

Parents' Health and Children's Help

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Abstract

The paper uses 'within-parent' variation to study how changes in British parents' health, marital status and financial resources affect receipt of help from their children. The analysis considers two measures of children's help (one enumerating specific activities and another reporting assistance with particular difficulties) and two measures of parents' health: self-reported assessments of overall health and enumeration of difficulties with activities of daily living. It uses three longitudinal data sets from Britain: the *British Household Panel Study*, *Understanding Society* and the *English Longitudinal Study of Ageing*. The paper finds that children's help is highly responsive to a parent's health and marital status, but the estimates of responsiveness that are based fully or partially on between-individual variation overstate the impact of parent's health.

Keywords:

Activities of daily living

Children's help to parents

Health

Intergenerational transfers

Panel data

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1. Background and Objectives

At some points in the life course the needs of one generation of adults substantially affect the behaviour of the preceding or subsequent generations. In this paper we are concerned with impact of the health of older parents on their middle-aged offspring. It is one manifestation of *solidarity* between parents and children during the adult family life course. In terms of the six elements of intergenerational solidarity advanced by Bengtson and Roberts (1991; p.857), it represents *functional* solidarity ('degree of helping and exchanges of resources'), which is influenced by *structural* solidarity (the 'opportunity structure' reflected in the number and geographic proximity of children). Silverstein and Bengtson (1997; p.452) speculate that physical and mental disabilities of parents 'may be important forces in structuring intergenerational relations.'

Help given by children to parents in poor health or with difficulties in performing normal activities is likely to be valued highly by many older parents, and is a channel through which intergenerational transfers are made to them. Spousal care in these circumstances plays a large role, but there may not be a spouse present or they may not be fit enough to provide the help required. The market alternatives to intra-family help are usually very costly, making children's responses important, particularly in an increasingly ageing society.

In the United Kingdom, the National Health Service provides doctor and hospital services free at-the-point-of-use. State support for personal care in a person's own home is organised by local authorities. Access to these services is based on assessment of need. Financial help depends on personal resources, and its amount varies with the authority in charge because of different allocation criteria and budgets. Many authorities only give financial support to people who are classed as having substantial or critical needs, meaning state support is not available to many. Institutional care is an expensive substitute for in-home care. In 2013-14, UK residents paid on average £28,500 a year in residential care costs, rising to over £37,500 a year if nursing care is necessary (Laing & Buisson 2014). According to state benefit rules, if a person's assets, which may include their property, are calculated to be above £23,250 they will, in most cases, be expected to pay for their own care. Help given by adult children to parents who are suffering from poor health may play a crucial role in keeping parents in their own home and avoiding the high costs of in-home and institutional care.

Our primary research question is: how responsive is help from children to the health of their parents? Answers to this question contribute to the wider literature on upward intergenerational transfers. Although there are a large number of papers theorising about and

documenting the incidence and types of such transfers, it is challenging to assess reliably how responsive they are to ‘need’ for a number of reasons. First, reliable measures of need generally require information from the parent’s perspective, preferably dyads but more usually survey information from parents. Second, there are many kinds of need for children’s help. Those easier to measure are health and disability of parents, whether or not they have a partner and financial circumstances. Third, associations between help and need based on cross-section data suffer from the inability to distinguish between children’s response to a parent’s needs and differences between families in difficult-to-measure features of parents’ kin and friendship networks and of children’s preferences (e.g. altruism, reciprocity), opportunities (e.g. geographic proximity) and resources, which may be correlated with parents’ needs.

As well these research challenges, different foci of previous research can impede unbiased estimation of children’s responsiveness to parents’ needs. For example, if the focus is to test theories of intergenerational transfers, such as reciprocity (e.g. Silverstein *et al.* 2002), the research design usually needs to exploit between-family variation in behaviour rather than variation over time in parents’ needs and children’s help.

The present paper uses ‘within-parent’ variation to study how changes in a parent’s health, marital status and financial resources affect help from their children. As a by-product it tests whether previous studies’ use of ‘between-family’ variation to estimate the impact of parents’ health on children’s help produces biases. It uses longitudinal data from the parent’s perspective, drawing on three British sources covering up to ten years of parents’ lives. The analysis considers two measures of help: one that enumerates specific activities (e.g. help with shopping) and another that reports assistance with difficulties in performing activities of daily living. It also employs two measures of parents’ health: self-reported assessments of overall health and enumeration of difficulties with activities of daily living. The paper finds that children’s help is highly responsive to a parent’s health and marital status, but the estimates of responsiveness that are based fully or partially on between-family variation overstate the impact of parent’s health, sometimes severely.

2. Previous literature

The early empirical literature on children’s help to older parents, such as Hogan *et al.* (1993) and Silverstein *et al.* (1997), analysed cross-sectional data. There are, however, a number of subsequent studies which use panel data. For example, Eggebeen and Davey (1998), using data from the first two waves of National Survey of Family and Households, find that parents

received more help from children in 1992 if they had experienced one or more life transitions between 1988 and 1992. Similarly, Silverstein *et al.* (2006) analyse data from the Longitudinal Study of Generations, and show that children provided more support to parents in 2000 if the latter's health deteriorated between 1997 and 2000. Both of these papers study responsiveness to need, such as poor health, by including a lagged dependent variable, and this produces biased estimates of the impact of indicators of need on help when there are persistent unobserved parent- or family-specific influences on children's help, which are of course correlated with lagged dependent variable.

Recent literature has used a multi-level modelling approach. Silverstein *et al.* (2002) and Lin (2008) estimate 'growth curve' models for assistance by adult children to parents. The former analyses six waves of data from the Longitudinal Study of Generations, but it was not able to include parents' functional health as a time-varying covariate in their model. Lin (2008) estimates its model with three waves from the Health and Retirement Study, each of which measures functional health. Henretta *et al.* (2011) use up to four repeated observations on mother-child dyads derived from the Asset and Health Dynamics Among the Oldest Old cohort (AHEAD, one of five component cohorts in the larger Health and Retirement Study) to estimate a tri-level model (family, child and time). The model includes characteristics of the mother (including self-reported health), of the child and of family context, and it estimates within-family and within-child correlations.

A maintained hypothesis of these multi-level modelling approaches is that unobserved persistent person or family-specific influences on children's help to parents are not correlated with the explanatory variables ('random effect' estimates). Violation of this assumption can lead to biased estimates of the impacts of parents' health on children's help. What follows shows that the assumption does not hold in the analysis of British children's response to a parent's health.

