Population Ageing (2013) 6:323–338
DOI 10.1007/s12062-013-9091-2

Offspring in Squeeze: Health and Sick Leave Absence among Middle-aged Informal Caregivers

Elisabeth Ugreninov

Received: 9 January 2013 / Accepted: 4 November 2013 / Published online: 19 November 2013

Abstract This paper is motivated by the major future challenges that an ageing population would bring on a demand for an increase in the workforce and potential health outcomes on informal caregivers. Understanding the individual health and sick leave costs of caregiving is important for improving work and family policy and for ensuring that eldercare policies do not counteract other public goals. The main concern of this article has been to illuminate the relationship between full-time working caregivers and their health and sick leave absence outcomes. Using probit estimation, we found that that those combining full-time work with parental care were more prone to report poor health and had a higher probability of sick leave absence. However, the effect of giving parental care on health and sickness absence was differently distributed between male and female caregivers. For instance, male caregivers had a higher probability of reporting poor health compared to male non-caregivers. We did not find any significant differences in self-reported poor health among female caregivers and non-caregivers. In contrast, giving parental care indicated a higher probability of sick leave absence among female caregivers compared to female non-caregivers, while no significant difference was found among male workers.

Keywords Double burden · Employment · Gender · Health · Sick leave absence

Introduction

The scenario for almost every country in Europe is that population ageing will shrink the working-age population relative to the number of pensioners. The Norwegian welfare state has a legal responsibility to provide eldercare; however, offspring are still major contributors to parental care. In practice, it is a shared responsibility between the family and the welfare state. The shortage of qualified labour in the healthcare sector would most likely increase the need for both formal and informal eldercare. Providing informal eldercare may place caregivers in a time-squeeze, thus gives less time for

E. Ugreninov (✉)
University of Oslo Boks, 1072 Blindern, 0316 Oslo, Norway
e-mail: elisabeth.ugreninov@sosgeo.uio.no

leisure and market work. It is a firmly established empirical fact that informal care is negatively correlated with labour supply (Bolin et al. 2008; Carmichael and Charles 2003; Ettner 1996; Gautun and Hagen 2010; Spiess and Schneider 2003; Heitmueller 2007; Jenson and Jacobzone 2000; Kotsadam 2011; Pavalko and Henderson 2006; Philips et al. 2002), and compared to non-caregivers, informal caregivers have lower wages (Heitmueller and Inglis 2007).

A possible side effect of informal care is lower health and/or higher sick leave absence. Health losses for the informal caregivers due to caregiving is found in the medical and social sciences literature, research indicates that caregiving has negative effects on physical and mental health (Pearlin et al. 1990; Hughes et al. 1999; Schulz and Beach 1999; Savage and Bailey 2004; Hirst 2005; Gautun and Hagen 2010). Less attention has been given to the effect of parental care on sick leave absence. An increase in the sick leave absence is not preferable because Norway already ranks among the countries in the world with the highest rates of sick leave absence, and a further increase would increase the share of potential workers on benefits. On a typical working day, 6–7 % of Norwegian employees are absent from work due to sickness, where women's absentee rate has been stable at approximately 40–50 % above men's absentee rate throughout the past 10 years (Kostøl and Telle 2011). In general, women work fewer hours than men work, and have a higher absentee rate due to sickness; thus, women are seen as a potential resource, both for increasing labour force participation and for decreasing sick leave absence. Additionally, the need for parental care is significant and is mainly provided by employed middle-aged women. The simultaneous demand for an increase in the workforce and an increase in the share of potential workers on benefits will bring major future challenges for the financing of an already overstretched public sector. Knowledge about the substitution between informal care and paid work is important for improving work and family policy and for ensuring that eldercare policies do not counteract other public goals. The policy relevance of this question should not be understated.

The motivation for this paper is to use a rich dataset, with both survey information and register data, to get a further understanding of the individual health and sick leave costs of caregiving. If combining paid work and caregiving gives lower health and/or higher sick leave absence, this will cause a reduction in productivity and increase the public expenditure. It is reasonable to assume that the burden of reconciling work and parental care can affect caregivers' health and sick leave absence for at least two reasons. First, according to role theory, combining several (conflicting) roles may result in a loss of health and might yield absences due to sickness. Second, for some caregivers, it may be difficult to reduce their working hours because the employer demand full-time work, or because the caregiver foresees that reduced work-hours adversely affects the future labour market career. The argument is that some caregivers may favour sick leave absence, which cost less, than using unpaid leave or holidays to tighten the care gap.

The main findings of this paper are that the effect of giving parental care on health and sickness absence was differently distributed between male and female caregivers. Male caregivers had a higher probability of reporting poor health compared to male non-caregivers. While no significant differences in self-reported poor health among female caregivers and non-caregivers are found. In contrast, giving parental care indicated a higher probability of sick leave absence among female caregivers compared to female non-caregivers, while no significant difference was found among male workers.

