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Length of Coresidence of Elders with Adult Relatives: A Survival Analysis Using GSOEP Data

By Jane Kolodinsky, Quingbin Wang,
and Christine Torre*

Summary

Using data from the 1984-1990 GSOEP and PSID-GSOEP equivalent files and event history analysis, we estimate the length of coresidence of elders with adult children. We find that variables describing the household an elder enters, including amount of transfer income received by the household, age of household head, and number of school age children, are important determinants of length of coresidence. Variables that describe the elder, with the exception of age, are insignificant in predicting the length of coresidence.

1. Introduction

The United States population over the age of 65 increased steadily from about 27.6 million in 1984 to 34 million in 1995 (Treas 1995; Zedlewski et al. 1990). This is a growth rate of more than 23 percent from the previous decade (Treas 1995). Projections indicate that the elder population will more than double over the next 40 years. Germany has one of the largest elder populations in Europe, with more than 15 percent over the age of 65 in 1992 (IAHSA 1995). Approximately 16 percent of American men and women over the age of 65 were living with a relative other than a spouse in 1994, while about 3 percent were living with nonrelatives (Treas 1995). Similarly, in the former West Germany approximately 15 percent of the population over the age of 65 was living in a two- or three-generation household in 1983 (Wall 1989).

With a host of socio-economic consequences, a steady growth in the elder population has brought about challenges for families and policy makers. While many adults with aging parents struggle to balance their time and family resources, policy makers face the challenge of providing necessary assistance to the increasing elder population. In the United States, the percent of elderly living in institutions increased by 29 percent from 1980 to 1990 and there are indications that this trend will continue. Of seventeen possible Medicaid programs to be cut in 1997, two are especially salient to the discussion of living arrangements and informal care of elders: prohibiting the building of more nursing home beds and limiting spending on home health care (Liley 1996). While the government may see a short-term decrease in spending on the aging population, the problem of how we will support the well-being of this growing portion of our population remains. How will we care for the elderly and how will the slack be picked up if programs such as Medicare are cut and the

number of nursing home beds remains stagnant or declines? When the future of many programs for the elder population is uncertain, more attention should be paid to community-based care.

Although there may not be any simple solutions for the problems associated with the increasing elder population, information from socio-economic studies is needed by policy makers in evaluating the socio-economic consequences and tradeoffs of alternative policy options. This study is motivated by this need for information and the lack of quantitative studies in the existing literature. Specifically, this study examines the factors that determine length of coresidence of elders with a relative other than a spouse, using the German Socio-Economic Panel Study (GSOEP). The following sections include a brief literature review, description of the data source and analysis method, discussion of the empirical results, and concluding remarks.

2. Review of Literature

The question of *who* lives with a relative has been extensively researched. The availability of kin is a prerequisite to intergenerational cohabitation. In economic terms, kin availability is a resource that can be tapped (Wolf 1994). Much of the research that examined the likelihood of the elderly living with kin has used the elderly person as the reference point. That is, what are the characteristics of the aging individual, given available resources, that influence the probability of living with kin? It is clear that declining health is associated with increased probability of living with others, not including spouses¹. Lower incomes are also associated with increases in the probability of living with relatives (Bishop 1986; Macunovich et al. 1995). Attitudes of elders toward living alone are also strong factors, both domestically and abroad (Groves and Wilson 1992; IAHSA 1995; Wister and Burch 1989). However, factors such as decreased incomes and increases in disability levels may be outweighed by attitudes in determining coresidence with kin. Hashimoto (1991) used cross-national data to determine the importance of culture on the living arrangements of elders. His findings support the hypothesis that ethnicity is often a stronger indicator of living arrangements than health, economic status or kin availability. In addition, men are less likely to coreside with relatives (Connidis and Rempel 1983; Parr, Green and Behncke 1989; Tissue and McCoy 1981).

