Disease Onset and Family Provision of Help: Evidence from the Irish Longitudinal Study of Ageing

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Abstract

This paper examines the implications of recent serious cardiovascular disease onset – a new heart attack, stroke, or congestive heart failure within the last two years – on family intergenerational time transfers using data from two waves of the Irish Longitudinal Study of Ageing (TILDA). The unexpected occurrence of a major health condition is likely to produce a reorganization across multiple life dimensions; and help to and from family members is likely to be affected. The data analysis compares households with and without a recent cardiovascular disease onset. Compared to households without a health event, affected households were less likely to provide any help rather than giving fewer hours of help. A recent health event is associated with receipt of more help from relatives but not from children. Children, however, provide higher levels of help in the presence of longer-term poor parental health. These findings may indicate that some relatives provide short-term help but children provide long-term help.

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Individuals and households fulfill their needs using three kinds of resources: their own employment and savings; public programs; and family members. The unexpected occurrence of a major disease is likely to produce a reorganization in all three areas. The likelihood of employment declines, health costs increase, and income is likely to decline (Smith 2005). Ensuing disability and lower income may mean greater dependence on state income support. It is also likely that the onset of a serious health event will to lead to changes in the family economy of help provision (e.g., Molloy, Johnson, and Witham 2005).

This paper examines the implications of a recent serious cardiovascular disease onset – a new heart attack, stroke, or congestive heart failure within the last two years – for family helping patterns using data from two waves of the Irish Longitudinal Study of Ageing (TILDA). The focus of the analysis is on hours of help with chores, paperwork, and grandchild help traded between the household with the health onset and their adult children and other relatives.

Previous Research

The primary focus of the European research on family transfers is on differences between countries. In general, occasional help is more common in northern countries while intense help is more common in southern countries. This finding is true both of adult child-to-parent help (Brandt, Haberkern, and Szydlik 2009) and grandparent provision of grandchild help (Hank 2009). These findings inform the research presented here in two ways. First, the correlation of geography with pattern of help provision has been linked to the extent to which services are provided publicly (Deindl and Brandt 2011), and Ireland, as well as the UK, are characterized by lower levels of social expenditure as a percentage of

GDP (Bonoli 1997; Esping Anderson 1990; Bambra 2005). Second, by differentiating occasional help and intense patterns of help, the findings point to the importance of examining the amount of help provided in addition to examining whether any help is provided.

Most research on family transfers includes health of the older generation as a control variable, typically measured by self-evaluated health (e.g., Attias-Donfut, Ogg, and Wolff 2005; Brandt, Haberkern, and Szydlik 2009). Poor health in the older generation increases help provided by children (Attias-Donfut, Ogg, and Wolff 2005; Brandt, Haberkern, and Szydlik 2009; Deindl and Brandt 2011) and reduces help from the older generation to their adult children (Hank 2009; Deindl and Brandt 2011).

Earlier research on family transfers, primarily North American studies, focused on the characteristics of elderly parents and mid-life children as they affect the probability that an adult child or an elderly parent will provide or receive transfers from a family member. Larger families are more likely to provide some help to a parent because there are more potential providers though any one child is less likely to provide help or to receive help from a parent (McGarry and Schoeni 1995 and 1997; Spitz and Logan 1990; Wolf and Soldo 1990; Wolf et al. (1997). Female children, rather than males, are more likely to provide help (Soldo et al. 1999). In addition to parental health, the parent's marital status is important for provision of help from children. Most help is provided by a spouse, and the absence of a spouse calls forth greater help from children. (Stone, Cafferata, & Sangl 1987; Soldo et al. 1990).

Transfers indicate the degree of family solidarity as well as reveal how families respond to changed situations (Kohli and Künemund 2003). The research reported here advances the study of the relation between changed circumstances and transfer patterns in three ways. First, focus on specific diseases improves health measurement over self-evaluated health measures. Second, the research adds a focus on the timing of health declines by comparing the effects of a recent event and earlier poor health. Finally, this research differentiates two patterns of family help by separating differences in whether any help is provided and how much is provided.