Background

There might be many motives for offspring to provide care for their parents, such as altruism, duty, social norms, or demonstration for their own children regarding the desired behaviour towards elderly parents. Regardless of the motive, there are at least two prominent theoretical traditions that can explain the relationship between informal caregiving and lower health and/or high sick leave absence. First, from a general role theory perspective, the combination of being an employee and an informal caregiver will result in the expectation of fulfilling different roles, which might result in conflicting ideals between the family person and the career person. The *scarcity hypothesis* (Goode 1960) is central in the literature and assumes that individuals' energy and resources are fixed and that time used on informal eldercare results in less time available for leisure and market work. Two conflicting ideals, the family person and the career person, are defined by Goode (1960 p. 483) as carrying role strain, in other words, "difficulty in fulfilling role obligations". Thus, more roles result in a greater burden and might result in health losses. Later, Sieber (1974) further noted that the notion of role strain comprises two overlapping constructs: (1) role overload and (2) role conflict. Role overload is based on the assumption that individuals experience a load because there is a finite amount of time and energy, and thus, there are limited resources to be allocated among alternative ends. The result of additional roles is a strain on the individual. The theory is gender neutral; men might also experience a role overload, but the expectations for men to combine employment and family care are less from both society and the family (Brody 1981; Brandt and Kvande 2003). Role conflict emphasises that there are internal and external role expectations, which might result in conflicting role expectation. A commonly used example is that of women who should achieve and perform at work, be good mothers and homemakers, and take care of elderly parents. The role conflict hypothesis is, to a larger degree, related to women because men, over a longer period, have combined the family role with employment.

Some argue that reconciling employment and informal eldercare does not imply a conflicting relationship, but could be a source of enrichment and encouragement (Greenhaus and Powel 2005). The positive aspect of combining several roles is central in the *role enhancement* hypothesis (Marks and McDermid 1996) and *role accumulation* theory (Sieber 1974; Thoits 1983). The assumption is that combining several roles works as a *buffer* against stress; a positive experience in one area gives positive extended effects to other areas (Staines 1980).

Second, sick leave absence can be regarded as a substitution effects and moral hazard. When costs related to sick leave absence increase, employees will substitute away from high costs, and choose less costly alternatives, for instance work. Moral hazard, in the use of absence due to illness, might arise because of information asymmetry between a doctor and a patient, or an employee and an employer. The patient is on purpose 'cheating' or gives wrong information about his health status to get sick leave insurance from the doctor, or an employee can use sick leave absence as a way of compensating for poor working condition or low wages, especially if the risk and economic loss are none or minimal. Shapiro and Stiglitz (1984) described this kind of absence behaviour as job 'shirking'.

Naturally, sick leave absence should be related to disease, sickness, and poor health; however, causally, absence behaviour is most likely more complex. The Norwegian

sickness insurance system is very generous; an employee whose occupational activity has lasted for at least 4 weeks is entitled to daily cash benefits if incapable of working due to illness. Daily cash benefits for employees are equal to 100 % of their income and are paid from the first day of sickness for a period of 260 days (52 weeks). Yet, there are no social programs in Norway targeted particularly at workers with parents who need care. Employees in Norway are entitled to 10 days of unpaid leave for taking care of parents in need, or 60 days of leave (20 days before 2010) for taking care of parents in the terminal phase.

Even though this study uses sickness absences above 17 days, which are more likely to represent absences caused by health problems, there is evidence that most sick leave is patient initiated and is rarely based on clear medical reasons (Carlsen and Nyborg 2009). The high absentee rate seems somewhat paradoxical in a country with such a high standard of living and high longevity (Ihlbæk et al. 2007). This indicates that there is most likely a complex causal relationship between health and absence due to sickness. Sickness absence is not identical to disease, sickness, or poor health status but can reflect absence behaviour.

Earlier Research

As far as the present author is aware, only two Norwegian studies have involved sick leave absence when studying effects of giving parental care; however, neither of them studies sick leave absence as the main focus. Using Norwegian register data, Fevang et al. (2011) found that having a single parent in the terminal stage of life affects the offspring's reliance on sickness insurance, and social security transfers increase significantly during the terminal stages of the parent's life. For sons, the claimant rate remains at a high level long after the parent's demise. However, the authors have no information on actual caregiving. The focus in the second study (Gautun and Hagen 2010) is on different strategies for reconciling employment and parental care. The most common strategy is to use holidays or to change working hours. Others said that they have used sickness absence even when they were not sick. The authors found few gender differences among strategies used, except that women more often used sickness absence and unpaid leave compared to men.

