A review of approaches to measure and monetarily value informal care

Rita Faria, Helen Weatherly and Bernard van den Berg

Acknowledgements

This work was funded under the Economic Evaluation Policy Research Unit (EEPRU) which receives funding from the Department of Health Policy Research Programme. EEPRU is a collaboration between researchers from two institutions (Centre for Health Economics, University of York and School of Health and Related Studies, University of Sheffield). The views expressed in this article are those of the authors and not necessarily those of the Department of Health. The authors wish to thank our reviewers, in particular Raphael Wittenberg for his very helpful comments.

Introduction

In 2011, more than 6 million of the UK population provided unpaid informal care with an estimated value to society of £119 billion (Buckner and Yeandle, 2011; The NHS Information Centre & Social Care Team, 2010). In spite of significant value, there is no consensus on how to measure and value informal care time (Francis and McDaid, 2009; van den Berg et al, 2004; Goodrich et al, 2012). Challenges in costing informal care include difficulties in clearly defining informal care, but are mostly due to issues in measuring and valuing time spent care-giving (Van den Berg et al, 2004). This article reviews the methods used for measuring and valuing informal care-giver time in monetary terms. It describes the characteristics of informal care and explores the methods used for measuring time spent on informal care, followed by a review of monetary approaches to valuing time spent on care-giving. Other methods have been developed to evaluate the impact of care-giving on well-being or health-related quality life and an overview can be found in van den Berg et al (2004).

The characteristics of informal care

Informal care refers to the care provided to individuals who would have difficulties managing without this help, by relatives, friends or volunteers who are unpaid although they may receive some nominal payment or state benefits (Jackson et al, 2011; Princess Royal Trust for Carers, 2010; Wright, 1987). In economic terms informal care can be defined as a non-market or quasi-market commodity consisting of heterogeneous tasks produced by unpaid carer-givers or care-givers who receive some nominal payment or state benefits and provided by one or more relatives, friends or volunteers (van den Berg et al, 2004).

Table 1 reports on the type of help given to the main person cared for, according to whether that person lived in the care-giver's household. The results originate from the carer-givers module of the General Household Survey 2000 for Great Britain (Maher & Green, 2002). Although a wide range of activities were specified in the survey, in practice an even wider range of activities were undertaken by carers: 71% of care-givers reported giving other practical help that was not specified. This highlights the diversity of tasks involved in care-giving and the challenges involved in accurately recording all informal care activity and this has implications for valuing the care provided. The interpersonal dynamics between care recipients and care-givers can add an additional challenge. Around 32% of care-givers in the UK share the same household as the care recipient (Maher & Green, 2002). It may be difficult to distinguish informal care activities from 'usual' household activities, which should not be included as care-giving (van den Berg et al, 2004). Measurement challenges are exacerbated if more than one care-giver helps the care recipient. In a study looking at the informal care provided to stroke survivors in Australia, 66% of care recipients had more than one care-giver (Dewey et al, 2002). Had the care provided by the secondary care-giver(s) not been included, the overall value of informal care would have been underestimated.

Table 1 Types of help given to main person cared for, by whether that person lived in the care-givers' household, Great Britain, 2000 (adapted from Maher & Green, 2002)

Help given	Carers with main person cared for		Total care population (%)
	In the same household (%)	In another household (%)	
Personal care (eg washing)	51	15	26
Giving medication	44	11	22
Physical help (eg with walking)	57	25	35
Paperwork or financial matters	41	38	39
Other practical help	69	73	71
Keeping company	49	58	55
Taking out	49	53	52
Keeping an eye on person cared for	62	59	60
Weighted base (thousands) = 100%	2,164	4,537	6,701

