square root of the number of observations by country.

(*) In the unmet needs equation, estimations for male, age 25-34, age 35-44, age 45-54, married, single, widow, care recipient (spouse, child, parent, sibling), working before being a caregiver, professional, business proprietor, white-collar and qualified worker have been omitted due to space constraints.

Source: Author's calculations.

Table A5. Estimated coefficients of the trivariate probit system (countries 7-12)

	7) France		8) Ireland		9) Italy		10) Luxembourg		11) Netherlands		12) Austria	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Eq. Caregiver												
Unmet needs	0.4581	2.79	0.7080	3.67	1.7573	3.68	0.5113	2.31	0.9455	7.47	0.5684	2.54
Labour problems	-0.0713	-2.50	-0.9342	-2.00	-0.1611	-2.49	-1.6123	-3.78	-0.2426	-2.11	-0.0416	-2.14
Male	-0.2301	-1.99	-0.2682	-2.01	-0.2315	-2.76	-0.3252	-2.08	-0.1278	-0.68	-0.4271	-2.32
Age 25-34	-0.0409	-0.23	-0.1967	-1.84	-0.2557	-0.72	0.1519	0.38	-0.1143	-0.49	-0.4487	-2.77
Age 35-44	-0.2723	-1.26	-0.0185	-0.35	-0.2766	-0.86	0.0110	0.03	0.3450	0.58	-0.1903	-0.86
Age 45-54	-0.1834	-1.14	-0.1761	-0.52	-0.1349	-0.53	-0.1905	-0.47	0.1543	0.61	-0.3830	-2.79
Married	0.3186	0.49	-0.1287	-0.24	1.0178	2.27	0.0411	0.15	-0.5627	-0.13	-0.5909	-1.16
Single	0.1224	0.19	-0.3817	-1.02	1.1155	2.03	0.0396	0.11	-0.5131	-0.12	-0.3880	-0.64
Widow	-0.0485	-0.06	3.1678	3.24	1.0947	1.51	-0.1406	-0.24	-0.7813	-0.16	-0.5708	-1.22
Care recipient: spouse	2.3387	3.02	2.0791	2.93	1.3264	2.25	2.7404	3.24	2.4264	2.76	2.4290	5.05
Care recipient: child	1.2446	2.16	3.1468	3.25	2.4292	2.87	2.0291	2.93	1.5007	1.83	2.0683	4.32
Care recipient: parent	1.3615	7.46	2.2460	10.88	1.7195	6.34	1.9627	5.39	1.6478	5.44	2.0942	5.59
Care recipient: sibling	1.0223	2.83	1.8523	5.14	0.7245	1.43	0.8426	3.10	1.3992	1.85	1.4550	2.09
Constant	-1.2119	-1.94	-0.5597	-0.64	-2.3870	-3.22	-2.6377	-4.36	-0.5107	-0.13	-0.3172	-0.61
Eq. Labour problems												
Unmet needs	1.7393	1.97	0.9169	-0.81	1.6054	3.40	0.5830	2.24	0.8290	2.22	0.5810	3.44
Male	-0.2185	-1.09	-0.4094	-2.29	0.0980	0.68	-0.2460	-1.68	-0.6456	-1.42	-0.4246	-2.07
Age 25-34	-1.2442	-2.81	-0.9986	-2.82	-0.6282	-1.92	-0.1893	-0.50	-0.0497	-0.02	-0.3034	-0.82
Age 35-44	-0.4280	-1.72	-0.2453	-1.37	-0.1849	-0.68	-0.2703	-1.26	0.1643	0.14	-0.4278	-1.39
Age 45-54	-1.0242	-4.72	-0.1466	-0.42	-0.3188	-1.55	-0.2429	-1.28	0.1492	0.13	-0.2380	-0.68
Married	0.2646	1.00	0.0685	0.13	-0.0969	-0.21	-0.0001	0.00	-0.4006	-0.73	-0.2663	-0.87
Single	0.8108	2.22	0.1170	0.19	-0.0746	-0.17	0.1137	0.42	-0.2353	-0.31	-0.4332	-1.08
Widow	1.5146	1.84	0.6082	1.01	0.7209	0.85	-0.2031	-0.37	-0.2458	-0.39	0.3315	0.71
Care recipient: spouse	0.9413	1.29	0.5298	1.24	0.8936	1.42	-0.1785	-0.45	0.9036	1.60	0.8635	1.19
Care recipient: child	0.6158	0.56	0.9846	1.75	0.2296	0.96	0.2904	0.66	0.6593	2.19	1.7050	2.58
Care recipient: parent	0.0352	0.09	1.0092	5.84	0.1228	0.43	0.9942	3.72	0.6959	1.00	0.3876	3.14
Care recipient: sibling	0.8666	1.07	0.6541	1.46	0.0637	0.09	0.0388	0.10	0.7424	1.15	0.1057	0.18
Working before careg.	-2.0333	-6.71	-0.5696	-2.02	-1.0158	-3.45	-1.9777	-3.49	-4.2203	-8.85	-0.4190	-0.86
Professional (1 person)	0.0659	0.12	1.0740	2.71	-2.2891	-3.12	-3.1723	-2.73	-0.0370	-0.03	0.2753	0.35
Business proprietor	0.8033	2.47	0.2941	0.60	0.7403	1.73	-0.5817	-2.68	0.2493	0.17	-0.1043	-0.24
White collar	0.3450	1.07	0.2551	0.80	-0.5110	-0.85	-0.6239	-1.19	0.4096	0.24	0.5957	1.53
Qualified worker	0.6303	1.50	0.6084	2.09	0.4843	1.91	-0.4831	-1.48	0.8388	0.92	0.5531	1.41
Constant	0.3262	0.83	-0.4316	-0.84	-0.6422	-0.83	0.0740	0.29	-1.0443	-1.06	-0.4094	-0.67
Eq. Unmet needs(*)												
Rural community	-0.2225	-1.25	0.0677	0.12	0.2725	1.51	0.9410	3.09	-0.2122	-0.36	-0.1635	-1.61
Small city	-0.2499	-1.20	0.0485	0.07	0.2784	2.34	0.9452	2.08	0.0391	0.03	-0.1889	-0.91
Has a personal computer	-0.0532	-0.40	0.4283	2.30	0.1831	1.75	0.1554	1.00	0.1348	0.10	-0.1857	-0.81
Has a car	0.0418	0.18	-0.0776	-0.47	-0.2489	-1.22	0.7605	1.40	-0.0721	-0.07	0.3355	1.25
Has fixed telephone	-0.1171	-0.78	-0.4818	-4.40	0.0189	0.15	-0.1211	-0.84	-0.7425	-0.34	0.0698	0.37
Constant	-0.7345	-1.89	-1.5679	-1.01	-1.6744	-3.14	-1.4331	-2.95	-0.0558	-0.03	-1.3512	-2.15
ρ_{12}	0.0827	0.47	0.7285	0.87	0.2816	1.69	0.9144	0.63	0.2726	0.44	0.1201	0.41
ρ_{13}	0.0311	1.10	0.3472	1.53	0.5168	3.66	0.3115	1.43	0.8752	1.00	0.7652	1.57
ρ_{23}	0.9304	3.16	0.8780	4.08	0.5689	2.46	0.6587	2.91	0.6782	3.59	0.1886	3.19
N	682		701		758		326		703		761	
Log pseudolikelihood	-694.65245		-484.9388		-594.5712		-258.94152		-700.77736		-568.46119	
LRTest							21.8501(0.00001)					
$\rho_{12}=\rho_{13}=\rho_{23}=0$	21.3357 (0.0000)		20.9812 (0.0001)		22.5752 (0.0000)				23.8871 (0.0000)		21.1987 (0.0001)	
Wald Test $\chi^2(13)$	175.14 (0.0000)		173.12 (0.0000)		175.23 (0.0000)		174.25 (0.0000)		175.29 (0.0000)		163.32 (0.0000)	

Omitted variables: women, age 55-64, separated/divorced, care recipient, other relative or friend, not working at the time of becoming a caregiver, not a qualified worker. Estimation by simulated maximum likelihood (Hammersley sequence for the GHK simulation and Davidon-Fletcher-Powell technique for the computation of the log likelihood in each trial). Using weights corresponding to the population aged 15+ for each country and clusters by region (except for Malta). The number of rows is equal to the square root of the number of observations by country.