Earlier research on informal care and labour market participation showed that parental care affects the employment situation negatively (Jenson and Jacobzone 2000; Pavalko and Henderson 2006; Philips et al. 2002). Some report problems in concentration at work, to a lesser degree attendance at social events (Mooney and Statham 2002; Philips 1994). Some caregivers are forced to reduce their working hours (Bolin et al. 2008; Philips et al. 2002). Studies from Norway found that women more often than men reduce their working hours because of parental caregiving (Gautun and Hagen 2010). Daatland et al. (2010) found that employed female caregivers have a higher probability of working part time compared to men. Kotsadam (2011) used instrument variables (e.g. number of siblings, age of mother/father, mother/father with poor health or memory problems, or in need of help) to control for potential endogeneity existing between informal care and employment-related outcomes. In general, he found that being an informal caregiver in Norway does not reduce the probability of employment, future earnings, or working hours. However, being an intensive caregiver

(providing care more than 20 times a month) reduces the probability of employment. Fevang et al. (2011) found that employment propensity declines prior to a parent's death but increases after the parent's demise. Hassink and van den Berg (2011) used Dutch "time use diary data" to distinguish between shiftable and non-shiftable types of informal care. They found that household and organisation activities seem to be shiftable for employed caregivers, while personal care seems to contain unshiftable activities. Employed caregivers providing personal care have an additional opportunity cost.

Data and Descriptive Statistics

The data were selected from the Norwegian study on life course, ageing, and generation (NorLAG), and Life Course, Generation, and Gender (LOGG). NorLAG and LOGG data are joint studies with a large national sample of 15,109 persons aged 18–84, collected from three sources: computer-assisted telephone interviews, postal surveys, and register data. The response rate for the telephone interviews was 59.6 % and 42 % answered both the telephone interview and the postal questionnaire. The response rate was lowest for the less educated, the oldest, and the youngest respondents. Data collection was completed in 2008 in cooperation with Norwegian Social Research and Statistics Norway. More details about the design and sample selections are available in Bjørshol et al. (2010).

To reduce sample bias, we restricted our analytical sample to information from only the telephone interviews and the register data. The telephone interviews are comprised of information on the domestic division of labour, self-reported health, and job characteristics such as working hours, sector of employment, and employment contract. Data from the public register include sick leave absence paid by the National Insurance Administration, household composition, family history, education, occupation, income, and source of income. The focus is on exploring whether middle-aged employees giving parental care have a higher probability of reporting poor health and higher sickness absence; thus, further restrictions are necessary. To avoid selection of part-time work among caregivers, we restrict our analytical sample to individuals working full time, or working 35 hours or more. This restriction maintains the focus on the burden of working full time as well as giving parental care. Further, we include only individuals aged 35–66 with at least one living parent. Restricting the analytical sample to those having at least one living parent is necessary because the timing of the parents' deaths cannot be assumed to be independent of the offspring's characteristics given that parent and offspring health are assumed to correlate. Our restrictions leave us with a sample size of 3,969 individuals.

Empirical Strategy

In this section, we will describe the estimation methods used. The main empirical strategy is to examine potential health outcomes of combining employment and parental care. Using probit-model estimation, this paper focuses on two different outcome measures: a) self-reported poor health, and b) sick leave absence.

Health Outcomes

The first measure of interest is *self-rated poor health*, which is a commonly used health measure in the literature, considered a valid and reliable measure of health (Idler and Benyamini 1997; Farmer and Ferraro 1997). All respondents were asked, "In general, would you say your health is excellent, very good, good, fair or poor?" Thus, the health variable ranges from 1 to 5. For ease of modelling, we recode the original five levels into a binary variable. Those individuals whose value is 4 or 5, answering fair or poor to the survey question, are categorised as having poor health (y=1), and those whose value is 1, 2 or 3, answering excellent, very good or good, are categorised as having good health (y=0):

$$y_i = \left\{ \begin{array}{ll} 1 & if\ y_i^* > 3 \\ 0 & if\ y_i^* \leq 3 \end{array} \right\}$$

Another measure of interest is absence from work due to sickness, measured as the number of days paid by the National Insurance Administration, which includes 17 days and above. We have no information on self-certified absences (1–3 days) and absence paid by the employer (less than 17 days). Self-certified absences and sickness absence paid by the employer are coded 0, together with respondents with no absence spells, whereas sickness absences of 17 days and above are measured continuously. Thus, the dependent variable is left censored, or as latent continuous response y*, representing the propensity for sick leave absence compared with no absence spell or sickness absence less than 17 days. All of the observations are included in the dataset, but we do not know the "true" value of observations with sickness absence less than 17 days. Given the form of the data and the nature of the outcomes, it is reasonable to organise the outcome as a dichotomous variable. If this latent response is greater than 0, then the observed response is 1, otherwise, the observed response is 0:

$$y_i = \left\{ \begin{array}{ll} 1 & if\ y_i^* > 0 \\ 0 & if\ y_i^* \leq 0 \end{array} \right\}$$

Probit-model

When using a latent-response formulation it is natural to assume that the residual error term has a normal distribution given variables of interests, x. When we assume a standard normal distribution and the outcome variable is binary, applying a probit model is useful. The second estimable equation will be:

$$\Pr(y = 1|\mathrm{x}) = \Phi(\mathrm{x}'\beta)$$

where Pr denotes the probability and $\Phi(\mathrm{x}'\beta)$ is the cumulative distribution function of the standard normal distribution. The vector of regressors x includes variables of interest (parental care, individual characteristics, and job characteristics), which are assumed to influence the outcome y (poor health and sick leave absence). We use maximum likelihood to estimate the parameters, ß. In the probit model, the inverse standard normal distribution of the probability is modelled as a linear combination of the predictors (Long and Freese 2006). All results reported are average marginal effects (AME).