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¹ See, for example, Bishop 1986; Burr and Mutchler 1996; Burr and Mutchler 1993; Clarke and Neidert 1992; Magaziner, Cadigan, Hebel and Parry 1988; Prohaska, Mermelstein and Miller 1993; Soldo, Sharma and Campbell 1984; Soldo, Wolf and Angree 1990; Speare, Avery and Lawton 1991; Spitze, Logan and Robinson 1992; Stinner, Byun and Paita 1990; Worobey and Angel 1990.

Few researchers have used information on the kin's household to examine cohabitation of elderly persons with relatives. Although some findings show that availability of kin influences living arrangements (Burr and Mutchler 1996; Crimmins and Ingegneri 1988; Macunovich, Easterlin, Schaeffer and Crimmins 1995; Spitze, Logan and Robinson 1992; Zsembik 1993), most findings are inconclusive as to whether increases in the availability of kin increase the likelihood of residing with them (Soldo, Wolf and Agree 1990). Aside from the coresidence decision, we know little about how long an elder lives with relatives once the cohabitation decision has been made. This is an area that needs further research.

In summary, while several researchers have examined living arrangements of the elderly, we know few details about households where elderly persons reside with a relative. While focus has been on how characteristics of the elderly individual and the household they leave influence living arrangements, little attention has been paid to the characteristics of the household where the elderly individual enters. Wolf (1994, p. 180) concludes that "more attention could, and should, be devoted to discovering the influence on living arrangement choices of particular traits of children...."

3. Methodology

In order to examine how characteristics of the household an elder moves into affect changes in living arrangements of elders, we employ the method of event history analysis. The approach is operationalized using Cox regression, a technique that reveals how independent variables affect the likelihood of an event continuing into the next time period. In the case of coresidence of elders with nonspouse adult relatives, the technique allows us to examine how the characteristics of the household an elder moves into and the characteristics of the elder both affect the length of time an elder lives with relatives.

Theoretical Framework

A major objective of this study is to identify significant socio-economic variables affecting the length of coresidence of elders with adult relatives and to quantify the impact of these variables. Because our research question is related to the time interval between two events beginning and ending of coresidence and the second event does not occur to everyone over the observed period, Cox regression (proportional survival and hazard models) is used to accomplish the objective².

Cox regression permits evaluation of factors determining the time interval between the two events and addresses the problems when data contain both noncensored and censored observations. Through Cox regression factors affecting the rate of "failure" (or ending coresidence) can be identified and their impacts can be quantified and tested.

Cox regression has been widely used in the analysis of many research problems related to the time interval between two events (Blossfeld, Hamerle and Mayer 1989). But this project is one of the first studies using this well-developed method in the area of length of living arrangements. The Cox regression model with multiple independent variables is written:

$$S(t) = [S_0(t)]^P \quad (1)$$

$$P = e^{B_1X_1 + B_2X_2 + \dots + B_nX_n} \quad (2)$$

where $S(t)$ is the cumulative survival function (proportion of cases "surviving" at a particular time); $S_0(t)$ is called the baseline survival function, the survival function that does not depend on the covariates but only on time; (X_1, X_2, \dots, X_n) is the vector of covariates; and (B_1, B_2, \dots, B_n) is the corresponding vector of parameters to be estimated.

Data

Data from the GSOEP and the Syracuse University PSID-GSOEP Equivalent Data File for the seven-year period of 1984-1990 are used in this study³. To use the method of event history analysis, the panel data must be rearranged into "event histories," with one observation per household. The unit of observation in this analysis is the intergenerational household, where the elder is related to the nonelderly adults in the household, and where the nonelderly adult is not a spouse. We keep only those households that fit this definition in all of the seven years. Several pieces of information are kept for the elder, including age, gender, and health status. Several household variables are also formed using all nonelderly adults in the household and information on children. We form variables representing whether any individual in the household suffers from poor health; whether all nonelderly adults in the household are employed in the labor market; whether all nonelderly adults have completed at least a high school education; total household income from labor, public transfers, and assets; number of children aged five or less; and number of school age children in the household. In addition, a variable is included that identifies the direction of the move (from parent to child or vice versa) when coresidence occurs.

