Family Structure and Nursing Home Entry Risk: Are Daughters Really Better?*

February 2001

Kerwin Kofi Charles
University of Michigan

Purvi Sevak
University of Michigan

Abstract

This paper assesses whether, conditional on the number of children, a higher fraction of daughters lowers the probability that an elderly person enters a nursing home entry. It is the first to use two nationally representative data sets which jointly represent the entire elderly population, both in nursing homes and living in the community. Panel data and cross section models are estimated. We find that, contrary to an emerging consensus in the aging literature, derived mainly from small and non-representative samples, having relatively more daughters than sons has no effect on nursing home entry risk. This effect is present across multiple specifications, and is quite striking given the large estimated effects found for other family structure measures such as marital status and total number of children.

* The authors would like to thank John Bound, the late Lee Lillard, Robert Willis, and participants at the University of Michigan Aging Seminar for helpful comments. Charles gratefully acknowledges grant support from the National Institute of Aging, P01 AG10179.

Family Structure and Nursing Home Entry Risk: Are Daughters Really Better?*

February 2001

Kerwin Kofi Charles
University of Michigan

Purvi Sevak
University of Michigan

Abstract

This paper assesses whether a higher fraction of daughters among an elderly person's offspring lowers the risk of nursing home entry. It is the first to use two nationally representative data sets which jointly represent the entire elderly population, both in nursing homes and living in the community. Panel data and cross section models are estimated. We find that, contrary to an emerging consensus in the aging literature, derived mainly from small and non-representative samples, having relatively more daughters than sons has no effect on nursing home entry risk. This effect is present across multiple specifications, and is quite striking given the large estimated effects found for other family structure measures such as marital status and total number of children.

* The authors would like to thank John Bound, the late Lee Lillard, Robert Willis, and participants at the University of Michigan Aging Seminar for helpful comments. Charles gratefully acknowledges grant support from the National Institute of Aging, P01 AG10179.

1. Overview

Most people fear spending the latter portion of their lives in a nursing home, separated from friends and loved ones and removed from familiar settings. This fear exists even though it is not obvious that being in a nursing home lowers well being among the elderly.[1] What factors determine nursing home institutionalization in later life? Published studies report that advancing age, sex, the presence of cancer, dementia, and problems with activities of daily living all seem to raise the institutionalization risk. While few studies have examined the effect of wealth or income, there is some evidence that individuals with higher income (Headen (1993)), and individuals who own their homes (Garber and MaCurdy, (1990)) are less likely to enter a nursing home in later life.

One particularly interesting strand of research examines the impact of formal and informal support on nursing home entry risk. Some authors have found that people in nursing homes receive fewer visits and telephone calls than elderly people living in the community**.** However, as has been pointed out by authors like Newman and Struyk (1990), it is difficult to attach a causal inference to these results. Is it that the people with low levels of support are in nursing homes *because* they receive less support, or the reverse? Rather than use these direct measures of social support, many authors have made the implicit assumption that the level of support should depend directly on the size of an elderly person's potential support network – whether the person has a spouse, children or siblings on whose assistance he or she might be expected to draw. And,

[1] Nursing homes should benefit individuals because they have trained professionals with expertise in geriatric care. On the other hand, they may lower well-being because they are a depressing place to live. Little work has been done on the impact of nursing homes on well being, perhaps because of the difficulty in separating selection effects from treatment effects. Wolinsky et al. (1992) find that nursing home entry is associated with a doubling in the odds of dying within a given period, but they acknowledge that much of this may reflect a selection effect.

support may not just depend on the size of this potential network, but also on the sex of the people who comprise it.

There is indeed evidence that the size and gender composition of potential support networks affect the level of support and care elderly people receive when they live in the community. Whether the variable used to measure support is the total hours of care (Stephens and Christianson (1986)), help with activities of daily life (Spitze and Logan (1990)), or phone calls or visits received (Spitze and Logan (1990)), researchers have found that being married and having daughters both raise the probability of receiving support. And, other work which looks at whether an individual gives support to an elderly parent, and the quality of support they give, finds that daughters outperform their brothers. (McGarry (1999), Coward and Dwyer (1990), Matthews and Rosner (1988), and Wolf, Freedman, and Soldo (1997)).