Control Variables

The main variable of interest is *parental care*. All individuals with at least one living parent were asked the question: "Is your mother/father limited in daily life tasks because of poor health, psychological problems or reduced functional ability". If at least one of the parents has limited functions in daily life, respondents were asked a follow-up question: "If limited, is your mother/father in need of help regarding daily life tasks or personal care"? All respondents who answered that they help their parents on a regular basis are defined as giving parental care.

The descriptive variables are divided into individual characteristics and work-place characteristics. Individual characteristics comprise the following: 1) *Age* of the respondent, which is continuous. *Age squares* are also included. 2) *Income*, which captures earnings from labour and property ownership and is divided by 10,000. *Income squares* are also included. 3) Educational attainment, which is divided into three categories and further organised as three dummy variables: *Low* (not having completed a high school degree), *medium* (having completed a high school degree), and *high* (having completed a university degree of any kind). 4) Household type, for which four different dummy variables are used: *Single* (a lone household without child/children below 19 years of age living in the household), *Couples* (couples living in the same household without child/children below 19 years), *Parents* (two adults living in a household with child/children below 19 years), serving as the reference group, and *Lone parent* (one adult living in a household with child/children below 19 years).

Work-place characteristics comprise the following: *private* (respondents working in private sector), *irregular working hours* (respondents who answered that they work before 6 in the morning and/or after 6 in the afternoon), and *temporary* (employees who work on temporary contracts).

Descriptive Statistics

In this section, we take a brief look at the descriptive statistics of the sample. Table 1 shows differences between caregivers and non-caregivers. Caregivers are more prone to report poor health, 19 % compared to 10 %, and to have at least one sick leave spell, 28 % compared to 18 %. The significant difference in self-reported poor health might be problematic. In fact, we do not know if the high fraction of self-reported poor health is a result of the additional burden of reconciling employment and parental care, or if poor health is used as an "excuse" for the high absentee rate. A possible health selection into caregiving is problematic as well. It is possible that individuals with poor health have parents with poor health in addition to a stronger disposition to give care. Table 1 indicates further that women are slightly more prone than men to give care (52 % and non-significant) and that caregivers are, on average, older than non-caregivers are (respectively 49 and 45 years of age). There is also a tendency for caregivers to have less education, have a lower income, and be more likely to work in the public sector compared to non-caregivers. To examine whether the correlation between giving care and health outcome is spurious, we use probit estimation with stepwise introduction of control variable to be able to control for competing explanations.

Table 1 Descriptive statistic of the analytical sample, caregivers and non-caregivers

Variables	Caregivers	Non-caregivers	*P*-value	*N*
Poor health	19***	10	0.001	421
Sick leave absence	28***	18	0.003	727
Individual characteristic				
Age	49***	45	0.000	3969
Male	48	59	0.123	2320
Earnings	416314**	468232	0.039	3969
Educational attainment				
Low	16	13	0.239	521
Medium	45	44	0.849	1755
High	39	43	0.329	1690
Type of household				
Parents	46***	58	0.004	2278
Single parent	6**	5	0.019	216
Couples	30**	21	0.015	861
Single	19	15	0.302	614
Work-place characteristic				
Public sector	57*	48	0.123	1906
Flexible	78**	76	0.028	3007
Irregular working hours	31	28	0.444	1106
Temporary employment	9**	15	0.037	584
N	140	3829	3969	3969

***$p<0.01$, **$p<0.05$, *$p<0.1$ (p-values in two-sided t-tests of the difference between caregivers and non-caregivers)

Results

Poor Health

Table 2 includes estimation results of the probability of reporting poor health. Two different models are estimated: Model 1 controls for individual characteristics such as age, sex, marital status, and educational attainment. Model 2 additionally controls for job-specific characteristics such as public or private sector work, flexible working schedule, irregular working hours, and temporary employment.