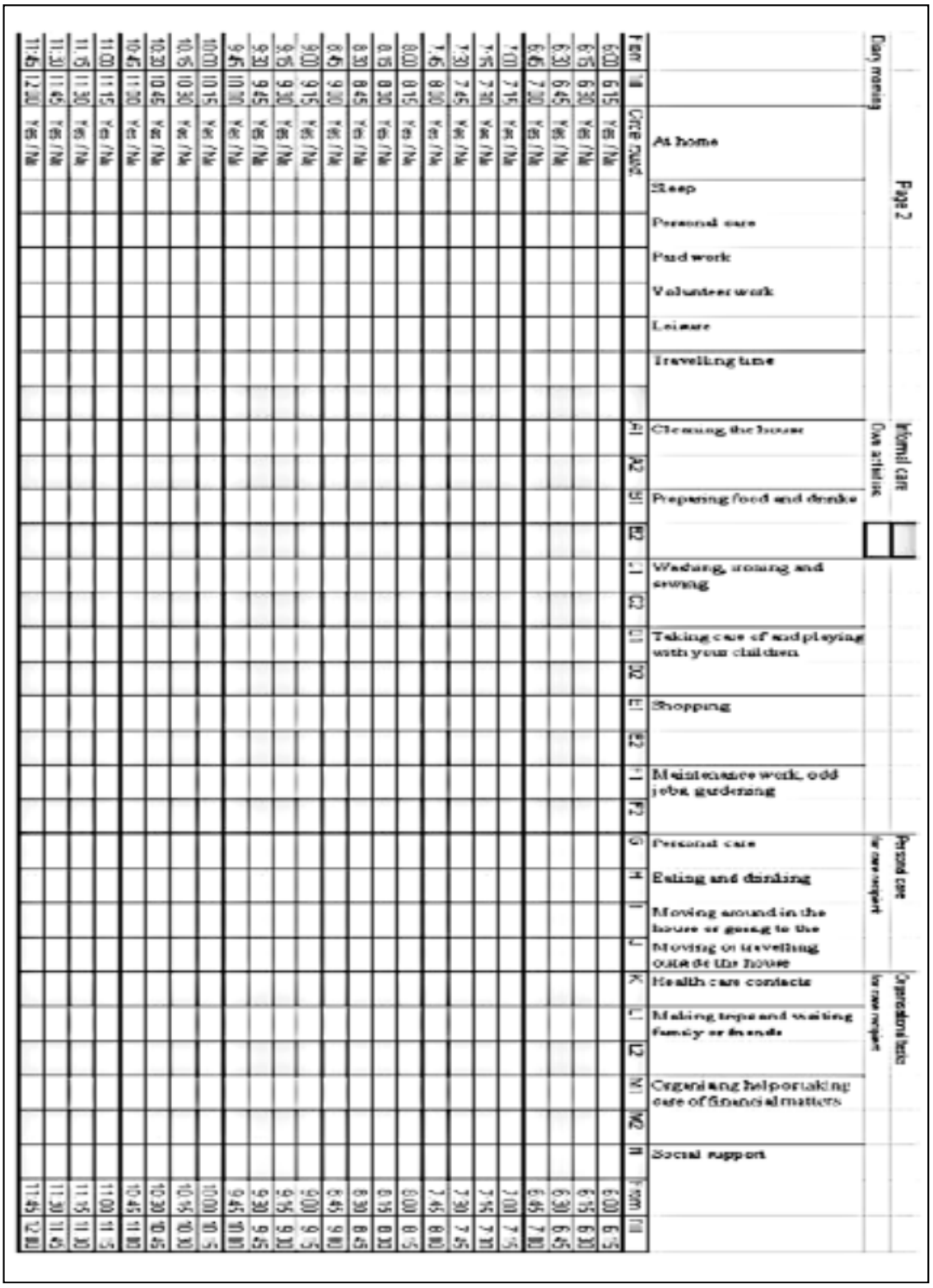
Measurement of informal care

Four key methods (or instruments) are available for collecting time-use data: diary, recall, experience sampling, and direct observation (Gershuny, 2011). These methods potentially suffer from recall bias and joint production (Juster et al, 1991, 2003). Recall bias arises because individuals tend to have poor or selective memory about the activities that they have undertaken in previous time periods. This can be minimised by reducing the recall time. Joint production occurs because individuals can perform more than one activity simultaneously. If the time spent on performing two activities simultaneously is apportioned to each activity in full, the hours over one day will add up to more than 24 hours, and the time spent in each of these activities will be overestimated. Joint production of tasks can be dealt with by defining a new activity composed of the two jointly produced activities, or by considering one of the activities as primary and the other(s) as secondary (Juster et al, 1991).