(*) In the unmet needs equation, estimations for male, age 25-34, age 35-44, age 45-54, married, single, widow, care recipient (spouse, child, parent, sibling), working before being caregiver, professional, business proprietor, white-collar and qualified worker have been omitted due to space constraints.

Source: Author's calculations.

Table A6. Estimated coefficients of the trivariate probit system (countries 13-18)

	13) Portugal		14) Sweden		15) UK		16) Cyprus		17) Czech Rep.		18) Estonia	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Eq. Caregiver												
Unmet needs	0.3531	2.41	0.0197	2.15	0.1610	2.26	0.3925	4.61	0.3089	2.79	0.3678	2.54
Labour problems	-0.2166	-2.56	-0.6563	-2.85	-0.0322	-2.16	-0.3474	-2.30	-1.0503	-2.84	-0.0631	-2.35
Male	-0.0611	-2.47	-0.1143	-2.21	-0.3947	-3.07	-0.2441	-2.37	-0.3427	-3.36	-0.1034	-2.51
Age 25-34	0.2338	1.46	-0.0195	-0.18	0.1919	0.79	-0.5335	-1.90	-0.0497	-0.23	-0.3370	-2.05
Age 35-44	-0.0038	-0.02	-0.0946	-0.46	0.1720	1.10	-0.6463	-1.93	-0.2031	-1.32	0.1297	0.71
Age 45-54	0.1100	1.21	-0.1059	-0.75	0.0045	0.02	-0.1312	-0.50	-0.2614	-2.11	-0.1333	-2.07
Married	-1.5456	-1.99	0.7924	1.66	0.5950	1.58	0.9603	1.54	1.0102	2.45	0.0398	0.32
Single	-1.4675	-2.01	0.6858	1.64	0.6273	1.35	0.8813	0.90	2.6853	3.12	2.3282	2.84
Widow	-1.2221	-1.78	2.3681	2.35	0.2087	0.40	0.5038	0.42	0.6783	1.50	0.0168	0.09
Care recipient: spouse	2.1424	7.04	2.3387	5.17	2.2824	13.20	2.2785	2.56	2.0412	6.00	2.3496	6.15
Care recipient: child	2.0646	2.35	1.2947	5.42	2.1485	4.12	2.8835	2.67	2.9103	4.75	2.4175	4.98
Care recipient: parent	2.1713	11.88	1.5324	19.06	2.1297	16.95	2.7027	15.30	2.2791	12.20	1.9553	12.77
Care recipient: sibling	1.6146	4.17	-0.3317	-0.48	1.0565	2.43	2.3348	2.78	1.9465	2.48	2.2501	2.86
Constant	-0.2409	-0.45	-1.8343	-4.10	-1.6501	-4.28	-2.8335	-1.91	-3.0055	-3.87	-1.1991	-5.89
Eq. Labour problems												
Unmet needs	1.3233	3.16	1.4644	2.71	1.2802	2.48	0.7641	3.40	1.4427	2.29	0.7772	2.46
Male	-0.0905	-0.82	-0.0869	-1.13	-0.0434	-0.29	0.2093	0.79	-1.0315	-2.52	-0.0404	-0.25
Age 25-34	-0.5141	-2.76	0.0346	0.09	-0.9894	-1.78	0.2444	0.79	-0.5664	-1.86	-0.1285	-0.30
Age 35-44	-0.3589	-2.49	0.2702	0.98	0.0429	0.36	0.0707	0.22	0.1725	0.41	-0.0886	-0.47
Age 45-54	-0.4607	-2.31	-0.3325	-1.81	0.0239	0.13	-0.1535	-0.43	-0.5082	-2.08	-0.1061	-0.22
Married	-1.9777	-1.85	0.0467	0.45	0.0199	0.08	-0.6557	-1.66	-0.7459	-3.64	0.1811	0.59
Single	-1.9861	-2.73	-0.3589	-1.52	0.3804	1.02	-1.7097	-2.11	-0.1971	-0.41	0.0617	0.17
Widow	-2.0263	-2.09	-0.3371	-0.71	-1.1439	-1.82	3.7489	3.83	0.3018	0.53	3.6488	3.45
Care recipient: spouse	1.3572	3.54	0.5985	1.31	0.3026	0.62	1.1050	3.49	0.2942	0.41	1.2611	1.83
Care recipient: child	1.1427	1.80	0.7499	1.21	0.1833	0.47	0.4371	0.72	-0.5611	-1.96	1.3613	2.88
Care recipient: parent	1.4028	12.96	0.7824	3.69	1.2037	6.93	0.9462	3.21	0.9702	4.43	0.8925	4.79
Care recipient: sibling	-0.3078	-0.73	0.8272	1.65	0.4578	2.06	1.6798	1.56	2.3309	2.65	2.6688	2.38
Working before caregiver	-0.8893	-3.93	-0.6894	-3.64	-0.9921	-2.88	-2.3567	-2.99	-1.9219	-3.97	-3.0063	-5.63
Professional (1 person)	-2.6134	-2.64	-0.2117	-0.63	0.3430	0.77	0.2199	0.31	0.5348	1.24	-1.3799	-2.56
Business proprietor	0.3841	1.30	0.4177	2.66	0.0514	0.23	-0.1487	-0.29	0.6114	2.62	-0.9081	-1.88
White collar	-0.5423	-1.61	0.2183	1.28	0.0575	0.14	-0.3671	-0.56	0.5848	1.62	-0.5926	-2.10
Qualified worker	0.4054	3.87	0.6209	1.80	-0.0289	-0.10	-0.2095	-0.44	0.7732	1.64	-0.4620	-1.83
Constant	1.8942	1.89	-0.6045	-1.71	-0.2488	-0.70	0.8961	1.37	0.9556	1.64	-1.6326	-5.79
Eq. Unmet needs(*)												
Rural community	-0.0527	-0.30	-0.3302	-3.87	0.0335	0.23	-0.1599	-0.61	-0.4679	-2.81	-0.1817	-0.85
Small city	-0.6078	-1.08	-0.4409	-3.21	-0.1561	-1.19	-0.0446	-0.23	-0.3416	-1.71	0.0136	0.10
Has Personal Computer	0.1591	1.96	-0.2715	-2.02	0.0722	0.65	0.2282	2.33	0.1527	1.61	-0.3914	-2.50
Has a car	-0.0914	-0.42	0.3710	3.09	0.0993	0.39	-0.1574	-0.70	0.2059	2.22	0.3201	2.75
Has fixed telephone	-0.2917	-1.65	-0.3692	-0.98	0.3615	1.96	-0.3587	-1.34	0.0492	0.51	0.2021	1.03
Constant	-0.8344	-2.93	-1.0302	-1.72	-1.7245	-2.04	-0.8319	-1.95	-1.8398	-6.17	-0.8519	-1.92
ρ_{12}	0.2999	1.29	0.1905	0.73	0.5596	1.06	0.3149	1.22	0.3102	1.46	0.4166	1.60
ρ_{13}	0.4352	2.84	0.4114	1.11	0.5741	1.35	0.4731	1.47	0.6670	2.84	0.7119	2.48
ρ_{23}	0.6884	1.35	0.9625	5.48	0.8590	3.49	0.5094	3.17	0.5023	1.44	0.5022	1.17
N	645		680		780		322		744		565	
Log pseudo-likelihood	-519.95567		-706.43926		-820.01958		-298.20751		-480.43714		-629.56657	
LR Test	24.1901 (0.0000)		21.9899 (0.0000)		23.8803 (0.0000)		21.1578 (0.0001)		22.1078 (0.0001)		20.1516 (0.0002)	
$\rho_{12}=\rho_{13}=\rho_{23}=0$	157.33 (0.0000)		160.12 (0.0000)		168.34 (0.0000)		167.10 (0.0000)		175.89 (0.0000)		190.12 (0.0000)	
Wald Test $\chi^2(13)$												

Omitted variables: women, age 55-64, separated/divorced, care recipient, other relative or friend, not working at the time of becoming a caregiver, not a qualified worker. Estimation by simulated maximum likelihood (Hammersley sequence for the GHK simulation and Davidson-Fletcher-Powell technique for the computation of the log likelihood in each trial). Using weights corresponding to the population aged 15+ for each country and clusters by region (except for Malta). The number of rows is equal to the square root of the number of observations by country.