Table 2 (Model 1) shows that workers giving parental care are 6 percentage points more likely to report poor health than workers who do not give parental care. This result is robust and does not alter when including controls for job characteristics. In general, male workers have a lower probability of reporting poor health compared to female workers. Further, single parents have a higher probability of reporting poor health. Educational attainment is important in individuals' reporting of poor health. Less-educated workers also have a higher probability of reporting poor health when controlling for job characteristics. However, highly educated workers have a lower

Table 2 Probit regression of poor health. AME. All

Variables	Model 1 dF/dx	Model 2 dF/dx
Parental care	0.06**	0.06**
	(−0.029)	(−0.029)
Individual characteristic		
Male	−0.01***	−0.01*
	(−0.020)	(−0.010)
Age	−0.01**	−0.01*
	(0.000)	(0.000)
Age square	0.0002	0.0002**
	(−0.010)	(0.000)
Income	0.001***	0.001***
	(−0.010)	(0.000)
Income square	0.00006***	0.00006***
	(0.000)	(0.000)
Educational attainment		
Medium (reference)		
Low	0.05***	0.05***
	(−0.016)	(−0.016)
High	−0.05***	−0.05***
	(−0.010)	(−0.011)
Type of household		
Parents (reference)		
Single parent	0.04**	0.04**
	(−0.025)	(−0.023)
Couples	0.02	0.02
	(−0.014)	(−0.014)
Single	0.004	−0.01
	(−0.013)	(−0.013)
Work-place characteristic		
Public sector		−0.01
		(−0.011)
Flexible		−0.01
		(−0.015)
Irregular working hours		0.01
		(−0.013)
Temporary employment		−0.01
		(−0.013)
N	3969	3969

Robust standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$ (p-values in two-sided t-tests of the difference between caregivers and non-caregivers)

probability of reporting poor health compared to medium-educated workers. We expect these results; however, our interest lies in the estimation of parental caregiving.

To further inspect whether the relationship between caregiving and poor health is different for men and women a sample split of male and female workers was used. When using interaction terms in probit models, sample split is preferred for calculating marginal effects, and secondly, separate analysis allows the control variables to vary between the sub-samples. Table 3 gives the estimates from the separate analysis for men and women (the same as Model 2 in Table 1).

Results from separate analysis (Table 3) indicate that male caregivers are 9 percentage points more likely to report poor health than male non-caregivers, controlling for both individual and workplace characteristics. Analysis on the female sample gives other indications. Female caregivers do not have a significantly higher probability of reporting poor health compared to female non-caregivers.

Sick Leave Absence

Table 4 includes estimation results of the probability of having at least one sick leave spell lasting more than 16 days. We estimate four different models: Model 1 controls for individual characteristics such as age, sex, marital status and educational attainment. Model 2 includes the same variables as Model 1 with an additional control for self-reported health. Model 3 includes the same variables as Model 1 with an additional control for job-specific characteristics such as public or private sector work, flexible working schedule, irregular working hours and temporary employment. Model 4 includes the same variables as Model 3 with an additional control for self-reported poor health.

Table 4 (Model 1) shows that workers who give parental care have 8 percentage points higher probability of having at least one sick leave spell compared to workers who do not give parental care. When controlling for health, the coefficient of giving parental care is still significant, but the probability of sick leave absence is reduced to 0.06. This indicates that caregivers who report good health have a higher probability of having at least one sick leave spell compared to non-caregivers who also report good health, holding all of the other control variables constant. When including work-place characteristics in Model 3 (without self-reported health), caregivers have a significantly higher probability of having sick leave absence (7 percentage points) compared to non-caregivers. When including self-reported poor health, the coefficient of giving care is reduced to 0.06 and is borderline significant ($p<0.08$) (Table 5).

In general, individuals reporting poor health have a much higher probability of having at least one sick leave spell compared to individuals reporting good health. Further, male workers and highly educated workers have a lower probability of taking sick leave. With respect to work-place characteristic, individuals with irregular working hours have a higher probability of having sick leave absence, while individuals with temporary employment status have a lower probability of having sick leave absence. Further, single parents have a higher probability of reporting poor health. Educational attainment is important in individuals' self-reported health. Less-educated workers have a higher probability of reporting poor health when controlling for job characteristics. However, highly educated workers have a lower probability of reporting poor health compared to medium-educated workers. These results are robust and do not alter controls for self-reported poor health.

Table 3 Probit regression of poor health. AME. Male and female

Variables	Male dF/dx	Female dF/dx
Parental care	0.09**	0.02
	(−0.043)	(0.039)
Individual characteristic		
Age	−0.01	−0.03
	(0.009)	(0.012)
Age square	0.00	0.001
	(0.001)	(0.000)
Income	0.00***	−0.003
	(0.001)	(0.001)
Income square	0.00***	0.00
	(0.001)	(0.001)
Educational attainment		
Medium (reference)		
Low	0.05**	0.06
	(0.019)	(0.028)
High	−0.05***	−0.05
	(0.013)	(0.018)
Type of household		
Parents (reference)		
Single parent	0.09**	0.02
	(0.054)	(0.028)
Couples	0.02	0.02
	(0.018)	(0.022)
Single	0.002	−0.01
	(0.017)	(0.021)
Work-place characteristic		
Public sector	−0.01	−0.01
	(0.014)	(0.017)
Flexible	−0.02	0.002
	(0.019)	(0.019)
Irregular working hours	0.02	0.01
	(0.017)	(0.019)
Temporary employment	−0.01	−0.03
	(0.021)	(0.021)
N	2320	1649