3. Description of parents' health and children's help in the UK

In this section we describe how help given by children to parents varies with a parent's health and their socio-demographic attributes using a very large national representative household survey from the United Kingdom: *Understanding Society*. It is an annual survey of each adult member of a nationally representative sample (Each wave is collected using computer assisted personal interviewing over 24 months, such that the first wave of data collection started in January 2009 and finished in January 2011; for further details see <https://www.understandingsociety.ac.uk/>). The same individuals are re-interviewed in each

wave, and if individuals leave their household, all adult members of their new household are interviewed. Ethnic minority groups are over-sampled. Each person aged 16 or older answers the individual adult interview and self-completion questionnaire, both of which ask many questions that may be salient for studying intergenerational help. The data analysed here come from the first (2009-2010) and third (2011-12) waves of the study. The former provides information about parents' 'stable' socio-demographic attributes, such as ethnicity, and the latter provides information about help and other time-varying attributes like health, marital status and geographic proximity to children. The population of interest is 'older' parents, who are defined to be aged 55 and over (in 2009-10). The sample of persons of these ages in both the first and third waves with a living child is 8,764.

The health measure is self-reported health status, grouped in a five-categories ranging from poor to excellent. Appendix 1 shows that such measures are related to a large number of objective physical health measurements, such as BMI, pulse and lung function.

Questions about help are addressed to parents who have a living child who is not in their household. Co-residence of parents and an adult child is not very common in the UK population as a whole, but it is for some ethnic groups. For instance, about 11 per cent of white UK residents aged 65 and over live with an adult child, but it rises to 64 per cent for people of these ages of Pakistani or Bangladeshi origin. The analyses that follow are confined to parents having at least one living child outside the household.

The survey asks about regular or frequent receipt of nine kinds of help: 'And do you regularly or frequently receive any of these things from your children aged 16 or older not living here?' In addition to financial help, which is rare, there are eight types of in-kind help mentioned: receiving lifts in a child's car; shopping; providing or cooking meals; help with basic personal needs, like dressing; washing, ironing or cleaning; dealing with personal affairs, like paying bills; decorating, gardening or house repairs; anything else. Figure 1 shows that parents in poorer health are more likely to receive at least one of these forms of regular in-kind help from children, rising from 36 per cent for those in excellent health to 60 per cent for those in poor health, and they also receive more types of help. Of course these relationships may reflect other attributes correlated with both health and help.

To address this issue, a multivariate analysis controls for a number of socio-demographic attributes of parents, including number of children, number of siblings, experiencing divorce while a person's child was under 16, ethnic group, marital status, educational attainment and 'equivalent household income' (defined as household income in the past month divided by the square root of household size, taking the average value for

2009-10 and 2011-12). Table 1 provides the estimates of a logistic regression for receipt of some in-kind help from children and of an ordinary regression for the number of types of help, along with the means of the explanatory variables. Similar results are obtained with a negative binomial regression, which explicitly takes into account the ‘count’ nature of the latter dependent variable.

As in Figure 1, we see that the odds of receiving some help and the number of types are higher for parents in poorer health. For instance, the logit parameter estimates imply that the predicted probability of receiving some in-kind help rises from 0.40 for parents in excellent health to 0.42 (very good), 0.46 (good), 0.49 (fair) and 0.55 if they are in poor health. The predicted number of types of help received is 0.8 for those in excellent health, and it increases to 0.85 (very good), 0.95 (good), 1.12 (fair) and 1.46 if they are in poor health. While the range of increase in help as a parent’s health worsens is smaller than in Figure 1, it is still substantial.

Receipt of children’s help is more likely for parents who have lower levels of education, lower equivalent household income, more children, a grandchild and are women. Dissolution of the person’s marriage while still having a dependent child reduces the chances of receiving help from children later in life. Relative to married parents, divorced and widowed parents are more likely to receive help, while those who are cohabiting are less likely to do so. The number of types of help shows analogous patterns in relation to these variables. In addition, parents of Pakistani origin receive significantly more types of help than other ethnic groups, although they are not significantly more likely to receive any help. The main relationships change very little when we control for the geographic proximity of the adult child that they ‘have the most contact with’ (results not shown).

4. Longitudinal analysis of health and help: methods

While the analysis in the previous section has controlled for a number of important socio-demographic characteristics of parents that affect their receipt of help from children, it is still possible that there are some omitted factors that influence children’s help and are correlated with a parent’s health. More formally, the models estimated below take the following form:

$$y_{it} = \beta x_{it} + \alpha_i + v_{it} \quad (1)$$

where y_{it} is either a continuous latent variable for the parent i ’s propensity to receive help from children in year t or a count of the number of types of help received; x_{it} is a vector of attributes of the parent, including their health; β are parameters to be estimated; α_i is a

persistent parent- or family-specific factor (e.g. the sex composition of children) affecting receipt of help and v_{it} represents time-varying residual influences and is assumed to be uncorrelated with \mathbf{x}_{it} . The concern is that α_i is correlated with variables in \mathbf{x}_{it} , in particular the parent's health.

When y_{it} is a latent variable, we observe a parent receiving help when y_{it} is positive. In this situation, we estimate the parameters β in equation (1) using 'conditional logit' (i.e. we assume that v_{it} has a logistic distribution), which produces consistent estimates when α_i is correlated with variables in \mathbf{x}_{it} . Only those who have at least one year when they receive help and one year when they do not receive it contribute to the analysis. More efficient estimates are possible if we can accept the hypothesis that α_i is not correlated with variables in \mathbf{x}_{it} . If it is correct, we can use both between-family and within-parent variation in a 'random effect' estimator. We test the hypothesis with a Hausman test, which compares the two sets of estimates of the common variables.

When y_{it} is a count of the number of types of help, the statistical procedures are analogous. Linear regressions are estimated using fixed effect and random effect estimators of β , and we test the hypothesis that α_i is not correlated with variables in \mathbf{x}_{it} using a Hausman test comparing the two estimators.

With only one possible exception, the Hausman test rejects the hypothesis that α_i is not correlated with variables in \mathbf{x}_{it} , implying that the fixed effect estimates are best. Even in the exceptional case, the p-value associated with the Hausman test is 0.054. The random effect estimates are nevertheless reported to show the biases that result when also using between-family variation to estimate the impacts of a parent's health and other variables on help from children.

