Health, Social Support, and Housing Transitions among Older Adults[1]

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Abstract

Previous research indicates age-related diseases that lead to disability increase the risk of a housing transition among older adults. However, the role of social support in this process is unclear. This analysis examines the relationship between health status, social support, and housing transitions among the older adult population with data from the 1993 and 1995 Asset and Health Dynamics among the Oldest Old (AHEAD) study.

The specific aims are to:

1) Examine the degree to which social support moderates the relationship between health and housing transitions.
2) Identify the effect of different sources of support on housing transitions.

The analysis assesses how reliance upon different sources of social support (i.e., informal only, formal only, and a combination of informal and formal) is related to changes in housing type (i.e., private residence, supportive housing, nursing home) over a two-year period. The analysis focuses on respondents who were living in their own private residence at the baseline.

The findings indicate that health status is related to housing transitions but the effects of particular health indicators are not uniform across the transition types. Furthermore, the effect of health status does not tend to diminish after controlling for social support. Receiving social support is not significantly related to transitions into another person's home but receiving informal assistance decreases the likelihood of moving into supportive housing. Receiving assistance from informal and formal sources is related to an increased likelihood of nursing home transitions and death, which is consistent with previous research that indicates social support networks are activated prior to these events.

As noted by Soldo & Freedman (1994: 197),

". . . the division of labor among the various sectors of society in providing for the needs of the young is well established . . . In contrast, the lines partitioning responsibility for the daily care and well-being of the elderly are not as cleanly drawn."

Research from various disciplines supports this observation by demonstrating that the family, the public sector, and private organizations are involved in providing various types of care to older adults. Yet, most studies focus on the support provided by a particular sector (e.g., family caregivers, nursing homes) or provided to a subset of the older adult population that has specific needs related to an illness (e.g., Alzheimer's disease). Studies that examine the support provided by different sectors usually do not consider the impact of this care provision on housing transitions. Does this support reduce the risk of a housing transition, particularly for those in poor health? Are informal and formal supports equally successful in reducing that risk? Is there a threshold of support reliance that triggers a housing transition?

The analysis addresses these questions by examining the relationship between community-based informal (i.e., family) and formal (i.e., public/private market) sources of social support and housing transitions among the older adult population. The specific aims of this analysis are to:

1) Examine the degree to which social support moderates the relationship between health and housing transitions.
2) Identify the effect of different sources of support on housing transitions.

The data for this project come from the 1993 and 1995 Asset and Health Dynamics among the Oldest Old (AHEAD) study, which contains a nationally representative sample of adults aged

70 and older (Soldo, Hurd, Rodgers, & Wallace, 1997). The data will be used to assess how reliance upon different sources of social support is related to housing transitions that occur over a two-year period.

Literature Review. Over the course of the twentieth century, the proportion of older Americans living independently systematically increased. The overwhelming majority of older adults report that living in their own home and maintaining current levels of independence are personally important (Mack, Salmoni, Viversais-Dressler, Porter, & Garg, 1997; Porter, 1995). Older adults recognize that good health and adequate finances facilitate independent living, and identify both formal and informal supports as potential resources for obtaining assistance with health-related problems that can threaten residential independence (Mack et al., 1997). When assistance is needed, older adults prefer to receive care in their own home instead of an institution (McAuley & Blieszner, 1985; Cetron, 1985). Recent evidence suggests nursing homes are increasingly being used for acute care, while home-based care and assisted living are becoming popular options among older adults who have chronic conditions (Bishop 1999). Thus, there is a strong preference among older adults to maintain residential independence.

As we enter the twenty-first century, one challenge we face is how to assist a growing older adult population in maintaining their preferred living environment. Chronic disability among older adults is declining but continues to be common, particularly among the oldest old and women (Manton, Corder & Stallard, 1993, 1997; Manton, Stallard, & Corder, 1995). These conditions pose a threat to independent living because they can cause physical impairments and functional limitations that lead to disability (Verbrugge and Jette, 1994; Lawrence and Jette, 1996; Jette, Assmann, Rooks, Harris, & Crawford, 1998). Previous research consistently indicates that older adults with fewer limitations are better able to maintain an independent residence, while those who experience declining health have an increased risk of co-residence with children,

institutionalization, and moving within the community (DeJong, Wilmoth, Angel, & Cornwell, 1995; Speare, Avery, & Lawton, 1991; Wolinsky, Callahan, Fitzgerald, & Johnson, 1992; Angel, DeJong, Cornwell, & Wilmoth, 1995). Thus, age-related diseases that lead to disability increase the risk of making a housing transition.