Robust standard errors
in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

(p-values in two-sided t-tests of the difference between caregivers and non-caregivers)

Table 4 Probit regression of sick leave absence. AME. All

Variables	Model 1 dF/dx	Model 2 dF/dx	Model 3 dF/dx	Model 4 dF/dx
Parental care	0.08**	0.06**	0.07**	0.06*
	(0.037)	(0.036)	(0.037)	(0.035)
Individual characteristic				
Poor health		0.19***		0.18***
		(0.024)		(0.024)
Male	−0.07***	−0.07***	−0.07***	−0.07***
	(0.013)	(0.013)	(0.013)	(0.013)
Age	−0.04***	−0.03***	−0.04***	−0.04***
	(0.001)	(0.001)	(0.001)	(0.001)
Age square	0.0004***	0.0004***	0.0004***	0.0004***
	(0.001)	(0.000)	(0.000)	(0.000)
Income	−0.001***	−0.001***	−0.001***	−0.001***
	(0.001)	(0.000)	(0.000)	(0.000)
Income square	0.00001***	0.00001***	0.00001***	0.00001**
	(0.000)	(0.000)	(0.000)	(0.000)
Educational attainment				
Medium (reference)				
Low	0.06***	0.04**	0.06***	0.04**
	(0.020)	(0.020)	(0.020)	(0.020)
High	−0.05***	−0.04***	−0.04***	−0.03**
	(0.013)	(0.013)	(0.014)	(0.014)
Type of household				
Parents (reference)				
Single parent	0.05*	0.05	0.05*	0.04
	(0.028)	(0.029)	(0.029)	(0.029)
Couples	0.01	0.01	0.01	0.01
	(0.018)	(0.018)	(0.018)	(0.017)
Single	0.02	0.02	0.02	0.02
	(0.018)	(0.018)	(0.018)	(0.018)
Work-place characteristic				
Private sector			−0.01	−0.01
			(0.014)	(0.014)
Flexible			−0.02	−0.01
			(0.017)	(0.017)
Irregular working hours			0.06***	0.06***
			(0.017)	(0.017)
Temporary employment			−0.07***	−0.06***
			(0.018)	(0.018)
N	3968	3968	3968	3968

Robust standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 5 Probit regression of sick leave absence. AME. Male and female

Variables	Male		Female	
	Model 1 dF/dx	Model 2 dF/dx	Model 1 dF/dx	Model 2 dF/dx
Parental care	0.04	0.03	0.09*	0.09*
	(0.045)	(0.042)	(0.058)	(0.057)
Individual characteristic				
Poor health		0.12***		0.27***
		(0.029)		(0.039)
Age	−0.02**	−0.02*	−0.06***	−0.05***
	(0.012)	(0.012)	(0.018)	(0.018)
Age square	0.0003**	0.0002*	0.0006***	0.0002***
	(0.000)	(0.000)	(0.001)	(0.000)
Income	−0.001***	−0.001***	0.0004	0.0001
	(0.000)	(0.000)	(0.001)	(0.001)
Income square	0.0001***	0.0001***	0.0001	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Educational attainment				
Medium (reference)				
Low	0.05**	0.04*	0.07**	0.05
	(0.023)	(0.023)	(0.037)	(0.037)
High	−0.05***	−0.04**	−0.03	−0.02
	(0.017)	(0.017)	(0.025)	(0.025)
Type of household				
Parents (reference)				
Single parent	0.04	0.03	0.05	0.04
	(0.056)	(0.054)	(0.029)	(0.029)
Couples	0.03	0.03	−0.02	−0.03
	(0.022)	(0.022)	(0.029)	(0.029)
Single	0.05**	0.05**	−0.03	−0.03
	(0.023)	(0.023)	(0.029)	(0.029)
Work-place characteristic				
Private sector	0.03	0.03	−0.05**	−0.05**
	(0.018)	(0.018)	(0.023)	(0.023)
Flexible	−0.04	−0.03	0.01	0.00
	(0.023)	(0.023)	(0.027)	(0.027)
Irregular working hours	0.07**	0.06**	0.05**	0.05
	(0.021)	(0.021)	(0.028)	(0.028)
Temporary employment	−0.06***	−0.06**	−0.06*	−0.50
	(0.022)	(0.022)	(0.032)	(0.032)
N	2320	2320	1649	1649

Robust standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

The results from the sample-split estimation in Table 3 indicate that male caregivers have a higher probability of reporting poor health compared to male non-caregivers; similar differences were not found in the estimation for male caregivers in correlation with sick leave absence. The coefficient of giving care was non-significant and did not indicate differences in sick leave absence when comparing caregivers with non-caregivers.