(*) In the unmet needs equation, estimations for male, age 25-34, age 35-44, age 45-54, married, single, widow, care recipient (spouse, child, parent, sibling), working before being caregiver, professional, business proprietor, white-collar and qualified worker have been omitted due to space constraints.

Source: Author's calculations.

Table A7. Estimated coefficients of the trivariate probit system (countries 19-24)

	19) Hungary		20) Latvia		21) Lithuania		22) Malta		23) Poland		24) Slovakia	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Eq. Caregiver												
Unmet needs	0.2316	2.30	0.7277	2.76	0.5358	2.24	1.7373	3.06	0.9322	2.80	0.8671	9.12
Labour problems	-0.5031	-2.93	-0.0258	-2.06	-0.2042	-2.41	-1.3672	-2.20	-0.1692	-2.22	-0.1937	-1.80
Male	-0.6085	-3.07	-0.2971	-2.00	-0.2830	-1.88	-1.0224	-2.18	-0.1724	-2.57	-0.1293	-2.67
Age 25-34	0.1567	0.81	0.2758	1.64	0.3517	1.44	-0.4701	-1.38	-0.4343	-2.30	-0.2804	-1.59
Age 35-44	-0.0864	-0.57	0.0584	0.47	0.0977	0.34	-0.1823	-0.54	-0.4329	-1.77	-0.4870	-4.16
Age 45-54	0.0867	0.99	-0.0929	-0.77	0.0380	0.13	0.2220	0.76	-0.5570	-2.05	0.0224	0.26
Married	0.2563	0.83	-1.2008	-1.57	-0.7466	-0.95	0.3443	0.39	0.2455	0.47	-0.0287	-0.13
Single	0.2018	0.41	-1.1983	-1.32	-0.9819	-1.29	0.6016	0.68	0.7287	1.21	-0.2614	-0.74
Widow	2.5426	3.26	-1.0545	-1.45	-0.7051	-0.53	0.6803	0.69	0.1129	0.20	2.5826	2.89
Care recipient: spouse	1.7490	8.79	2.4452	3.62	-0.5052	-0.65	3.0194	3.53	-0.4270	-0.71	2.4279	6.35
Care recipient: child	2.6567	12.26	2.0976	5.62	1.8963	3.47	3.0136	3.08	2.1216	3.38	2.2705	2.21
Care recipient: parent	2.4318	24.76	2.5086	10.61	2.6760	11.04	2.7683	3.49	1.9466	11.13	2.1544	18.72
Care recipient: sibling	0.4014	0.55	1.3877	3.86	1.0830	2.32	1.6796	2.76	1.6754	2.89	1.6687	8.02
Constant	-1.8558	-3.83	-0.3079	-0.47	-0.5839	-0.68	-0.2486	-0.25	-1.2076	-1.26	-0.8016	-2.48
Eq. Labour problems												
Unmet needs	0.3509	2.34	0.4737	3.29	0.5491	3.82	0.5935	2.05	1.7153	3.92	0.1418	2.62
Male	-0.1156	-0.48	-0.6493	-2.92	-0.5708	-2.45	-1.6495	-1.62	0.1613	0.91	-0.0852	-1.51
Age 25-34	-0.6278	-2.14	-1.0441	-1.49	-0.6068	-1.25	-1.3578	-2.14	-1.1894	-2.92	0.2199	0.55
Age 35-44	-0.4418	-1.55	-0.4303	-1.56	0.3514	0.99	-0.7220	-0.42	-1.1251	-3.83	0.2028	0.62
Age 45-54	-0.8493	-3.24	-0.3016	-0.84	0.4504	1.54	-1.1774	-2.00	-0.4617	-1.91	-0.6697	-2.90
Married	-0.9794	-1.84	-0.2788	-1.42	-0.3773	-1.69	0.2560	0.39	-0.0433	-0.08	-0.3125	-1.18
Single	-0.8717	-1.38	3.6702	4.57	0.0478	0.16	-0.0043	-0.11	0.3919	0.90	-0.0518	-0.20
Widow	0.6538	1.06	-0.1205	-0.33	1.7216	2.09	0.1830	0.15	-0.0112	-0.01	3.5221	5.67
Care recipient: spouse	1.7844	2.84	0.5626	1.87	0.3593	0.92	1.2202	2.22	0.5382	1.01	0.9784	2.58
Care recipient: child	0.6751	3.36	0.4403	0.83	0.8887	1.32	0.5272	0.56	0.7314	1.93	-0.0284	-0.80
Care recipient: parent	0.9076	8.73	0.4354	0.70	0.6808	1.97	2.0868	3.81	0.4923	2.35	0.8042	3.86
Care recipient: sibling	0.7555	1.15	-0.1447	-0.76	0.3952	1.11	-0.2847	-0.96	-0.1453	-0.50	0.7540	2.54
Working before caregiver	-1.5671	-2.44	-2.0688	-2.02	-1.0770	-1.65	-3.0737	-1.92	-1.5059	-4.34	-2.7081	-3.97
Professional (1 person)	0.5175	0.84	0.1920	0.38	0.5949	1.63	-0.4546	-0.72	-0.1265	-0.18	-0.2327	-1.25
Business proprietor	0.7495	2.18	-0.0477	-0.09	1.0362	3.44	-1.0466	-2.01	0.0570	0.17	-0.1076	-0.65
White collar	0.7357	1.75	0.4231	0.79	-0.1137	-0.29	-0.4395	-0.65	-0.0089	-0.02	-0.5660	-4.12
Qualified worker	0.2971	1.66	0.1211	0.22	0.5317	1.78	-1.0417	-1.72	0.2969	0.94	-0.0397	-0.61
Constant	1.4747	1.55	1.1577	1.62	-0.6421	-1.01	1.6183	1.23	0.9676	2.27	-1.5174	-3.55
Eq. Unmet needs(*)												
Rural community	-0.1360	-0.59	-0.2038	-1.03	-0.5370	-2.49	0.2188	0.31	-0.2496	-2.46	-0.1467	-1.36
Small city	0.3313	1.97	-0.2126	-1.62	-0.3541	-2.89	0.6391	1.20	0.0007	0.01	-0.2378	-2.63
Has a personal computer	0.0736	0.31	-0.1116	-0.66	-0.0051	-0.04	-0.4149	-0.68	-0.1872	-1.10	0.2488	2.69
Has a car	-0.2548	-1.82	0.1096	0.26	-0.1648	-1.25	0.3586	1.06	0.1159	0.67	0.0134	0.50
Has fixed telephone	0.1606	1.59	-0.1128	-0.67	0.3623	3.71	-0.4170	-0.65	-0.1591	-0.84	0.0785	0.94
Constant	-1.7038	-2.00	-1.2039	-1.44	-1.1436	-2.67	0.5935	0.39	-1.0440	-3.53	-1.0620	-3.92
ρ_{12}	0.2676	2.20	0.3288	2.01	0.0728	0.19	0.3572	0.21	0.0250	1.06	0.4700	2.16
ρ_{13}	0.2854	0.72	0.2489	0.60	0.2900	3.04	0.3155	0.55	0.2905	2.14	0.9544	2.57
ρ_{23}	0.5012	0.69	0.5722	0.47	0.1143	0.40	0.6443	3.87	0.9083	4.88	0.2257	5.36
N	636		653		623		351		599		745	
Log pseudo-likelihood	-463.80823		-512.88229		-531.29959		-174.93593		-553.44986		-620.32671	
LR Test	25.4642 (0.0000)		25.1219 (0.0000)		23.1980 (0.0000)		24.5690 (0.0000)		22.2574 (0.0001)		22.7691 (0.0004)	
$\rho_{12}=\rho_{13}=\rho_{23}=0$	159.34 (0.0000)		163.34 (0.0000)		171.65 (0.0000)		153.44 (0.0000)		175.87 (0.0000)		170.39 (0.0000)	

