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The impact of formal care on informal care for people over 75 in England

Eirini Saloniki, Olena Nizalova, Gintare Malisauskaite and Julien Forder

Personal Social Services Research Unit
University of Kent
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University of Kent

University of Kent
Cornwallis Building
Canterbury
Kent
CT2 7NF
Tel: 01227 823963
pssru@kent.ac.uk

London School of Economics

London School of Economics
LSE Health & Social Care
Houghton Street
London
WC2A 2AE
Tel: 020 7955 6238
pssru@lse.ac.uk

ESHCRU Economics of Social and Health Care Research Unit

University of Kent

LSE The London School of Economics and Political Science

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Abstract

In this study, we examine the relationship between formal care provision and informal care receipt from within and outside the household for people over 75 years old using data from the British Household Panel Survey between 1991 and 2009. To address potential concerns about endogeneity of formal care we use a set of instrumental variables including a novel care eligibility variable. We find a negative and statistically significant effect of formal care on informal care from within the household, suggesting a substantial degree of substitutability between these two modes of care. With regards to informal care provided from outside the household, although the effect is still negative, the degree of substitutability is substantially smaller and mostly not statistically significant. These findings support current discussions and policies towards the implementation of an integrated care system, providing grounds for estimates of savings in the cost of informal care enabled by spending on formal care.

1. Introduction

Informal (or unpaid) care by family and friends is at the heart of the care system and is crucial in the face of population ageing. English Longitudinal Study of Ageing (ELSA) shows that among those aged 65 and older, 27% receive informal care from outside the household, 2% receive social care and 4% use privately purchased care (Nizalova et al., 2017). Despite fewer family members living in the same household, it is evident that children or grandchildren (inside or outside the household) are more likely to provide informal care in England (Sole-Auro and Crimmins, 2014).

There has been a long-standing debate over the relationship between informal care for older people and provision of formal care services. An increase in formal care services can lead to a decline in informal care provision followed by high substitution costs, which may subsequently hinder any improvements in accessing publicly funded long-term care. The Government's social care Green Paper in 2009 favouring a 'partnership' approach to long-term care funding came to mitigate these concerns. More recently, ahead of the social care Green Paper (to be published "at the first opportunity in 2019"), the Government has said that it is crucial to look more broadly at the provision of long-term care services rather than just the funding situation – integrated care was set out to be one of the main principles, whereby health and social care services operate as one and are tailored to the person's needs. Accessing and having control over these services can have a great impact on an individual's life and the need for informal care from another family member inside or outside the household. Therefore, it is important that the relationship between formal and informal care is re-examined. The direction of the relationship is not straightforward and may vary depending on country-specific care eligibility criteria and institutional differences – the latter, in terms of the comprehensive coverage of formal care services (Bakx et al., 2015).

A number of studies examining the relationship between formal and informal care report mixed results, with the majority of European and US studies finding a substitution effect between informal and formal care (Pickard 2012; Viitanen, 2007; Stabile et al., 2006; Ettner, 1994). For example, Pickard (2012) using data from the General Household Survey (GHS) report that in Britain, during the 1980s and 1990s, formal care received in nursing homes or long-stay hospitals substituted for very intense informal care provided by co-resident children, especially for those aged 80 and above. A few international studies report a complementary relationship (Motel-Klingebiel et al., 2005; Langa et al., 2001) – a 'crowding in' or 'mixed responsibility' effect – between formal and informal care, whereby family support is encouraged through the formal care provision. In this case, both informal caregivers and formal services take on specialised roles by providing the services that they deliver best. Motel-Klingebiel et al. (2005) using data from an international comparative research project (OASIS) with 5 countries (including England) distinguish between formal and informal care as help received with a

number of tasks (household chores, transport or shopping and personal care) in the last year from family members, formal services or other sources. They find no evidence of a substitution effect between family-provided and formal care services for those aged 75 and above in England in 2000. Their findings showed a substantial receipt of family and formal help and support by older people in generous welfare state regimes such as Norway, Israel and England, supporting the argument that formal and informal care services are complements.