5. Self-reported health and children's help

The present section combines waves 2001 and 2006 of the British Household Panel Study (BHPS: <https://www.iser.essex.ac.uk/bhps>), predecessor of *Understanding Society* in general design and content, along with BHPS members in the 2011-12 wave of *Understanding Society*. Both surveys ask the same questions about help from children, but differ slightly with respect to the coding of self-reported health. In the BHPS, the categories are 'excellent, good, fair, poor, very poor', while in *Understanding Society* they are 'excellent, very good, good, fair, poor.' For comparability purposes we define a new variable indicating whether or not a person rates their health as fair or poor, including 'very poor' in the BHPS. Concern

about the subjective nature of the health measure is mitigated by fixed effect estimation, which only uses changes in each person's view of their health to identify its effect, rather than differences between persons in perception of their health.

Overall, when a parent reports their health as fair or poor, 55 per cent report receiving some regular in-kind help from children (mean number of help-items=1.4) compared with 41 per cent for those with good to excellent health (mean number=0.8). But the conditional (fixed effect) logit estimates (first column of Appendix Table 2 in Appendix II) indicate that having fair or poor health has virtually no impact on the odds of receiving some help from children. In contrast the random effect estimate of the impact of fair or poor health (second column of Appendix Table 2) implies that it increases the odds of receiving some help from a child by 40 per cent. Because we find no impact in the fixed effect analysis, it must be the case that a parent who, for unobserved reasons, is more likely to receive some help from a child is also more likely to experience fair or poor health.

While variation in health over time does not affect receipt of at least one type of help, there are child-help responses to other indicators of parental 'need'. In particular, becoming a widow(er) significantly increases the odds of receiving help. Help is more likely for parents with a lower current equivalent household income, but its impact is not statistically significant. Having a grandchild increases the chances receiving help, perhaps partly in return for parents' help with childcare. For instance, regular or frequent childcare help by parents is positively correlated with receipt of in-kind help from children (the raw correlation is 0.18).

There is more within-person variation in the number of types of regular or frequent help received in each year, and it is indicative of the intensity of help as well as its incidence. In this analysis there is evidence that the impact of poorer health differed between mothers and fathers. Fixed effect linear regression estimates in Table 2 show that deterioration of mothers' health from excellent or good to fair or poor increases the average number of types of help received by 0.25, a statistically significant increase. The health of fathers had no impact on receipt of children's help. Becoming a widow(er) increases help received, as does becoming divorced or separated, with no evidence of a difference between fathers and mothers. Using a fixed effect negative binomial regression model instead of a linear one leads to the same conclusions, and there is also an indication that acquiring a grandchild significantly increases the number of types of help. We also see a tendency for help received from children to increase as the parent ages, which may reflect sources of a parent's needs other than their health, marital status or financial resources.

6. Difficulties with activities of daily living and children's help

Two generally accepted indicators of potential need for assistance are difficulties in the 'activities of daily living' (ADLs: eating, bathing, dressing, toileting, walking and getting in and out of bed) and problems performing 'instrumental ADLs' (activities not necessary for fundamental functioning, but which let an individual live independently in a community). These difficulties may tap more directly into the need for assistance than self-reported general health. In the 2001 and 2006 BHPS, questions about a small number of ADLs are asked concerning ability: 'to manage stairs', 'to get around the house', 'to get in and out of bed', 'to cut toenails' and 'to bath or shower'. As expected, people who report more ADLs also report poorer health. For example, among parents reporting excellent health, 87 per cent report no ADLs compared with 22 per cent among those reporting very poor health.

The ADL questions are only asked of persons aged 65 or older, making the analytical sample older than the samples in Tables 1 and 2 (mid-70s rather than late 60s). Using the two waves of data in a linear regression for the number of types of help, we cannot reject, at the 0.05 level, the hypothesis that unobserved parent- or family-specific influences on the number of types of children's help (α_i) are uncorrelated with the explanatory variables, and so the random effect estimates are preferred. The estimates in Table 3 show that, compared to a parent with no ADLs, the number of types is about 0.3 higher if the parent has one ADL and about 1.1 higher if they have 2 or more ADLs. Also, widow(er)s, the divorced or separated, parents with a grandchild and older parents receive more help from children. Better educated parents and those with higher average past equivalent income receive less help.

Information on many more ADLs and IADLs was collected in the English Longitudinal Study of Ageing (ELSA), and the sample is much larger than that in Table 3. ELSA is a longitudinal panel study of people aged 50 and over and their partners, living in private households in England. It began in 2002. The sample was drawn from households that had previously responded to the Health Survey for England (HSE) between 1998 and 2004 and in 2006. Its aim is to study a sample of people aged 50 and over. As the study progresses, ELSA respondents get older and the sample effectively ages, therefore the youngest people need to be replaced as they are no longer represented. At Wave 3 the ELSA sample was refreshed to make the sample representative of the youngest people. The refreshment sample included new people from HSE 2001 - 2004 who were previously too young to join ELSA (or become an ELSA core member) in 2002, but who were now aged 50 or over (i.e. people aged 50 to 53 and their partners). At Wave 4 the ELSA sample was

further refreshed across a wider age range of 50 to 74 years. This refreshment sample included new people from HSE 2006 and their partners. For further details, see NatCen Social Research (2012). In the analysis here, the sample is confined to parents aged 55 and older with at least one living child.

The same group of respondents have been interviewed at biennial interviews to measure changes in their health, economic and social circumstances. At present there are 5 'waves' of data. The question which identifies ADLs and IADLs is: 'We need to understand difficulties people may have with various activities because of a health or physical problem. Please tell me whether you have any difficulty doing each of the everyday activities on this card. Exclude any difficulties that you expect to last less than three months.' The first column of Table 4 shows the incidence of each type of ADL or IADL in a pooled sample of waves 1, 2, 4 and 5, when this information was collected. In addition, people are asked to respond to a list of 10 mobility difficulties (e.g. walking for 100 yards, sitting for 2 hours, climbing several flights of stairs). Fifty-eight per cent report at least one mobility difficulty, with a mean of 2.1 per person (3.6 for those with at least one).