Method

Data

Data come from the first two waves of the Irish Longitudinal Study on Ageing (TILDA). Wave one began in late 2009 and wave two in 2012. TILDA is a nationally representative sample of persons aged 50 and over in the Republic of Ireland and includes spouses even if not age-eligible for the study. Respondents were interviewed in their homes. A total of 8514 respondents were interviewed in wave one, and they matched with 7285 respondents in wave two, of whom 6995 were age eligible. Of these 6995, there are 6773 respondents in the analysis of transfers to and from non-child relatives, a loss of 3% to missing data. There are 5750 in the children analysis. A total of 1039 respondents have no living children and 206 (3.5%) are lost to missing data. Not all respondents have grandchildren, and there are 4924 respondents in the analysis of grandchild help.

Measures

The analysis focuses on the association of serious illness onset with various measures of time transfers between respondents and their children or other relatives. A number of other variables are included in the model to adjust for possible differences between those without and without a serious illness onset.

Outcome measures include wave two time transfers to and from children and to and from other relatives. There are two measures of time transfers to children: *hours given to children* for help with household tasks and *hours in grandchild help*. Respondents were first asked whether they or their spouse had spent 'at least one hour per week' helping adult children or grandchildren with household chores or paperwork excluding grandchild help. Those responding positively were ask how many hours per month on average they devoted to these tasks. They were then asked a parallel set of questions

about provision of grandchild help. Help from children, *hours received from children,* comes from a question asking respondents whether their children or grandchildren had provided 'at least one hour per week' of help with household tasks or paperwork. If they responded positively they were asked to estimate how many hours on average they received each month.

A similar set of questions regarding relatives yielded two measures of family transfers: *hours given to relatives* and *hours received from relatives*. In the case of relatives, the question asked whether the respondent had given 'any help.' Those who responded were then asked how many hours a month they gave or received help. For comparisons of children and other relatives, it is not clear whether the difference between 'at least one hour per week' and 'any help' is consequential in the minds of respondents. The wording sets a lower bar for relatives; however, questions about relatives follow the children questions and respondents may carry forward the anchor of one hour per week. There were some very high values for number of hours of help received from relatives, and values over 200 hours a month were trimmed to 200 hours – the equivalent of about 7 hours every day.

The measure of serious illness onset, *new cardiovascular* event, derives from a set of questions asking respondents whether, since the last interview, a doctor told them they had had a heart attack, a stroke, or congestive heart failure. There were not enough observations with these events to separate the different conditions.

Control variables include two measures of socioeconomic status: income and school-leaving age. Household *income* is reported in wave one. Respondents were asked to estimate their total household income. Those responding don't know or who refused were asked whether their income fell in one of several income brackets. These data were used to impute income. *School-leaving age* is the age at which the respondent first left full-time schooling and was asked at wave two. Both these variables measure socioeconomic status which is related to health and possibly related to intergenerational exchanges. Based on the literature reported above, four additional variables measure characteristics of

donors and recipients. *Female* is an indicator for a female vs. a male respondent, and *age* is measured in years at the first wave. *Not married* is an indicator variable for not currently being married at the wave one interview. *Number of children* is the total number of living children, including step and adopted children, reported at the first wave.

In addition, three variables measure health as of the first wave. They are included to separate the effects of a recent event from longstanding poor health. The measures include *previous CESD*, the Center for Epidemiologic Studies Depression Scale for depressive symptoms measured at wave one. It is included because greater depression is associated with poor health and may be lead to retreat from family relationships. A second measure, *previous cardio*, is a wave one measure of whether the respondent reported a past heart attack, stroke, or congestive heart failure. If so, the previous event may account for family relationships. Finally, a wave one global health measure asks the respondent to rate his or her health as excellent, very good, good, fair, or poor.

The health measures in this analysis refer to an individual but the transfer measures refer to help given to or from the household and are asked of only one respondent in the household. Hence there is a disjunction between the measure of health and the measure of transfers. At the end of the Results section, I discuss a sensitivity analyses that I used to examine the implications of this disjunction. My conclusion is that there is no evidence that the disjunction affects the reported results.