The relationship between health status and independent living may be moderated by community-based social support. Previous research suggests that informal and formal social support intervene in the disablement process by providing assistance that attenuates environmental and social demands (Verbrugge and Jette, 1994). Family members, usually spouses and children, are the primary source of social support for older adults (Shanas, 1979). Other sources of support, including relatives, friends, and formal organizations, tend to provide care when immediate family members are unavailable (Cantor, 1979; Stoller & Earl, 1983). In addition to substituting for informal support, formal support supplements informal support in some cases (Bass & Noelker, 1987; Noelker & Bass, 1989). There is also evidence that different parts of the social support system are suited to specific types of care-giving tasks (Litwak, 1985). Overall, previous research suggests that formal social support offers complementary assistance that usually substitutes for, and sometimes supplements, informal support (Cantor and Brennan 2000). However, whether informal and formal support can sufficiently compensate for age-related declines in functional ability and thereby reduce the risk of a moving into a less independent living environment has not been documented.

Previous research indicates that informal social support is an important component of independent living (Avery, Speare, and Lawton, 1989; Freedman, 1996). Recent research also shows that over-reliance on informal social support is related to an increased risk of a living arrangement transition (Wilmoth, 2000a), thus suggesting that informal social support may be limited in helping older adults maintain residential independence. Informal networks may become

taxed when providing support beyond a particular threshold. Consequently, they may encourage the older adult to move into a different living environment so that support can be received from additional sources. Social services that provide in-home assistance offer community-based formal social support that can minimize over-reliance upon informal support networks. The residential independence of older adults, who rely heavily on informal support but do not use these formal services due to personal preference or lack of access, may be threatened.

The relative importance of different sources of social support to maintaining residential independence has not been addressed by previous research. We know there is a relationship between household composition and receipt of social support. Older adults who are living with a spouse or others are more likely to receive informal support and those who live alone are more likely to receive formal support (Norgard and Rodgers, 1997). However, there are theoretical reasons for expecting community-based social support to influence an older adult's need to change living environments.

Theoretical Orientation. Previous research tends to use the term "living arrangements" to refer to an older adult's living environment. However, this is a conceptually imprecise term that refers to three related dimensions of the living environment: structural characteristics (i.e., multi-story, wheelchair accessible), household composition (i.e., who lives in the home), and housing type (i.e., private residence, assisted living facility, nursing home). It is important to note that most studies of "living arrangement transitions" have not examined the structural characteristics of the physical environment. Instead, this research tends to examine household composition and general housing type (e.g., community-based versus institutionalized). For example, older adults living in the community are often categorized as living alone, with spouse only, with children only, or with others; and older adults living in nursing homes are considered institutionalized.

The proposed analysis will measure these three dimensions of the living environment separately. Structural characteristics, household composition, and housing type are not combined into a single measure because the person-environment perspective (Lawton, 1982), which serves as the project's guiding theoretical framework, suggests they are conceptually distinct and causally related. These dimensions capture the physical, social, and proprietary character of the living environment. The person-environment perspective predicts the physical and social characteristics of the living environment influence environmental press. Environmental press encompasses the physical and social demands that can trigger adaptation, including adaptations that involve changes in housing type (Lawton 1982; Ferraro and Farmer, 1995).

For example, a living environment that has living quarters on different floors, is in poor condition, is not wheelchair accessible, or does not contain assistance devices increases environmental press, particularly for those in poor health. Thus, structural characteristics can prompt adaptations that involve moving to a different housing type. Given this, structural characteristics will be considered an antecedent variable in this analysis. Similarly, a living environment that does not have other individuals in the household who can provide assistance (e.g., a spouse or child) also increases environmental press. Thus, household composition is a measure of social support availability that conceptually precedes a change in housing type. Given this, household composition will be used in this study as a measure of social support.

Social support is important from a person-environment perspective because it influences environmental press by moderating the physical and social demands that arise from life events. Life events, like a health decline, create stress by posing new challenges or intensifying chronic problems. This increased stress encourages an older adult to seek support and prompts informal networks to respond to the older adult's need (Arling, 1987; Pearlin, Menaghan, Lieberman, and Mullan, 1981; Thoits, 1995). Informal social support networks, both within and outside of the

older adult's household, are activated in times of need, when a life change is imminent or in process (Cantor, 1980; Hogan, Eggebeen, & Clogg, 1993; Eggebeen & Davey, 1998). Once these informal networks are activated, they influence the risk of a housing transition in two ways.

