Home care for the elderly: the role of relatives, friends and neighbors

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Abstract   We use data from the Survey of Health, Ageing and Retirement in Europe to examine the hours of home care received by the elderly. The existing empirical literature has mostly examined informal home care from children and formal home care. We identify two additional informal home care providers, namely, relatives (other than children) and friends (including neighbors) who provide about 30 % of the hours of informal home care. Our main new empirical finding is that single elderly persons who can rely less on children—and in particular daughters—for their home care receive not only more formal care but also more care from friends and neighbors. These findings suggest that policymakers need to take into account not only home care provision from children but also home care provision from friends and neighbors to obtain accurate projections concerning the increasing costs of formal care programs due to an aging population.

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1 Introduction

The proportion of people aged 65 and over in Europe is currently around 17 % but will rise to about 30 % by 2050 (Eurostat 2008). Such aging of the European population, the result of declining mortality and fertility rates over the last century, has raised concerns about the social cohesion and sustainability of the welfare state (Hantrais 1999; Lee 2003). One consequence of an aging population is an increase in the demand for home care due to the limitations that elderly people experience in daily activities and the help they need for basic tasks like house cleaning and personal care (Comas-Herrera et al. 2006; Pickard et al. 2007). Such home care for the elderly may be provided by family or friends (informal care), or by professional home care institutions, often part of the welfare system (formal care).

In order to obtain accurate projections concerning the abovementioned increasing costs of formal home care, public policymakers require insights into the extent to which the different informal care providers can meet the demand for home care. Evidence from previous studies shows, for instance, that informal care from children reduces the probability of nursing home entry (Charles and Sevak 2005) and is a net substitute for formal home care (van Houtven and Norton 2004; Bonsang 2008; Bolin et al. 2008a). Concerning these latter findings, an additional important policy consideration is that friends and relatives, other than children, are likely to be of a similar age to the elderly and retired, which makes policies aimed at stimulating their care provision less likely to adversely affect labor supply than when stimulating care provision from children who are usually labor market participants (Bolin et al. 2008b; Wolf and Soldo 1994).

To this end, most of the existing empirical literature focuses on spouses or children, while other types of informal care providers are neglected: as mentioned by Byrne et al. (2009), multiple informal care provision is still under-studied. The main contribution of our paper is to fill this gap in the literature and to empirically analyze the care provision from friends and relatives, other than children, in addition to formal home care and informal home care from adult children. The extant literature supports the importance of our analysis. First, informal care provision from friends and relatives is quantitatively relevant. Spillman and Pezzin (2000) show that 13.1 % of elderly Americans with a chronic disability receive care from friends or relatives other than a spouse or from children. We use data on elderly individuals (aged 65 years or older) across nine European countries and show that, on average, about 30 % of the weekly hours of informal care from outside the household are received from friends, neighbors or relatives other than children. Second, the opportunity cost of providing care plays an important role in the theoretical models which economists use to examine care-giving choices. In a standard revealed preferences approach, individuals decide how much time to devote to home care on the basis of their opportunity cost, i.e. the forgone benefits due to the time spent on providing care. The opportunity cost of providing care is, therefore, likely to depend on the characteristics of each type of care provider. As van Houtven and Norton (2008) state, financial and blood ties of elderly with their children are stronger than with their friends and other relatives, but a retired friend or neighbor could find it more pleasant to spend time providing help than would a

daughter of working age who, possibly, has children of her own to care for. Therefore, inferences on preferences obtained from an analysis of one type of care provider cannot be extended to other providers. Third, Lakdawalla and Philipson (2002) show that the need for formal care has reduced as a result of decreased male mortality over time, which translated into a shorter period of widowhood for wives and a longer period during which the spouses took care of each other. The authors then make the more general claim that a reduction in disability rates among the elderly could expand the non-market supply of home care, since an elderly person with no demand for home care may, in fact, become a supplier of informal care. Along this line of reasoning, we argue that friends and relatives other than children may be important home care providers.

In our empirical analysis we relate the hours of home care received by the elderly from different potential care providers to their health limitations and children's characteristics. In addition to formal home care provision, and as mentioned above, we distinguish informal care provisions from adult children (including their spouses), from relatives other than children (e.g. siblings) and from friends (including neighbors). We use data from the Survey of Health, Ageing and Retirement in Europe. These data are particularly relevant for our analysis since they contain detailed information on the hours of home care from different care providers. Our primary new empirical finding is that single elderly people who, *ceteris paribus*, rely less on children for the provision of home care, e.g., because they have only one child or their children live far away, receive more hours of home care from friends and neighbors and not only more hours of formal home care.

This paper is organized as follows: Sect. 2 introduces the data and provides descriptive evidence of the quantitative relevance of care provision from friends and relatives; Sect. 3 discusses a theoretical framework, emphasizing the differences in opportunity cost among informal care providers, and outlines the empirical model. Section 4 presents and discusses the empirical results, while Sect. 5 summarizes the main findings and discusses the policy implications.

2 Data

We use data from the first and second waves of the Survey of Health, Ageing, and Retirement in Europe (SHARE). SHARE is a multidisciplinary cross-national survey of the population aged 50 years and over, and the first wave was conducted in 2004/2005 in twelve European countries and the second wave was conducted in 2006/2007 in fifteen European countries.[1] The nine countries that are in both waves and are included in our analysis are Austria, Germany, Sweden, the Netherlands,

Table 1 Numbers of households by survey year, age and country

	In wave 1	In wave 2	In both waves
Age			
65–69	1,513	1,454	914
70–74	1,345	1,345	766
75–79	1,164	1,109	656
80–84	761	795	403
85+	408	450	151
All	5,191	5,153	2,890
Country			
Austria	459	323	230
Germany	632	617	282
Sweden	743	690	433
Netherlands	624	568	330
Spain	367	368	148
Italy	419	626	267
France	657	638	385
Denmark	422	614	266
Belgium	868	709	549
All	5,191	5,153	2,890

Wave 1 has been conducted in 2004 and 2005 and wave 2 has been conducted in 2006 and 2007

Spain, Italy, France, Denmark and Belgium.[2] Our analysis focuses on elderly households and, in line with the relevant studies mentioned in the introduction, we select single persons aged 65 years or older and couples (married or cohabiting) of whom at least one member is aged 65 years or older. The raw data on these singles and couples in nine countries cover about 9,000 households that are in one or both waves. SHARE contains information on the hours of home care provided by people from outside the household. When the elderly receive help from co-residing children or other co-residing adults such as siblings, we do not observe the amount of hours they provide. We therefore exclude about 12 % of the households with co-residing adults and children from the analysis. Finally, as van Houtven and Norton (2004) point out, the types of care needed by institutionalized individuals differ substantially from those of the elderly living at home. For this reason, we exclude a further 3 % of the households with a member who is institutionalized at the time of the sample selection.