The analysis uses wave one characteristics plus onset of a cardiovascular disease to predict wave two transfers. Therefore the analysis compares households with and without a health event of this type. I do not examine difference scores for two reasons. First, given the relatively few observations with a health event, the unreliability of difference scores can overwhelm true differences.[1] Second, the

[1] Difference scores (wave2 – wave1) are unreliable because they increase measurement error, particularly correlated measurement error. The 'regressed change' approach (i.e., regressing wave 2 on wave 1 plus covariates) produces inconsistent estimates (Johnston, 1972:279 because it is likely that the wave 2 and wave 1 versions of the dependent variable will share some causes not measured in the model.

wave two scores have the bulk of their observations at zero because most families do not report any help. This structure lends itself to a simultaneous analysis of differences in provision of any help and amount of help as described in the next section. Difference scores would create negative scores but most observations would still be at zero. This data structure would be more difficult to analyze.

Estimation

A high proportion of children and relatives give and receive no hours. Therefore the outcome measures consist mostly of zero hours, and an analysis method must take this limited dependent variable into account. In addition, it is likely that individuals make one decision to provide a certain amount of help – not separate decisions on whether to help and, subsequently, how much to help. The analysis method should reflect the simultaneous nature of the decision. One such model is the tobit model which assumes one unobserved latent variable that takes a positive value if it exceeds a threshold and is zero otherwise (Theil, 1971). The coefficient of any covariate in a tobit model can be decomposed into two components: the proportion of the regression coefficient due to its effect on the probability of providing non-zero hours and the proportion due to its effect on the number of hours provided.[2] I rely primarily on this decomposition to interpret effects.

Results

Univariate statistics for the covariates are presented in an Appendix separately for the subpopulation with children and the larger group who have other relatives. They indicate that about 1.6% of respondents had a cardiovascular event between waves one and two. The univariate statistics

[2] Specifically, the coefficient can be decomposed into the effect of a one unit increase in an independent variable on number of hours supplied or received conditional on the outcome being greater than zero and weighted by the probability of having positive hours (thus providing the correct regression estimate conditional on having non-zero hours; and the effect of a one unit increase in an independent variable on the probability of having positive hours weighted by the expected value of the outcome if hours are greater than zero. (McDonald & Moffitt, 1980; Roncek, 1992).

for the outcome measures are reported in top panels of Tables 1 and 3. The main results are presented in Tables 1 – 4.

Table 1 About Here

Table 1 presents results for time help to and from children. The top panel of the table presents the proportion having a new cardiovascular event and receiving or supplying some hours as well as the mean hours conditional on having some hours. Descriptively, having a new cardiovascular disease onset increases the probability of receiving some hours of help from children and reduces the probability that the respondent's household gives help with chores or grandchild help. Among those with some hours, hours of help received from children is about 50% higher in households that have had a health event while the differences in chore hours given or grandchild help given are relatively small.

The bottom panel of the table presents the tobit models. A number of variables are significant in each equation, but our focus will be on the effect of a new cardiovascular event. The effect of a new cardiovascular on hours received from children is positive but not significant. However, long-term health, measured by fair or poor self-evaluated health in wave one are both significant. A recent heart-related health event does have a negative and significant effect on chore hours given to children and hours of grandchild help.

Among other variables, a higher school-leaving age is associated with lower levels of all transfers in both directions. Female respondents are more likely to receive help and more likely to give grandchild help but less likely to give chore hours. Those who are not married receive more help but give less grandchild help.

Table 2 About Here

Table 2 presents the decomposition of the new cardiovascular event coefficient in the three models, holding constant other variables in the model.[3] This decomposition is based on the new cardiovascular event coefficient in Table 1. Ignoring the first line, the hours received from children line, because it is not statistically significant, I focus on the two significant coefficients for time transfers from the respondent household to children: hours of chore help given to children and grandchild help.[4]

The second column of Table 2 indicates that about one-quarter (24.4%) of the tobit coefficient for giving hours of chore help to children is due to differences among those providing some hours. Conversely about three-quarters is due to the effect of a cardiovascular event on the probability of not helping children at all. A new cardiovascular event is associated with 2.93 fewer hours provided to help children and an 11% difference in the probability that any hours will be supplied. The results for provision of grandchild help follow the same pattern. Slightly over a third (35.4%) of the observed tobit coefficient is due to differences among those who are providing hours while about two-thirds is due to the difference in the probability of providing any hours of grandchild help. A new cardiovascular event is associated with 6.67 fewer hours of grandchild help among those with some hours while affected respondents are 12% less likely to provide any hours. In sum, the primary difference between households of respondents with and without a new cardiovascular event is that those with an event are more likely to not provide any time help to children rather than providing fewer hours.