The aim of this study is to explore how formal care provision affects the receipt of informal care from within and outside the household. Building on previous work by Forder et al. (2018) on substitution between health and social care, we utilise English survey data from the British Household Panel Survey (BHPS) between 1992 and 2009. We examine the relationship between formal and informal care by employing probit and instrumental variables estimations, the latter to address potential endogeneity of formal care. For the purposes of this study, we define informal care as any support provided to sick, disabled or elderly people in a non-professional capacity, which is identified as the least problematic definition (Beesley, 2006). In terms of formal care, we consider services provided in the community relating for example to personal care, housekeeping or domestic work and nursing, hereafter referred to as home help.

Compared to the previous literature, the contribution of this paper is four-fold. First, we explore the possibility of using a 'spatial lag' formal care utilisation (Forder et al., 2018) as an instrumental variable in the setting of informal-formal care. Second, we explore a novel instrument according to the eligibility criteria outlined by the Care Act (2014). Third, we compare the effect of formal care on informal care obtained from within the household to that from outside the household. Finally, we account for the discrete nature of both formal and informal care variables in the instrumental variables estimations. The rest of the report is organised as follows. Section 2 outlines the empirical model and discusses issues around the endogeneity of formal care. Section 3 provides a description of the BHPS and the variables used in the empirical model. Section 4 presents the estimation results and Section 5 concludes.

2. Empirical model

We examine the causal effect of formal care utilisation on the receipt of informal care. We consider two measures of informal care receipt: (a) from someone else living *in* the household; (b) from children living *outside* the household. We consider formal care in the form of home help. Given the discrete nature of our informal care indicators, we start by estimating a probit model whereby the propensity of individual i to receive informal care (IC_i^*) is given by:

$$IC_i = \beta X_i + \psi FC_i + \varepsilon_i \text{ with } \varepsilon_i \sim N(0,1) \quad (1)$$

However, only the binary indicator is observed:

$$IC_i = \begin{cases} 1 \; if \; IC_i^* > 0, \\ 0 \; otherwise \end{cases} \tag{2}$$

Socio-demographic characteristics (age, age squared, gender, self-assessed health, smoking status, type of health problem) are included in X_i, and FC_i denotes the use of formal care (home help). In the absence of endogeneity in the relationship between formal and informal care, estimates from (1) will be unbiased and consistent. However, endogeneity may arise due to unobserved omitted control variables, measurement error and reverse causality. In our context, it may be, for example, that individuals with severe memory disorders (such as Alzheimer's or dementia) are more likely to receive both formal and informal care compared to those with less severe disorders. Failing to account for such correlation will imply that the effect of formal care utilisation on the receipt of informal care obtained from the probit estimation is biased upwards. To address potential endogeneity in the relationship of formal and informal care, we use the instrumental variables (IV) approach. The aim is to find an instrument that would be correlated with formal care but have no direct impact on informal care.

We started by considering a 'spatial lag' instrument ($\overline{FC}_{j \neq i \in L_j}$) for the home help variable (Forder et al., 2018): for each person i in the dataset, we calculated the average long-term care utilisation of respondents in the dataset in the person's region (L_i), excluding person i's use of long-term care services (i.e. $\overline{FC}_{j \neq i \in L_j} = \sum_{j \neq i} FC_{j \in L_i} / n_{L_i}$).[1] Theoretically, this instrument may be valid for two reasons. The use of formal care by other people in the same region shall be correlated with person i's use of these services due to common local authority policy factors in that market, yet there seem to be no reason to believe that this variable can affect receipt of informal care, other than through own formal care use. If there is a concern of a decline in the pool of available informal carers due to population ageing and increasing mobility (Beesley, 2006), it may be that the receipt of formal care by others in the area relieves the burden from potential caregivers and thus directly affects receipt of informal care. To address this concern, we further control for labour market characteristics at the regional level (annual employment rate and gross earnings) using annual statistics from the Labour Force Survey (LFS) and the Annual Survey of Hours and Earnings (ASHE).