One interesting implication of these different results is that an elderly person's risk of nursing home entry may be lowered not only by the size of his family, but also by whether he has relatively more daughters among his offspring. Some work has indeed found that the size and gender make-up of a person's family may matter for institutionalization risk. Freedman (1996), and Pearlman and Crown (1992) find that being married is associated with a lower risk of nursing home entry. Rabiner (1996) finds that having an additional child reduces the odds of nursing home entry by about 11%. Freedman (1996) finds that having a living daughter reduces the hazard of nursing home entry by 27%, and having a sibling is associated with a 21% reduction in the risk. Jette et al. (1995) find in a sample of elderly Massachusetts residents that having a primary caregiver who was female was associated with a dramatic reduction in the odds of entering a nursing home. We are convinced about the effect of family size on entry

risk, but question the validity of the emerging consensus that having daughters as opposed to sons lowers the risk of nursing home entry.

One concern is theoretical: it is curious that simply because women are more likely to assist and care for elderly relatives than men, having relatively more daughters should make an elderly person more likely to receive care and be less at risk to enter a nursing home in advanced age. After all, sons marry women. And, even if daughters-in-law are slightly less likely to care for an elderly person than a daughter, the receipt of caregiving is not the only factor which determines nursing home entry. As mentioned above, the ability to draw on financial resources affects institutionalization risk as well, and sons and daughters certainly have different amounts of these.

Another set of concerns has to with the data and methods used to assess the effect of family structure on nursing home risk. The first problem is that most published studies of these effects use samples which are very small. The precision of the various estimates are thus severely compromised. Second, most samples used in previous published work are not representative of the entire elderly population for one or the other of two reasons. Data have often been drawn from specific sub-populations of the elderly, in specific parts of the country, and is consequently difficult to generalize from these samples to the population as whole. Alternatively, when large, nationally representative surveys such as the National Long-Term Care Survey (NLTCS) have been used to study nursing home transitions, samples are restricted to individuals who, as of the initial date of the survey, have been disabled and living in the community for a number of years. Transitions into nursing homes from this highly selected sample may not be representative.

Our Approach

In the work which follows, we offer new evidence about the impact of family structure on the risk of nursing home entry. We study factors such as marital status, and the number of offspring, but we are mainly interested in determining how the proportion of daughters among an elderly person's offspring affects the chance that the person will end up in a nursing home.

We offer several types of evidence. First, we use panel data to track transitions into nursing homes over time, from a sample which is initially representative of the entire elderly, non-institutionalized population, and which is not selected in terms of baseline health. The characteristics of the initial sample raise our confidence that the estimates we present are not peculiar to a locality, or the result of various sample restrictions. However, because we observe very few nursing home transitions over the time period studied, there is concern about the precision (and possibly even the consistency) of these longitudinal estimates.

To deal with this problem, we then study the incidence of particular family structure variables in two samples – one a representative sample of the elderly non-institutionalized population, and the other a representative sample of the elderly nursing home population. A greater prevalence of a given characteristic in nursing home sample may be viewed as evidence that that characteristic raises the odds of nursing home entry. Because the sample size is relatively large, these estimates are likely to be quite efficient.

2. Empirical Framework

We are interested in how the share of children who are female affects institutionalization risk. We suppose that over any arbitrary time period Δt, the probability that an elderly person enters a nursing home at time t, P_i, depends on the set of observable factors X_{it}, a set of variables summarizing the person's family structure, and a random error ε_{it}. Specifically,

$$P_i = \beta X_i + \gamma_1(\text{Married}_i) + \gamma_2(\text{Number of Children}_i) + \gamma_3(\text{Number of Daughters}_i) + \varepsilon_i. \quad (1)$$

Notice that in (1), the true marginal effect of the number of daughters is *net* of the effect of the total number of children. Since the number of daughters a person has positively covaries with their number of children they have, no control for the number of children may lead to the conclusion that daughters affect the risk of nursing home entry, when the effect is completely the result of having a large family.[2]

One simple way to empirically implement (1) is to estimate the simple linear probability model

$$nh_{i,\Delta t} = \beta X_i + \gamma_1(\text{Married}_i) + \gamma_2(\text{Number of Children}_i) + \gamma_3(\text{Number of Daughters}_i) + \varepsilon_i. \quad (2)$$

where $nh_{i,\Delta t}$ is an indicator variable which equals 1 if a person enters a nursing home over some interval Δt.[3]

[2]It is not clear whether previous work on the effect family structure on support or nursing home entry have always taken account of this effect, since many authors simply report the coefficient from the "number of daughters" variables, and do not discuss how or whether the controlled for family size. For example, Freedman (1996) uses the New Haven site of the Established Populations for Epidemiological Studies of the Elderly (EPESE) from 1982 to 1989 to estimate the hazard of entering a nursing home. She finds that having a living daughter reduces nursing home risk by 27%, but she does not include controls for total number of children.