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[3] This effect is evaluated at the point on the cumulative normal distribution corresponding to the proportion of cases above the limit. The underlying formulas and an explanation of the decomposition are found in Roncek (1992). The same decomposition can be applied to the other coefficients in the model because the first two columns of Table 2 apply to the all coefficients in the model.

[4] Give to children and grandchild help cannot be combined because it is inappropriate to compare hours for those without and with grandchildren.

Table 3 About Here

Table 3 presents results for other relatives. The proportion of relatives providing some hours of help is far lower than for children but among respondent household with a cardiovascular event who receive some help, the hours received is much greater than among children. To interpret the mean hours received by respondent households on the left side of Panel 1, it is important to first note the very small number of households involved: there are 18 unweighted respondent households who receive help from relatives and have had a new event; and there are 12 households who give help and have had an event. Yet the data indicate that those who receive help from relatives receive a fairly large amount of help. The right side of the top panel indicates that those with a new health event are half as likely to give any help to their relatives, and, among those who do help, the number of hours is substantially reduced.

Panel 2 of the table indicates that, in addition to a new event, those who are not married or have fewer children are more likely to receive help. The mean number of children is 3; hence the effects for being not married and having fewer children are substantial. In the hours given equation to the right, being not married and having more children reduce help to relatives. Greater education is associated with providing more help to relatives. There is some evidence that relatives respond to long-term poor health as well as a new health onset; the results show that respondents whose health was fair at wave one are more likely to receive help.

Table 4 About Here

Table 4 presents a decomposition of the new cardiovascular event coefficient. More than half (55.1%) of the effect of a new event on getting help is due to the difference an event makes among those receiving some hours. That is, having had a cardiovascular event is associated with 17.3 more hours per month in help from relatives, conditional on receiving some hours and holding other variables constant. This result is quite different from the difference in means of 45 hours in Panel 1. However, the combined decomposed effect of a new event, being unmarried, having no children (instead of the mean of 3) and being in fair health at wave one is very slightly over 45 hours, even without considering other variables. Hence the estimate of 17.3 is reasonable as an estimate holding the other variables constant. A new health event increases the probability of receiving some help by 9%.

In contrast to the very large coefficients for hours received from relatives, the effects of variables in the hours given to relatives are muted. As shown in Table 4, only a quarter (25.8%) of the effect of a new event is due to those with hours greater than zero and three-quarters is due to the difference in the probability of giving any hours.

Sensitivity Analysis

As noted earlier, the health onset measure refers to the individual but the transfer measures refer to help given or received by the household. This measure is appropriate because a health event is likely to affect the behavior of the household. However, for married households there is an additional respondent who did not have a health onset but who shares the same response to the transfer questions because the latter questions are asked of only one respondent reporting for the household. The implication is that a measure 'spouse had onset of a cardiovascular event' should have an effect similar to that of the measure used. I examined the effect of a spouse measure and found it had no significant effect in three out of four equations. The one equation with a significant effect for the spouse measure was the hours given to relatives equation, but its inclusion had little effect on the coefficient

for a new health event.[5] One reason for the limited effect of the spouse onset variable may be the small number of persons affected. While there are 112 (unweighted) respondents with a cardiovascular onset, only half – 55 respondents – have a spouse.

It would be expected that omission of the spouse onset measure would bias the coefficient for having had a cardiovascular event toward zero by including some people whose households had a cardiovascular event in the group that had none. However, this expectation is not borne out in the analysis. Three of the five coefficients are larger in the results without the spouse onset measure, and all but one of the differences is very small. The one difference that is large is one in which the coefficient increases when spouse onset is omitted. In sum, there is no evidence of a bias toward zero with the omission of the spouse onset measure in the results shown.

Discussion

Serious health events have implications for intergenerational family exchange. In general, they lead to less time being given to children and other relatives and more hours received. This pattern is to be expected, but the results presented above provide additional information that is not obvious.