Time diary

The gold standard for the collection of time data is the time diary method (Juster et al, 1991). An example of a general time diary can be found in Gershuny (2011), and an application to informal care, used by van den Berg et al (2006), is reproduced below (Figure 1). The diary method involves asking individuals to note down the time spent on care-giving activities as the day progresses, over a set period of time. Time diaries are time consuming to complete, which can create difficulties in recruiting study participants and can impact on the time spent care-giving (van den Berg et al, 2006).

Figure 1 An example of a time diary (van den Berg & Spauwen, 2006)



Recall (or stylized or questionnaire) method

The recall method involves asking individuals to report the frequency and/or amount of time spent on a particular activity in a typical day or for a period of time in the past. Examples of instruments used for measuring informal care are the Caregivers Activity Time Survey (Clipp et al, 1996), the Caregiver Activity Survey (Davis et al, 1997), and the recall questionnaire used by van den Berg et al (2006) reproduced below (Figure 2). The recall method is used frequently because it is less time consuming and relatively inexpensive to administer. However, it suffers from a number of limitations. It is particularly sensitive to reporting or recall bias, which typically results in individuals overestimating the time spent on the activities (Juster et al, 1991, 2003; van den Berg et al, 2006; Gershuny, 2011). This occurs less often in the time diary method because individuals report their activities as the day progresses. In addition, it assumes that individuals consider joint production of tasks in their answers, and allocate time between the two tasks performed simultaneously.

Figure 2 An example of a recall questionnaire (van den Berg et al, 2006)

We would like to know how much time you spent on giving informal care to your care recipient. Please, consider the past week!

1: Last week did you spent time on the activities below in your care recipient's house? If you did, please, indicate how much time you spent on the activities.

		Minutes per day		*Hours per week*
a.	Preparating food and drinks?	→ ☐	*or*	☐
b.	Cleaning the house?	→ ☐	*or*	☐
c.	Washing, ironing and sewing?	→ ☐	*or*	☐
d.	Taking care of and playing with your own children?	→ ☐	*or*	☐
e.	Shopping?	→ ☐	*or*	☐
f.	Maintenance work, odd jobs, gardening?	→ ☐	*or*	☐

2: Last week did you spent time on assisting your care recipient with the activities below? If you did, please, indicate how much time you spent on the activities.

		Minutes per day		*Hours per week*
a.	Personal care (dressing/undressing, washing, combing, shaving)?	→ ☐	*or*	☐
b.	Moving around in the house or going to the toilet?	→ ☐	*or*	☐
c.	Eating and drinking?	→ ☐	*or*	☐
d.	Moving or travelling outside the house (aid with walking or wheelchair)?	→ ☐	*or*	☐
e.	Making trips and visiting family or friends?	→ ☐	*or*	☐
f.	Health care contacts (like visiting a doctor)?	→ ☐	*or*	☐
g.	Organising help, aids, house adaptations or taking care of financial matters like insurance?	→ ☐	*or*	☐
h.	Social support?	→ ☐	*or*	☐

Experience sampling (or beeper or buzzer) method

This method involves individuals carrying an electronic device programmed to prompt them to register their activity at random intervals over a pre-specified time period (Gershuny, 2011; Juster et al, 1991). To our knowledge the experience sampling method has not been used to collect information on informal care, however it has been used in other applications (Hektner et al, 2006; Kimhy et al, 2006). This method is less prone to error than the recall method as the data is collected at the time the activity takes place (Gershuny, 2011; Juster et al, 1991, 2003). However, the need to respond to an electronic beeper can be perceived as burdensome to some individuals, which can result in failure to respond to the beep (Schneider, 2009). This method does not record information on the sequence or the duration of the activities (Schneider, 2009).

Direct observation

Direct observation (also termed 'outsider method') consists of having observers recording care-givers activities. This method is rarely used since it is particularly time consuming and costly for researchers, and can be intrusive for individuals (Juster et al, 1991). To our knowledge, this method has not been used in informal care.

Monetary valuation of informal care

The key issue in the monetary valuation of informal care time is that there is no market for informal care so there are no market prices available for informal care-giving. Therefore, a method is required to estimate a monetary value or a price. Economic methods are available to value goods and services such as informal care, where market prices are not available. As reported in Table 2, these methods can be categorised as revealed preference or stated preference, depending on whether values are obtained indirectly from preferences revealed in other markets (revealed preference) or reported directly (stated preference).