[3] Equation (2) is similar to those previously used to estimate the effect of various support measures, such as the number of telephone calls or visits received, on institutionalization risk.

Of course, this type of analysis requires longitudinal data on a set of people who live in the community at the beginning of the time period over which Λt is defined. But if the panel is short, the number of people observed making the transition to nursing homes over time might be very small. It follows that the observed variance of the outcome variable is very small, and the precision of the estimated coefficients in (2) will be small as well.

An alternative estimation strategy recognizes that if Δt is very small, the probability in (1) measures the likelihood that, at some *particular point in time* T, an individual will be *in* a nursing home, $NH_{iT} = 1$, rather than *in* the community, $NH_{iT} = 0$. Empirical implementation requires merely that there be cross-sectional data covering both people in and out of nursing homes at a point in time. With such data, estimating various regressions of the form

$$\begin{aligned} NH_{iT} = \beta X_i + \gamma_1(\text{Married}_i) + \gamma_2(\text{Number of Children}_i) \\ + \gamma_3(\text{Number of Daughters}_i) + \varepsilon_i \end{aligned} \tag{3}$$

on a pooled sample allows all of the parameters of interest to be estimated.

Below, we describe the data uses to estimate (2) and (3).

3. Data

The Asset and Health Dynamics among the Oldest Old (AHEAD) is the first of the two datasets used in the study. AHEAD was designed and conducted by the Survey Research Center at the University of Michigan. The first wave of AHEAD is a nationally representative sample of individuals aged 70 or older in 1993. It contains detailed data

---

The fraction of children who are female is a measure of "potential support," and unlike direct measures of actual support, is completely exogenous in (2).

on family structure and relationships, health and disability, and income and wealth. Both the identified individual and their spouse (regardless of age) were interviewed, and we use the 7,431 "age-eligible" respondents in this paper.

The AHEAD is an ongoing, panel dataset, with interviews for the first three waves occurring in 1993, 1995 and 1998, respectively.[4] Detailed information is available in the AHEAD about demographic characteristics, including very rich information about the number and gender of offspring. There is also very good information about health status. We use the first three waves of the data to estimate (2). Over these three waves, many persons who entered a nursing home were not re-interviewed after institutionalization.[5] This poses no problem for us because information on family structure, health and other variables of interest was obtained before any transition into a nursing home.

The "nursing home" sample in the paper is drawn from the 1996 Medical Expenditure Panel Survey (MEPS), Nursing Home Component (NHC). The MEPS-NHC is the first nationally representative sample of nursing home residents with data on family structure.[6] There is also information on other demographic characteristics and

[4] AHEAD re-interviewed individuals in 1995, but in 1998 it was subsumed by the Health and Retirement Study (HRS) which until then had been a panel study of slightly younger individuals. Hence, interviews in 1998, 2000, and every two years thereafter are part of the HRS.

[5] Although it is the goal of HRS/AHEAD to re-interview individuals regardless of residence (by self-interview or proxy), in reality, a disproportionate share of attrition is due to institutionalization.

[6] The National Long-term Care Survey (NLTCS), which does contain data on family structure, interviewed a sample of nursing home residents in 1984. However, because the residents in the sample had to have been disabled and living in the community in 1982 to be included in the initial survey, the NLTCS it is not representative of the entire non-institutionalized elderly population. An additional limitation is that the NLTCS's nursing home sample is very small. The National Nursing Home Surveys are random samples of nursing home residents but they contain no information about respondents' children. The 1987 National Medical Expenditure Survey (NMES), the predecessor of the MEPS, had an institutional component with information on the total number of offspring, but no information on the gender of the children.

health conditions. The dataset was designed and fielded by Westat, for the Agency for Health Care Research and Quality, in the Department of Health and Human Services. The sample was collected using a two-stage stratified probability design – the first stage selected nursing homes, and the second stage selected residents of these selected homes. We use the "Current Residents Sample" of the MEPS, which contains 3,747 residents in 952 nursing homes. Nursing homes in the sample must have at least three beds, and be certified as nursing homes by either Medicare or Medicaid. When combined with sample weights, the sample represents the 1.5 million persons in nursing homes on January 1, 1996.