First, informal social networks provide information and opportunities for adapting the living environment, especially community-based adaptations that involve alterations in household composition or moves into children's households (Soldo, Wolf, & Agree, 1990; Spitze, Logan, & Robinson, 1992; Wolf & Soldo, 1988). Second, the assistance provided by informal support acts as a buffer that allays the negative effects of stressful life events. This assistance delays moves into institutionalized settings (Avery et al., 1989; Cohen & Willis, 1985; Freedman, 1996).

However, informal supports may be unable to help older adults avoid a housing transition due to time constraints or a lack of skills to meet specific needs. Formal social support can meet some of the older adult's needs, which may prevent a change in housing type. Therefore, older adults who receive a blend of support from informal and formal networks should be less likely to make a housing transition, particularly a change into assisted living or a nursing home, than older adults who receive no support or only receive one type of support.

From the person-environment perspective, housing transitions are not only related to the type of support that is received; they are also related to social press. Social press can arise from the dependency of an older adult on his or her social support network. High reliance upon social support implies there is an underlying need of the aging individual that could potentially be met by a housing adjustment. Thus, housing transitions should be related to the reliance of an older adult on support networks. For those who receive assistance, high reliance on any part of the support system is expected to be positively related to the risk of changing housing types.

There are several characteristics of the person and their environment, beyond health status and social support, which may influence housing transitions. Age increases the risk of making

housing related adjustments, particularly changes that involve institutionalization (Mutchler & Burr, 1991; Wilmoth, 1998; Wolinsky et al., 1992). Women are more likely than men to experience living alone, with children, or a nursing home (Siegel, 1993). There is considerable variation in independent living across race, ethnic, and immigrant groups, with native born, Non-Hispanic Whites being the most likely to live independently (Angel, Angel, & Himes, 1992; Wilmoth, DeJong, and Himes, 1997; Wilmoth, 2000b). Economic resources provide the means to purchase preferred living environments and services that maintain independent living (Soldo et al., 1990). Having more children, particularly female children, increases the potential pool of social support and individuals with whom an older adult can live (Soldo et al., 1990; Wolf & Soldo, 1988).

Figure 1 presents the conceptual model that will guide the empirical analysis. The demographic and the health status factors (i.e., disease conditions and functional limitations) measure personal characteristics. The housing and social support factors measure the physical and social environment. Demographic and housing characteristics are background factors that provide a setting in which health status and social support influence housing transitions. Conceptually, disease conditions indirectly influence housing transitions by activating social support networks and causing functional limitations. The manifestation of functional limitations is also influenced by the presence of social support.

(Figure 1 about here)

Hypotheses. Given the findings of previous research and the proposed conceptual model, it is expected that:

I. Social support will moderate the relationship between health and the risk of a housing transition.

A. Poor health status is positively related to housing transitions.

B. The positive effect of poor health status on housing transitions diminishes after social support is taken into account.

II. Social support is negatively related to the risk of a housing transition.

A. Older adults who receive informal social support are less likely to change housing types than those who do not receive informal social support.

B. Older adults who receive formal social support are less likely to change housing types than those who do not receive formal social support.

C. The use of informal and formal social supports decreases the likelihood of changing housing types.

Data and Methods

The data for this project come from the Asset and Health Dynamics among the Oldest Old (AHEAD) study, which contains a nationally representative sample of 8,222 adults aged 70 and older. The baseline data were collected in 1993 and subjects were followed-up in 1995 and 1996 (Soldo, Hurd, Rodgers, & Wallace, 1997). Table 1 summarizes the measures that are used in this analysis.

(Table 1 about here)

Measurement of Housing Type. The housing type variable contains three categories at the baseline: older adult's private home, another person's private home, and supportive housing. Items regarding ownership information and housing characteristics will be used to construct this variable. Supportive housing encompasses a variety of long-term care settings including board and care homes, assisted living facilities, and continuing-care retirement communities (Blanchette 1997). Its distinguishing feature, in comparison to private homes, is access to group meals and personal care services. Respondents who report living in a community for people over the age of 60 that provides group meals, nursing care, or help with bathing, dressing, or eating (regardless of

whether the respondent uses these services) are coded as living in supportive housing. Respondents who do not live in a facility or community that provides systematic access to these services are coded as living either in their own or another person's private home (depending on the specific ownership information). Nursing home residence is an additional housing type category in the follow-up interview. The AHEAD questionnaire defines a nursing home as a residential facility that "provides all of the following services for its residents: dispensing of medications, 24-hour nursing assistance and supervision, personal assistance, and room & meals."