Once observations with missing values on the variables of interest are removed, the final sample consists of 5,191 households in wave 1 and 5,153 households in wave 2. About 56 % of the households are in both waves (see Table 1). About 54 % of the households are married or cohabiting couple households (hereafter, "couples") and the remaining 46 % are never married, widowed or divorced single

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[2] Information on formal home care is missing for Greece and Switzerland and these two countries are therefore excluded from the analysis (about 14 % of the total sample).

Table 2 Home care provision to households by age and marital status/gender

Marital status			Incidence of home care by provider					Weekly hours of home care conditional on receiving home care from any provider, by provider				
Gender			Children	Relatives	Friends	Formal care	All	Children	Relatives	Friends	Formal care	All
Age[a]	n[b]		%	%	%	%	%	Average	Average	Average	Average	All
Couples												
65–69	1,870		5.6	2.3	5.2	4.9	15.5	1.6	1.1	0.9	0.6	4.3
70–74	1,633		7.2	2.1	4.3	8.6	18.6	2.6	0.7	0.5	1.0	4.8
75–79	1,146		9.4	3.3	5.6	13.6	26.1	3.7	0.4	0.4	2.1	6.7
80–84	684		14.2	2.2	5.6	22.4	36.0	2.9	0.5	0.2	2.4	6.1
85+	224		21.9	3.1	10.3	34.4	49.1	3.8	0.4	0.7	5.6	10.6
All	5,557		8.6	2.5	5.3	11.1	22.5	2.8	0.7	0.5	1.9	5.9
Single men												
65–69	344		3.8	8.1	9.6	7.0	25.0	0.7	2.8	1.1	1.3	6.0
70–74	282		8.2	8.2	10.3	17.7	33.7	2.4	0.6	1.3	2.0	6.3
75–79	275		6.2	11.6	12.7	19.3	38.9	0.7	0.7	0.7	2.5	4.5
80–84	182		20.3	8.2	14.3	29.7	52.2	3.3	1.0	1.0	2.3	7.7
85+	176		31.3	5.7	8.0	50.0	63.6	7.3	0.3	1.0	5.0	13.6
All	1,259		11.5	8.6	10.9	21.4	39.3	3.0	1.0	1.0	2.8	7.8
Single women												
65–69	753		13.8	6.8	14.6	9.6	33.1	2.5	0.9	1.0	1.1	5.5
70–74	775		17.9	5.8	13.7	13.0	36.8	3.6	0.7	1.3	1.5	7.1
75–79	852		22.9	7.4	10.8	22.3	46.4	3.6	0.7	0.5	1.7	6.5
80–84	690		29.6	6.2	14.8	34.8	58.7	4.5	0.6	0.8	2.8	8.7
85+	458		35.2	7.2	14.8	57.6	74.9	5.7	0.6	1.3	4.8	12.5

Table 2 continued

Marital status				Incidence of home care by provider					Weekly hours of home care conditional on receiving home care from any provider, by provider				
Gender				Children	Relatives	Friends	Formal care	All	Children	Relatives	Friends	Formal care	All
Age[a]	n[b]			%	%	%	%		Average	Average	Average	Average	
All	3,528			22.8	6.7	13.5	24.6	47.5	4.1	0.7	0.9	2.5	8.2

[a] For couples, age is based on the oldest person in the household

[b] Number of observations

person households ("singles") (see first column of Table 2). Of the singles, 74 % are women.

2.1 Descriptive statistics on the hours of home care

SHARE adopts the OECD definition of long-term care (Fujisawa and Colombo 2009). Informal home care, defined as unpaid home care, includes three tasks: (1) personal care, such as dressing, bathing or showering, eating, getting in or out of bed, using the toilet; (2) help with practical household tasks, such as home repairs, gardening, transportation, shopping, household chores; and (3) help with paperwork, such as filling out forms and settling financial or legal matters. The data contain detailed information on the identity of the first three informal home care providers, each of whom could have any relationship to the elderly respondent. Informal care provision from more than one provider is quite common: among the households which receive informal home care, 25 % report having two and 12 % report having three informal home care providers. We distinguish three types of informal home care providers: (1) adult children and their spouses (referred to as children); (2) other relatives such as siblings and cousins (referred to as relatives); and (3) friends and neighbors (referred to as friends). Respondents report how often and for how much time they or their (co-residing) partners have been receiving informal care from each provider. The relatively large fraction of respondents reporting three informal care providers may raise concerns on selectivity induced by the questionnaire: respondents who receive help from four or more informal caregivers may systematically disregard a given category of helper. We tested for that by also doing the whole empirical analysis on the selected subsample of non-constrained respondents, i.e. those who report at most two informal care providers, and the main results were unaffected by this selection.

Formal home care, defined as professional or paid home care, includes three tasks: (1) nursing or personal care, (2) home help, and (3) meals-on-wheels. Meals-on-wheels is registered in number of weeks per year in which this service was received and we transformed this variable into hours of care by assuming that it is one hour per meal. One hour is an arbitrary choice but using a different assumption, or even excluding meals-on-wheels as a formal care provision, leaves the main conclusions of this paper unchanged.

Table 2 shows the incidence and average number of hours of home care from the four different types of home care providers for couples, single men and single women. The overall picture that emerges is that, on average, the elderly singles or couples receive about 30 % of their informal home care from relatives and friends. Children provide the remaining 70 % of informal care. The incidence and average hours of informal home care increase with age and couples receive less home care than singles. This latter observation suggests that if a respondent is married, the partner, rather than someone outside the household, provides care, or that married individuals are healthier. A comparison of single men and women also reveals a noteworthy difference: single men receive less home care from children compared to single women. The total number of hours of formal care is on average lower than the total hours of informal care (accounting both for incidence and hours of care),

which may partly be explained by a difference in care efficiency (see, e.g., Byrne et al. 2009). Singles receive more formal care than couples and the amount of formal home care increases with age. Moreover, the relative importance of formal home care increases with age among couples, which may be the result of a decrease with age in the ability of the spouse to provide care.