We place several restrictions on the MEPS-NHC sample for the main part of our analysis. First, because AHEAD is representative of the population aged 70 and older, we exclude the 473 MEPS respondents who were under age 70 at the time of the interview. Second, in order to exclude those nursing home episodes that were for post-acute care as opposed to long-term care, we exclude the 413 residents who have been institutionalized for less than 90 days. In addition, we exclude 163 residents in the top five percent of the distribution of length of stay. Lastly, we exclude 432 cases with incomplete data on family structure.

Combining these data sets yields a sample of 9,787 individuals. When pooled and weighted, the two samples jointly represent the population of U.S. residents over 70 years of age in the mid-1990's. The weights are particularly important in this analysis because we have an "over-sample" of nursing home residents. For both AHEAD and MEPS respondents, we use the weights provided in the data. Because the weights in the AHEAD data sum to the community dwelling population, and the weights in MEPS sum

to the nursing home population, the combination of the weighs should sum to the total population. We use this pooled sample to estimate different versions of (3).

4. Data Summary

Table 1 presents summary statistics for the community dwelling sample drawn from Wave 1 of the AHEAD, and the nursing home sample constructed from the MEPS. The first several rows of the table present means and standard deviations for variables which summarize basic demographic information, health and education in the two samples.

The most striking difference in demographic characteristics between the two samples is the much greater age of people in nursing homes. Whereas the community dwelling sample is, on average, 77 years old, people in nursing homes are more than 85 years old, on average. People in nursing homes are much more likely to be female than those in the community dwelling population, but this difference is likely the result of the age difference between the two populations. Women outlive men, so a population in which people are older is also a population that is more likely to be female. There is slight evidence that the non-whites may be less likely to be represented in the nursing home population, but this effect too may be because of the age differences across the two groups.

The incidence of poor health is also much different in the two samples. Whereas non-institutionalized elderly people on average have difficulty performing less than one out of six queried activities of daily living (ADLs), the corresponding number for the nursing home population is four. This difference likely indicates that the reason people enter nursing homes in the first place, is disability and poor health. Alternatively, differences in age between the populations might explain this difference as well.

The table also shows differences between the populations in various family structure measures - the variables of chief interest in the paper. Elderly people who are not institutionalized are much more likely to be married than their counterparts in nursing homes. In addition, they are more likely to have children, and have a greater number of children, on average. Whereas only thirteen percent of the community-dwelling elderly population has no children, the corresponding number for people in nursing homes is thirty percent. Similarly, only twenty-three percent of the elderly in nursing homes have three or more children, while forty-four percent of those in the community have families of this size. These mean differences suggest a possible role for the mere existence of many close relatives in reducing the risk of nursing home entry.

The table provides no suggestive evidence that the sex of offspring might matter. People in nursing homes are more likely to have no daughters, but they are also more likely to have no sons. The last row of the table shows that among individuals with children, the proportion of their children that are daughters is almost identical among those in the community and those in nursing homes.

5. Results

Longitudinal Estimates of Nursing Homes Entry

Table 2 present the results of linear probability models in which the outcome (Δnh_i) indicates whether an elderly person who was at least 70 years old in 1993 becomes a nursing home resident by 1995. The regressions in this table are from Wave 1 and 2 of the AHEAD, between which the overall transition rate into nursing homes was a miniscule 3.7%. Regression (I) includes only the basic controls - education, race, age, gender and health. The effect of age is positive on the risk of nursing home entry and is

strongly statistically significant. Having difficulty with an additional ADL also raises entry risk with a statistically significant effect. There is mixed evidence about the effect of race. The coefficient on an indicator variable for whether the person is non-white is negative, but the large standard error makes it impossible to reject the hypothesis that the effect is truly zero. On the other hand, the effect of being Hispanic is negative and statistically significant on entry risk. Interestingly, neither education or being female is estimated to have a statistically significant effect in the basic model. This pattern for the controls is observed in all of the regressions presented in the table.

In Regression (II), we add some controls for family structure – whether the person is married, a variable indicating whether the person has any children, and another measuring the total number of children. Being married has a large, negative, and strongly statistically significant effect on becoming a nursing home resident between the first and second waves of the AHEAD. This effect is not surprising. But the estimated effect of children is curious: neither the fact of having any children or the number of children has an effect which is statistically significant. The coefficient on having any children is negative, as might be expected, but again the standard error of the estimate is too large to permit the rejection of the null hypotheses of no effect.