However, the probability of having at least one sick leave spell is higher among female caregivers compared to female non-caregivers. When only controlling for individual characteristics, female caregivers have a 10 percentage point higher probability of having at least one sick leave spell compared to female non-caregivers; the coefficient is borderline significant ($p<0.6$). When controlling for work-place characteristics (Model 2) and self-reported poor health (Model 3), the marginal effect of giving care was slightly reduced, and the coefficients gets borderline significant ($p<0.8$). The effect of giving parental care on sickness absence is fairly strong among female workers, while it is not significant among male caregivers.

Discussion and Concluding Remarks

The main concern of this article has been to illuminate the relationship between full-time working caregivers and their health and sick leave absence outcomes. To sum up, our first research question was as follows: are full-time working caregivers more prone to report poor health than full-time working non-caregivers? The second was as follows: do full-time working caregivers take more sick leave than full-time working non-caregivers? The summary statistics indicate that parental caregivers more often report poor health and are more prone to have sick leave absence spells compared to employed non-caregivers. In general, caregivers are older, less educated, work fewer hours, and have a lower income compared to non-caregivers. To avoid spurious correlation and to approach an understanding of how, or if, reconciling parental care and fulltime employment affect health and sickness absence, we compared individuals who were as equal as possible by controlling for individual and job characteristics. In general, the results indicated that those combining full-time work with parental care were more prone to report poor health and had a higher probability of sick leave absence. However, the effect of giving parental care on health and sickness absence was differently distributed between male and female caregivers. For instance, male caregivers had a higher probability of reporting poor health compared to male non-caregivers. We did not find any significant differences in self-reported poor health among female caregivers and non-caregivers. In contrast, giving parental care indicated a higher probability of sick leave absence among female caregivers compared to female non-caregivers, while no significant difference was found among male workers.

These differences in male and female caregivers' self-reporting of poor health and sick leave absence are very interesting, and new questions arise. First, do these differences indicate gendered differences in norms and attitudes towards absence behaviour? We know that women in general, female caregivers in particular, are more prone to take sick leave absence than their male counterparts are. A possible explanation is that women and men calculate risk of using sick leave absence differently. If male caregivers are more risk-averse than female caregivers, men would take a higher health risk to prevent a reduction in career and their future earnings compared to women. Regarding

the role theory, women are more likely to have a greater burden at home, which predicts a greater burden in combining parental care and work compared to other women, and because males might not have this extra burden at home, parental care has less effect on male caregivers' absence behaviour. On the other hand, the expected female roles of caregiving may protect or have a minor effect of stress in caring for parents, whereas men's combining of work and caregiving reflects subjective distress, which affect males' health outcomes negatively. However, we need more research to sort out whether this discrepancy relies on norms and attitudes in absence behaviour. Second, gender might also reflect aspects of women's working conditions, which are not completely accounted for by the controls included here (public/private sector work, flexible working schedule, irregular working hours, and employment contract). It is possible that male caregivers' working conditions better fit the combination of work and parental care. Without controlling for detailed occupational categories and working conditions, it is not possible to rule out an alternative interpretation of our results, which is that female workers in general have poorer working conditions compared to male workers, thus generating more sick leave absence among female caregivers.

Partly to address the limitation of this study's data recourses, we encourage future research to focus more on gender differences in norms and attitudes in absence behaviour and on whether working conditions can work as a "buffer" against sick leave absence in demanding care situations. If women are more prone to use sick leave absence in demanding situations, thus preventing poor health compared to their male counterparts, one policy implication arises: the right to paid leave for taking care of parents in need. Paid leave would adjust the combination of work and parental care, consequently lowering the care burden. In turn, this might prevent poor health among male caregivers and decrease female caregivers' sick leave absence, which will have positive long-term effects on both informal care and health outcomes.

References

Bjørshol, E., Høstmark, M., & Lagerstrøm, B. O. (2010). *Livsløp, generasjon og kjønn*. LOGG 2007. *Dokumentasjonsrapport*. (SSB-rapport 19/2010). Oslo – Kongsvinger: Statistisk sentralbyrå.

Bolin, K., Lindgren, B., & Lundborg, P. (2008). Your next of kin or your own career? Caring and working among the 50+ of Europe. *Journal of Health Economics, 27*(3), 718–738.

Brody, E. M. (1981). Women in the midle and family help to older people. *Gerontologist, 21*(5), 471–480.

Brandt, B., & Kvande, E. (2003). *Fleksible fedre. Maskulinitet, arbeid, velferdsstat*. Oslo: Universitetsforlaget.

Carlsen, B., & Nyborg, K. (2009) The gate is open: Primary care physicians as social security. Memorandum, No 07/2009. Oslo: Department of Economics, University of Oslo.