There are significant differences across European countries in formal and informal care provision, which, according to Reher (1998), could reflect a mix of cultural and institutional differences. The relatively few observations per country prevent a thorough analysis of home care provision at a country level, but in the empirical analysis we include country-specific effects to control for the impact on the levels of home care provisions due to these differences.[3]

Table 6 in the appendix provides the definitions of all variables that are included in the analysis. Details about health limitations and socio-economic characteristics of the elderly and their children can be found in Tables 7, 8, and 9 in the appendix.

3 Theoretical background and empirical model

This section first discusses the theoretical background for the supply and demand of informal and formal home care from outside the household. Insights into the trade-offs faced by home care providers are particularly helpful for the empirical specification of the model and the interpretation of the results.[4] Next we outline the empirical model for analyzing the effects of health limitations and family structure on the hours of home care received by the elderly.

3.1 Theoretical background

Our theoretical framework follows van Houtven and Norton (2004), who, as do many others, model the informal care decision by building upon the seminal article of Grossman (1972).[5] The individual requiring home care is the potential care receiver, while those supplying informal home care (i.e. children, other relatives and friends) are the potential informal care providers. Private institutions and the State are formal home care providers. The health status of the elderly is a function of past health shocks, chronic diseases and impairments in daily living, but also of the received home care. The elderly weight the help from each potential care provider

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[3] For single elderly we carried out our empirical analysis separately for North (Sweden, Denmark, The Netherlands), Central (Austria, Germany, Belgium, France) and South (Italy, Spain) European countries. Although a separate analysis yields fewer statistically significant results, our main conclusions are by and large the same.

[4] See Byrne et al. (2009) for a structural model of family decisions about the provision of informal, versus formal, care for the elderly.

[5] The Grossman model of health capital has been extended in several ways and not only to include long-term care as an input in the health function. As an example, Anderson and Grossman (2009) clarify the relation between health and human capital accumulation processes, which is crucial for a proper life cycle analysis of household economic decisions.

differently in the health production function, depending on their preferences towards each of them.

The care receiver maximizes her utility, which depends on actual health status and consumption, subject to a budget constraint and given the informal care which children, other relatives and friends are willing to supply. Likewise, each potential home care provider maximizes her utility function by choosing consumption, leisure and informal care, subject to a budget constraint. An altruistic potential care provider incorporates the health of the elderly into her own utility (Becker 1976) and decides how much care to provide, depending on her degree of altruism toward the care receiver and her opportunity cost of providing informal care. The crucial difference from van Houtven and Norton (2004) is that we account for multiple informal care providers who differ in their degree of altruism towards the care receiver due to different blood and financial ties (van Houtven and Norton 2008), and different opportunity costs, i.e., the provider's forgone benefits due to spending time on providing care. Van den Berg et al. (2004) and Posnett and Jan (1996) stress the fact that the opportunity cost of each type of care provider depends on which specific alternative activity is displaced. Adult children give up working hours or leisure in order to take care of their parents, and thus the wage rate seems the best proxy for the shadow price of providing care. On the contrary, informal care provided by retired siblings or other relatives of the elderly is provided at the cost of leisure time or unpaid work and, thus, the distance from the care receiver may be a better proxy for the opportunity cost of informal care. Finally, friends and neighbors, despite their weak blood ties with the receiver, are likely to be elderly individuals, retired from work and living nearby; thus, their opportunity cost is likely to be lower than the one of, for instance, children. If health costs are taken into account as well, the difference in the opportunity cost of caring between adult children on the one hand and elderly caregivers such as friends, neighbors on the other, may be even larger. While providing care to the elderly has been found to negatively affect the health of caregivers (van Houtven et al. 2005), in a recent contribution, Ku et al. (2012) show that providing care to grandchildren is health-enhancing for elderly grandparents.

Summarizing, the key point of these theoretical considerations is that since different types of informal care providers are likely to differ in the activity that is displaced when providing care and therefore in the opportunity cost of caring, the observed informal care provision of one type of provider does not convey information on the preferences of another type of provider. From an empirical point of view, this points to the necessity of analyzing informal care differentiated by the type of provider.

3.2 Empirical model

Our aim is to evaluate the determinants of hours of home care from the different providers that are outside the household. We cannot include the spouse explicitly as a care provider in our analysis since SHARE does not provide data on the intensity of care supplied within the household. Nevertheless, the literature stresses the role of the partner as main care provider (see, e.g., Zhou et al. 2003). To take this into

account, we perform our analysis separately for single person and couple households, thus conditioning on the supply of care within households.

The model we estimate is a two-part model (see, e.g., Cameron and Trivedi 2005). The first part models the incidence of receiving home care from any of the four providers. The second part models, conditional on receiving care, the hours of home care from each of the four providers who, according to the theoretical considerations discussed above, are likely to have different opportunity costs of caring. This two-part model assumes for identification that, conditional on the explanatory variables, the incidence of home care is independent of the intensity of home care provision.[6] The incidence and numbers of hours of home care a household receives from each of the four providers are related to variables that the theoretical model identifies as important determinants of home care, such as children's characteristics and health limitations.