Table 2 Monetary valuation methods for informal care

Type of Method	Methods
Revealed Preference Uses observational data from decisions taken by individuals regarding goods or services assumed equivalent to informal care. In general, revealed preference methods use wages or income data to derive monetary values.	• Opportunity cost • Proxy good • Well-being
Stated Preference Obtains the individual's valuation of a particular service, either by directly asking individuals to state a money value through contingent valuation or by asking individuals to make trade-offs between different characteristics of the service, using price or cost as one characteristic, in a conjoint analysis or discrete choice experiment.	• Contingent valuation • Conjoint analysis

Stated preference methods can account for all the costs and benefits associated with providing informal care. However, the methods rely on statements of preference, and not on actual choices, thus may not reflect the individual's actual behaviour and are therefore criticised by mainstream economists. Stated preference methods are likely to be affected by response bias due to strategic behaviour especially if respondents believe their answers could influence policy. Revealed preference methods can be insensitive to different care options available at different times. For example, a care-giver may prefer to move the care recipient to a nursing home if the amount of care required increases significantly and this data may not be collected as part of the questionnaire. In addition, revealed preference methods do not take into account whether the care-giver derives personal enjoyment from care-giving, which may reduce the monetary compensation required, or whether there are long-term consequences from spending time care-giving, such as when a young person provides care to the extent that it adversely affects their education.

The next section summarises the methods available to value informal care time. These two methods are described below and Table 3 reports examples of monetary valuation of informal care in the empirical literature. See Goodrich et al (2012) for a systematic review on economic evaluations which included informal care in the analysis.

Table 3 Empirical examples of monetary valuation methods for informal care

Method	Reference	Application	Unit cost per hour (price year if stated/country)
Opportunity cost	Dewey et al (2002)	One third of the average weekly wage.	A$5.86 (1997/Australia)
	Patel et al (2004)	Minimum wage.	£4.10 (2001/UK)
	Smith & Frick (2008)	Average hourly income for all employed county residents.	$17.34 (2004/US)
	Wilson et al (2008)	Average gross hourly wage rate for both genders.	£13.11 (2004/UK)
Proxy good	Ruchlin & Morris (1981)	Hourly rate per type of activity.	Supervision - $1.15. Meals - $1.15. Home-making - $9.20. Daily checking - $0.19. Transportation - $2.30 (1977/US)
	Dewey et al (2002)	Hourly rate per type of activity.	Community and domestic services - A$11.20. Personal care – AS13.45. All care by secondary care-givers – A$11.20. (1997/Australia)
	Gaugler et al (2003)	Hourly rate for home care services.	$2.93 (1993/US)
	Gitlin et al (2010)	Hourly rate for home health aid.	$10.14 (2006/US)
Well-being	van den Berg & Ferrer-i-Carbonell (2007)	Extra compensation necessary to maintain the same level of well-being after providing an additional hour of care.	€8-9 (2001/Netherlands)
Contingent valuation	Gustavsson et al (2010)	Care-givers' monthly willingness to pay (WTP) for an 1 hour per day of reduction in informal care.	UK - £105. Spain - £121. Sweden - £59. US - £144. (various countries)
	van den Berg et al (2005); Exel & Koopmanschap (2005)	Care-givers' mean willingness to accept to provide an additional hour of care.	€9.52 (2001/Netherlands)
	van den Berg et al (2005)	Care recipients' WTP for an additional hour of informal care per week and their and willingness to accept (WTA) for a reduction in 1 hour of the informal care received. Care-givers' WTA to provide an additional hour and WTP to provide one less hour of care.	Rheumatoid arthritis: Care recipients: WTP €7.84, WTA €8.22 Care-givers: WTP €7.80; WTA €9.52 Heterogeneous sample: Care recipients: WTP €6.72; WTA €8.62 Care-givers: WTP €8.61; WTA €10.52 (2001/Netherlands)
Conjoint Analysis / Discrete Choice Experiment*	van den Berg et al (2005), van Exel & Koopmanschap (2005)	Extra compensation required to provide one additional hour of informal care.	Extra compensation - €1.00, which implies the 7th hour of care requires €7 of compensation, the 8th hour €8, and thereafter. (2001/Netherlands)
	van den Berg et al (2008)	Extra compensation per hour required to provide 21 hours instead of 7 hours of informal care per week.	€12.36 (2001/Netherlands)
	Mentzakis et al (2011)	Care-givers' willingness to accept to provide an additional hour of care of a number of tasks.	Personal care: £0.12-£2.29. Supervision: £0.07-£0.81. Household tasks - £0.25-1.04 (?/UK)