Figure 2 arrays the four housing types on a continuum of independence. Living in one's own private home potentially provides the highest level of community-based residential independence. Living in another person's home (usually the home of a child or relative) or in supportive housing represents a moderate level of residential independence. In both cases, the older adult is in a setting that potentially provides more assistance but less personal freedom. Given that supportive housing involves a shift away from private residence toward communal living, it is depicted as providing less independence than living in another person's home. Nursing homes offer a low level of independence due to the bureaucratic organization of care provision (Diamond 1992).

(Figure 2 about here)

The state space in Figure 3 shows how older adults move between these housing types or to the absorbing state of a nursing home or death over time. Older adults living in their own private home can move to another person's private home, supportive housing, or a nursing home. Older adults living in another person's private home can move into their own private home, supportive housing, or a nursing home. Older adults living in supportive housing can move into a private home (either their own or another person's) or a nursing home. Transitions out of a

nursing home are theoretically possible but are not modeled in this project because none of the respondents lived in a nursing home at the baseline.

(Figure 3 about here)

Transition histories are constructed for each respondent based on housing type at the baseline and reports of transitions provided in the second interview. The source of the transition information depends upon the respondent's status at the time of the follow-up. Proxy exit interviews are conducted for respondents who have died. These exit interviews collect information on the month and year of death, as well as residential transitions that occurred before death including moves within the community or to a nursing home. Respondents (or proxy respondents) who indicate the current residence is a nursing home are asked the month and year of nursing home placement. Respondents not living in a nursing home who indicate a change in main residence since the baseline interview are asked the month and year they moved to their current main residence. Respondents who report a move between the first and second interview are identified and questions related to ownership information and housing characteristics are examined to identify shifts in housing type. This information is used to construct an event history file that tracks housing transitions.

Preliminary analysis indicates that moves to less independent states (e.g., nursing homes) are more common than moves to more independent states (e.g., private homes). Consequently, some transitions do not have a sufficient number of cases to support the multivariate analysis, particularly transitions from housing types that are relatively uncommon at the baseline. For example, Table 1 indicates that the majority (79%) of the respondents live in their own private home at the baseline. Only 18% live in another person's private home and only 2% live in supportive housing. Therefore, the analysis only models transitions among respondents living in their own private home at the baseline. Future

analyses will build upon this analysis by including data from the 1998, 2000, and 2002 follow-up surveys, which will allow the less common housing transitions to be modeled.

Measurement of Social Support and Health Status. The central independent variables are community-based social support and health status. Three dimensions of social support are measured. The first dimension is availability of potential informal social support in the older adult's household. Baseline marital status and household composition are used to create a dichotomous variable that measures whether the respondent is living alone at the baseline.

The other social support measures are based on the questions regarding basic and instrumental activities of daily living. All respondents were asked if they received help with six basic activities of daily living (ADL). If they indicate that they received help most of the time, then they were asked who provides the help. In addition, all respondents were asked if they were able to do the four instrumental activities of daily living (IADL) without help. If they indicate they are unable to do any of the IADLs without help, then they were asked who provided help.

These questions are used to construct the social support variables, which measure whether the respondent receives ADL/IADL assistance from informal (1=yes) and formal (1=yes) sources. Then a variable is constructed that contains four categories: no support (reference), informal only, formal only, and informal and formal. Although these measures are also available at the second wave, timing information on changes in the support type are not available. Consequently, it is not possible to identify whether the social support change occurred before or after the change in housing type. Therefore, only baseline measures of support type are included in the analysis.

There is an excellent array of health status measures in the AHEAD that are independent of the ADL and IADL measures. This analysis uses a summary variable based on eight baseline health conditions and an aggregate index of cognitive functioning (Herzog & Wallace, 1997) to measure the presence of disease conditions. In addition, the month and year of the most recent

occurrence of three serious health conditions (i.e., cancer, heart attack, and stroke) is measured in the follow-up survey. This information is used to track the occurrence of these conditions before a change in household type. Functional limitations are measured with a summary index of upper and lower body limitations.