Omitted variables: women, age 55-64, separated/divorced, care recipient, other relative or friend, not working at the time of becoming a caregiver, not a qualified worker. Estimation by simulated maximum likelihood (Hammersley sequence for the GHK simulation and Davidon-Fletcher-Powell technique for the computation of the log likelihood in each trial). Using weights corresponding to the population aged 15+ for each country and clusters by region (except for Malta). The number of rows is equal to the square root of the number of observations by country.

(*) In the unmet needs equation, estimations for male, age 25-34, age 35-44, age 45-54, married, single, widow, care recipient (spouse, child, parent, sibling), working before being caregiver, professional, business proprietor, white-collar and qualified worker have been omitted due to space constraints.

Source: Author's calculations.

Table A8. Estimated coefficients of the trivariate probit system (countries 25-29)

	25) Slovenia		26) Bulgaria		27) Romania		28) Croatia		29) Turkey	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Eq. Caregiver										
Unmet needs	0.8402	2.33	0.5541	2.64	0.5902	2.22	0.5753	3.56	0.3166	3.80
Labour problems	-0.1625	-2.92	-0.6620	-2.56	-0.4466	-1.98	-0.2672	-2.65	-0.0265	-2.07
Male	-0.3598	-2.25	-0.3451	-2.57	-0.1144	-2.58	-0.1190	-2.36	-0.4302	-2.95
Age 25-34	-0.0687	-0.37	0.3464	1.57	-0.2967	-0.71	-0.2127	-1.59	-0.0740	-0.42
Age 35-44	-0.1298	-0.83	-0.0372	-0.17	-0.2113	-0.97	-0.1480	-0.69	0.0391	0.22
Age 45-54	-0.1103	-0.70	-0.0215	-0.14	-0.3128	-1.15	-0.1969	-0.82	-0.1434	-0.80
Married	-0.1195	-0.28	-0.3116	-1.39	0.1863	0.58	-0.4856	-1.03	-0.2077	-0.64
Single	0.3946	1.44	-0.2233	-0.55	0.4910	1.17	-0.3521	-0.97	-0.6100	-1.30
Widow	0.3672	0.64	0.3192	0.84	2.9335	2.89	0.2459	0.34	3.0444	2.44
Care recipient: spouse	-0.4150	-0.97	2.6119	7.24	2.7334	8.45	-0.5170	-1.07	2.1443	3.86
Care recipient: child	2.3626	6.22	3.0068	4.33	2.6814	4.67	2.0123	4.91	2.6359	3.96
Care recipient: parent	2.0647	10.09	3.1941	14.17	2.9477	14.45	2.4862	8.85	2.6756	15.03
Care recipient: sibling	2.0625	4.12	3.0154	6.28	2.1727	4.30	1.7780	3.86	1.4231	2.90
Constant	-1.0525	-2.98	-1.7987	-3.30	-1.3757	-2.50	-0.2720	-0.45	-1.0514	-2.70
Eq. Labour problems										
Unmet needs	1.3168	1.82	0.3770	2.25	1.1913	2.50	0.4181	3.76	2.1249	4.86
Male	0.0468	0.17	-0.0905	-0.27	-0.2474	-1.62	0.1362	1.11	0.1933	0.77
Age 25-34	-2.4841	-5.48	-1.4627	-3.19	-0.9627	-3.22	-1.2569	-1.82	-0.2025	-0.65
Age 35-44	-0.6414	-2.75	-0.4553	-1.61	-0.8788	-4.01	-0.1459	-0.59	-0.3596	-1.14
Age 45-54	-0.3302	-0.99	-0.8199	-2.08	-0.6682	-3.00	0.0461	0.30	0.1090	0.41
Married	0.3180	0.65	0.5265	0.85	0.1034	0.41	0.2725	0.48	0.7959	1.46
Single	0.4014	0.74	-0.2327	-0.43	-0.0531	-0.13	0.4170	0.54	-0.2322	-0.56
Widow	0.5398	0.84	0.7859	0.92	0.4518	0.90	0.4282	1.23	0.8717	1.11
Care recipient: spouse	0.2634	0.80	0.7608	1.34	0.8606	3.08	0.1182	1.29	0.1607	0.21
Care recipient: child	1.2091	3.37	0.2791	-0.71	1.0550	2.82	-0.3853	-1.46	0.2188	0.39
Care recipient: parent	0.2955	1.36	1.0202	1.87	0.9929	3.00	0.8381	2.87	-0.1671	-0.53
Care recipient: sibling	1.9116	2.60	0.6738	1.78	1.6094	1.50	1.8376	1.97	-0.3708	-0.32
Working before caregiver	2.1975	3.61	2.4380	3.46	1.7556	10.32	2.0341	5.22	1.6000	4.72
Professional (1 person)	0.3511	0.77	0.6314	1.05	0.2271	0.28	-0.7906	-1.56	2.3339	2.45
Business proprietor	-0.2282	-0.43	-0.2387	-0.52	-2.5157	-2.34	-0.3875	-1.33	-0.0484	-0.09
White collar	-0.2343	-0.46	-0.4492	-0.91	-0.9928	-2.66	-0.1289	-0.35	-0.2221	-0.59
Qualified worker	0.0165	0.04	-0.0762	-0.18	-0.2244	-1.76	-0.5587	-3.06	-0.2833	-1.44
Constant	0.5793	1.09	0.6853	0.98	-0.2373	-0.62	-0.2727	-0.41	-0.5293	-0.89
Eq. Unmet needs(*)										
Rural community	-0.1207	-0.54	-0.0674	-0.29	-0.2976	-0.93	-0.2507	-1.90	0.0736	0.47
Small city	-0.0153	-0.05	-0.1353	-0.62	-0.0799	-0.34	-0.0531	-0.33	-0.2966	-1.25
Has a personal computer	0.3598	3.06	0.0903	0.56	0.2129	2.51	0.0243	0.26	-0.2733	-1.41
Has a car	0.3848	1.78	0.1973	1.49	0.0726	0.23	-0.3063	-1.55	-0.1054	-0.76
Has fixed telephone	0.2866	2.30	0.1702	1.19	-0.1179	-1.03	-0.2092	-1.09	0.3867	2.32
Constant	-1.0034	-1.47	-1.0066	-1.78	-0.6270	-0.97	0.3077	0.63	-1.6724	-1.72
ρ_{12}	0.5195	2.12	0.0642	0.17	0.3833	1.99	0.1888	0.57	0.1465	0.97
ρ_{13}	0.0588	0.22	0.5797	3.72	0.4447	1.46	0.7632	2.31	0.2193	1.66
ρ_{23}	0.5361	3.85	0.4987	0.50	0.8974	0.79	0.0521	0.30	0.8611	3.76
N	604		644		692		684		630	
Log pseudo-likelihood	-534.51226		-391.57647		-508.3794		-545.96463		-517.73625	
LR Test $\rho_{12}=\rho_{13}=\rho_{23}=0$	20.3360 (0.0001)		21.3563 (0.0001)		23.3240 (0.0000)		24.1790 (0.0000)		25.1760 (0.0000)	
Wald Test $\chi^2(13)$	183.90 (0.0000)		178.34 (0.0000)		145.27 (0.0000)		168.90 (0.0000)		178.94 (0.0000)	

Omitted variables: women, age 55-64, separated/divorced, care recipient, other relative or friend, not working at the time of becoming a caregiver, not a qualified worker. Estimation by simulated maximum likelihood (Hammersley sequence for the GHK simulation and Davidson-Fletcher-Powell technique for the computation of the log likelihood in each trial). Using weights corresponding to the population aged 15+ for each country and clusters by region (except for Malta). The number of rows is equal to the square root of the number of observations by country.