In waves 1, 4 and 5, ELSA also asks questions about help for people having an ADL, IADL or mobility difficulty: 'Thinking about the activities that you have problems with, does anyone ever help you with these activities (including your partner or other people in your household)?' In wave 1 it goes on to ask 'Who helps you with these activities?' Helpers can include a spouse, a paid employee, children, other relatives, friends and neighbours. In waves 4 and 5, there are a series of follow-up questions of the form 'Who, if anyone, helps with [specific activities]?' Seven sets of activities are mentioned. The list of possible sources of help is: husband or wife or partner, son, daughter, sister, brother, other relative, privately paid employee, local authority/social services helper (e.g. home care worker), nurse (e.g. health visitor or district nurse), member of staff at the care/nursing home (a small number of people move into an institution during the panel, contributing 101 person-year observations in an institution), friend or neighbour and other person. For instance, if we consider help with bathing or dressing (the 2 highest incidence ADLs in Table 4), the most common source of help was a spouse (44 per cent), followed by son or daughter (10 per cent), local authority or social services (9 per cent) and staff at a care home (6 per cent); 30 per cent received no help.

Among those reporting problems with at least one ADL or IADL, a son or daughter provided help in 25 per cent of the person-years. Thirty-seven per cent received help from a spouse, while 28 per cent received help from others. There is some overlap in sources of

help: for instance, 12 per cent received help from both children and from others (excluding spouses), while 7 per cent received help from children and a spouse. The two panels of Figure 2 show how help from each source increases with the number of ADLs and IADLs, respectively. In both cases, the steepest increase is in the incidence of other help, followed by help from children. The second column of Table 4 shows the percentage of parents with each particular ADL/IADL who receive any help from children. Among those with no ADLs or IADLs (i.e. only a mobility difficulty), only 4 per cent receive help from a child.

Under this definition, ‘help’ is specifically targeted on difficulties experienced. It may, however, encompass instrumental help activities (e.g. shopping) similar to those mentioned in the BHPS and *Understanding Society*. Because the help question is only asked of those who report some difficulty, the sample is relatively old (mean age=72 cf. 68 in the broader sample).

Table 5 reports conditional logit and random effect logit estimates for the odds of receiving help from a child. Both estimators indicate that the number of ADLs has no significant impact on the receipt of child help. This might reflect the fact that the ELSA help questions are only directed at parents with some difficulties, in contrast to the BHPS, which asks about instrumental help (cf. Table 3). While both estimators show that the odds of receiving help from a child increase with the number of IADLs and with the number of mobility problems, the random effect estimates overstate the magnitude of the increase in both cases. With regard to the impact of a parent’s resources, the preferred fixed effect estimates indicate a positive but marginally significant effect (at the 0.10 level) on receipt of child’s help, in contrast to the negative coefficient in the random effect estimates. The latter reflects the tendency for parents who are richer to have unmeasured attributes that make them less likely to receive help from their children.

Using the fixed effect estimates, and calculating the marginal effects at the mean proportion receiving child-help in the sample (0.14), the probability of receiving help from a child is higher by the following amounts relative to a parent with no IADLs: 0.12 (1 IADL), 0.18 (2), 0.24 (3), 0.34 (4 or more). Each additional mobility problem increases the probability by 0.017. Also, widows have a probability of receiving help that is 0.18 higher than a married person, and parents with an additional living sibling are 0.03 less likely to receive help from a child. There is no evidence of different effects of IADLs or number of mobility problems for mothers and fathers (estimates not shown).

Many surveys only collect measures of self-reported health. In Table 6, ADLs, IADLs and mobility problems are replaced by self-reported health, and we see a strong

tendency for help to increase as health becomes worse, as we might expect from the strong relationship between the number of these difficulties and self-reported health. The fixed effect estimates are again preferred, with the random effect ones overstating the impact of a parent's health on children's help. The fixed effect estimates imply (at the mean proportion receiving child-help) that compared to a parent in excellent health, the probability of receiving help increases in the following way as health deteriorates: 0.12 (very good), 0.13 (good), 0.16 (fair) and 0.23 (poor).

When self-reported health is added to the model in Table 5, it is not statistically significant. Thus, measures of difficulties in daily living discriminate better in predicting when a parent receives help from children.

Finally, Appendix I develops an index of health that varies purely because of objective physical health measurements. It is derived from a relationship between self-reported health and health-related measurements taken from nurse visits in waves 2 and 4 of ELSA. Unfortunately, only wave 4 has both measures of children's help and information from the nurse visits. In this cross-section, there is a significant negative relationship between the health index and children's help.

7. Conclusions

Two primary conclusions emerge from analysis of three British longitudinal data sets using two definitions of children's help and two definitions of parents' health. One is that children's help is highly responsive to a parent's poor health or difficulties with daily living and also to parents becoming a widow or widower. The other is that estimates based fully or partly on between-family variation—either from cross-section data or the 'random effect' assumption in the analysis of longitudinal data—tend to overstate the responsiveness to a parent's health by significant amounts and bias the estimated impact of a parent's marital status. These biases arise because unobserved influences on the chances of receiving help from children, such as aspects of need other than health or marital status, are correlated with a parent's health and marital status.

When measures of children's help and parents' health are less strongly linked to particular difficulties with activities of daily living (in the BHPS and *Understanding Society*), there is strong evidence that parents who are divorced or separated, who are older, and who have a grandchild also receive more instrumental help from children. The impact of a grandchild may reflect reciprocity, as the data show that parents who give more help to children (e.g. childcare) also receive more help. When using an indicator of poor health

(rather than difficulties with activities of daily living) and the number of types of instrumental help, it is found that children only respond to the mother's poor health, not the father's. There is also evidence that the presence of more living siblings reduces the odds of help from children related to difficulties of daily living, perhaps because of help given by siblings.

People in middle-age face pressures from child-rearing and from the needs of their parents, particularly as they advance into their 70s and beyond. The paper finds that these middle-aged 'children' respond to their parents needs with in-kind help, which is extremely important in light of the high cost of care from outside the family in the UK. These intra-family responses are crucial in coping with an ageing society.