The most important findings relate to the difference between children and other relatives in their provision of help to the older household. There is no evidence that children are more likely to help a parent with a new cardiovascular event. However, there is substantial evidence that children are more likely to help in the presence of longer-term poor health. While relatives are also more likely to help in the presence of longer-term poorer health, the results indicate that children only respond to longer-term illness while relatives respond to both long- and short-term health decline.

For relatives a new cardiovascular event is associated with giving more help. About half of the difference between those with and without a health event is due to a higher probability of helping and

[5] The coefficient for a new cardiovascular event is -17.95 when the spouse onset variable is omitted and -17.69 when it is included.

half is due to providing more hours. In contrast to children, other relatives significantly increase their help. As noted earlier, other relatives are less likely than children to provide help but the small number who do provide help provide a large number of hours. There are a number of possible explanations that might account for the contrast between children's and relatives' provision of help. Relatives may be more able to provide short-term help after an unexpected event. Children may live at a distance and may be more involved in paid work and raising their own small children whereas some of the relatives may already be retired and not have small children at home. Hence relatives may be more able to provide a large number of hours of help, at least in the short run.

Children receive less assistance from their parents both in chores and grandchild help when the parent has a recent cardiovascular event. The decomposition indicates that between two-thirds and three-quarters of the difference in helping children between those with and without a new cardiovascular event is in the probability of the older household providing any help to children, not in the amount of help provided. The results for help given to relatives are similar. About three-quarters of the difference in helping relatives is in the probability of providing any help. Households with a new health event are less likely to give any help.

Among socioeconomic variables, income has no effect but a higher school-leaving age is associated with less time help to or from children. This finding may indicate a lower familistic orientation among those with more education or possibly it might indicate greater geographic distance between parents and children. The demographic variables have effects that might be expected. Greater age is associated with greater receipt of help from children and less help to children and relatives. Women are more likely to receive help and are less likely to give chore help but more likely to provide grandchild help. The unmarried are more likely to receive help from children and relatives and less likely to give it. It should be noted that TILDA transfer questions refer to the household and therefore those not married are reporting on one person, not two. The greater help received from children may simply

reflect the lack of a spouse to provide help and the lower provision of grandchild help may similarly reflect the number of persons in the older household.

The results from this analysis advance the study of intergenerational transfers by examining the effects of a recent health event on transfer patterns. Further research might well use several waves of data in TILDA, SHARE, or HRS to examine the natural history of help provision and address directly the question of whether relatives provide a short-term response to an unexpected health event and children organize longer-term help.

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Table 1: Time Help To and From Children (a, b)

Panel 1: Time Help To and From Children

	Chore and Paperwork Help				Grandchild Care	
	Hours Received From Children		Hours Given To Children			
	new cardiovascular		new cardiovascular		new cardiovascular	
	no	yes	no	yes	no	yes
% with hours > 0	37.0%	45.8%	27.1%	14.1%	46.1%	27.7%
N	5659	91	5659	91	4846	78
Mean hours given or received (non-zero obs.)	20.4	30.6	17.0	17.7	36.0	31.6

Panel 2: Tobit Models for Time Help

	Chore and Paperwork Help				Grandchild Care	
	Hours Received From Children		Hours Given To Children			
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
new cardiovascular	5.24	6.73	-12.04	5.79 *	-18.84	8.13 *
income	1.3E-05	1.0E-05	-1.9E-05	1.1E-05	-1.1E-05	1.8E-05
school-leaving age	-2.61	0.43 **	-0.96	0.32 **	-3.30	0.48 **
female	6.95	1.46 **	-4.12	1.06 **	6.12	1.63 **
age	0.75	0.13 **	-0.63	0.09 **	-1.07	0.16 **
not married	11.83	2.46 **	-1.30	1.88	-22.03	2.90 **
number of children	3.53	0.58 **	0.47	0.45	3.96	0.72 **
previous CESD	-0.03	0.14	0.01	0.09	-0.22	0.16
previous cardio	3.08	3.82	-4.74	3.02	-1.21	4.55
previous health (vs. excell)						
2 very good	5.36	2.93	-2.89	2.16	-3.50	3.42
3 good	4.30	2.69	-1.74	2.13	-1.74	3.33
4 fair	8.44	3.33 *	-4.04	2.76	-1.33	3.96
5 poor	15.46	6.30 *	-6.59	4.27	-9.09	5.72
constant	-72.04	12.21	38.86	9.01	116.27	14.05
/sigma	47.03	4.44	37.55	3.13	60.98	3.33
N censored at zero	3720		4197		2688	
N > 0	2030		1553		2236	
% above limit	35.3%		27.0%		45.4%	

Notes:

(a) * p<=.05; ** p<=.01

(b) The discrepancy between the number of persons saying yes in Panel 1 and the percent above zero reported for the tobit model results from those who said they gave or received hours but reported zero hours in the following question.