Variable definitions and statistics summarizing the characteristics of coresiding households are presented as Table 1. The average length of coresidence for the seven year period (TIME) is 3.58 years. The average age of the coresiding elder at the start of coresidence is about 73 years,

² 24 percent of spells end with death of the elder, 22 percent of spells end with a move out, and 54 percent of spells continue up to the end of the period of observation.

³ See Burkhauser, Daly, and Butrica (1995) for a discussion of this data file.

Table 1

Summary Statistics for Co-Residing Elders

Variable	Definition	Mean	Standard Deviation
TIME	Length of co-residence.	3.58	2.16
AGE	Age of elder at the start of the event.	73.26	8.00
GENDER	equals 1 if elder is male.	0.43	0.50
CHRONIC	equals 1 if elder has a reported chronic illness at the start of the event.	0.63	0.43
HHAGE	Age of the head of household at the start of the event.	60.97	13.31
HHEALTH	equals 1 if at least one person in the household (excluding those > age 65) reported a health problem at the start of the event.	0.43	0.50
HLABOR	Amount of labor income the household received at the start of the event.	36,766.0	34,341.9
HTRANS	Amount of public transfer income the household received at the start of the event.	19,828	19,012
HASSET	Amount of asset income the household received at the start of the event.	7,027	7,085
ALLWORK	equals 1 if all adults in the household are working at the start of the event.	0.23	0.42
ALLEDUC	equals 1 if all adults in the household have a high school education or greater at the start of the event.	0.33	0.47
RENTDWL	equals 1 if dwelling is rented at the start of the event.	0.28	0.45
SCHLKID	Number of school age children in household at the start of the event.	0.45	0.62
KID5	Number of children less than age 5 in the household at the start of the event.	0.18	0.85
MOVE	equals 1 if the elder moved in with adult relative.	0.60	0.49

Source: GSOEP and PSID-GSOEP Equivalent Data File, and authors' calculations.

while the average age of the head of household of the co-residing household is 61 years. Forty-three percent of co-residing elders are male and 63 percent report having chronic illnesses. Forty-three percent of these households have at least one individual reporting having health problems. In about 23 percent of households all nonelderly adults are employed, and all nonelderly adults have completed at least high school in one-third of the households. Children under five reside in about one-quarter of the households and school age children live in 38 percent of the households. In 60 percent of the households, the elder has moved in with adult children.

4. Results

Results of the Cox regression of TIME on all the covariates are shown in Table 2. Six of the fourteen covariates included in the analysis are significant. Especially important is the fact that variables describing the household an elder enters represent the largest group of significant variables. Increases in the age of the household head, all adults in the household having a high school education or higher, and increases in the number of school age children in the household increase the length of coresidence. Increases in the amount of transfer income received by the household decreases the length. Household income, whether derived from labor or assets, is not significant. The only characteristic of the elder that is

significant is age of elder at the start of coresidence. The older the elder the shorter the length of coresidence. Direction of the move is an important predictor of the length of coresidence. If the elder moved into the adult child's household, the spell length increases. Important is the finding that once characteristics of the household the elder enters are controlled for, health status and gender of the elder are not significant.