Carmichael, F., & Charles, S. (2003). Benefit payments, informal care and female labour supply. *Applied Economic Letters, 10*, 411–415.

Daatland, S. O., Veenstra, M., & Lima, I. A. (2010). Norwegian sandwiches – on the prevalence and consequences of family and work role squeezes over the life course. *European Journal of Ageing, 7*, 271–281.

Ettner, S. L. (1996). The opportunity costs of elder care. *The Journal of Human Resources, 31*, 189–205.

Farmer, M. M., & Ferraro, K. F. (1997). Distress and perceived health: mechanisms of health decline. *Journal of health and Social Behavior., 38*(1), 298–311.

Fevang, E., Kverndokk, S., & Røed, K. (2011) Labor supply in the terminal stages of lone parents' lives. *Journal of Population Economic* (forthcoming).

Gautun, H., & Hagen, K. (2010) How do middle-aged employees combine work with caring for elderly parents? *Comunity Work & Family, 4*, 393–409.

Goode, W. (1960). A theory of role strain. *American Sociological Review, 25*, 483–496.
Greenhaus, J. H., & Powel, G. N. (2005). When work and family are allies: a theory of work family enrichment. *Academy of Management Review, 31*, 72–92.
Hassink, W., & van den Berg, B. (2011). Time- bound opportunity costs of informal care: consequences for access to professional care, caregiver support, and labour supply estimates. *Social Science & Medicine, 73*(10), 1508–1516.
Heitmueller, A. (2007). The chicken or the egg?: endogeneity in labour market participation of informal carers in England. *Journal of Health Economics, 26*(3), 536–559.
Heitmueller, A., & Inglis K. (2007). The Earnings of informal carers: wage differentials and opportunity costs. *Journal of Health Economics, 26*(3), 821–41.
Hirst, M. (2005). Carer distress: a prospective, population-based study. *Social Science and Medicine, 61*, 697–708.
Hughes, S. L., Giobbie-Hurder, A., Weaver, F. M., Kubal, J. D., & Henderson, W. (1999). Relationship between caregiver burden and health-related quality of life. *Gerontologist, 39*, 534–545.
Ihlbæk, C., Brage, S., & Eriksen, H. R. (2007). Health complaints and sickness absence in Norway, 1996–2003. *Occupational Medicine (London), 57*, 43–49.
Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty seven community studies. *Journal of health and Social Behavior., 38*(1), 21–37.
Jenson, J., & Jacobzone, S. (2000) *Labour market and social policy occasional papers* (No 41. OECD Working Papers). Paris: OECD.
Kostøl, A. R., & Telle, K. (2011) Sykefraværet i Norge de siste tiårene. Det handler om kvinnene [Sick leave in Norway the last decades. It is all about the women].
Kotsadam, A. (2011) The employment costs of caregiving in Norway. I Kotsadam, A. *Gender, Work and Attitudes*. Economic studies 197.
Long, S.J., & Freese, J. (2006) Regression models for categorical dependent variables using stata. 2nd Edition. Stata Press
Marks, S. R., & McDermid, S. M. (1996). Multiple roles and the self: a theory of role balance. *Journal of Marriage and Family, 58*(2), 417–432.
Mooney, A., & Statham, J. (2002). *The pivot generation. Informal care and work after 50*. Bristol: The Policy Press and the Joseph Rowntree Foundation.
Pavalko, E. K., & Henderson, K. A. (2006). Combining care work and paid work. Do workplace policies make a difference? *Research on Aging, 28*(3), 359–374.
Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: an overview of concepts and their measures. *Gerontologist, 30*, 583–594.
Philips, J. (1994). The employment consequences of caring for older people. *Health & Social Care, 2*, 143–152.
Philips, J., Bernard, M., & Chittenden, M. (2002). *Juggling work and care. The experiences of working carers of older adults*. Bristol: The Policy Press.
Savage, S., & Bailey, S. (2004). The impact of caring on caregivers' mental health: a review of the literature. *Australian Health Review, 27*, 111–117.
Schulz, R., & Beach, S. P. (1999). Caregiving as a risk factor for mortality: the Caregiver Health Effects Study. *Journal of the American Medical Association, 282*, 2215–2219.
Sieber, S. D. (1974). Toward a theory of role accumulation. *American Sociological Review, 39*(4), 567–578.
Spiess C. K., & Schneider A. L. (2003) Interactions between care-giving and paid work hours among European midlife women, 1994 to 1996. *Aging & Society, 23*, 41–68.
Staines, G. I. (1980). Spill over versus compensation: a review of the literature on the relationship between work and non-work. *Human Relations, 33*, 111–129.
Shapiro, C., & Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *American Economic Review, 74*(3), 433–444.
Thoits, P. A. (1983). Multiple identities and psychological well-being. A reformulation of the social isolation hypothesis. *American Sociological Review, 48*, 174–187.