(*) In the unmet needs equation, estimations for male, age 25-34, age 35-44, age 45-54, married, single, widow, care recipient (spouse, child, parent, sibling), working before being caregiver, professional, business proprietor, white-collar and qualified worker have been omitted due to space constraints.

Source: Author's calculations.

Table A9. Instrument diagnosis

i) Caregiving equation

Country	Partial R ² excluded instruments	Overidentification (Hansen stat.)		Test of excluded instruments		Anderson- Rubin Wald test		Kleibergen- Paap rk LM test		Kleibergen- Paap rk Wald statistic		Stock-Wright LM statistic	
		$\chi^2(8)$	p-value	F-statistic	p-value	$\chi^2(10)$	p-value	$\chi^2(9)$	p-value	$\chi^2(9)$	p-value	$\chi^2(10)$	p-value
Belgium	0.7541	7.388	0.4954	F(10,638)=751.46	0.0000	19.86	0.0306	40.61	0.0000	52.61	0.0000	158.40	0.0000
Denmark	0.7320	6.802	0.5582	F(10,677)=1681.30	0.0000	20.90	0.0218	46.23	0.0000	50.96	0.0000	134.81	0.0000
Germany	0.7396	6.168	0.6284	F(10,949)=633.38	0.0000	19.86	0.0306	58.62	0.0000	84.87	0.0000	153.18	0.0000
Greece	0.6768	10.279	0.2460	F(10,576)=199.59	0.0000	20.01	0.0292	28.65	0.0007	41.73	0.0000	179.75	0.0000
Spain	0.6049	3.470	0.9015	F(10,580)=199.79	0.0000	19.90	0.0321	43.65	0.0000	66.67	0.0000	108.93	0.0000
France	0.7331	9.567	0.2967	F(10,621)=712.49	0.0000	18.52	0.0468	49.74	0.0000	66.36	0.0000	104.13	0.0000
Ireland	0.7439	7.935	0.4398	F(10,660)=802.67	0.0000	20.85	0.0221	52.12	0.0000	64.24	0.0000	141.23	0.0000
Italy	0.7121	8.526	0.3839	F(10,679)=411.60	0.0000	19.45	0.0349	38.91	0.0000	58.03	0.0000	135.39	0.0000
Lux.	0.5966	13.779	0.0877	F(10,736)=376.58	0.0000	20.92	0.0217	41.84	0.0000	61.48	0.0000	99.55	0.0000
Netherlands	0.7522	10.304	0.2443	F(10,304)=215.58	0.0000	19.38	0.0357	20.46	0.0153	34.94	0.0001	57.71	0.0000
Portugal	0.7180	14.957	0.0600	F(10,681)=1106.38	0.0000	21.12	0.0203	64.21	0.0000	82.01	0.0000	185.06	0.0000
UK	0.5815	9.019	0.3407	F(10,739)=324.97	0.0000	19.92	0.0300	40.40	0.0000	66.00	0.0000	130.99	0.0000
Austria	0.6064	11.219	0.1896	F(10,623)=442.72	0.0000	24.12	0.0073	31.52	0.0002	55.52	0.0000	88.60	0.0000
Sweden	0.6370	13.498	0.0958	F(10,658)=1695.05	0.0000	19.13	0.0387	34.96	0.0001	39.41	0.0000	137.21	0.0000
Finland	0.7168	13.485	0.0962	F(10,757)=602.82	0.0000	26.60	0.0030	63.01	0.0000	73.64	0.0000	191.04	0.0000
Cyprus	0.6014	14.829	0.0383	F(10,311)=184.79	0.0000	18.88	0.0262	32.32	0.0000	42.44	0.0000	129.61	0.0000
Czech Rep.	0.6888	9.334	0.3149	F(10,722)=605.31	0.0000	25.02	0.0053	49.23	0.0000	73.63	0.0000	157.89	0.0000
Estonia	0.6681	19.024	0.0147	F(10,543)=475.33	0.0000	31.00	0.0006	59.52	0.0000	181.69	0.0000	143.80	0.0000
Hungary	0.6707	5.822	0.6672	F(10,614)=305.99	0.0000	27.33	0.0023	24.08	0.0042	26.70	0.0016	140.38	0.0000
Latvia	0.7349	3.558	0.8947	F(10,631)=776.18	0.0000	19.33	0.0366	28.24	0.0009	34.57	0.0001	137.80	0.0000
Lithuania	0.7505	10.720	0.2181	F(10,600)=1184.74	0.0000	22.97	0.0109	37.34	0.0000	63.15	0.0000	150.72	0.0000
Malta	0.7763	4.964	0.7614	F(10,329)=260.15	0.0000	25.10	0.0052	18.33	0.0315	17.39	0.0429	106.00	0.0000
Poland	0.7129	3.319	0.9128	F(10,577)=447.14	0.0000	24.05	0.0075	22.69	0.0069	28.77	0.0007	137.68	0.0000
Slovakia	0.5065	12.909	0.1150	F(10,723)=377.28	0.0000	26.45	0.0032	82.97	0.0000	141.97	0.0000	188.36	0.0000
Slovenia	0.6696	3.197	0.9214	F(10,582)=335.40	0.0000	19.30	0.0366	27.47	0.0012	42.89	0.0000	116.51	0.0000
Bulgaria	0.6926	4.058	0.8518	F(10,662)=316.98	0.0000	27.54	0.0210	40.63	0.0000	55.14	0.0000	150.88	0.0000
Romania	0.4807	6.550	0.5858	F(10,670)=200.35	0.0000	19.49	0.0344	42.32	0.0017	58.88	0.0000	143.64	0.0000
Turkey	0.7058	21.901	0.0051	F(10,608)=547.91	0.0000	30.10	0.0008	26.34	0.0000	32.39	0.0002	169.61	0.0000
Croatia	0.4850	2.839	0.9440	F(10,662)=117.28	0.0000	20.91	0.0217	40.70	0.0000	317.37	0.0000	153.98	0.0000