References

- Eggebeen, D. J. and Davey, A. (1998) Do safety nets work? The role of anticipated help in times of need. *Journal of Marriage and the Family*, 60, 939–950.
- Henretta, J. C., Soldo, B. J. and Van Voorhis, M. F. (2011) Why do families differ? children's care for an unmarried mother. *Journal of Marriage and Family*, 73, 383-395.
- Hogan, D. P., Eggebeen, D. J., and Clogg, C. C. (1993) The structure of intergenerational exchanges in American families. *American Journal of Sociology*, 98, 1428–1458.
- Laing & Buisson. (2014) *Care of Older People UK Market Report 2013/14*. (https://www.laingbuisson.co.uk/Portals/1/MarketReports/Documents/CareOlderPeople_26th_BRO.pdf)
- Lin, I. F. (2008) Consequences of parental divorce for adult children's support of their frail parents. *Journal of Marriage and Family*, 70, 113-128.
- NatCen Social Research 2012. *English Longitudinal Study of Ageing (ELSA), Wave One to Wave Five, User guide to the datasets* (August 2012). UK Data Archive Study Number 5050, London.
- Silverstein, M., Bengtson, V. L., and Lawton, L. (1997) Intergenerational solidarity and the structure of adult child–parent relationships in American families. *American Journal of Sociology*, 103, 429–460.
- Silverstein, M., Conroy, S. J., Wang, H., Giarrusso, R., and Bengtson, V. L. (2002) Reciprocity in parent–child relations over the adult life course. *Journal of Gerontology: Social Sciences*, 57B(1), S3–S13.
- Silverstein, M., Gans, D., and Yang, F. M. (2006) Intergenerational support to aging parents: the role of norms and needs. *Journal of Family Issues*, 27, 1068–1084.

Figure 1:

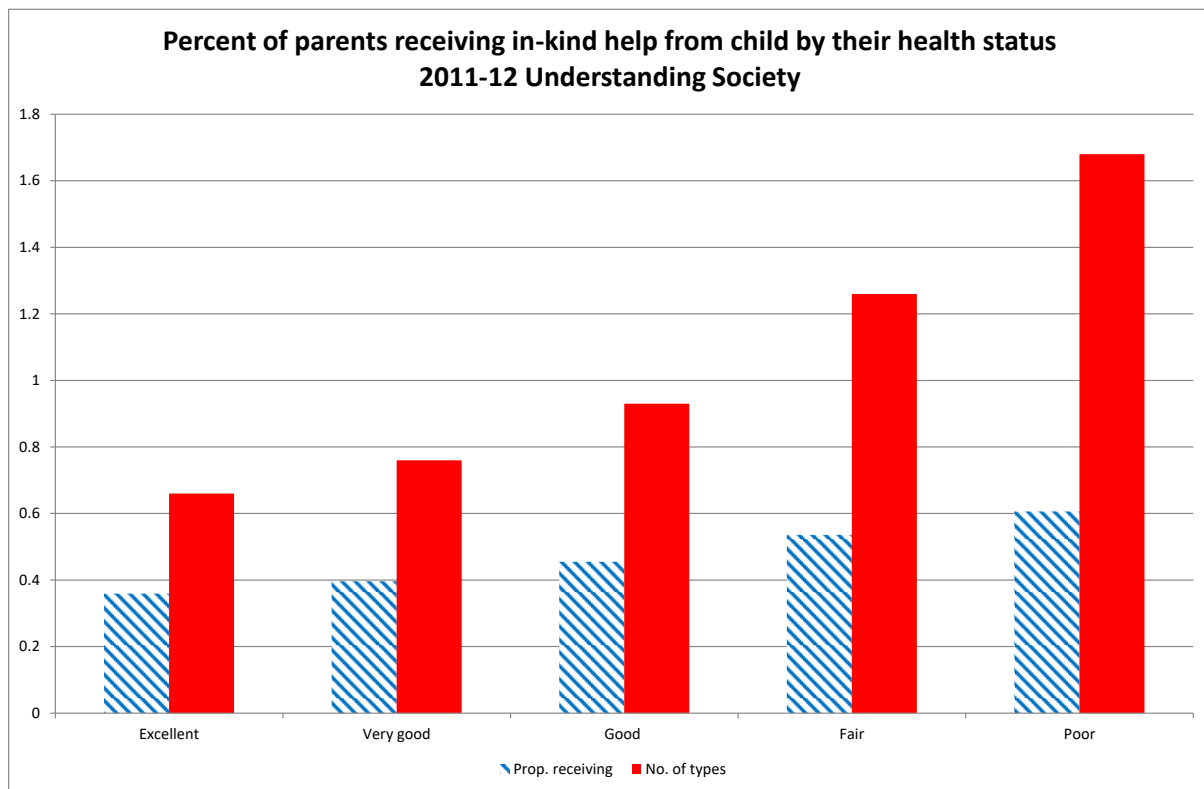
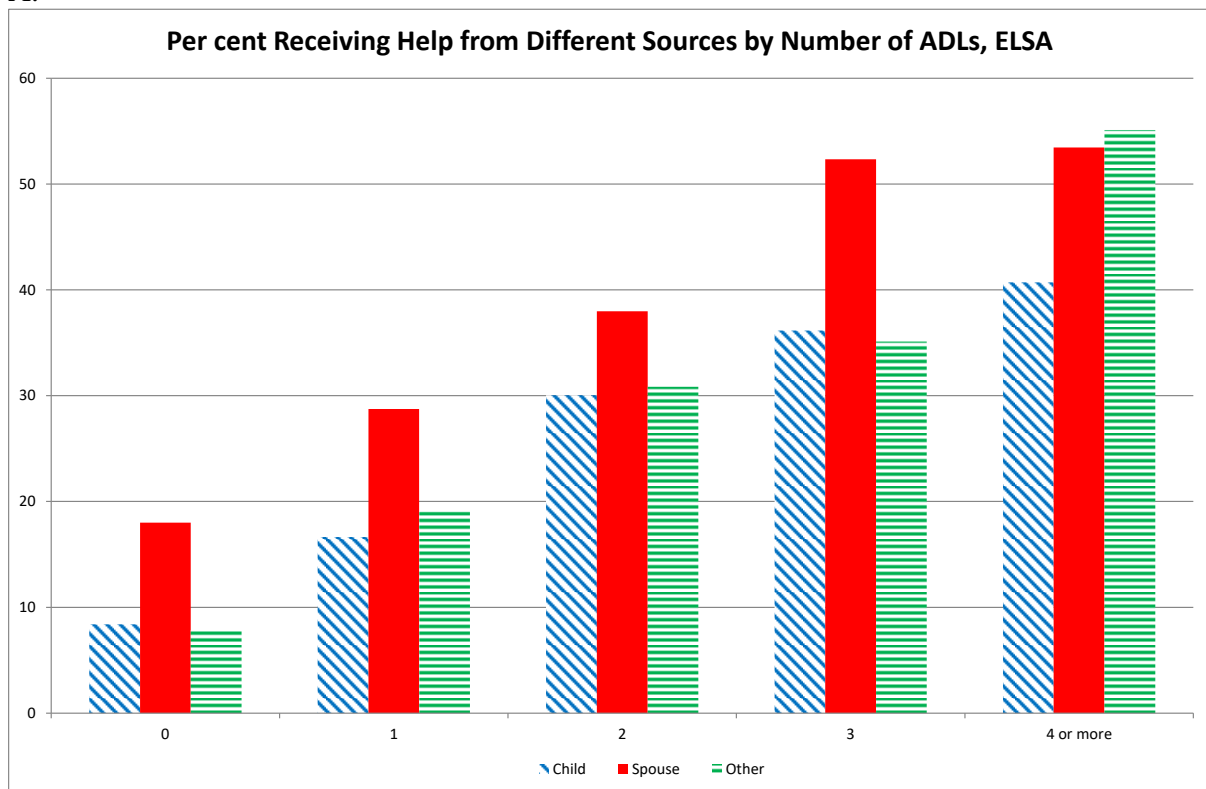