The first part is modeled using a probit specification:

$$\Pr\big(HC > 0|X, H^W, H^M, X^C\big) = \Phi\big(\alpha_0 + X\alpha_1 + H^W\alpha_2 + H^M\alpha_3 + X^C\alpha_4\big), \quad (1)$$

where HC is the total hours of home care received from all four providers and Φ is the cumulative standard normal distribution function. In the second part the numbers of hours of home care from each of the four providers are modeled using the following multivariate Tobit specification:

$$IC^c = \max(0, \beta_{10} + X\beta_{11} + H^W\beta_{12} + H^M\beta_{13} + X^C\beta_{14} + \varepsilon_1), \quad (2)$$

$$IC^r = \max(0, \beta_{20} + X\beta_{21} + H^W\beta_{22} + H^M\beta_{23} + X^C\beta_{24} + \varepsilon_2), \quad (3)$$

$$IC^f = \max(0, \beta_{30} + X\beta_{31} + H^W\beta_{32} + H^M\beta_{33} + X^C\beta_{34} + \varepsilon_3), \quad (4)$$

$$FC = \max(0, \beta_{40} + X\beta_{41} + H^W\beta_{42} + H^M\beta_{43} + X^C\beta_{44} + \varepsilon_4). \quad (5)$$

IC^c is the hours of informal home care provided by children, IC^r is the hours of informal home care provided by relatives, IC^f is the hours of informal home care provided by friends, and FC is the hours of formal home care. The error terms in Eq. (2–5) are allowed to be correlated and assumed multivariate normally distributed. We use a tobit specification to allow for zero hours of home care, which will happen for instance if one has no children and is often referred to as a corner solution of the decision process discussed in Sect. 3.1. The model is estimated by Maximum Likelihood and standard errors are clustered at country level (see, e.g., Cameron and Trivedi 2005).

The characteristics of the elderly included in X are household income, sociability, number of siblings and grandchildren, education and age. The children's characteristics, included in X^C, are the number of sons and daughters, their age, marital and employment status, and the distance to their parental home. H^w and H^m are sets of variables on the health limitations for, respectively, the woman and/or man in the household. As discussed in Sect. 2, the model also includes country-specific dummy

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[6] An alternative is to model the hours of home care from each provider unconditional on receiving home care (see, e.g., Pezzin et al. 2009). Our main conclusions are not affected if we employ this alternative model.

variables. The intercept parameters are allowed to differ across the two waves. The variables for children's characteristics are set equal to zero if the respondent has no children and we also include controls for the presence of children. The definitions of all explanatory variables are given in Table 6 in the appendix. Pezzin and Schone (1999) and Stern (1995), among others, have argued that care provision and living arrangements of adult children are joint decisions. If this is the case, explanatory variables such as the distance to the parental home and the employment status of the child are potentially endogenous variables. For this reason the estimated effects will not be given a strong causal interpretation and can be considered associations. Nevertheless, of importance to the objective of our paper is that the estimates provide valuable insights into the characteristics of the households that receive home care from, for instance, friends and neighbors. In this way, we can assess whether or not households who receive care from friends are those that can rely less on their children for home care.

4 Estimation results

The empirical results are reported in Tables 3, 4, and 5. Section 4.1 discusses the estimation results of the model outlined in Sect. 3.2 (Tables 3, 4) and Sect. 4.2 discusses the predictions of the hours of home care received from the four different home care providers, and how these vary with the number of children and their gender and availability (Table 5). We assume a 5 % level of significance when discussing the statistical significance of results.

4.1 Determinants of home care

Table 3 reports the estimation results for single person households of the determinants of the hours of informal home care provided by children, relatives, friends, and formal home care. At the bottom of the table we report F-statistics corresponding to tests for joint significance of the effects of the children's characteristics and for joint significance of the effects of health limitations. The first column shows that the incidence of home care for singles is mainly determined by health limitations. The test results at the bottom of this column show that the effects of children's characteristics on the incidence of home care are not jointly significant while the effects of health limitations on the incidence of home care are jointly significant. The test results at the bottom in the remaining columns corresponding to the hours of home care conditional on receiving care, show that children's characteristics have (jointly) significant effects on the hours of home care from children, relatives and friends but that they have no significant effect on formal home care. These test results, together with the directions of the estimated effects of children's characteristics, suggest that those elderly who can rely less on children to provide home care, have alternative home care arrangements with relatives and friends and in this way they do not only rely more on formal home care. This latter suggestion is in contrast to what is often argued in the literature discussed in the introduction. We explore this issue further in Sect. 4.2.

Table 3 Estimation results for single person households using a two-part model (Eqs. 1–5)

Dependent variable	First part		Second part								
	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care	
	Marginal effect		Parameter		Parameter		Parameter		Parameter	
Explanatory variable	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value
Single male	0.10	0.45	**−47.05**	**−3.46**	9.74	0.70	−9.43	−0.92	7.64	1.25
Log-income	0.00	−0.20	0.24	0.47	0.01	0.03	0.20	0.57	0.34	1.62
Sociability	**0.02**	**2.25**	−0.60	−1.15	0.03	0.06	0.25	0.72	−0.51	−1.73
Number of grandchildren	0.00	0.02	**−0.68**	**−3.89**	**0.36**	**2.02**	0.06	0.49	0.03	0.35
Number of siblings	0.00	0.02	−0.09	−0.37	**0.68**	**2.91**	−0.17	−0.95	−0.13	−1.21
Has sons	−0.06	−0.61	5.73	0.90	4.72	0.78	6.04	1.17	−1.22	−0.37
Number of sons	−0.01	−0.61	**4.63**	**4.78**	**−3.27**	**−2.69**	**−2.00**	**−2.77**	0.25	0.47
Age sons (average)	0.00	0.71	0.05	0.48	−0.22	−1.95	−0.15	−1.69	−0.03	−0.57
Married sons (average)	0.06	1.88	2.47	1.51	−0.26	−0.13	−1.60	−1.27	1.41	1.69
Distance sons (average)	0.01	0.28	**−12.37**	**−4.68**	5.48	1.92	**6.14**	**2.70**	1.49	0.85
Employment sons (average)	−0.06	−1.78	1.85	1.12	−1.31	−0.71	−1.63	−1.10	0.28	0.31
Has daughters	−0.12	−1.22	**22.52**	**3.17**	−3.32	−0.48	−8.16	−1.63	−5.59	−1.66
Number of daughters	0.00	0.04	**2.77**	**3.00**	**−2.97**	**−2.67**	**−2.07**	**−2.67**	0.41	0.91
Age daughters (average)	0.00	1.30	0.00	−0.02	−0.08	−0.62	−0.05	−0.52	0.09	1.57
Married daughters (average)	0.01	0.35	0.21	0.13	−3.46	−1.89	−0.58	−0.52	−1.16	−1.25
Distance daughters (average)	0.00	0.05	**−14.89**	**−4.95**	**7.88**	**2.13**	**11.66**	**4.41**	1.02	0.67
Employment daughters (average)	0.01	0.29	**−3.20**	**−2.01**	1.64	0.85	0.84	0.75	0.91	1.11
Men, age	**0.01**	**3.54**	**0.67**	**3.85**	−0.22	−1.50	−0.02	−0.18	**0.21**	**3.09**
Men, years of education	0.00	0.41	**−0.54**	**−2.20**	−0.06	−0.26	0.05	0.31	0.02	0.19