1: Revealed preferences

Opportunity cost method

This method values informal care as the income forgone by the care-giver due to the time spent care-giving. Typically care-giver time is valued as a wage rate. The appropriate nominal wage rate for a care-giver of working age might be their previous wage rate (Francis et al, 2009). For those with no previous employment experience, the average or median wage of similar individuals employed in the labour market might be used; however, it is less straightforward for care time provided by those who have retired, older people or children and young people (van den Berg et al, 2004). In addition, it might not be appropriate to apply the wage rate for paid work if part of the time spent care-giving is leisure time forgone. Therefore, the opportunity cost method is less straightforward to use than it might appear at first glance.

Proxy good method

The proxy good (or replacement cost method) uses the market price of a close substitute to value the good or service (van den Berg et al, 2004). For informal care, the relevant market substitute depends on the specific care-giving activities undertaken: help feeding would require a health care assistant, for example, whereas help taking medication may require a nurse. Since these 'formal care' substitutes are paid different wage rates, different activities are valued at different prices. The proxy good method is better than the opportunity cost method at dealing with the different activities involved in informal care, but requires detailed data on the time spent on each activity (van den Berg et al, 2006). Using this method assumes that the informal care is equivalent to formal care in terms of quality and efficiency (McDaid, 2001).

Well-being method (van den Berg & Ferrer-i-Carbonell, 2007)

The well-being method was described for the first time by van den Berg et al (2007) for the valuation of informal care. This method follows two steps: first, the care-givers' well-being is defined as a function of income and of the amount of care provided; second, estimation of the income required to maintain the care-givers' well-being if an additional hour of care is provided, which is taken as the value of providing an additional hour of informal care. The well-being method uses data from care-givers themselves, rather than substitute markets, and gives a total value of informal care, which includes time forgone and other aspects of care such as psychological impact but potentially also accounting for the positive utility of care-giving.

2: Stated preferences

Contingent valuation

Contingent valuation can be used to estimate care-givers' and care recipients' willingness to pay and willingness to accept informal care (Gustavsson et al, 2010; van den Berg et al, 2005; van den Berg et al, 2005), as exemplified in Table 4, which shows the contingent valuation questions asked for the van den Berg et al study (2005). Contingent valuation responses may be affected by the way in which the questions are framed and due to strategic behaviour (Donaldson et al, 2006). Open-ended or closed-ended questions might be used to elicit opinion. Open-ended questions can be difficult for individuals to answer, and can result in imprecise estimates due to large variation between respondents. Closed-ended questions can be biased due to anchoring, since the starting point used can predispose individuals towards a particular value. Furthermore, contingent valuation questions can pose significant cognitive burden on respondents (van den Berg et al, 2005).

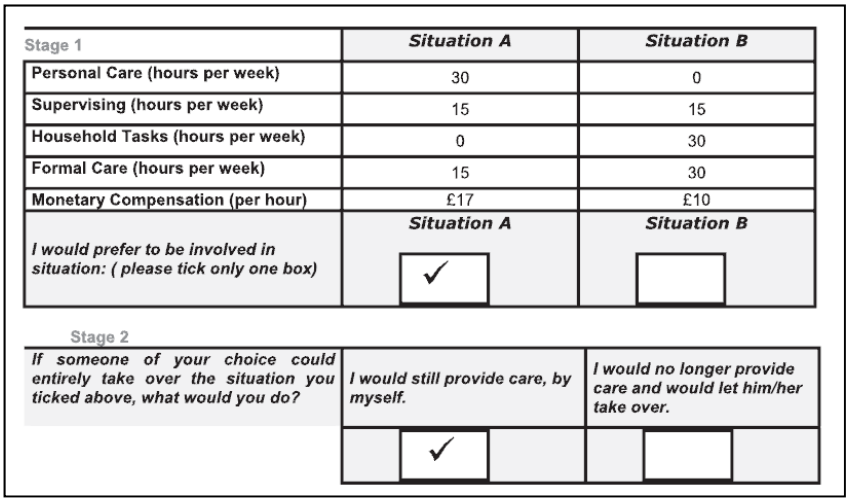
Table 4 An example of contingent valuation questions used in informal care (van den Berg et al.Error! Bookmark not defined., 2005)