Figure 2:

A.



B.

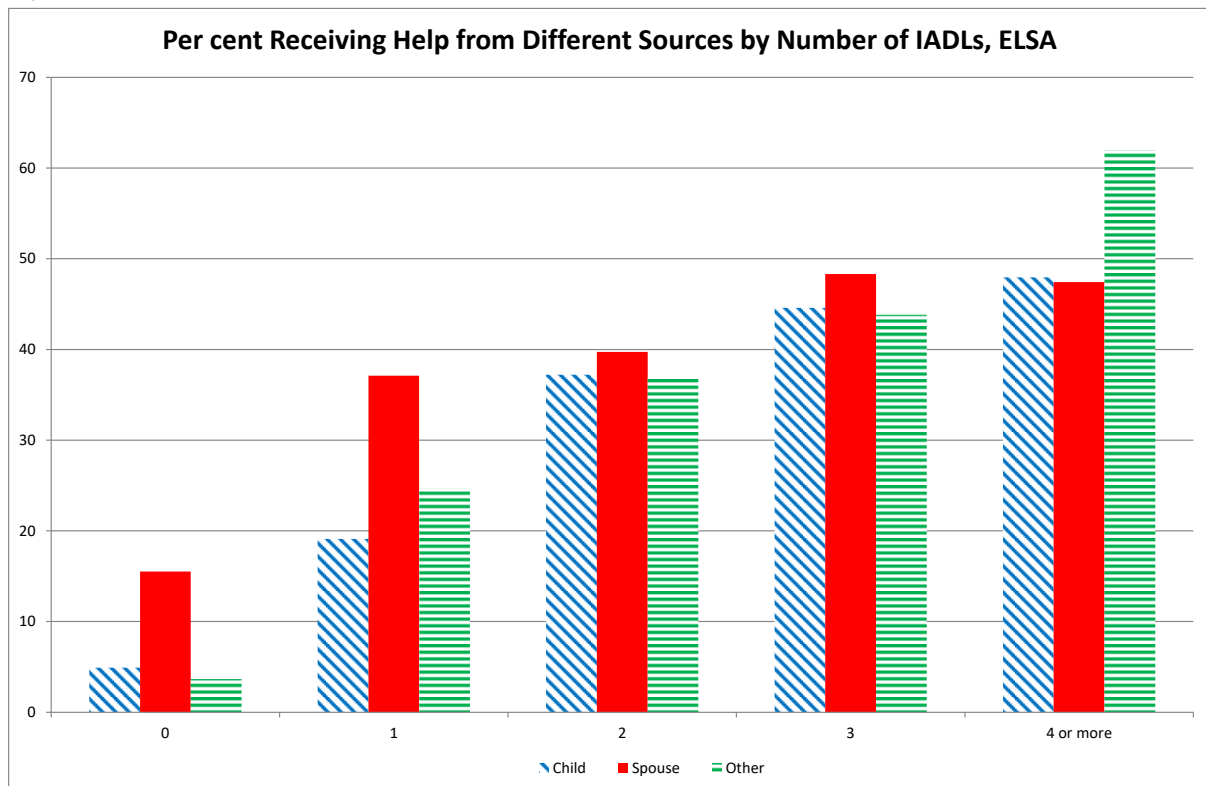


Table 1 Receipt of help from children and parent's health, *Understanding Society*

Variable	Odds of receipt of child help		<i>Mean (SD)</i>	Number of types of child help	
	Coefficient	S.E.*		Coefficient	S.E.*
Mother	0.323	0.046	<i>0.570</i>	0.239	0.028
Age	-0.079	0.049	<i>67.1 (8.1)</i>	-0.105	0.033
Age-squared	0.001	0.000		0.001	0.000
Ethnic group (reference: 'white')			<i>0.946</i>		
Indian, SriL, Afr.Asian	0.070	0.232	<i>0.019</i>	0.083	0.153
Pakistani	0.156	0.345	<i>0.005</i>	0.635*	0.373
Bangladeshi	-0.010	0.689	<i>0.001</i>	0.416	0.742
Caribbean	0.037	0.229	<i>0.016</i>	0.080	0.175
African	0.413	0.333	<i>0.006</i>	0.063	0.207
Chinese, Far East	0.079	0.474	<i>0.004</i>	-0.022	0.270
Turkish, Medit.	-0.455	0.518	<i>0.002</i>	0.312	0.460
Marital status (reference: married)			<i>0.661</i>		
Divorced/sep.	0.316	0.084	<i>0.124</i>	0.316	0.057
Widow(er)	0.633	0.075	<i>0.183</i>	0.629	0.056
Cohabiting	-0.394	0.157	<i>0.033</i>	-0.184	0.068
Education (reference: degree)			<i>0.142</i>		
Other higher	0.155	0.097	<i>0.123</i>	0.114	0.051
A level etc	0.196	0.100	<i>0.128</i>	0.185	0.053
GCSE etc	0.150	0.096	<i>0.147</i>	0.053	0.048
Other qualification	0.249	0.095	<i>0.167</i>	0.166	0.053
No qualification	0.416	0.092	<i>0.292</i>	0.331	0.053
Number of children (reference=1)			<i>0.118</i>		
2	-0.014	0.087	<i>0.478</i>	0.034	0.050
3	0.150	0.095	<i>0.251</i>	0.128	0.055
4 or more	0.381	0.104	<i>0.153</i>	0.338	0.066
Number of siblings (reference: none)			<i>0.256</i>		
1	-0.017	0.066	<i>0.291</i>	0.032	0.040
2	-0.084	0.074	<i>0.199</i>	0.020	0.045
3	-0.016	0.088	<i>0.111</i>	0.056	0.054
4	-0.080	0.111	<i>0.059</i>	0.099	0.074
5 or more	0.074	0.100	<i>0.085</i>	0.137	0.066
Divorced w/ dep child	-0.291	0.068	<i>0.225</i>	-0.150	0.040