Measurement of Control Variables. As noted previously, demographic and housing characteristics provide a setting for the relationship between health, social support, and housing transitions. Demographic controls include: age (in years), gender (1=female), race/ethnicity (1=Non-Hispanic White), number of children, and household income (in dollars). Baseline housing characteristics include: geographic location (1=rural), whether the respondent is a long-term resident (1=more than 10 years), self-rated condition of the home (scale 1=poor to 5=excellent), and accessibility of the home (scale based on a sum of five items that measure whether the home has all of the living space is on one floor, ramps at street level, special railings, bathroom grab bars/shower seat, and allows wheelchair access indoors).

Analytic Plan. The analysis is based on an event history file that tracks changes in housing type among respondents who were living in their own private residence at the baseline(N=6437). These respondents could have experienced no transition, a transition into another person's private home, a transition into supportive housing, a transition into a nursing home, or transition into the absorbing state of death/lost-to-follow-up. Respondents who did not experience a transition or were lost-to-follow-up are censored at the time of the second interview. Respondents who experienced a transition are assigned a duration that is based on the first move date (or the date of death for respondents who did not experience a move before their death).

As shown in Figure 4, approximately one-quarter of those living in their own private home at the baseline experience a transition between the first and second waves. Figure 5 indicates that among those who experienced a transition, the most common transition path is to death/lost-to-

follow-up, followed by transitions to another person's home, and a nursing home. Transitions to supportive housing are relatively rare during the two-year study period.

(Figure 4 about here)

(Figure 5 about here)

PROC PHREG in SAS is used to estimate a series of competing risk Cox regression models. To test the first set of hypotheses, a model is estimated with all respondents that includes the health status variables. Then the social support source variables are entered into the model so that the change in the health status coefficients will be noted. Finally, a full model is estimated that controls for the background demographic and housing variables.

Results

Table 2 presents the first Cox regression model predicting transitions from living in one's own private home to living in another person's private home. The models indicate that better cognition decreases the likelihood of transitioning into another person's private residence. In other words, respondents who exhibit cognitive limitations are more likely to transition into another person's home. The effect of cognition remains significant after controlling for social support, demographic characteristics, and housing conditions. Living alone is positively related to transitions into another person's home, but this effect is not significant after controlling for the background variables. Age, being female, having more children, household income, and rural location increases the likelihood of transitioning into another person's home. In contrast, older adults who report living in a more accessible home at the baseline are less likely to transition into another person's home.

(Table 2 about here)

The predictors of transitions into supportive housing are quite different from the predictors of transitioning into another person's private home. Interestingly, better cognitive functioning

increases the likelihood of making a transition into supportive housing. Receiving assistance from informal sources only significantly decreases the likelihood of transitions from a private home into supportive housing. However, receiving assistance from formal sources only or a mix of informal and formal sources is not significant. Age is the only demographic characteristic that is related to supportive housing transitions. However, several housing conditions are significant. Older adults who live in rural settings are less likely to transition into supportive housing, perhaps due to a lack of accessibility to supportive housing facilities. And, those who have been living in their current residence for more than ten years are also less likely to move to supportive housing. Those who report more accessible housing in the baseline are more likely to report a supportive housing transition. This was not expected but might indicate the older adult's need for a living environment that is more accessible than can typically be provided in a private residence.

(Table 3 about here)

As indicated by Table 4, transitions into a nursing home are driven by health concerns. Although it might seem unexpected that number of disease conditions is negatively related to transitions into a nursing home, it is important to keep in mind that these are competing risk models. Those who have multiple conditions might be transitioning straight into death without a nursing home stay. As expected, better cognition is negatively related to nursing home transitions. Having a serious heath event or functional limitations increases the likelihood of nursing home placement. Controlling for social support does not eliminate the significance of these health effects. Living alone and receiving assistance (from any source) increases the likelihood of a nursing home transition. The effect for receiving assistance from a mix of informal and formal sources is notably larger than the effects of receiving assistance from only informal or only formal sources. The only other variable in the full model that is significant is age; each additional year of age increases the likelihood of a nursing home transition.

(Table 4 about here)

As expected, health status significantly predicts transitions into death or lost-to-follow-up. Each additional disease condition, health event, and functional limitation increases the likelihood of death or lost-to-follow-up. Better cognitive functioning is negatively related to this type of transition. Receiving assistance from informal sources only or a mix of informal and formal sources increases the likelihood of a death/lost transition. However, receipt of assistance from formal sources only is not significant. As expected, age increases the risk or a death/lost transition whereas females are less likely to transition into death/lost. Interestingly, living in a more accessible home lowers the risk of a death/lost transition, perhaps because those living in a more accessible home are less likely to move and therefore are less likely to be lost-to-follow-up.