Care-giver	Willingness to accept	Suppose your patient needs per week 1 hour extra care and the government compensates you for this. What is the minimum amount of money you would want to receive from the government net of taxes to provide this additional hour of care? (1) *fx* Euro, (2) less than *fx* Euro, that is. . ..., (3) more than *fx* Euro, that is. . ..
	Willingness to pay	Suppose there is a possibility for you to provide per week 1 hour less informal care. Someone else will replace you, so the total amount of care for the patient remains the same. What is the maximum amount of money you would want to pay in order that someone else takes over this hour of care? (1) *fx* Euro, (2) less than *fx* Euro, that is. . ..., (3) more than *fx* Euro, that is. . ..
Care recipient	Willingness to accept	Suppose you receive per week 1 hour less informal care and the government compensates you for this. What is the minimum amount of money you would want to receive from the government net of taxes for this hour less informal care? (1) *fx* Euro, (2) less than *fx* Euro, that is. . ..., (3) more than *fx* Euro, that is. . ..
	Willingness to pay	Suppose you need an additional hour of informal care per week and you have to pay for this hour yourself. What is the maximum amount of money you would want to pay for this extra hour of informal care? (1) *fx* Euro, (2) less than *fx* Euro, that is. . ..., (3) more than *fx* Euro, that is. . ..

Conjoint analysis (or discrete choice experiments)

Conjoint analysis uses survey methods to estimate the relative importance of different attributes of an intervention and to estimate whether a particular attribute is important (Ryan et al, 2006). If price or cost is included as a characteristic, the exchange rate of the price indicates the willingness to pay (or accept, depending on how the questions are framed) for the service (Ryan, 2004). Discrete choice experiments (DCE) are a type of conjoint analysis, and for simplicity are considered as the same method here. Figure 3 shows an example of a choice set of characteristics used in a DCE (Mentzakis et al, 2011). Conjoint analysis methods avoid asking individuals directly for their preferences for service provision and are able to collect information on the trade-offs individuals make between characteristics (Mentzakis et al, 2011; van den Berg et al, 2005). However, it can be cognitively burdensome on respondents to collect such detailed information.

Figure 3 An example of a choice set of characteristics used for a discrete choice experiment (Mentzakis et al, 2011)



Stage 1	*Situation A*	*Situation B*
Personal Care (hours per week)	30	0
Supervising (hours per week)	15	15
Household Tasks (hours per week)	0	30
Formal Care (hours per week)	15	30
Monetary Compensation (per hour)	£17	£10
I would prefer to be involved in situation: (please tick only one box)	*Situation A* ✓	*Situation B*

Stage 2		
If someone of your choice could entirely take over the situation you ticked above, what would you do?	*I would still provide care, by myself.* ✓	*I would no longer provide care and would let him/her take over.*

Implications

The value of informal care can be estimated using existing methods. The choice of method depends on the research question, the data available and the type of research. A challenge for monetary valuation methods is that the values obtained are dependent on the individual's income, as greater ability to pay will drive up their willingness to pay for a service and possibly willingness to accept to provide informal care. In addition, the value of the caring activity undertaken may differ by task, by life stage of the care-giver and by context. This could be captured in all monetary valuation methods except the opportunity cost method. Future research regarding this heterogeneity is recommended. Another area for future research would be to further explore the link between definition, measurement and monetary valuation. Not every care-giver might define the same tasks as providing informal care, which may affect both the measurement and the sensitivity of monetary valuation methods. The definition, measurement and valuation of informal care is important as it affects the value placed on care-giving.