Widowed w/dep child	-0.017	0.163	<i>0.025</i>	-0.033	0.112
Not UK born	-0.228	0.127	<i>0.086</i>	-0.028	0.090
Has grandchild	0.445	0.077	<i>0.832</i>	0.125	0.042
Self-reported Health (reference: Excellent)			<i>0.103</i>		
Very good	0.086	0.090	<i>0.294</i>	0.047	0.045
Good	0.258	0.091	<i>0.290</i>	0.154	0.048
Fair	0.406	0.096	<i>0.215</i>	0.318	0.054
Poor	0.644	0.113	<i>0.098</i>	0.664	0.078
log equivalent income	-0.190	0.050	<i>2.70 (0.61)</i>	-0.073	0.030
Constant	1.342	1.696		3.385	1.113

N=7,656; means of dependent variable: 0.457 and 0.990, respectively

*Standard errors adjusted for within household correlation between spouses.

Table 2: Impacts on number of types of help from children, *BHPS/Understanding Society*

	Fixed effect		Random effect*		<i>Mean (SD)</i>
	Coefficient	S.E.	Coefficient	S.E.	
Age	0.028	0.005	0.024	0.002	68.6 (9.3)
Mother	(omitted)		0.209	0.047	0.573
Poor/fair health	0.028	0.081	0.200	0.052	0.363
Poor/fair health*Mother	0.254	0.109	0.198	0.067	0.409
Cohabiting	0.166	0.216	-0.195	0.099	0.032
Divorced, separated	0.420	0.195	0.283	0.065	0.092
Widow(er)	0.757	0.101	0.698	0.050	0.212
Has grandchild	0.074	0.079	0.246	0.045	0.825
log equivalent income	0.019	0.042	0.037	0.031	2.38 (0.65)
Education (reference: degree)					0.078
Other higher/ A-level			0.187	0.077	0.322
O-level or below			0.242	0.083	0.223
No qualification			0.367	0.083	0.378
Log mean past equiv. income			-0.193	0.052	2.20 (0.52)
Constant	-1.209	0.315	-1.033	0.234	

*Ratio of between variance to total residual variance=0.48.

Hausman chi-square (7df)=21.98 (p=0.0050).

FE sample: 4874 persons, 7634 person-years.

RE sample: 4566 persons, 7240 person-years.

Mean of dependent variable=1.109.

Table 3: Impacts on number of types of help from children, *BHPS*

	Fixed effect		Random effect*		<i>Mean (SD)</i>
	Coefficient	S.E.	Coefficient	S.E.	
No ADL (reference)					<i>0.649</i>
1 ADL	0.266	0.119	0.321	0.060	<i>0.222</i>
2 ADLs	0.877	0.223	1.123	0.100	<i>0.068</i>
3 or more ADLs	0.806	0.229	1.144	0.108	<i>0.061</i>
Age	0.042	0.011	0.018	0.004	<i>74.6 (6.8)</i>
Widow(er)	0.948	0.167	0.699	0.062	<i>0.340</i>
Cohabiting	-0.657	0.655	-0.193	0.216	<i>0.015</i>
Divorced, separated	0.808	0.430	0.238	0.106	<i>0.067</i>
Has grandchild	0.251	0.200	0.427	0.081	<i>0.892</i>
log equivalent income	-0.073	0.094	0.055	0.059	<i>2.18 (0.55)</i>
Education (reference: degree)					<i>0.0451</i>
Other higher/ A-level			0.167	0.137	<i>0.2234</i>
O-level or below			0.262	0.141	<i>0.2231</i>
No qualification			0.373	0.137	<i>0.5085</i>
Log mean past equiv. income			-0.389	0.086	<i>1.96 (0.46)</i>
Mother			0.206	0.057	<i>0.57</i>
Constant	-2.349	0.821	-0.764	0.423	

*Ratio of between variance to total residual variance=0.52.

Hausman chi-square (9df)=16.70 (p=0.0535).

FE sample: 2973 persons, 3783 person-years.

RE sample: 2813 persons, 3595 person-years.

Mean of dependent variable=1.383.

Table 4: Presence of ADL/IADL, *ELSA*

ADL	Per cent with ADL/IADL ^a	Per cent receiving help from child ^b
Difficulty Dressing	13.0	26.4
Difficulty Walking	2.6	41.5
Difficulty Bathing/Showering	10.3	32.8
Difficulty Eating	1.6	38.1
Difficulty getting in/out of bed	5.8	32.8
Difficulty using toilet	2.9	31.8
IADL		
Difficulty preparing hot meal	3.5	42.5
Difficulty shopping	8.1	44.0
Difficulty doing work around house/garden	15.2	33.4
Difficulty managing money	1.8	44.0
Difficulty using map	4.2	33.0
Difficulty making phone calls	1.5	32.6
Difficulty taking medication	1.3	39.3

^a N person-years=23,371 (waves 1, 2, 4 and 5)

^b Receipt of help from children for any ADL or IADL, waves 1, 4 and 5.