The next two regressions shown in the table examine the effect of the gender make-up of a person's offspring by adding a variable measuring the number of daughters a person has in (III) and the proportion of offspring who are daughters in (IV). In neither of these regressions does either the number or type of children an elderly person has affect nursing home entry in a statistically significant way. We also estimate versions of the transition risks shown here in which the outcome is whether the person enters a

nursing home between 1993 and 1998. In these regressions as well, neither the number nor type of children has any effect on transition probability.

These results illustrate the limitations of using short panels to study nursing home risk. Factors which should theoretically affect nursing home risk – number of kids and education, and other factors whose theoretical effect may not be as clear but have been found to affect nursing home risk in numerous studies – female gender, and daughters, are not found to have a statistically significant effect on the risk of entry. Nevertheless, the coefficients on many of these variables are of the expected sign. This suggests that a larger sample may be necessary to see the effects of these characteristics on nursing home risk.

Pooled Sample Results

We turn next to estimates of (3), where the outcome variable measures whether the person is in a nursing home at a particular point in time, and where we use the pooled AHEAD and MEPS samples. The first regression in the table has only the basic set of demographic controls. The point estimates from this regression are for the most part, similar in sign to the nursing home entry longitudinal results, but they are now estimated with enough precision for us to conclude that their effects on being in a nursing home are statistically different from zero. These results show that being older and the number of ADL disabilities have a positive and statistically significant effect on being in a nursing home. The effect, hinted at in the longitudinal "entry" regressions, that non-whites face a smaller probability of being in nursing homes is confirmed in those regression. Only female gender is estimated to not have a statistically significant relationship.

Regression (II) adds the three family structure variables. The signs and level of statistical significance of the estimated effect of all the demographic controls, except that for being female, remain unchanged after the these variables are added. With a control for marital status, being female is estimated to lower, by a statistically significant amount, the probability of being in a nursing home. This is striking because many studies find that being female either *increases* the risk of entry or has no effect (see Garber and MaCurdy (1990) for a discussion). These results illustrate how a failure to control for family structure can bias estimates of other coefficients. The results show that being married, having at least one child, and having a larger number of children all lower the probability of being in a nursing home. All of these effects are strongly statistically significant, unlike the results from the longitudinal estimates in Table 2.

Regression (III) adds a control for the number of daughters. Its coefficient cannot be distinguished from zero, unique among the family structure variables. We present estimates of alternative versions of Regression (III) in Table 3, in which we control for the "femaleness" of the elderly person's children in many different ways. All regressions control for the total number of offspring, and all other covariates from Regression III. The estimated coefficients and standard errors for these different measures of femaleness are presented in Table 4. The estimated marginal effects of all of the other variables as well as their level of statistical significance are virtually identical to those in regression (III) of Table 3. Table 4 shows that the incidence of daughters among an elderly person's offspring has no effect on the probability that the person is in a nursing home, regardless of the measure of femaleness of offspring. These results are particularly striking given the effects for the other family structure variables.

The nursing home sample is significantly older than the sample of elderly in the community. We are doubtful that this difference biases our results in any way, but to check, we run a series of regressions which asks a slightly different question than the ones we have posed thus far. In the MEPS data, we can determine the year that someone became a nursing home resident. Consider those who entered a nursing home before they were age 75. Comparing these people to AHEAD respondents who are at least 75 years old, and who are *not* in a nursing home, we can estimate how particular variables affect the probability that an elderly person enters a nursing home *by age 75*. Indeed, we can do this exercise for different ages.

Table 5 shows the results of regressions where the AHEAD sample is restricted to people of at least a certain age, and the MEPS sample to those who entered a nursing home at an age younger than the one in question. The two different age restrictions placed on the two samples means that the observations from the MEPS are drawn from the young end of the age distribution, and observations from the AHEAD are drawn from the high end of the distribution. The very specific question we ask forces the community dwelling population – people from AHEAD – to be older. The natural result of these restrictions is apparent in all of the regressions, in that the effect of age is estimated to be negative in each. We emphasize that this is a result of the restrictions imposed in the data, which permit us to answer the very specific question we pose. The effect of the other variables is in no way compromised, so we advise ignoring the effect of age in this table.