In an attempt to explore alternative instruments to address the endogeneity issue, we turned our attention to the eligibility criteria for formal care receipt. We rely on the eligibility criteria set out in

[1]By region we refer to: Inner and Outer London, Region of South East, South West, East Anglia, East Midlands, West Midlands Conurbation, Region of West Midlands, Greater Manchester, Merseyside, Region of North West, South Yorkshire, West Yorkshire, Region of Yorks and Humberside, Tyne and Wear, and Region of North.

the Care and Support Act (2014) for England where (a) "the adult's needs arise from or are related to a physical or mental impairment or illness; (b) as a result of the adult's needs the adult is unable to achieve two or more outcomes (such as managing and maintaining nutrition, maintaining personal hygiene, managing toilet needs); and (c) as a consequence there is, or is likely to be, a significant impact on the adult's well-being. Being unable to achieve an outcome relates to, for example, not being able to achieve it without assistance or being able to achieve it but doing so causes the adult significant pain, distress or anxiety". One of the primary goals of the Care Act was to reconcile the eligibility criteria across regions but we use them here as proxies for the criteria used by local authorities prior to 2014 as well.

Although eligibility criteria are based on the activities of daily living and health conditions, which are also determinants of informal care use, we will rely on the non-linearity of the constructed eligibility indicator while controlling for the individual components in the informal care equation. We used different sets of questions to construct this indicator, which were asked in different parts of the questionnaire. This together with the time reference of each of these questions and the actual use of care (i.e. relating to recent or current needs) may bias our estimates. To address this potential bias, not only did we use the lagged version of the care eligibility instrument but we also controlled for the number of activities of daily living (ADLs) and its square.

3. Data and variables

The British Household Panel Survey (BHPS) is one of the largest longitudinal surveys looking at social and economic change at the individual and household level in Britain. It comprises of a representative sample of more than 5,000 households in Britain with approximately 10,000 individuals being recruited in 1991. These individuals were re-interviewed in each wave. If they split-off from their original household in one wave, they were interviewed in their new household together with any other adult members within this household. Children were interviewed when they reached the age of 16. The information collected via the individual questionnaires span different areas including socio-economic and family structure, consumption, wealth, employment, health and wellbeing.

The BHPS records information about the use of different health and social care services. We are interested in formal care as identified by the use of home help services; a direct question on whether the respondent used home help in the previous year is available in the dataset with possible responses being yes or no.

A number of informal care indicators have been identified in the literature, depending on data availability as well as on whether the focus is on informal care provision or receipt. They often relate to the average number of hours of informal care received from children, children's spouse,

grandchildren or other members of the family (Bonsang, 2009; Van Houtven et al., 2004). Alternatively, they are derived from indirect questions related to looking after a person in or outside the household who is in need of help or assistance with activities of daily living (Pickard, 2012; Litwin and Attias-Donfut, 2009; Viitanen, 2007; Davey and Patsios, 1999).

In this analysis, we are interested in identifying those receiving care. In the BHPS respondents were asked "Is there anyone living with you who is sick, disabled or elderly whom you look after or give special help to (for example, a sick or handicapped (or elderly) relative/husband/wife/friend, etc)?". A positive response to this question prompted respondents to provide the personal number (within the household) of the person they are caring for, with the option to provide up to three personal numbers. Therefore, indirectly we tracked informal care recipients as identified by their relatives/carers, providing they were in the household. It is a dummy variable available in all waves and has also been used in the study by Viitanen (2007) as an informal care provision indicator – henceforth we will refer to as informal care receipt *within household*. Informal care receipt from children living outside the household was measured by a positive response to a number of things from a list – such as getting lifts in their car, providing or cooking meals, helping with basic personal needs like dressing, eating or bathing, dealing with personal affairs (paying bills, writing letters) and financial help – available only in Wave 11 (September 2001 to August 2002) and Wave 16 (September 2006 to August 2007).

We used a number of questions to construct the eligibility dummy, following closely the eligibility criteria outlined in the previous section. First, the respondent must have reported having at least one health problem from a list (for example, difficulty in hearing, skin conditions or allergies, diabetes, alcohol or drug related problems, epilepsy, stroke). Second, we identified the number of outcomes the respondent reported managing "only with help from someone else" or "not at all". These outcomes, which effectively are ADLs, include getting up and down stairs or steps, getting around the house, getting in and out of bed, cutting his toenails, bathing, showering or washing all over, and going out of doors and walking down the road. The respondents with at least one health problem, and at least two activities of daily living that they could not manage without the help from someone else or on their own were considered eligible for care and support in our analysis.