This article provided a general overview of the methods used for measuring and valuing informal care-giver time in monetary terms, including key assumptions and limitations of the methods. Informal care-givers provide a vital service within the community and this review illustrates that there are many methods available to quantify the economic value of this essential service.

References

Buckner, L. & Yeandle, S. (2011) *Valuing Carer 2011. Calculating the value of carers' support*, Carers UK, London.

Clipp, E.C., Moore, M.J. & George, L.K. (1996) The content and properties of the Caregiver Activities Time Survey (CATS): An outcome measure for use in clinical trial research on Alzheimer's disease', *American Journal of Alzheimer's Disease and Other Dementias,* 11, 6**,** 3.

Davis, K.L., Marin, D.B., Kane, R., Patrick, D., Peskind, E.R., Raskind, M.A. & Puder, K.L. (1997) The Caregiver Activity Survey (CAS): development and validation of a new measure for caregivers of persons with Alzheimer's disease, *International Journal of Geriatric Psychiatry,* 12, 10**,** 978-988.

Dewey, H.M., Thrift, A.G., Mihalopoulos, C., Carter, R., Macdonell, R.A.L., McNeil, J.J. & Donnan, G.A. (2002) Informal care for stroke survivors, *Stroke*, 33, 4**,** 1028-1033.

Donaldson, C., Mason, H. & Shackley, P. (2006) Contingent valuation in health care, in A. Jones (ed.) *The Elgar Companion to Health Economics*, Edward Elgar, Cheltenham.

Francis, J. & McDaid, D. (2009) SCIE's work on economics and the importance of informal care, in L. Curtis (ed.) *Unit Costs of Health and Social Care 2009*, Personal Social Services Research Unit, University of Kent, Canterbury.

Gaugler, J.E., Zarit, S.H., Townsend, A., Parris Stephens, M.-A. & Greene, R. (2003) Evaluating community-based programs for dementia caregivers: the cost implications of adult day services, *Journal of Applied Gerontology,* 22, 1**,** 118-133.

Gershuny, J. (2011) *Time-Use Surveys and the Measurement of National Well-Being*, Centre for Time-use Research , Department of Sociology, University of Oxford, Oxford.

Gitlin, L.N., Hodgson, N., Jutkowitz, E. & Pizzi, L. (2010) The cost-effectiveness of a nonpharmacologic intervention for individuals with dementia and family caregivers: The tailored activity program, *American Journal of Geriatric Psychiatry,* 18, 6**,** June, 510-519.

Goodrich, K., Kaambwa, B. & Al-Janabi, H. (2012) The inclusion of informal care in applied economic evaluation: a review, *Value in Health*, 15, 975-981.

Gustavsson, A., Jönsson, L., McShane, R., Boada, M., Wimo, A. & Zbrozek, A.S. (2010) Willingness-to-pay for reductions in care need: estimating the value of informal care in Alzheimer's disease, *International Journal of Geriatric Psychiatry,* 25, 6**,** 622-632.

Hektner, J.M., Schmidt, J.A. & Csikszentmihalyi, M. (2006) *Experience sampling method: Measuring the quality of everyday life,* Sage Publications, Thousand Oaks, CA.

Jackson, D., Williams, D., Turner-Stokes, L. et al. (2011) How do carers of people with long term neurological conditions experience the provision of replacement care? King's College London.

Juster, F.T. & Stafford, F.P. (1991) The allocation of time: Empirical findings, behavioral models, and problems of measurement, *Journal of Economic Literature,* 29, 2**,** 471-522.

Juster, F.T., Ono, H. & Stafford, F.P. (2003) An assessment of alternative measures of time use, *Sociological Methodology,* 33, 1**,** 19-54.

Kimhy, D., Delespaul, P., Corcoran, C., Ahn, H., Yale, S. & Malaspina, D. (2006) Computerized experience sampling method (ESMc): assessing feasibility and validity among individuals with schizophrenia, *Journal of Psychiatric Research,* 40, 3**,** 221-230.

Maher, J. & Green, H. (2002) *Carers 2000 - results from the carer module of the General Household Survey 2000,* Office of National Statistics, London.