Table 3 continued

Dependent variable	First part		Second part							
Explanatory variable	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care	
	Marginal effect		Parameter		Parameter		Parameter		Parameter	
	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value
Men, adl	0.00	0.01	−0.40	−0.14	3.13	1.44	1.41	0.73	0.88	0.79
Men, gali	**0.11**	**2.98**	3.68	1.50	−3.01	−1.59	−2.64	−1.40	−0.20	−0.18
Men, IADL	**0.31**	**6.56**	2.72	1.09	0.28	0.15	1.53	0.88	**3.77**	**3.44**
Men, severe condition	0.06	1.63	−4.27	−1.90	−1.62	−0.95	−0.27	−0.19	1.29	1.31
Men, mobility	**0.08**	**1.98**	−1.48	−0.51	−2.08	−1.04	−1.26	−0.77	1.73	1.46
Men, mental health	**0.08**	**1.99**	0.33	0.14	−2.01	−1.04	0.91	0.64	0.85	0.78
Men, numeracy	0.07	1.65	1.45	0.52	−2.49	−1.36	−2.90	−1.65	1.33	1.39
Men, reading	0.10	1.79	**6.77**	**2.04**	4.42	1.66	−1.52	−0.76	−0.11	−0.08
Women, age	**0.01**	**5.49**	0.12	1.00	−0.17	−1.43	**−0.17**	**−2.30**	**0.26**	**5.20**
Women, years of education	0.00	1.03	**−0.46**	**−3.30**	0.06	0.37	−0.08	−0.58	**0.21**	**2.57**
Women, adl	**0.13**	**4.58**	2.19	1.52	2.67	1.63	0.19	0.18	**3.74**	**5.89**
Women, gali	**0.12**	**5.61**	1.19	1.01	−1.14	−0.77	1.35	1.46	**1.78**	**2.90**
Women, IADL	**0.22**	**9.42**	**2.79**	**2.29**	0.47	0.38	0.07	0.09	**3.83**	**6.96**
Women, severe condition	**0.07**	**3.41**	**−3.18**	**−2.70**	1.57	1.15	−0.37	−0.43	**1.66**	**2.94**
Women, mobility	**0.13**	**5.59**	−0.38	−0.30	−1.74	−0.86	0.63	0.65	0.65	0.89
Women, mental health	0.03	1.45	−0.11	−0.09	0.35	0.28	−0.76	−0.84	0.69	1.24
Women, numeracy	−0.02	−0.82	0.84	0.68	−1.27	−0.95	1.07	1.20	**1.27**	**2.11**
Women, reading	**0.08**	**2.53**	3.66	1.91	0.57	0.28	−0.55	−0.39	−0.08	−0.10

Table 3 continued

Dependent variable	First part		Second part							
	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care	
	Marginal effect	z-Value	Parameter	z-Value	Parameter	z-Value	Parameter	z-Value	Parameter	z-Value
Explanatory variable	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value
Correlation children—relatives			**−0.32**	**−4.84**						
Correlation children—friends			**−0.17**	**−2.52**						
Correlation children—formal care			**−0.17**	**−4.19**						
Correlation relatives—friends			**−0.17**	**−2.22**						
Correlation relatives—formal care			**−0.11**	**−2.10**						
Correlation friends—formal care			**−0.20**	**−4.71**						
Joint significance of children's characteristics (*p* value)	0.53		**0.00**		**0.00**		**0.01**		0.33	
Joint significance of health limitations (*p* value)	**0.00**		**0.00**		0.41		0.66		**0.00**	
Log pseudo likelihood	−2,689		−13,871							
Number of observations	4,787		2,172							

The first part is a probit model for the incidence of home care (from any provider) and the second part a multivariate tobit model for the hours of home care from each of the four providers for households that receive home care. The model includes year and country-specific dummy variables. Variable definitions are in Table 6. Estimates significant at a 5 % level are in bold

Table 4 Estimation results for couple households using a two-part model (Eqs. 1–5)

Dependent variable	First part		Second Part								
Explanatory variables	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care	
	Marginal effect		Parameter		Parameter		Parameter		Parameter	
	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value
Log-income	0.01	1.73	1.36	0.91	−0.25	−0.16	0.86	1.59	0.55	1.28
Sociability	0.00	−0.34	0.16	0.24	0.83	0.95	**0.92**	**2.24**	**−1.22**	**−3.71**
Number of grandchildren	0.00	−0.32	0.09	0.29	0.71	1.90	0.01	0.05	−0.06	−0.54
Number of siblings	0.01	1.73	−0.43	−1.16	−0.50	−1.11	0.31	1.55	0.00	−0.02
Has sons	−0.10	−1.34	7.23	0.94	−2.93	−0.24	0.98	0.22	−6.44	−1.53
Number of sons	**0.03**	**2.80**	**3.04**	**2.36**	−1.31	−0.80	−1.67	−1.89	0.06	0.13
Age sons (average)	0.00	1.10	−0.05	−0.37	−0.07	−0.32	−0.14	−1.34	0.11	1.39
Married sons (average)	0.03	1.26	1.68	0.86	2.17	0.61	1.11	0.88	−1.08	−1.10
Distance sons (average)	0.03	0.82	**−10.34**	**−2.55**	0.42	0.08	4.18	1.82	1.18	0.69
Employment sons (average)	**−0.08**	**−3.16**	1.05	0.38	1.21	0.29	−0.10	−0.07	1.28	1.06
Has daughters	−0.09	−1.29	**31.25**	**3.13**	4.17	0.39	**−21.10**	**−2.18**	−4.27	−0.73
Number of daughters	0.02	1.45	**2.82**	**2.20**	−1.65	−1.00	−1.62	−1.87	0.32	0.58
Age daughters (average)	0.00	1.86	−0.31	−1.58	−0.26	−1.26	0.38	1.96	0.05	0.47
Married daughters (average)	−0.01	−0.30	−3.96	−1.82	2.60	0.81	−3.21	−1.94	−1.13	−0.93
Distance daughters (average)	−0.03	−0.97	**−10.54**	**−3.11**	5.30	1.03	**5.87**	**2.29**	2.49	1.38
Employment daughters (average)	0.00	0.19	**−4.96**	**−2.24**	2.18	0.78	2.92	1.76	1.21	1.17
Men, age	0.00	0.98	**0.34**	**2.32**	0.11	0.68	−0.13	−1.87	0.16	1.26
Men, years of education	0.00	1.72	−0.18	−0.96	−0.13	−0.50	0.07	0.68	0.09	0.91
Men, adl	**0.05**	**2.23**	2.21	1.00	−2.64	−0.97	−2.16	−1.73	**3.54**	**3.47**