ii) Labour problems equation

Country	Partial R ² excluded instruments	Overidentifica- tion test (Hansen stat.)		Test of excluded instruments		Anderson- Rubin Wald test		Kleibergen- Paap rk LM test		Kleibergen- Paap rk Wald statistic		Stock-Wright LM statistic	
		$\chi^2(4)$	p- value	F-statistic	p- value	$\chi^2(5)$	p- value	$\chi^2(4)$	p- value	$\chi^2(4)$	p- value	$\chi^2(5)$	p- value
Belgium	0.5469	5.292	0.2586	F(5,639)=1082.49	0.0000	42.60	0.0000	15.76	0.0034	25.38	0.0000	214.32	0.0000
Denmark	0.5374	1.742	0.7831	F(5,678)=1864.01	0.0000	16.60	0.0053	89.97	0.0000	701.35	0.0000	182.13	0.0000
Germany	0.6446	2.318	0.6775	F(5,950)=838.63	0.0000	63.27	0.0000	59.80	0.0000	921.31	0.0000	297.80	0.0000
Greece	0.5415	6.375	0.1729	F(5,577)=432.14	0.0000	131.31	0.0000	14.13	0.0069	27.17	0.0000	220.81	0.0000
Spain	0.6110	3.434	0.4879	F(5,581)=315.88	0.0000	117.23	0.0000	40.73	0.0000	194.80	0.0000	207.37	0.0000
France	0.6119	1.247	0.8703	F(5,622)=1037.33	0.0000	21.02	0.0008	17.66	0.0014	63.76	0.0000	201.05	0.0000
Ireland	0.6066	1.812	0.7702	F(5,661)=1039.13	0.0000	21.66	0.0006	43.69	0.0000	334.51	0.0000	168.01	0.0000
Italy	0.6059	1.632	0.8031	F(5,680)=728.92	0.0000	48.74	0.0000	23.45	0.0001	258.47	0.0000	280.12	0.0000
Lux.	0.6850	7.943	0.1594	F(5,737)=510.90	0.0000	247.73	0.0000	68.60	0.0000	265.58	0.0000	212.42	0.0000
Netherlands	0.6500	3.886	0.4216	F(5,305)=565.33	0.0000	55.43	0.0000	10.21	0.0370	56.44	0.0000	117.55	0.0000
Portugal	0.6342	2.481	0.6481	F(5,628)=2698.96	0.0000	35.65	0.0000	14.26	0.0065	29.82	0.0000	181.86	0.0000
UK	0.7152	8.438	0.0768	F(5,740)=501.77	0.0000	88.50	0.0000	43.66	0.0000	197.80	0.0000	203.38	0.0000
Austria	0.5625	22.913	0.0004	F(624)=473.13	0.0000	233.75	0.0000	58.62	0.0000	275.26	0.0000	182.02	0.0000
Sweden	0.4725	4.866	0.3013	F(5,659)=1872.88	0.0000	32.82	0.0000	30.58	0.0000	542.22	0.0000	111.71	0.0000
Finland	0.6243	2.969	0.5630	F(5,758)=1018.66	0.0000	61.55	0.0000	42.57	0.0000	480.94	0.0000	294.55	0.0000
Cyprus	0.6770	2.114	0.5491	F(5,312)=249.97	0.0000	53.55	0.0000	15.76	0.0034	25.38	0.0000	214.32	0.0000
Czech Rep.	0.6045	2.477	0.6487	F(5,723)=900.54	0.0000	42.40	0.0000	9.98	0.0407	26.81	0.0000	132.44	0.0000
Estonia	0.6214	1.966	0.7420	F(5,544)=539.20	0.0000	24.01	0.0002	29.19	0.0000	240.22	0.0000	205.38	0.0000
Hungary	0.7110	4.674	0.3255	F(5,615)=357.48	0.0000	18.66	0.0022	26.23	0.0000	455.21	0.0000	191.91	0.0000
Latvia	0.6632	10.139	0.0382	F(5,632)=1160.73	0.0000	25.80	0.0001	46.98	0.0000	223.75	0.0000	218.23	0.0000
Lithuania	0.5817	6.929	0.1397	F(5,601)=1191.70	0.0000	27.00	0.0001	20.92	0.0003	56.62	0.0000	243.08	0.0000
Malta	0.6369	1.172	0.8828	F(5,330)=1104.74	0.0000	97.51	0.0000	28.63	0.0000	640.41	0.0000	224.38	0.0000
Poland	0.6073	9.311	0.0538	F(5,578)=554.02	0.0000	57.74	0.0000	10.01	0.0402	34.89	0.0000	104.00	0.0000
Slovakia	0.6540	6.942	0.1390	F(5,724)=525.73	0.0000	74.13	0.0000	34.22	0.0000	89.28	0.0000	215.03	0.0000
Slovenia	0.6303	7.255	0.1230	F(5,583)=389.90	0.0000	32.36	0.0000	51.32	0.0000	298.68	0.0000	169.34	0.0000
Bulgaria	0.5993	1.481	0.8300	F(5,623)=402.35	0.0000	17.42	0.0042	30.76	0.0000	98.77	0.0000	158.44	0.0000
Romania	0.5076	8.545	0.0735	F(5,671)=268.00	0.0000	112.12	0.0000	18.59	0.0009	53.46	0.0000	220.16	0.0000
Turkey	0.6698	0.996	0.9104	F(5,609)=821.90	0.0000	86.68	0.0000	86.09	0.0000	345.16	0.0000	207.05	0.0000
Croatia	0.7085	1.436	0.8380	F(5,663)=279.88	0.0000	684.44	0.0000	46.72	0.0000	102.68	0.0000	236.25	0.0000

Test name	Author	Null hypothesis
Hansen J-statistic	Hansen (1982)	Ho: Instruments are properly excluded
Anderson-Rubin Wald Test	Anderson and Rubin (1949)	Ho: Joint significance of endogenous regressors
F-statistic of excluded Instrumental	Staiger and Stock (1997)	Ho: Excluded IV are jointly significant
Kleibergen-Paap rk LM statistic	Kleibergen and Paap (2006)	Ho: Model is underidentified
Kleibergen-Paap rk Wald statistic	Kleibergen and Paap (2006)	Ho: Model is underidentified
Stock-Wright LM statistic	Stock and Wright (2000)	Ho: Joint significance of endogenous regressors

Source: Author's calculations.

Table A10. Projected probabilities of being a caregiver in the presence of unmet needs for formal care, conditioned on having labour force participation problems

Country	Pr[Caregiver=1,Prob=1 Unmet needs=1]		Pr[Caregiver=1,Prob=0 Unmet needs=1]		Pr[Caregiver=1,Prob=1 Unmet needs=0]		Pr[Caregiver=1,Prob=0 Unmet needs=0]	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Belgium	0.5630	0.2370	0.4370	0.2495	0.3409	0.2512	0.6591	0.2378
Denmark	0.6790	0.2228	0.3210	0.2345	0.2157	0.2014	0.7843	0.2068
Germany	0.5964	0.2342	0.4036	0.2465	0.5032	0.2510	0.4968	0.2510
Greece	0.5964	0.2352	0.4036	0.2476	0.5420	0.2402	0.4580	0.2501
Spain	0.5213	0.2397	0.4787	0.2523	0.5857	0.2408	0.4143	0.2477
France	0.7403	0.2093	0.2597	0.2203	0.2682	0.2232	0.7318	0.2226
Ireland	0.5881	0.2351	0.4119	0.2475	0.2912	0.2440	0.7088	0.2283
Italy	0.5469	0.2380	0.4531	0.2505	0.4534	0.2503	0.5466	0.2506
Lux.	0.5479	0.2381	0.4521	0.2506	0.4260	0.2500	0.5740	0.2490
Netherlands	0.5006	0.2434	0.4994	0.2562	0.4267	0.2183	0.5733	0.2494
Portugal	0.7150	0.2155	0.2850	0.2268	0.2718	0.2273	0.7282	0.2234
UK	0.4620	0.2386	0.5380	0.2512	0.4697	0.2466	0.5303	0.2508
Austria	0.5890	0.2368	0.4110	0.2493	0.6197	0.2405	0.3803	0.2446
Sweden	0.7127	0.2160	0.2873	0.2274	0.1965	0.2214	0.8035	0.1994
Finland	0.5896	0.2347	0.4104	0.2470	0.4821	0.2489	0.5179	0.2510
Cyprus	0.6000	0.2346	0.4000	0.2469	0.5097	0.2504	0.4903	0.2521
Czech Rep.	0.5070	0.2389	0.4930	0.2515	0.4232	0.2514	0.5768	0.2482
Estonia	0.6263	0.2310	0.3737	0.2432	0.4174	0.2456	0.5826	0.2478
Hungary	0.3203	0.2242	0.6797	0.2360	0.5376	0.1921	0.4624	0.2503
Latvia	0.6596	0.2270	0.3404	0.2389	0.2699	0.2485	0.7301	0.2230
Lithuania	0.5670	0.2370	0.4330	0.2495	0.3021	0.2498	0.6979	0.2307
Malta	0.5101	0.2423	0.4899	0.2551	0.6047	0.2044	0.3953	0.2457
Poland	0.5579	0.2381	0.4421	0.2506	0.4904	0.2330	0.5096	0.2511
Slovakia	0.6093	0.2328	0.3907	0.2451	0.5226	0.2465	0.4774	0.2512
Slovenia	0.5756	0.2368	0.4244	0.2493	0.4441	0.2466	0.5559	0.2497
Bulgaria	0.5859	0.2361	0.4141	0.2485	0.4112	0.2416	0.5888	0.2473
Romania	0.6516	0.2290	0.3484	0.2411	0.4893	0.2456	0.5107	0.2513
Turkey	0.8543	0.1688	0.1457	0.1777	0.7351	0.1629	0.2650	0.2218
Croatia	0.5457	0.2384	0.4543	0.2509	0.3930	0.2480	0.6070	0.2452