In Figure 1, survival time (length of coresidence) is plotted against time at the means of the covariates and a significant categorical variable (MOVE) is chosen to depict changes in the survival function by characteristics of the sample. Figure 1a shows how cumulative survival rates change over time for elders who move in with adult relatives (dotted line) versus those who have adult relatives move in with them (solid line). Clearly, the direction of the move is an important indicator of survival rate of coresidence. Elders who move in with adult children have a much higher survival rate after one year of coresidence than do elders who have children move in with them. During the first year of coresidence, the survival rates are more similar (0.95 for elders who move in with children and 0.90 for elders who have children move in with them). Adding one more variable to the analysis allows us to examine how direction of move and having school age children in the household affects the length of coresidence. The pattern in Figure 1a remains intact. Figure 1b (dashed line) shows that when an adult relative moves in with the elder and there are no school age

Table 2

Cox Regression Results
Dependent Variable: Length of Co-Residence Spell

Variable	Definition	β
AGE	Age of elder at the start of the event.	-0.060*** (0.02) ¹⁾
GENDER	equals 1 if elder is male.	0.09 (0.10)
CHRONIC	equals 1 if elder has a reported chronic illness at the start of the event.	-0.11 (0.09)
HHAGE	Age of the head of household at the start of the event.	-0.02* (0.01)
HHEALTH	equals 1 if at least one person in the household (excluding those > age 65) reported a health problem at the start of the event.	-0.10 (0.09)
HLABOR	Amount of labor income (in 10,000s) the household received at the start of the event.	0.008 (0.024)
HTRANS	Amount of public transfer income (in 10,000s) the household received at the start of the event.	0.140* (0.049)
HASSET	Amount of asset income (in 10,000s) the household received at the start of the event.	0.095 (0.170)
ALLWORK	equals 1 if all adults in the household are working at the start of the event.	0.02 (0.10)
ALLEDUC	equals 1 if all adults in the household have a high school education or greater at the start of the event.	0.19*** (0.11)
RENTDWL	equals 1 if dwelling is rented at the start of the event.	-0.16 (0.11)
SCHLKID	Number of school age children in household at the start of the event.	0.22*** (0.13)
KID5	Number of children under age 5 in the household at the start of the event.	0.02 (0.11)
MOVE	equals 1 if the elder moved in with adult relative.	0.43** (0.25)
N = 318 $\chi^2 = 41.64***$		
¹⁾ Standard errors appear in parentheses. — *) Significant at the 10 percent level. — **) Significant at the 5 percent level. — ***) Significant at the 1 percent level. Source: Authors' calculations.		

children in the household, the cumulative survival rates are 0.90, 0.45, and 0.26, respectively, after one, three, and five years of coresidence. These are lower than the survival rates when the elder moves into the relative's household where there are no school aged children (solid line) of 0.95, 0.72, and 0.57. In households with children, the one, three, and five year coresidence survival rates are also higher when the elder moves in (0.98, 0.83, and 0.62) with the relative than vice versa (0.93, 0.60, and 0.27).

5. Discussion

These preliminary results indicate that when the elder moves in with the child (40 percent of coresidence

arrangements) characteristics of the receiving household are important in determining the length of coresidence of elders with adult children. In fact, when these characteristics are controlled for, health of the elder is not a significant factor in the length of coresidence. The most important determinants of length of coresidence in this study are the direction of the move, educational level of nonelderly adults in the household, and number of school age children. Age of both elder and adult child are also influential. We find that neither labor nor asset income is a significant predictor of length of coresidence, but that increases in transfer income decrease length of coresidence. Based on our results, we conclude that once coresidence takes place, health status of the elder is of no