Table 4 continued

Dependent variable	First part		Second Part								
	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care	
	Marginal effect		Parameter		Parameter		Parameter		Parameter	
Explanatory variables	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value
Men, gali	**0.05**	**3.52**	−0.07	−0.05	−3.01	−1.39	0.09	0.11	−0.02	−0.02
Men, IADL	**0.16**	**7.89**	2.75	1.59	−2.36	−1.00	1.37	1.46	1.49	1.59
Men, severe condition	0.00	−0.26	−2.18	−1.56	−0.72	−0.36	−1.13	−1.29	0.66	0.83
Men, mobility	**0.07**	**4.92**	0.97	0.65	1.66	0.84	**2.67**	**2.43**	0.06	0.08
Men, mental health	0.03	1.93	−1.52	−0.97	1.93	0.84	0.52	0.55	0.92	1.09
Men, numeracy	0.00	−0.27	**4.53**	**2.01**	−2.02	−0.77	−1.27	−0.99	1.24	1.24
Men, reading	0.00	−0.21	0.19	0.08	−9.00	−1.85	−0.17	−0.13	−0.22	−0.20
Women, age	0.00	1.55	0.05	0.32	−0.29	−1.77	−0.11	−1.47	0.01	0.08
Women, years of education	0.00	0.02	−0.48	−1.29	**0.59**	**2.00**	0.03	0.23	0.14	1.39
Women, adl	**0.05**	**2.54**	0.83	0.43	−1.01	−0.35	−1.40	−1.03	**4.76**	**4.87**
Women, gali	**0.06**	**4.63**	2.48	1.63	−3.32	−1.49	−0.74	−0.88	−0.08	−0.13
Women, IADL	**0.10**	**6.20**	1.08	0.65	1.33	0.52	0.04	0.04	1.05	1.64
Women, severe condition	**0.05**	**3.31**	−1.32	−0.81	0.81	0.41	0.81	0.98	1.30	1.91
Women, mobility	0.02	1.70	0.89	0.60	3.49	1.43	−1.11	−1.27	−0.56	−0.65
Women, mental health	0.01	0.88	−0.02	−0.01	3.63	1.79	0.09	0.10	0.81	1.08
Women, numeracy	**0.03**	**2.07**	0.75	0.48	0.41	0.18	−1.00	−0.98	1.00	1.34
Women, reading	−0.02	−0.73	−0.72	−0.21	4.99	1.26	−0.69	−0.42	0.51	0.30
Correlation children - relatives			−0.06	−0.97						

Table 4 continued

Dependent variable	First part		Second Part								
	Home care incidence		Hours of home care Children		Hours of home care Relatives		Hours of home care Friends		Hours of home care Formal care		
	Marginal effect	z-Value	Parameter		Parameter		Parameter		Parameter		
Explanatory variables	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	Estimate	z-Value	
Correlation children - friends			**−0.49**	**−5.44**							
Correlation children - formal care			**−0.23**	**−2.89**							
Correlation relatives - friends			**−0.42**	**−5.42**							
Correlation relatives - formal care			**−0.29**	**−3.11**							
Correlation friends - formal care			−0.19	−1.49							
Joint significance of children's characteristics (p value)	**0.00**		**0.00**		0.90		0.22		0.67		
Joint significance of health limitations (p value)	**0.00**		0.10		0.76		0.96		**0.00**		
Log pseudo likelihood	−2,506.3		−6,989								
Number of observations	5,557		1,248								

The first part is a probit model for the incidence of home care (from any provider) and the second part a multivariate tobit model for the hours of home care from each of the four providers for households that receive home care (see Sect. 3). The model includes year and country-specific dummy variables. Variable definitions are in Table 6. Estimates significant at a 5 % level are in bold

Health status variables have strong and (jointly) significant effects on the incidence of home care and the hours of home care from all four providers. For men, however, the health status variables are mostly, but not all, insignificant for the hours of home care and this may be the result of a relatively low number of observations for this group (see Table 2). Nevertheless, limitations in instrumental activities of daily living (IADL) are for men significantly associated with formal care. For women the results are stronger and show increased hours of home care among women with limitations in (instrumental) activities of daily living (ADL/IADL), and limitations in global activity (GALI).

Hours of formal home care significantly increase with age for both men and women: this is likely due to unobserved health characteristics. However, the hours of informal home care from children, relatives and friends do not significantly increase with age except for home care from children for single men and home care from friends for single women. These age-related findings may be explained in two ways. First, in line with Bonsang (2008), older parents may need more skilled care. Second, as claimed by Lakdawalla and Philipson (2002), as the elderly age, so do their siblings and friends who, at first, could provide home care but then become informal home care receivers because of their worsening health, as suggested by the significant negative effect of age on care from friends for single women. Hence, the number of potential informal care providers other than children reduces with age.

Income has no significant association with the hours of home care and the years of education of men and women are negatively associated with the hours of home care from children. The number of grandchildren is negatively associated with home care from children and positively associated with home care from relatives. While the literature offers some explanations for these results we refrain from further discussion as they are not the primary concern of this paper.

Finally, Table 4 reports the estimation results for couple households of the determinants of the hours of informal home care provided by children, relatives and friends, and formal home care. A dominant observation, when making a comparison with the results in Table 3 for singles, is that for couples the characteristics of the children are insignificantly associated with the care provisions of relatives and friends. This underlines the importance of the spouse as an informal home care provider. The reported F-statistic at the bottom of Table 4 shows that children's characteristics are only associated with informal care from children and, notably, not associated with formal home care. The F-statistics, furthermore, show that health limitations are significantly associated with the incidence of home care and formal care provisions. The statistical relevance of the limitations in activities of daily living (ADL) for formal care provision suggests that these types of limitations are difficult for a spouse to deal with and formal care is needed.