Table 5: Impacts on log Odds of Parent's Receipt of Help from Children, *ELSA*

	Fixed Effect		Random Effect*		<i>Means (SD)</i>
	Coefficient	S.E.	Coefficient	S.E.	
Age	-0.019	0.018	0.005	0.007	72.3 (9.0)
Has grandchild	-0.061	0.382	0.016	0.201	0.886
Mother			0.313	0.125	
Marital status (reference=Married)					0.632
Cohabiting	-2.425	1.575	-2.035	0.708	0.021
Widow	1.454	0.303	1.894	0.136	0.252
Divorced	1.044	0.656	1.268	0.179	0.083
Separated	1.521	0.762	0.685	0.418	0.013
Number of siblings	-0.280	0.151	0.056	0.041	1.55 (1.34)
Number of ADLS (reference=0)					0.656
1	-0.228	0.174	-0.257	0.134	0.181
2	0.210	0.224	0.110	0.165	0.079
3	0.008	0.293	-0.105	0.208	0.042
4 or more	-0.219	0.332	-0.194	0.228	0.042
Number of IADLs (reference=0)					0.636
1	1.024	0.164	1.473	0.129	0.190
2	1.469	0.208	2.064	0.161	0.092
3	2.001	0.279	2.528	0.210	0.043
4 or more	2.826	0.379	3.017	0.239	0.039
Number of mobility problems	0.142	0.039	0.261	0.026	3.45 (2.49)
log equivalent income	0.233	0.131	-0.261	0.089	5.25 (0.60)

*Ratio of between variance to total residual variance=0.38. The RE specification also includes a number of variables that do not vary over time: number of own children (5 categories), number of step children (4 categories), highest educational qualification (8 categories) and whether or not there is a child in the household in wave 2.

Hausman chi-square (17 df)=108.7 (p=0.0000)

FE sample: 682 persons, 1773 person-years.

RE sample: 4357 persons, 8371 person-years.

Table 6: Impacts on log Odds of Receipt of Help from Children, *ELSA*^a

Self-reported Health	Fixed Effect		Random Effect ^b		<i>Means</i>
	Coefficient	S.E.	Coefficient	S.E.	
Excellent (reference)					<i>0.050</i>
Very good	0.991	0.505	0.619	0.346	<i>0.201</i>
Good	1.112	0.488	1.122	0.332	<i>0.349</i>
Fair	1.313	0.495	2.145	0.332	<i>0.288</i>
Poor	1.899	0.521	3.063	0.345	<i>0.111</i>

^a Model also includes the other variables in Table 5.

^b Ratio of between variance to total residual variance=0.41.

Hausman chi-square (16df)=107.97 (p=0.0000)

Appendix I:

Self-reported Health and Nurse Measurements

There may be a concern that subjective health status, grouped in a five-categories ranging from poor to excellent, may reflect some unobserved personal characteristics which affect how they report their health, and may make people more likely to report both poor health and receipt of help. Persistency in a person's propensity to report favourably or negatively on their health is addressed by the fixed effect estimates in the paper, but there may be lingering concern about subjective health reports. I address this issue by constructing an index of health that varies purely because of objective physical health measurements, a source of variation that is contaminated less by measurement error and perhaps more likely to be exogenous with respect to reports of help.

In the second and fourth waves of ELSA there was a nurse visit in which various health-related measurements were taken.

Physical measurements

1. Blood cholesterol level: coded to 3 categories: less than 5.2mmol/l (low); 5.2-6.1 (borderline) and more than 6.1 (high).
2. Blood haemoglobin level: continuous (g/l)
3. Pulse reading; continuous (beats per minute)
4. Blood pressure: coded to 3 categories: high (systolic \geq 140 or diastolic \geq 90); low (systolic \leq 90 or diastolic \leq 60); other.
5. Mean arterial pressure: continuous
6. Lung function: FVC reading (litres), continuous.
7. Body Mass Index: continuous.
8. Waist/Hip ratio: continuous
9. Semi-tandem stand: dichotomous held for ten seconds (0); held for less than 10 seconds (1).

These measures are included in an ordered probit regression for self-reported health, which has sex, year of birth and the health measurements as explanatory variables. The health index is the sum of the estimated probit coefficients multiplied by the corresponding explanatory variables for each person ('probit score'). It clearly varies over individuals only because of variation in the health measurements.

The estimated probit coefficients in Appendix Table 1 indicate that the self-reported health reports have content in relation to objective measures related to health. In particular, a higher pulse rate, higher BMI, higher waist-hip ratio, and high or low blood pressure are

associated with poorer reports of health, while better lung function, higher mean arterial pressure and higher blood haemoglobin levels are associated with better health reports. One oddity is the tendency for cholesterol readings above 5.1 to be associated with reports of better health. Also, health reports tend to be better in wave 4 of ELSA.

Appendix Table 1: Ordered Probit for Self-reported Health, ELSA waves 2 and 4

	Coefficient	SE*
Female	0.053	0.040
Year of birth	0.006	0.002
Cholesterol <5.2	Ref.	
Cholesterol 5.2-6.1	0.245	0.029
Cholesterol Higher >6.1	0.245	0.029
Haemoglobin	0.045	0.011
Pulse	-0.009	0.001
BMI	-0.032	0.003
Waist-hip ratio	-1.600	0.202
Lung function (FVC)	0.172	0.015
Semi-tandem stand less than 10 seconds	-0.582	0.084
High blood pressure	-0.074	0.034
Low blood pressure	-0.073	0.049
Mean arterial pressure	0.004	0.002
Wave=4 (ref: wave=2)	0.055	0.020
/cut1	9.308	2.994
/cut2	10.303	2.995
/cut3	11.275	2.996
/cut4	12.331	2.996

Standard error adjusted for multiple obs. per person.

In a logit model for child help in wave 4 including the variables in the RE model in Table 5, the impact of the health index on the log odds of help is -0.59 (SE=0.26; SE adjusted for multiple observations per household).

Appendix II

Appendix Table 2: Impacts on log Odds of Receipt of Help from Children, BHPS

	Fixed effect		Random effect*	
	Coefficient	S.E.	Coefficient	S.E.
Age	0.054	0.012	0.031	0.005
Poor/fair health	0.025	0.141	0.352	0.079
Cohabiting	0.472	0.492	-0.857	0.240
Divorced, separated	-0.015	0.490	0.370	0.142
Widow	0.965	0.274	1.010	0.116
Has grandchild	0.486	0.213	0.844	0.108
log equivalent income	-0.115	0.111	-0.010	0.073
Education:				
Other higher/ A-level			0.482	0.175
O-level or below			0.737	0.186
No qualification			0.885	0.185
Log mean past equiv. income			-0.442	0.116
Sex			0.515	0.087
Constant			-3.725	0.558

*Ratio of between variance to total residual variance=0.46.

Hausman chi-square (7df)=29.18 (p=0.0001)

FE sample: 701 persons, 1834 person-years.

RE sample: 4556 persons, 7240 person-years.

There is no evidence of different effects of poor/fair health for men and women.