Figure 1a

Survival Function at mean of covariate

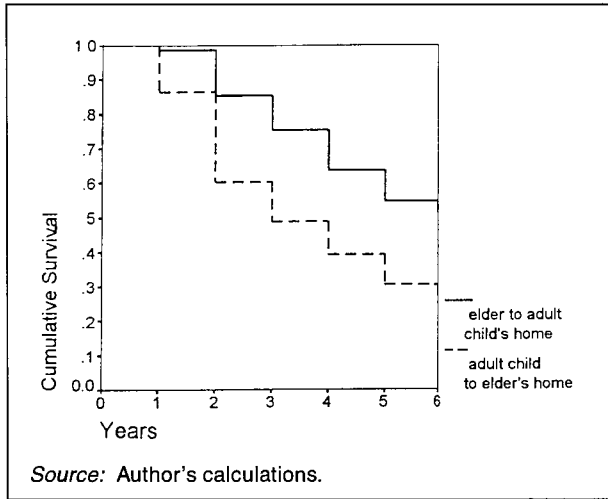
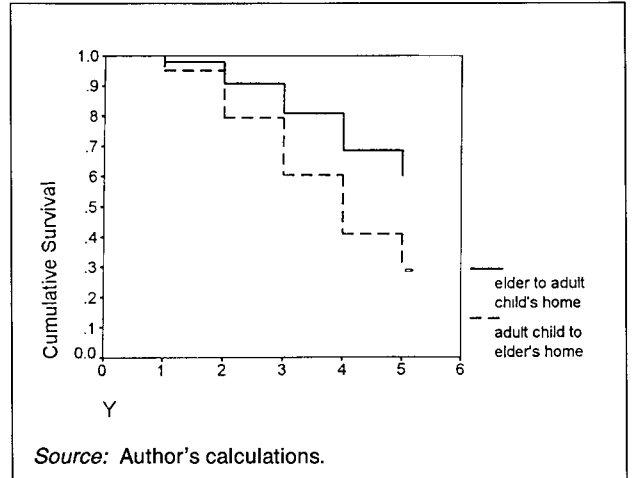


Figure 1c

Survival Function for households with children



consequence in determining the length of coresidence. Health status of the nonelderly adult is also insignificant.

Important, but preliminary as far as results are concerned, is the finding that increases in the number of school age children in a household are significant in increasing length of coresidence. The term "sandwich generation" has been applied to adult daughters who care for elders as well as children. In addition, perhaps those with larger families feel more kinship toward elders. This is a rich area for future research.

It is important to note that this is the first step in analyzing length of coresidence. As noted above, there are many policy questions this type of research could be helpful in answering, ranging from "what types of monetary resources do households need to extend coresidence once it takes place," to "what types of health care resources do

households require in order to increase the length of coresidence." In an environment where fewer resources are becoming available for institutional care of elders, answers to these questions are important.

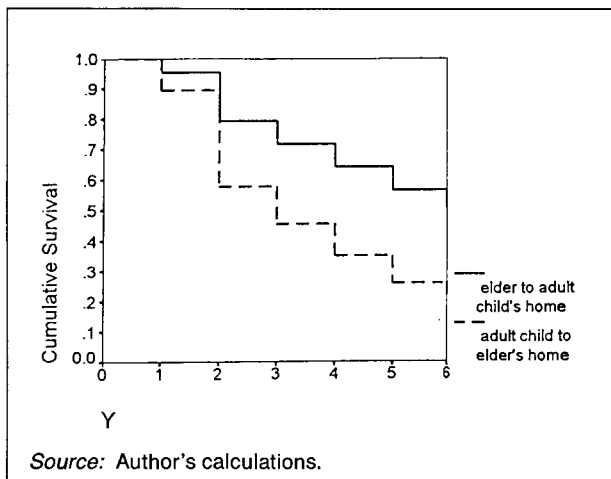
One limitation of this study is that we have not addressed left-censoring, that is, the household for which the event was already occurring when information became available for the household. This is potentially a problem in this study since about 50 percent of the household information was left-censored⁴.

Despite this major limitation, results indicate that further investigation into household characteristics of both the household exited and the household entered when coresidence occurs is warranted. As one of the first studies applying survival analysis techniques in coresidence research, this study suggests that Cox regression can be used to provide information useful in answering many questions. This study also suggests that a greater effort is needed to collect more detailed data for studying the socio-economic problems caused by the growing elder population.

⁴ As a rough specification check, we ran the survival analysis including two additional dummy variables — one for a left-censored spell and one for a right-censored spell. Neither dummy coefficient was significant.

Figure 1b

Survival Function for households with no children



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