4.2 Predictions

Table 5 reports the predicted hours of home care from the four different providers. In order to obtain these values we use the estimation results from Tables 3 and 4 to first predict the hours of home care for a reference household who receives care. The reference (or baseline) single person household is a single woman who is 70 years

Table 5 Predictions for a reference single person and a reference couple household

| | Baseline situation[a] | | Difference from the baseline | | | | | |
| | One son and one daughter | | Only one son | | Only one daughter | | Increased distance[c] | |
	Estimate	z-Value[b]	Estimate	z-Value[b]	estimate	z-Value[b]	Estimate	z-Value[b]
Single person household								
Children	**7.99**	**4.94**	**−5.61**	**−4.96**	**−4.05**	**−5.08**	**−3.65**	**−4.62**
Relatives	0.54	1.65	**1.02**	**1.92**	**0.84**	**1.93**	**0.40**	**1.78**
Friends	**1.14**	**3.07**	**1.28**	**3.12**	**0.41**	**1.79**	**1.27**	**3.60**
Formal care	**3.08**	**5.76**	**0.68**	**2.10**	−0.18	−0.58	0.35	1.23
Couple household								
Children	**3.33**	**2.18**	**−1.68**	**−2.09**	**−1.13**	**−1.68**	**−1.47**	**−2.11**
Relatives	0.64	1.33	0.19	0.73	0.33	0.96	0.14	0.66
Friends	0.47	1.56	0.50	1.62	0.40	1.51	0.35	1.63
Formal care	**4.50**	**2.62**	0.47	0.75	0.37	0.48	0.64	1.18

[a] Single woman (or a couple), (both) 70 years old, (both) with (I)ADL health limitations, two grandchildren and a son and daughter who are living nearby and are 45 years old, the son works fulltime and the daughter part-time, both are married and median level of education

[b] Estimates significant at a 5 % level are in bold. We use in the second, third, and fourth columns one-sided test statistics

[c] From nearby to (sample) average distance

old with limitations in (instrumental) activities of daily living, has one son and one daughter who are living nearby and are both 45 years old, has two grandchildren, median income and median level of education. The predicted hours of home care for this reference single individual are reported in the first column of the table. This single woman receives about eight hours a week of home care from children, about one hour of care from friends and about three hours of formal home care.

Next, Table 5 shows how the predicted hours of home care differ between the reference household and households with a different number of children or their availability for home care. We consider three scenarios. The first and second scenarios are for a single elderly person who has, respectively, only one son or only one daughter; the second column shows the differences in the predicted hours of home care from all four providers between the reference individual (who has one son and one daughter) and an individual who has only one son and no daughter and with all other characteristics equal to the reference individual. The third column shows the differences between the reference individual and an individual with only one daughter and no sons. In both scenarios the predicted hours of home care provided by children are about 4–5 h lower. Note that when we test for increases or decreases in hours of home care we use one-sided tests. For a single person household the predicted hours of home care from friends and formal home care are significantly higher when there is only one son, while when there is only one daughter the hours of formal care are not significantly higher. In addition, the increase in home care from friends is three times higher when there is only one son

than when there is only one daughter. These gender differences in care provision are in line with, e.g., Carmichael and Charles (2003). Home care provision of relatives is significantly higher when there is only one son or daughter. The third scenario considers a single elderly individual who has two children that live further away than the children of the reference individual. Within a time allocation framework the distance can be considered as a measure of the opportunity cost for children of providing home care, and an increase in distance lowers the availability of children for home care provision. Compared to the reference individual, this individual is predicted to receive fewer hours of home care from children, more hours of home care from friends but not significantly more hours of formal home care.

In short, and in line with the evidence presented in Sect. 4.1, these predictions show that single elderly who can rely less on children—and in particular on daughters—to provide home care, do not only turn to formal home care providers but also make alternative home care arrangements with relatives and friends.

Lastly, Table 5 shows the predictions for a couple household. The reference household is a couple and the man and woman are both 70 years old and have limitations in (instrumental) activities of daily living; as for the single reference household, they have one son and one daughter who are living nearby and are both 45 years old, two grandchildren, and median income and levels of education. A comparison with a single person household shows that the predicted hours of home care from children are much lower for an elderly couple household but that the formal home care provision on a household level is somewhat higher. In the couple households the home care per person is about 25 % less than that for a single person household. These findings are in line with Lakdawalla and Philipson's (2002) proposition that husbands and wives take care of each other. Concerning the number of children, we find again that the gender of the child plays some role and that couples with a daughter are predicted to receive relatively more care from their child than couples with only one son. In addition, an increased distance from the residence of the elderly couple implies a significant reduction in the predicted home care provision from children but not from other care providers. This latter finding suggests that the spouse is an important care provider for married couples, who need to rely less on care providers from outside the household other than their children.

5 Summary and conclusions

We examine the hours of home care received by the elderly in Western Europe, using data from the Survey of Health, Ageing and Retirement in Europe. The existing empirical literature has mostly focused on informal home care provisions from children and formal home care. We obtain insights into the extent to which households that can rely less on children for the provision of home care receive informal home care from relatives and friends, possibly in addition to more formal home care. For this purpose we include relatives and friends as informal care providers in our analysis, in addition to children and formal care, and estimate the relationships between hours of home care from each of the four types of home care providers and the characteristics of the elderly and their children.

In line with previous studies, we find that single person households receive much more home care from outside the household than couple households, underscoring the importance of the spouse as a main care provider; that the incidence of home care is mainly determined by elderly limitations in (instrumental) activities of daily living, mobility, and global activity, and that the hours of informal home care provided by children are determined by the number of children and the distance children live from their parents.

Our primary new empirical finding is that single person households who can rely less on children—and in particular on daughters—for their home care needs receive, on average, not only more formal home care but also more home care from friends and neighbors. This is a comforting result since the role of friends and neighbors as informal care providers is likely to become more important due to the projected reduction in morbidity at older ages (Fries 1980). From a public policy perspective, this suggests that it is important to take multiple care providers into account in order not to overstate the projected increasing costs of formal care programs due to an aging population (Costa-Font et al. 2007).