McDaid, D., (2001) Estimating the costs of informal care for people with Alzheimer's disease: methodological and practical challenges, *International Journal of Geriatric Psychiatry,* 16, 4**,** 400-405.

Mentzakis, E., Ryan, M. & McNamee, P. (2011) Using discrete choice experiments to value informal care tasks: exploring preference heterogeneity, *Health Economics,* 20, 8**,** 930-944.

NHS Information Centre & Social Care Team (2010) *Survey of Carers in Households 2009/10*. The Health and Social Care Information Centre,

http://www.ic.nhs.uk/webfiles/publications/009_Social_Care/carersurvey0910/Survey_of_Carers_in_Households_2009_10_England_NS_Status_v1_0a.pdf/ , accessed 27 September 2012.

Patel, A., Knapp, M., Evans, A., Perez, I. & Kalra, L. (2004) Training care givers of stroke patients: economic evaluation, *British Medical Journal,* 328, 7448**,** 1102.

Princess Royal Trust for Carers 2010. *What is a carer?* [Online], Princess Royal Trust for Carers. Available: http://www.carers.org/what-carer/, accessed 05 March 2012.

Ruchlin, H.S. & Morris, J.N. (1981) Cost-benefit analysis of an emergency alarm and response system: a case study of a long-term care program, *Health Services Research,* 16, 1**,** 65-80.

Ryan, M. (2004) Discrete choice experiments in health care, *British Medical Journal,* 328, 7436**,** 360-361.

Ryan, M., Gerard, K. & Currie, G. (2006) Using discrete choice experiments in health economics, in A. Jones (ed.) *The Elgar Companion to Health Economics*, Edward Elgar, Cheltenham.

Schneider, B.L. (2009) Method differences in measuring working families' time, *Social Indicators Research,* 93, 1**,** 105-110.

Smith, C.A. & Frick, K.D. (2008) Cost-utility analysis of high- vs. low-intensity home- and community-based service interventions, *Social Work in Public Health,* 23, 6**,** 75-98.

van den Berg, B., Brouwer, W.B.F. & Koopmanschap, M.A. (2004) Economic valuation of informal care, *European Journal of Health Economics,* 5, 1**,** 36-45.

van den Berg, B., Brouwer, W., Exel, J. & Koopmanschap, M. (2005) Economic valuation of informal care: the contingent valuation method applied to informal caregiving, *Health Economics,* 14, 2**,** 169-183.

van den Berg, B., Al, M., Brouwer, W., van Exel, J. & Koopmanschap, M. (2005) Economic valuation of informal care: the conjoint measurement method applied to informal caregiving, *Social Science & Medicine,* 61, 6**,** 1342-1355.

van den Berg, B., Bleichrodt, H. & Eeckhoudt, L. (2005) The economic value of informal care: a study of informal caregivers' and patients willingness to pay and willingness to accept for informal care, *Health Economics,* 14, 4**,** 363-376.

van den Berg, B. & Spauwen, P. (2006) Measurement of informal care: an empirical study into the valid measurement of time spent on informal caregiving, *Health Economics,* 15, 5**,** 447-460.

van den Berg, B., Brouwer, W., van Exel, J., Koopmanschap, M., van den Bos, G.A. & Rutten, F. (2006) Economic valuation of informal care: lessons from the application of the opportunity costs and proxy good methods, *Social Science & Medicine*, 62, 4**,** 835.

van den Berg, B., & Ferrer-i-Carbonell, A. (2007) Monetary valuation of informal care: the well-being valuation method, *Health Economics,* 16, 11**,** 1227-1244.

van den Berg, B., Al, M., van Exel, J., Koopmanschap, M. & Brouwer, W. (2008) Economic valuation of informal care: conjoint analysis applied in a heterogeneous population of informal caregivers, *Value in Health,* 11, 7**,** 1041-1050.

Wilson, E., Thalanany, M., Shepstone, L., Charlesworth, G., Poland, F., Harvey, I., Price, D., Reynolds, S. & Mugford, M. (2009) Befriending carers of people with dementia: a cost utility analysis, *International Journal of Geriatric Psychiatry,* 24, 6**,** June, 610-623

Wright, K. (1987) The economics of informal care of the elderly, Discussion Paper 23, Centre for Health Economics, University of York.