Using country weights representing the population aged 15+.

Source: Author's calculations.

Table A11. Projected probabilities of being a caregiver under the conditions of labour force participation problems and unmet needs

Country	Pr[Caregiver=1,Unmet needs=1 Problems=1]		Pr[Caregiver=1,Unmet needs=0 Problems=1]		Pr[Caregiver=1,Unmet needs=1 Problems=0]		Pr[Caregiver=1,Unmet needs=0 Problems=0]	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Belgium	0.5672	0.2490	0.4328	0.2490	0.3371	0.1372	0.6629	0.2372
Denmark	0.3473	0.2402	0.6527	0.2402	0.5224	0.1506	0.4776	0.2506
Germany	0.5855	0.2475	0.4145	0.2475	0.5144	0.1510	0.4856	0.2510
Greece	0.7297	0.2232	0.2703	0.2232	0.3931	0.1457	0.6069	0.2457
Spain	0.6647	0.2375	0.3353	0.2375	0.4371	0.1503	0.5629	0.2503
France	0.5137	0.2520	0.4863	0.2520	0.4972	0.1509	0.5028	0.2509
Ireland	0.4649	0.2511	0.5351	0.2511	0.4031	0.1463	0.5969	0.2463
Italy	0.4944	0.2517	0.5056	0.2517	0.5060	0.1516	0.4940	0.2516
Lux.	0.4890	0.2518	0.5110	0.2518	0.4845	0.1516	0.5155	0.2516
Netherlands	0.7541	0.2179	0.2459	0.2179	0.1957	0.1010	0.8043	0.2010
Portugal	0.5028	0.2518	0.4972	0.2518	0.4808	0.1507	0.5192	0.2507
UK	0.5622	0.2496	0.4378	0.2496	0.3720	0.1432	0.6280	0.2432
Austria	0.7266	0.2247	0.2734	0.2247	0.4677	0.1525	0.5323	0.2525
Sweden	0.4703	0.2516	0.5297	0.2516	0.4059	0.1462	0.5941	0.2462
Finland	0.5247	0.2509	0.4753	0.2509	0.5477	0.1499	0.4523	0.2499
Cyprus	0.5489	0.2509	0.4511	0.2509	0.5617	0.1501	0.4383	0.2501
Czech Rep.	0.5068	0.2514	0.4932	0.2514	0.4233	0.1484	0.5767	0.2484
Estonia	0.5214	0.2514	0.4786	0.2514	0.5243	0.1509	0.4757	0.2509
Hungary	0.6861	0.2332	0.3139	0.2332	0.2005	0.1019	0.7995	0.2019
Latvia	0.5829	0.2489	0.4171	0.2489	0.3389	0.1377	0.6611	0.2377
Lithuania	0.5056	0.2518	0.4944	0.2518	0.3566	0.1406	0.6434	0.2406
Malta	0.7983	0.2019	0.2017	0.2019	0.2870	0.1291	0.7130	0.2291
Poland	0.6368	0.2417	0.3632	0.2417	0.3031	0.1315	0.6969	0.2315
Slovakia	0.5144	0.2512	0.4856	0.2512	0.6171	0.1443	0.3829	0.2443
Slovenia	0.6700	0.2366	0.3300	0.2366	0.3479	0.1396	0.6521	0.2396
Bulgaria	0.5590	0.2499	0.4410	0.2499	0.2802	0.1260	0.7198	0.2260
Romania	0.7455	0.2195	0.2545	0.2195	0.3796	0.1444	0.6205	0.2444
Turkey	0.5577	0.2492	0.4423	0.2492	0.2728	0.1267	0.7272	0.2267
Croatia	0.6259	0.2434	0.3741	0.2434	0.3173	0.1338	0.6827	0.2338

Using country weights representing the population aged 15+.

Source: Author's calculations.

Table A12. Projected probabilities of being a caregiver and having labour force participation problems, conditioned on unmet needs for formal care

Country	Pr[Caregiver=1 Man=1]		Pr[Caregiver=1 Woman=1]		Pr[Caregiver=1,Problems=1 Man=1]		Pr[Caregiver=1,Problems=1 Woman=1]	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Belgium	0.5502	0.0879	0.6069	0.0944	0.2250	0.1199	0.3902	0.1453
Denmark	0.4598	0.0754	0.5363	0.0877	0.0400	0.0185	0.1170	0.0361
Germany	0.4100	0.0982	0.5402	0.0964	0.0673	0.0164	0.1373	0.0252
Greece	0.6457	0.1278	0.6719	0.1330	0.1983	0.1000	0.6121	0.1285
Spain	0.5352	0.0926	0.5768	0.1095	0.3692	0.0807	0.3996	0.1070
France	0.4645	0.0875	0.5111	0.0889	0.0929	0.0450	0.1285	0.0536
Ireland	0.4613	0.0779	0.4786	0.0877	0.2707	0.1079	0.3575	0.1189
Italy	0.4496	0.1023	0.4988	0.1162	0.2032	0.0645	0.2587	0.0738
Lux.	0.5228	0.1122	0.5930	0.0914	0.2876	0.0853	0.3861	0.0909
Netherlands	0.4421	0.0917	0.5542	0.1096	0.1711	0.0740	0.4135	0.1113
Portugal	0.4179	0.0912	0.4721	0.0883	0.0592	0.0170	0.1678	0.0420
UK	0.4801	0.1057	0.5791	0.1091	0.1442	0.0470	0.2518	0.0633
Austria	0.4777	0.1015	0.5118	0.1020	0.3058	0.0905	0.4020	0.0881
Sweden	0.5342	0.0962	0.5712	0.0894	0.1825	0.0603	0.1999	0.0567
Finland	0.5583	0.0985	0.5890	0.1102	0.2421	0.0813	0.2590	0.0836
Cyprus	0.5746	0.1355	0.6430	0.1175	0.3197	0.0951	0.4629	0.1162
Czech Rep.	0.5480	0.1025	0.6914	0.1075	0.2476	0.0947	0.4401	0.1066
Estonia	0.5753	0.1064	0.5785	0.1060	0.1529	0.0491	0.1532	0.0473
Hungary	0.5641	0.0998	0.6929	0.1111	0.3655	0.1149	0.4261	0.1156
Latvia	0.5848	0.1152	0.6613	0.1149	0.1101	0.0647	0.2468	0.1006
Lithuania	0.5955	0.1253	0.6515	0.1172	0.0670	0.0267	0.2215	0.0597
Malta	0.7636	0.0692	0.7653	0.1026	0.2654	0.1194	0.6817	0.1193
Poland	0.5255	0.1021	0.6045	0.0931	0.3144	0.1010	0.3689	0.1069
Slovakia	0.4909	0.1072	0.5813	0.0909	0.1722	0.0380	0.2171	0.0356
Slovenia	0.5403	0.0990	0.5884	0.1077	0.3927	0.1082	0.5074	0.1197
Bulgaria	0.7000	0.1043	0.7453	0.1232	0.3460	0.1185	0.3813	0.1257
Romania	0.6362	0.1124	0.6980	0.1068	0.2921	0.0777	0.4205	0.0844
Turkey	0.5746	0.1104	0.6709	0.1185	0.2218	0.0953	0.5477	0.0980
Croatia	0.5434	0.1193	0.6303	0.1247	0.3789	0.1137	0.4310	0.1158

Using country weights representing the population aged 15+.