The first regression in the table estimates the risk of entering a nursing home by age 70 - relatively early in old age. These results are virtually identical to those presented earlier: women are less likely to enter nursing homes young, conditional on

being married; additional ADL difficulties raises the risk of nursing home entry, and the presence of family support in the form of a spouse or children lowers the risk of early institutionalization. But the number of daughters, conditional on the number of children a person has, has no statistically significant effect on the risk. Reading across the columns, this same pattern emerges: the only family structure variables which seem affect the risk of institutionalization is whether a person is married and the number of children he or she has. Whether many of those children are daughters does not affect the risk of either early or late institutionalization.

Why does having more daughters not lower the risk of going into a nursing home in later life, given that daughters have been found in innumerable studies to be more attentive to elderly parents? There are possibly two answers which we cannot examine in this study because of data limitations. First, the kinds of support which daughters have been found to offer more than their brothers, do not affect nursing home entry. It could be that certain illnesses are so severe, or require such a high level of care and medical expertise that no child could care for a parent suffering from one of these conditions. This would be true even for children (daughters) who care for parents in all other cases.

Alternatively, it could be that the care which daughters are known to more commonly provide their parents does, in fact, lower the risk of nursing home entry. If so, these results necessarily imply that sons, despite the fact that they are less attentive to elderly parents living in the community, must do something which *also* lowers nursing home entry risk. We speculated earlier that the likely difference between sons and daughters in terms of ability to access financial resources may be an explanation, but this is only a speculation. Future research is needed to answer this question.

6. Conclusion

This paper assesses whether a higher fraction of daughters among an elderly person's offspring lowers the risk of nursing home entry. It is the first to use two nationally representative data sets which jointly represent the entire elderly population, both in nursing homes and living in the community. Panel data and cross section models are estimated. We find that, contrary to an emerging consensus in the aging literature, having relatively more daughters than sons has no effect on nursing home entry risk. This effect is present across multiple specifications, and is quite striking given the large estimated effects found for other family structure measures such as marital status and total number of children. The results raise a cautionary note about the results in the aging literature derived from small, non-representative samples.

Bibliography

Boaz, R. F., & Muller, C. F. (1994). Predicting the Risk of "Permanent" Nursing Home Residence: The Role of Community Help as Indicated by Family Helpers and Prior Living Arrangements . Health Services Research.

Coward, R. T., & Dwyer, J. W. (1990). The Association of Gender, Sibling Network Composition, and Patterns of Parent Care by Adult Children. Research on Aging, 12(2), 158-181.

Freedman, V. A. (1996). Family Structure and the Risk of Nursing Home Admission. The Gerontologist, 51B(2), S61-S69.

Garber, A. M., & MaCurdy, T. (1990). Predicting Nursing Home Utilization among the High-Risk Elderly. David Wise Issues in the Economics of Aging (pp. 173-204). Chicago: University of Chicago Press.

Headen, A. E. Jr. (1993). Economic Disability and the Health Determinants of Nursing Home Entry. The Journal of Human Resources, 28(1), 80-110.

Henretta, J. C., Hill, M. S., Soldo, B. J., & Wolf, D. A. (1997). Selection of Children to Provide Care: The Effect of Earlier Parental Transfers. The Journals of Gerontology, 52B, 110-119.

Jette, A. M., Tennstedt, S., & Crawford, S. (1995). How Does Formal and Informal Community Care Affect Nursing Home Use? Journal of Gerontology.

McFall, S., & Miller, B. H. (1992). Caregiver Burden and Nursing Home Admission of Frail Elderly Persons. Journal of Gerontology: Social Sciences, 47(2), S73-S79.

McGarry, K. (1999). Caring for the Elderly: The Role of Adult Children. D. Wise Economics of Aging (pp. 133-166).

Newman, S. J., & Struyk, R. (1990). Overwhelming Odds: Caregiving and the Risk of Institutionalization. Journal of Gerontology: Social Sciences, 45(5), S173-S183.

Pearlman, D. N., & Crown, W. H. (1992). Alternative Sources of Social Support and their Impacts on Institutional Risk. The Gerontologist, 32(4), 527-535.

Spitze, G., & Logan, J. (1990). Sons, Daughters, and Intergenerational Support. Journal of Marriage and the Family, 52, 420-430.

Stephens, S.A., & Christianson, J.R. (1986). Informal Care of the Elderly. Lexington, MA: Lexington Books.