Appendix

See Tables 6, 7, 8, and 9.

Table 6 Variable definitions

Variable	Definition
Socioeconomic characteristics of the elderly	
Marital status	Marital status is 1 if married or cohabiting, 0 otherwise (single or widowed)
Education	The number of years of completed education based on the 1997 International Standard Classification of Education
Age	Age in years
Siblings	The number of brother or sisters
Household income	The percentile of the household income distribution. Income is a gross amount in wave 1 and a net amount in wave 2. This forces the use of a relative instead of an absolute measure of income and is valid under the assumption that the tax regimes do not affect the rank of a household's income in the population income distribution
Sociability	The number of social activities that an elderly person has been involved in. This includes volunteer and charity work, active membership in a church, sports, or social club, or political involvement

Table 6 continued

Variable	Definition
Number of sons, daughters or grandchildren	Includes biological, fostered, adopted and step children
Health limitations of the elderly	
ADL	ADL refers to limitations in the activities of daily living; it is equal to 1 when the elder suffers one or more limitations, 0 if none. ADL includes 6 activities: (i) dressing, including putting on socks and shoes; (ii) walking across a room; (iii) bathing or showering; (iv) eating, such as cutting up one's food; (v) getting in and out of bed; and (vi) using the toilet, including getting up and down
GALI	GALI is the global activity limitation indicator; it is equal to 1 if the respondent is limited, 0 if not. The question for this index is the following: "For the past 6 months at least, to what extent have you been limited, because of a health problem, in activities people usually do?" The possible response range is "severely limited", "limited but not severely", and "not limited"
IADL	IADL is the instrumental activities of daily living limitations; it is equal to 1 if the elder has one or more limitations, 0 if none. IADL includes seven activities: (i) using a map to determine how to get around in a strange place; (ii) preparing a hot meal; (iii) shopping or buying groceries; (iv) making telephone calls; (v) taking medicine; (vi) working around the house or garden; and (vii) managing money, such as paying bills and keeping track of expenses
SEVERE	It refers to severe chronic diseases; it is equal to 1 if a respondent has one or more severe conditions, 0 otherwise. Severe conditions are, e.g., cardiovascular diseases and cancers, and mild conditions are, e.g., high blood pressure and stomach problems
MOBILITY	MOBILITY is equal to 1 if the elderly individual has any mobility limitations, 0 if none. Assessment of these limitations is based on the activities "walking 100 meters", "sitting for about 2 h", and "getting up from chairs after sitting for long periods"
MENTAL	MENTAL is equal to 1 if the respondent suffers from one or more depression symptoms from the so-called EUROD scale (a mental health measure), and 0 otherwise
NUMERACY	The respondents are asked to perform four basic numerical operations in a specific economic or financial scenario. Based on these, Dewey and Prince (2005) built an index ranging from bad (1) to very good (5) numeracy skills. Here, NUMERACY is a dummy variable that takes value 1 if the index generated is 1 or 2, and 0 otherwise
READING	It is equal to 1 if self-reported reading skills are fair or poor, 0 otherwise
Children's characteristics	
Distance to the parents	The living distance between children and elderly parents. The distance variable is normalized (between 0.002 and 1) and takes a value of 1 if the child is living over 500 km away (or abroad), and 0.002 if parents and children live within 1 km of each other
Marital status	Marital status is 1 if married or cohabiting, 0 otherwise
Employment	Employment status is 1 if working full-time, 0.5 if working part-time and 0 if not working
Age (in years)	Average age of children

Table 7 Household characteristics by age

Age[a]	Income average percentile Average	Married %	Man present %	Woman present %	Number of sons[b] Average	Number of daughters[b] Average	Childless %	Number of grandchildren Average	Years of education	
									Man Average	Woman Average
65–69	57.19	63.0	74.6	88.2	1.16	1.16	12.4	3.2	10.5	10.1
70–74	51.76	60.7	70.9	89.4	1.19	1.22	11.7	4.0	9.6	8.9
75–79	46.73	50.4	62.4	87.8	1.21	1.24	14.7	4.5	9.4	8.3
80–84	43.91	44.0	55.6	88.2	1.21	1.19	16.5	4.6	9.5	8.1
85+	40.37	26.1	46.6	79.3	1.18	1.17	18.6	4.8	9.1	8.1
All	50.09	53.7	65.8	87.7	1.19	1.20	13.9	4.1	9.8	8.9

[a] Age is based on the oldest person in the household. Variable definitions are in table 6

[b] Conditional on having children

Table 8 Health limitations of the elderly by gender and age

Age	ADL %	GALI %	IADL %	Severe conditions %	Mobility %	Mental health %	Numeracy %	Reading %
Men								
65–69	7.2	35.6	7.3	27.0	37.9	14.7	14.1	8.0
70–74	7.8	44.6	12.6	34.0	45.4	17.2	17.5	9.4
75–79	10.9	52.0	18.3	39.7	53.7	18.4	20.3	9.8
80–84	18.3	58.5	26.4	50.3	60.1	24.1	24.6	11.2
85+	28.0	61.8	42.4	44.9	71.3	28.3	31.8	10.8
All	11.0	46.3	16.0	35.8	48.5	18.3	19.0	9.4
Women								
65–69	7.2	35.6	7.3	27.0	37.9	14.7	14.1	8.0
70–74	7.8	44.6	12.6	34.0	45.4	17.2	17.5	9.4
75–79	10.9	52.0	18.3	39.7	53.7	18.4	20.3	9.8
80–84	18.3	58.5	26.4	50.3	60.1	24.1	24.6	11.2
85+	28.0	61.8	42.4	44.9	71.3	28.3	31.8	10.8
All	11.0	46.3	16.0	35.8	48.5	18.3	19.0	9.4

Age is based on the oldest person in the household. Variable definitions are in Table 6

Table 9 Children's characteristics

Cells: averages	Sons	Daughters
Distance to the parents (normalized)	0.78	0.79
Distance to the parents (in km)[a]	78.50	78.70
Years of education	11.80	12.08
Married (fraction)	0.81	0.81
Employment (fraction)	0.86	0.68
Age (in years)	44.47	44.54

Variable definitions are in Table 6

[a] Based on category-averages distances. We use the normalized distance in our analysis

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