As the older population are more likely to be using formal care services and receiving informal care, we restrict the sample to only those aged 75 and above.[2] The final sample size for this analysis is 5,452 observations.

[2]In the BHPS, within those aged between 65 and 74, only 1.7 percent receive home help and 7.7 percent receive (within household) informal care, therefore we expect our results to be fairly representative of the 65+ group.

Descriptive statistics

Table 1 shows the average number of respondents receiving informal care within and outside the household. 11 percent of the sample report receiving informal care from someone else in the household while 65 percent of the respective sample report receiving informal care from children not living in the household. On average, home help users are more likely to receive informal care compared to those who do not use home help irrespective of the informal care indicator. Therefore, there is some positive correlation between informal and formal care, which may be because they are just crude means or due to the endogenous home help. We will explore this further in the estimation results in the next section.

Descriptive statistics for the full sample are presented in Table 2. The average age of the respondents is 82 years. 60 percent are females and almost 40 percent of the respondents report being married. Health problems related to arm/leg/hand and heart/blood are the most common ones (63 percent and 50 percent respectively). Over 50 percent of the sample report excellent or good health and 18 percent were eligible for care and support in the previous year under our defined criteria.

4. Results

Informal care from within the household

Average marginal effects from the probit model investigating receipt of informal care from within the household are presented in Table 3. We report results from three specifications where the only difference is in terms of the labour market indicator we control for: average employment rates or gross earnings at a regional level or both. The results are very similar both qualitatively and in magnitude. As the third column shows, married individuals, smokers, and those reporting poor health are more likely to receive informal care from within the household. Receipt of this mode of informal care increases with the number of ADLs, but at a decreasing rate. Among the reported health conditions, diabetes has the most notable effect, followed by sight and hearing problems. With regards to our variable of interest, we find a negative and significant effect of home help on within household informal care receipt irrespective of the model specification: receiving home help services reduces the probability of receipt of informal care from within the household by 3 percent.

As mentioned in Section 2, and as seen from the descriptive statistics in the previous section, we have reasons to believe that the estimates from the probit models are upward biased and inconsistent due to the potential endogeneity of formal care. To address this issue we further estimated a set of extended IV models, which accounted for the discrete nature of both informal and formal care variables (i.e. run a probit model in both stages). We used the new command *eprobit* in Stata 15 to run these estimations (StataCorp, 2017).

The results from the *eprobit* estimations are presented in Table 4. The models were estimated separately for the different instruments and labour market indicators considered. In the first stage, we find that the average home help use by region ('spatial lag') is a strong predictor of home help (the endogenous variable) independently of the labour market indicator we control for (see Panel A). On the contrary, the lagged care eligibility does not significantly predict home help in any of the specifications in the first stage, which suggests that the instrument is not relevant (see Panel B). In the second stage, we find a statistically significant and negative effect of home help on within household informal care with the 'spatial lag' instrument, suggesting that formal and informal care are substitutes. Also, the results from the likelihood ratio test indicate that home help is endogenous in all specifications with the 'spatial lag'. Home help becomes exogenous with care eligibility and with controlling for both labour market indicators in the estimation, but in the absence of any other diagnostics and given the first stage results, we focus our attention on the 'spatial lag' results and use it as a preferred specification in what follows.

As additional analyses we run the estimations separately by gender (see Table 5) in case there were significant differences in the main effect on home help between males and females. In the first stage, average home help by region remains a strong predictor of home help across the different specifications and irrespective of gender. The results from the second stage point again to a substitution relationship between formal and informal care for both males and females. The effect is larger for females than males, in absolute terms, but the difference is not statistically significant.

Informal care from outside the household

The use of a different informal care indicator, i.e. care received from outside the household, does not change the direction of the *eprobit* results with a 'spatial lag'. Average home help by region marginally predicts home help, though to a smaller degree. The relationship between formal and informal care from outside the household remains negative, but statistically significant only in one of the model specifications. Also, the results from the likelihood ratio test in this case do not support the endogeneity of home help. However, the small sample size in these estimations and other unobservable factors may explain the absence of stronger effects with this mode of informal care. So, more research is needed to compare the effects of formal care on informal care coming from outside the household to that from within the household.