Wolf, D. A., Freedman, V., & Soldo, B. J. (1997). The Division of Family Labor: Care for Elderly Parents. The Journals of Gerontology, 52B, 102-109.

Wolinsky, F. D., Callahan, C. M., Fitzgerald, J. F., & Johnson, R. J. (1992). The Risk of Nursing Home Placement and Subsequent Death Among Older Adults. Journal of Gerontology: Social Sciences, 47(4), S173-S182.

Table 1: Summary Statistics for Selected Variables (ages 70+), by Residence

	Community Dwelling (n=7431)		Nursing Home (n=2356)	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Demographics				
Age	77.60	5.92	85.55	7.35
Female	0.62	0.49	0.76	0.42
Nonwhite	0.12	0.32	0.09	0.28
Hispanic	0.04	0.19	0.02	0.14
Education				
<High School Grad	0.42		0.47	
High School Grad	0.31		0.36	
Any College	0.27		0.16	
Health				
Number of ADLs	0.69	1.36	4.00	2.02
Family Structure				
Married	0.50	0.50	0.15	0.36
Has Children	0.87	0.34	0.70	0.46
Number of Children	2.64	2.09	1.65	1.73
No Children	0.13		0.30	
1 Child	0.17		0.23	
2 Children	0.26		0.24	
3+ Children	0.44		0.23	
Has Daughters	0.70	0.46	0.53	0.50
Number of Daughters	1.34	1.35	0.87	1.11
No Daughters	0.30		0.47	
Has Sons	0.68	0.47	0.50	0.50
Number of Sons	1.30	1.33	0.78	1.04
No Sons	0.32		0.50	
% Children who are female	0.51	0.34	0.52	0.37

Weighted estimates; see text for a discussion of the samples and the weights.
Community dwelling sample is from AHEAD, nursing home sample is from MEPS; both are restricted to those ages 70 and older.

Table 2: Linear Probability Model of Risk of Entering a Nursing Home Between 1993 and 1995.

Variable	Regression I	Regression II	Regression III	Regression IV
Demographics				
HS Drop	0.0010	0.0004	0.0004	0.0004
	(0.0056)	(0.0057)	(0.0056)	(0.0057)
College	-0.0085	0.0084	-0.0084	-0.0084
	(0.0062)	(0.0062)	(0.0061)	(0.0061)
Age	0.0050*	0.0048*	0.0048*	0.0048*
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Female	0.0050	0.0008	0.0008	0.0008
	(0.0044)	(0.0044)	(0.0044)	(0.0044)
Nonwhite	-0.0059	-0.0081	-0.0080	-0.0080
	(0.0073)	(0.0073)	(0.0073)	(0.0073)
Hispanic	-0.0333*	0.0340*	-0.0340*	-0.0340*
	(0.0086)	(0.0090)	(0.0090)	(0.0090)
Health				
# ADLs	0.0280*	0.0279*	0.0279*	0.0279*
	(0.0036)	(0.0036)	(0.0036)	(0.0036)
Family				
Any Kids		-0.0082	-0.0082	-0.0065
		(0.0092)	(0.0092)	(0.0100)
# Kids		0.0003	0.0013	0.0003
		(0.0012)	(0.0018)	(0.0012)
# Daughters			-0.0019	
% Daughters				-0.0033
Married		0.0107*	-0.0106*	-0.0107*
		(0.0047)	(0.0047)	(0.0047)
Constant	-0.3682*	-0.3353*	-0.3352	-0.3352*
	(0.0476)	(0.0500)	(0.0500)	(0.0500)
R – Squared	0.0711	0.0720	0.0720	0.0720
Mean ΔNH	0.0037	0.0037	0.0037	0.0037
# observations	6,652	6,652	6,652	6,652

Weighted estimates; see text for a discussion of the weights.
* Denotes the coefficient is statistically different from zero at the 5% level