Source: Author's calculations.

Table A13. Projected probabilities of having labour force participation problems according to professional situation

Country	Pr[Problems=1 Professional=1]		Pr[Problems=1 Business proprietor=1]		Pr[Problems=1 White collar=1]		Pr[Problems=1 Qualified worker=1]		Pr[Problems=1 No qualified worker=1]	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Belgium	0.8225	0.1588	0.8262	0.1525	0.8917	0.0912	0.7797	0.1577	0.2753	0.0597
Denmark	0.1064	0.0704	0.1496	0.0882	0.1332	0.0586	0.0984	0.0308	0.0727	0.0424
Germany	0.1144	0.0296	0.1371	0.0380	0.1351	0.0400	0.1184	0.0353	0.0983	0.0369
Greece	0.2201	0.1024	0.6234	0.1601	0.8203	0.1082	0.8788	0.0915	0.1586	0.1187
Spain	0.6594	0.3123	0.5870	0.1803	0.5742	0.0602	0.4987	0.1581	0.2919	0.1240
France	0.2246	0.1109	0.2929	0.1019	0.3736	0.0808	0.3153	0.0867	0.0582	0.0382
Ireland	0.6835	0.2273	0.8919	0.0808	0.6018	0.1621	0.7012	0.1209	0.1601	0.1062
Italy	0.1032	0.0861	0.3172	0.1263	0.4917	0.0979	0.3199	0.1267	0.1801	0.0825
Lux.	0.4132	0.2134	0.4592	0.1354	0.3781	0.1209	0.5367	0.1303	0.2589	0.1164
Netherlands	0.8814	0.4033	0.5242	0.1392	0.7084	0.1135	0.6162	0.1417	0.1270	0.0790
Portugal	0.0736	0.0497	0.1330	0.0578	0.1231	0.0611	0.1155	0.0557	0.1148	0.0557
UK	0.1600	0.0756	0.3218	0.1007	0.2959	0.0494	0.2839	0.0829	0.1583	0.0836
Austria	0.7132	0.3327	0.7103	0.1652	0.5959	0.1256	0.4721	0.1291	0.2776	0.1189
Sweden	0.3338	0.1523	0.2271	0.1049	0.2561	0.1222	0.1922	0.1114	0.1827	0.0812
Finland	0.3473	0.1586	0.4181	0.1460	0.3976	0.1387	0.3752	0.1404	0.1790	0.0954
Cyprus	0.9152	0.0503	0.8037	0.1841	0.7926	0.1393	0.8141	0.1165	0.2248	0.0760
Czech Rep.	0.5005	0.1695	0.7197	0.1238	0.7994	0.1062	0.5473	0.1587	0.2409	0.1181
Estonia	0.2519	0.1325	0.2271	0.1185	0.1459	0.0748	0.1704	0.0707	0.1415	0.0656
Hungary	0.4712	0.1981	0.6791	0.1567	0.8326	0.0624	0.6252	0.1670	0.1891	0.0921
Latvia	0.7227	0.1099	0.8347	0.0432	0.5839	0.1537	0.5719	0.1063	0.0647	0.0447
Lithuania	0.4163	0.0784	0.2015	0.1027	0.1984	0.0614	0.3361	0.1047	0.1068	0.0553
Malta	0.9930	0.0034	0.8607	0.1286	0.7896	0.0585	0.8387	0.1098	0.1347	0.1024
Poland	0.7730	0.1325	0.6651	0.1470	0.5514	0.1427	0.4761	0.1596	0.1957	0.1088
Slovakia	0.1858	0.0657	0.1921	0.0425	0.1825	0.0400	0.1999	0.0455	0.2006	0.0593
Slovenia	0.8331	0.1574	0.8475	0.0554	0.8255	0.0492	0.8362	0.0868	0.2742	0.1246
Bulgaria	0.9612	0.0219	0.7231	0.2083	0.6252	0.1775	0.7499	0.1492	0.1531	0.0816
Romania	0.7523	0.3012	0.7902	0.0167	0.6654	0.0885	0.4842	0.1219	0.3001	0.1116
Turkey	0.9178	0.3332	0.7096	0.0991	0.6598	0.1154	0.5825	0.1376	0.1024	0.0654
Croatia	0.5744	0.1958	0.5965	0.1623	0.7903	0.1125	0.6586	0.1156	0.2750	0.1528

Using country weights representing the population aged 15+.

Source: Author's calculations.

ANCIEN

Assessing Needs of Care in European Nations



FP7 HEALTH-2007-3.2-2

L launched in January 2009, ANCIEN is a research project financed under the 7th EU Research Framework Programme. It runs for a 44-month period and involves 20 partners from EU member states. The project principally concerns the future of long-term care (LTC) for the elderly in Europe and addresses two questions in particular:

- 1) How will need, demand, supply and use of LTC develop?
- 2) How do different systems of LTC perform?

The project proceeds in consecutive steps of collecting and analysing information and projecting future scenarios on long term care needs, use, quality assurance and system performance. State-of-the-art demographic, epidemiologic and econometric modelling is used to interpret and project needs, supply and use of long-term care over future time periods for different LTC systems.

The project started with collecting information and data to portray long-term care in Europe (WP 1). After establishing a framework for individual country reports, including data templates, information was collected and typologies of LTC systems were created. The collected data will form the basis of estimates of actual and future long term care needs in selected countries (WP 2). WP 3 builds on the estimates of needs to characterise the response: the provision and determinants of formal and informal care across European long-term care systems. Special emphasis is put on identifying the impact of regulation on the choice of care and the supply of caregivers. WP 6 integrates the results of WPs 1, 2 and 3 using econometric micro and macro-modelling, translating the projected needs derived from WP2 into projected use by using the behavioral models developed in WP3, taking into account the availability and regulation of formal and informal care and the potential use of technological developments.

On the backbone of projected needs, provisions and use in European LTC systems, WP 4 addresses developing technology as a factor in the process of change occurring in long-term care. This project will work out general principles for coping with the role of evolving technology, considering the cultural, economic, regulatory and organisational conditions. WP 5 addresses quality assurance. Together with WP 1, WP 5 reviews the policies on LTC quality assurance and the quality indicators in the EU member states, and assesses strengths, weaknesses, opportunities and threats of the various quality assurance policies. Finally WP 7 analyses systems performance, identifying best practices and studying trade-offs between quality, accessibility and affordability.

The final result of all work packages is a comprehensive overview of the long term care systems of EU nations, a description and projection of needs, provision and use for selected countries combined with a description of systems, and of quality assurance and an analysis of systems performance. CEPS is responsible for administrative coordination and dissemination of the general results (WP 8 and 9). The Belgian Federal Planning Bureau (FPB) and the Netherlands Bureau for Economic Policy Analysis (CPB) are responsible for scientific coordination.

For more information, please visit the ANCIEN website (<http://www.ancien-longtermcare.eu>).