Table 2: Decomposition of the Table 1 Tobit Coefficients for the Effect of a New Cardiovascular Event on Hours To and From Children

			Decomposition	
	% of sample with hours > 0	% of mean total response due to those with hours > 0	coefficient if hours > 0	difference in probability hours > 0
Hours received	35.3%	31.2%	1.63	0.04
Hours given	27.0%	24.4%	-2.93	-0.11
Grandchild care	45.4%	35.4%	-6.67	-0.12

Table 3: Time Help To and From Relatives (a,b)

Panel 1: Cross Classification of Cardiovascular Event and Time Help

	Help To and From Relatives			
	Hours Received From Relatives		Hours Given To Relatives	
	new cardiovascular		new cardiovascular	
	no	yes	no	yes
% with hours > 0	9.5%	17.5%	22.7%	10.6%
N	6694	113	6694	113
Mean hours (non-zero obs.)	16.9	61.9	25.3	9.6

Panel 2: Tobit Models for Time Help

	Help To and From Relatives				
	Hours Received From Relatives			Hours Given To Relatives		
	Coef.	Std. Err.		Coef.	Std. Err.	
new cardiovascular	31.39	11.07	**	-17.95	7.97	*
income	-1.2E-05	2.3E-05		1.2E-05	1.2E-05	
school-leaving age	-0.83	0.46		1.02	0.37	**
female	4.04	2.30		-0.05	1.52	
age	-0.02	0.17		-1.89	0.16	**
not married	22.57	3.34	**	-6.48	2.34	**
number of children	-4.86	1.00	**	-2.59	0.59	**
previous CESD	0.05	0.18		-0.04	0.15	
previous cardio	2.93	4.69		-0.55	4.38	
previous health (vs. excellent)						
2 very good	5.89	4.16		0.97	3.04	
3 good	6.60	4.23		-0.37	2.98	
4 fair	13.47	5.24	**	-4.39	3.65	
5 poor	13.31	7.02		-6.98	6.17	
constant	-92.53	19.48		71.73	11.27	
/sigma	55.51	5.68		54.99	2.74	
N censored at zero	6160			5227		
N > 0	647			1580		
% above limit	9.5%			23.2%		

Notes:

(a) * p<=.05; ** p<=.01

(b) The discrepancy between the number of persons saying yes in Panel 1 and the percent above zero reported for the tobit model results from those who said they gave or received hours but reported zero hours in the following question.

Table 4: Decomposition of Table 3 Tobit Coefficients for the Effect of a new Cardiovascular Event on Hours To and From Relatives

			Decomposition	
	% of sample with hours > 0	% of mean total response due to those with hours > 0	coefficient if hours > 0	difference in probability hours > 0
Hours received	9.5%	55.1%	17.30	0.09
Hours given	23.2%	25.8%	-4.62	-0.10

Appendix: Univariate Statistics for Covariates (a)

	Children		Relatives	
	Mean or %	s.e.	Mean or %	sd
new cardiovascular	1.6%		1.7%	
income	€ 37,577	€ 67,447	€ 36,246	€ 66,011
school-leaving age	16.3	3.6	16.3	3.8
female	53.7%		51.8%	
age	63.2	13.1	63.4	13.2
not married	24.4%		30.8%	
number of children	3.5	2.6	3.0	2.8
previous CESD	5.8	10.5	5.9	10.5
previous cardio	6.3%		6.5%	
previous health				
1 excellent	15.6%		15.0%	
2 very good	29.4%		29.0%	
3 good	32.4%		32.6%	
4 fair	17.8%		18.6%	
5 poor	4.8%		4.8%	
N	5750		6807	

Notes:
(a) N differs between children and friends/relatives because not all respondents have children.