Table 3: Two Sample Linear Probability Model Predicting Nursing Home Residence

Variable	Regression I	Regression II	Regression III
Demographics			
HS Drop	-0.0238*	-0.0235*	-0.0235*
	(0.0033)	(0.0034)	(0.0034)
College	-0.0178*	-0.0179*	-0.0179*
	(0.0031)	(0.0032)	(0.0032)
Age	0.0044*	0.0038*	0.0038*
	(0.0003)	(0.0003)	(0.0003)
Female	0.0017	-0.0069*	-0.0069*
	(0.0024)	(0.0027)	(0.0027)
Nonwhite	-0.0273*	-0.0309*	-0.0309*
	(0.0039)	(0.0040)	(0.0040)
Hispanic	-0.0292*	-0.0265*	-0.0266*
	(0.0063)	(0.0064)	(0.0064)
Health			
# ADLs	0.0539*	0.0535*	0.0535*
	(0.0019)	(0.0019)	(0.0019)
Family Structure			
Married		-0.0187*	-0.0187*
		(0.0027)	(0.0027)
Any Kids		-0.0214*	-0.0214*
		(0.0053)	(0.0053)
# Kids		-0.0027*	-0.0026*
		(0.0007)	(0.0009)
# Daughters			**-0.0001**
			(0.0014)
Constant	-0.3262*	-0.2372	-0.2372
	(0.0231)	(0.0251)	(0.0251)
R - Sq.	0.2159	0.2210	0.2210
# Observations	9787	9787	9787

Weighted estimates; see text for a discussion of the samples and the weights.
* Denotes the coefficient is statistically different from zero at the 5% level.

Table 4: Two Sample Linear Probability Model Estimates
Various Daughter/Son Specifications

Measure of "femaleness" of children	Coefficient	Robust Std. Error
# Daughters	-0.0001	0.0014
% Daughters	-0.0001	0.0041
Any Daughters	0.0006	0.0036
Any Daughters	0.0011	0.0043
# Daughters	-0.0004	0.0017
Any Daughters	0.0019	0.0038
Any Sons	0.0030	0.0039
1 Daughter	0.0019	0.0038
2 Daughters	-0.0029	0.0042
3 Daughters	0.0041	0.0056
4 Daughters	-0.0018	0.0074
5+ Daughters	0.0029	0.0097
1 Daughter	0.0017	0.0038
2+ Daughters	-0.0017	0.0041

Weighted estimates; see text for a discussion of the samples and the weights.

Note: None of these estimated coefficients are statistically different from zero. Above regressions control for all the variables included in previous regressions. Their coefficients and the overall R-sq. values are virtually identical across specifications.

Table 5. Linear Probability Estimates of Risk of Entering Nursing Home by Given Age.

Variable	**Age=70**	**Age=75**	**Age=80**	**Age=85**
Hsdrop	0.0066 *	0.0045	-0.0200 *	-0.0812 *
	(0.0017)	(0.0034)	(0.0070)	(0.0146)
College	-0.0012	-0.0043	-0.0305 *	-0.1028 *
	(0.0015)	(0.0034)	(0.0074)	(0.0159)
Age	-0.0060 *	-0.0126 *	-0.0257 *	-0.0268 *
	(0.0003)	(0.0003)	(0.0006)	(0.0007)
Female	-0.0121 *	-0.0202 *	-0.0228 *	-0.0188
	(0.0015)	(0.0030)	(0.0060)	(0.0120)
Nonwhite	-0.0062 *	-0.0112 *	-0.0296 *	-0.0401 *
	(0.0022)	(0.0040)	(0.0072)	(0.0142)
Hispanic	-0.0092 *	-0.0133 *	-0.0286 *	-0.0240
	(0.0034)	(0.0068)	(0.0134)	(0.0251)
Health				
# ADL's	0.0199 *	0.0339 *	0.0534 *	0.0706 *
	(0.0010)	(0.0015)	(0.0024)	(0.0032)
Family Structure				
Married	-0.0252 *	-0.0399	-0.0454 *	-0.0452
	(0.0016)		(0.0059)	(0.0123
Any Kids	-0.0208 *	-0.0319 *	-0.0341 *	-0.0103 *
	(0.0027)	(0.0048)	(0.0087)	(0.0157)
# Kids	-0.0022 *	-0.0031 *	-0.0034 *	-0.0081 *
	(0.0004)	(0.0010)	(0.0020)	(0.0044)
# Daughters	-0.0007	-0.0005	-0.0002	-0.0006
	(0.0006)	(0.0015)	(0.0030)	(0.0066)
Constant	0.5063 *	1.0754	2.2290 *	2.4971 *
	(0.0209)		(0.0472)	(0.0619)
R-Squared	0.1816	0.3068	0.4878	0.5408
Ahead Sample	7447	4704	2367	1071
MEPS Sample	557	882	1397	2034

Weighted estimates; see text for a discussion of the samples and the weights.
* Denotes the coefficient is statistically different from zero at the 5% level.