Estimating return to spending on home care in terms of informal care costs

The substitution effects can also be expressed in cost terms. Assuming 10 hours of informal care provision per week on average (Kelly and Kenny, 2018; Department for Work and Pensions, 2018; Office for National Statistics, 2016) and a minimum wage of £7.83 (at 2018 prices), the average cost

of informal care is £78.3. With a given national unit cost for home help,[3] we can then estimate the return to spending on home care in terms of informal care costs. For example, if we start providing home help to someone who did not receive it before, this will increase the cost of long-term care spending by £189, but reduce the cost of within household informal care by £63 – for a substitution effect of 0.804. This is equivalent to savings of £0.33 for a £1 spent on long-term care per week on average.[4] For informal care received outside the household – for a substitution effect of 0.071 – it corresponds to a saving of £0.03 for a £1 spent on long-term care per week on average.

5. Conclusion

In this report, we investigated the relationship between formal care utilisation and informal care receipt from within and outside the household using data from the BHPS between 1991 and 2009. The study uses a number of instruments to address the potential endogeneity of formal care. In particular, we first examine whether instrumentation with a 'spatial lag' formal care utilisation variable is possible in the informal-formal care setting. We additionally take advantage of the care eligibility criteria, as set out in the Care and Support Act (2014), and use them as a proxy for years prior to 2014 to construct a novel care eligibility instrument, relying on the non-linearity property of this indicator.

Our main estimation results suggest that there is a substitution effect between formal and informal care, which is consistent with the majority of studies in this area (Pickard 2012; Viitanen, 2007; Stabile et al., 2006; Ettner, 1994). Using a different mode of informal care does not have an impact on the direction of this effect, though the degree of substitutability is much smaller for informal care received from outside the household compared to informal care received from within the household.

Translating the substitution effect (between formal and within household informal care) into cost savings in terms of informal care, it corresponds to savings of £0.33 for a £1 spent on long-term care per week on average. Similarly, for informal care from outside the household, it corresponds to savings of £0.03 for a £1 spent on long-term care per week on average, though we should be somewhat cautious given the small sample used in the estimations with this indicator.

These findings support the existence of an integrated system between health and social care services, whereby services are designed to meet not only the individual's needs but also give the person the necessary control and access over these services. Such coordination and increased accessibility of

[3]We used a unit cost of £27 per weekday hour for a face-to-face contact, with an average of 7 hours per week of home care provision (Curtis and Burns, 2018).
[4]A substitution effect of 0.647 (0.859) for males (females) corresponds to a saving of £0.27 (£0.36) for a £1 spent on long-term care per week on average.

services is likely to reduce the demand for informal care or at least minimise the negative impact of increased informal care on carers and care recipients themselves.

This study is not without limitations. The lack of more detailed diagnostics regarding the validity of the instruments in the main estimations precludes us from making concrete inferences about the appropriateness of using the care eligibility instrument. As more data becomes available after the introduction of the Care Act, the use of care eligibility instrument shall be revisited. Furthermore, rich information relating to the household composition and care provision (such as the number of hours caring for someone or the relationship to the person) could not be utilised in the BHPS dataset as linking these questions with the individual person in the household was restrictive. Alternative informal care indicators were not available in all waves and any spatial information was also limited at the regional level.

Future studies can consider using richer data regarding critical spatial and household composition information as well as identify ways of obtaining more detailed diagnostics in such sophisticated econometric estimations, which may subsequently impact the results.

Overall, this study adds to the evidence of significant interrelationships between formal and informal care for older people. These results come at a crucial time where discussions and policies for an integrated care approach are underway.

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Table 1: Informal care receipt

People 75+	Within household	Outside household
Mean	0.11	0.65
Std. Dev.	0.32	0.48
People 75+ using home help	Within household	Outside household
Mean	0.13	0.79
Std. Dev.	0.34	0.41
% of sample	12.26	13.46
People 75+ not using home help	Within household	Outside household
Mean	0.11	0.63
Std. Dev.	0.32	0.48
% of sample	87.74	86.54
N	*5,452*	*958*

Table 2: Descriptive statistics

(N=5,452)	Mean	Std. Dev.	Min	Max.
Service use				
Home help	0.11	0.31	0	1
Personal characteristics				
Female	0.60	0.49	0	1
Age	81.57	4.54	75	100
Married	0.38	0.48	0	1
Smoker	0.09	0.29	0	1
Health condition/impairment				
Count of ADLs	0.87	1.29	0	4
Sight	0.20	0.40	0	1
Hearing	0.33	0.47	0	1
Arm/leg/hand	0.63	0.48	0	1
Skin	0.09	0.29	0	1
Breathing	0.20	0.40	0	1
Stomach	0.13	0.33	0	1
Diabetes	0.11	0.31	0	1
Anxiety/depression	0.09	0.29	0	1
Alcohol/drugs	0.00	0.02	0	1
Epilepsy	0.00	0.06	0	1
Migraine	0.05	0.21	0	1
Other	0.07	0.25	0	1
Heart/blood	0.50	0.50	0	1
Health over the last 12 months				
Excellent/Good	0.51	0.50	0	1
Fair	0.33	0.47	0	1
Poor/Very poor	0.16	0.37	0	1
Region				
London	0.08	0.28	0	1
South	0.40	0.49	0	1
Midlands	0.19	0.39	0	1
North	0.33	0.47	0	1
Labour market characteristics				
Average employment by region	0.73	0.03	0.64	0.78
Average earnings (gross) by region	9.95	0.22	9.61	10.72
Instrument				
Average home help by region	0.12	0.04	0.06	0.20
Lagged care eligibility	0.18	0.39	0	1

Table 3: Effect of using home help on informal care receipt (within household) – probit results

	Informal care receipt		
	probit⁺	probit⁺	probit⁺
	(1)	(2)	(3)
Home help	-0.030***	-0.030***	-0.030***
	(0.011)	(0.011)	(0.011)
Female	0.007	0.007	0.007
	(0.009)	(0.009)	(0.009)
Age	0.003	0.002	0.002
	(0.024)	(0.024)	(0.024)
Age squared	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Married	0.164***	0.164***	0.164***
	(0.009)	(0.009)	(0.009)
Smoker	0.0279**	0.029**	0.028**
	(0.014)	(0.014)	(0.014)
Count of ADLs	0.084***	0.083***	0.083***
	(0.010)	(0.010)	(0.010)
Count of ADLs squared	-0.011***	-0.011***	-0.011***
	(0.003)	(0.003)	(0.026)
Sight	0.028***	0.028***	0.028***
	(0.009)	(0.009)	(0.009)
Hearing	0.016**	0.015*	0.015*
	(0.008)	(0.008)	(0.008)
Arm/leg/hand	0.004	0.004	0.004
	(0.009)	(0.009)	(0.009)
Skin	-0.013	-0.012	-0.013
	(0.013)	(0.013)	(0.013)
Breathing	0.006	0.006	0.006
	(0.009)	(0.009)	(0.009)
Stomach	0.016	0.016	0.017
	(0.011)	(0.011)	(0.011)
Diabetes	0.047***	0.046***	0.046***
	(0.011)	(0.011)	(0.011)
Anxiety/depression	-0.004	-0.005	-0.005
	(0.013)	(0.013)	(0.013)
Alcohol/drugs	0.088	0.087	0.090
	(0.112)	(0.109)	(0.110)
Epilepsy	0.012	0.133	0.015
	(0.049)	(0.050)	(0.050)
Migraine	-0.030	-0.030	-0.030
	(0.020)	(0.020)	(0.020)
Other	0.017	0.016	0.016
	(0.014)	(0.014)	(0.014)
Heart/blood	-0.007	-0.007	-0.007
	(0.008)	(0.008)	(0.008)
Fair	0.015	0.016	0.015
	(0.010)	(0.010)	(0.010)
Poor/Very poor	0.050***	0.050***	0.050***
	(0.012)	(0.012)	(0.012)
South	0.032	-0.062*	-0.022
	(0.022)	(0.036)	(0.044)
Midlands	-0.020	-0.106**	-0.080*
	(0.018)	(0.042)	(0.046)
North	-0.006	-0.080*	-0.065
	(0.015)	(0.043)	(0.044)

	Informal care receipt		
	probit[+]	probit[+]	probit[+]
Average employment by region	-0.505**	-	-0.424*
	(0.247)	-	(0.253)
Average earnings (gross) by region	-	-0.136*	-0.110
	-	(0.074)	(0.076)
Wave dummies	Yes	Yes	Yes
Observations	5,452	5,452	5,452

[+]Average marginal effects are reported
Robust standard errors are reported in parentheses
***,**,* denote significance at the 1%, 5% and 10% level respectively

Table 4: Effect of using home help on informal care receipt (within household) – eprobit results

	eprobit	eprobit	eprobit
Panel A	(1)	(2)	(3)
First stage			
Home help 'spatial lag'	3.556***	3.076***	3.110***
	(0.618)	(0.431)	(0.433)
Second stage[+]			
Home help	-0.646***	-0.804***	-0.804***
	(0.037)	(0.019)	(0.020)
Average employment by region	Yes	No	Yes
Average earnings (gross) by region	No	Yes	Yes
Wave dummies	Yes	Yes	Yes
Likelihood ratio test (of endogeneity)	53.39***	40.98***	16.40***
Observations	5,452	5,452	5,452
Panel B	(1)	(2)	(3)
First stage			
Lagged care eligibility	-0.031	-0.023	-0.024
	(0.068)	(0.070)	(0.070)
Second stage[+]			
Home help	-0.635***	-0.612***	-0.615***
	(0.044)	(0.046)	(0.046)
Average employment by region	Yes	No	Yes
Average earnings (gross) by region	No	Yes	Yes
Wave dummies	Yes	Yes	Yes
Likelihood ratio test (of endogeneity)	22.52***	23.81***	0.16
Observations	5,452	5,452	5,452

[+]The probability of receiving informal care conditional on using home help is reported
Robust standard errors are reported in parentheses
***,**,* denote significance at the 1%, 5% and 10% level respectively

Table 5: Effect of using home help on informal care receipt (within household) – eprobit results (by gender)

		Males			**Females**	
	eprobit	eprobit	eprobit	eprobit	eprobit	eprobit
First stage	(1)	(2)	(3)	(4)	(5)	(6)
Home help 'spatial lag'	3.443**	3.066*	3.350**	3.060***	3.102***	3.060***
	(1.723)	(1.619)	(1.710)	(0.504)	(0.508)	(0.521)
Second stage[+]						
Home help	-0.641***	-0.647***	-0.643***	-0.858***	-0.859***	-0.858***
	(0.084)	(0.085)	(0.083)	(0.023)	(0.018)	(0.018)
Average employment by region	Yes	No	Yes	Yes	No	Yes
Average earnings (gross) by region	No	Yes	Yes	No	Yes	Yes
Wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Likelihood ratio test (of endogeneity)	6.05**	5.00**	5.69**	19.44***	32.21***	31.87***
Observations	2,160	2,160	2,160	3,292	3,292	3,292

[+]The probability of receiving informal care conditional on using home help is reported
Robust standard errors are reported in parentheses
***,**,* denote significance at the 1%, 5% and 10% level respectively

Table 6: Effect of using home help on informal care receipt (outside household) – eprobit results

	eprobit	eprobit	eprobit
First stage	(1)	(2)	(3)
Home help 'spatial lag'	1.469*	1.252*	1.364*
	(0.866)	(0.708)	(0.734)
Second stage[+]			
Home help	-0.068	-0.071	-0.071***
	(11.36)	(3.101)	(0.014)
Average employment by region	Yes	No	Yes
Average earnings (gross) by region	No	Yes	Yes
Wave dummies	Yes	Yes	Yes
Likelihood ratio test (of endogeneity)	2.11	1.81	1.88
Observations	958	958	958

[+]The probability of receiving informal care conditional on using home help is reported
Robust standard errors are reported in parentheses
***,**,* denote significance at the 1%, 5% and 10% level respectively