Discussion

Overall, the analysis indicates that health status is related to housing transitions but the effects of particular health indicators are not uniform across the transition types. Therefore, only mixed support is found for Hypothesis IA. Better cognition decreases the likelihood of transitions into another person's home, a nursing home, or death/lost. But, cognition is positively related to supportive housing transitions. This might occur because assisted living facilities cater to a relatively healthy and wealthy segment of the older adult population. In addition, some facilities have policies that make this housing option less attractive to cognitively impaired older adults. Functional limitations are only related to nursing home and death/lost transitions. Serious health events only increase the likelihood of death/lost transitions. Number of conditions decreases the likelihood of nursing home transitions while increases the likelihood of death/lost transitions. This is most likely due to respondents with multiple disease conditions transitioning straight into death without a nursing home stay.

In contrast to the predictions of Hypothesis IB, the partial models provide no evidence that

social support moderates the effects of health. The effect of health status on housing transitions does not tend to diminish after social support is taken into account. The coefficients for the effect of functional limitations on nursing home and death/lost transitions are reduced by controlling for social support but both coefficients remain statistically significant in both models. Therefore, health status has a robust, direct effect on housing transitions.

The results provide mixed support for Hypothesis II. Social support is significant in many of the models but it does not consistently reduce the risk of housing transitions. Social support is not significantly related to transitions into another person's private home. This suggests that community based social support does not prevent community based moves for coresidence. As expected, receiving assistance from only informal sources decreases the likelihood of supportive housing transitions. This suggests that informal support is more effective than formal support at preventing moves into supportive housing.

Contrary to expectations, receiving assistance from any source increases the risk of nursing home transitions. Furthermore, receiving support from both informal and formal sources increases the risk of a nursing home placement more than receiving assistance from only informal or only formal sources. Similarly, receiving assistance from informal sources only or a mix of informal and formal sources increases the risk of death/lost transitions. And, the effect of receiving support from mixed sources is greater than receiving assistance from only informal sources. These results are consistent with previous research that indicates social support networks are activated prior to and during serious life events. It is also possible that heavy reliance on these social supports precipitate transitions into nursing homes because the caregivers are unable to meet the needs of the older adult and therefore turn to the services of a nursing home facility. However, a supplementary analysis of this data (not shown) suggests that higher reliance on social supports (i.e., receiving assistance with more ADL/IADL tasks) is not significantly related to

nursing home transitions.

Overall, this analysis suggests that health and social support have strong, direct effects on housing transitions in later life. But it is important to recall that this analysis is based on transitions that occurred over a relatively short time frame – two-years. Consequently, it was unable to model transitions from less common housing arrangements, like living in another person's private home or assisted living. In addition, some of the transitions from living in a privately owned residence are relatively rare. Therefore, the models presented here should be considered preliminary until subsequent waves of data can be added to the analysis, which will increase the number of observed transitions and improve the power of the analysis. Also, the analysis only takes into account baseline social support. It was unable to track changes in social support that might have preceded the observed transitions due to data limitations. Thus, critical changes in social support might not be observed. Consequently, the effects of receiving social assistance may be underestimated in these models.

Despite these limitations, this analysis provides an important foundation upon which future analyses of housing transitions can be built. It provides a theoretical framework that motivates research in this area. This research also demonstrates the usefulness of an event history approach to modeling housing transitions and the importance of longitudinal data that enable the estimation of competing risk models.

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Figure 1. Conceptual model of housing transitions

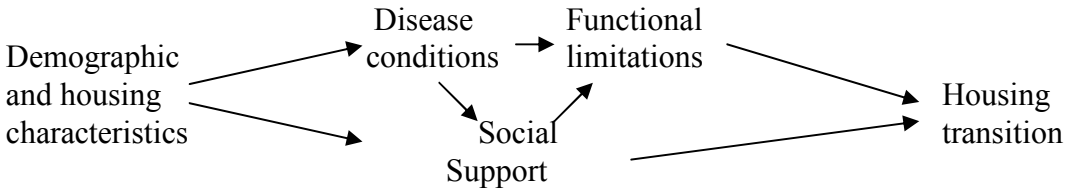

Figure 2. Continuum of Housing Types

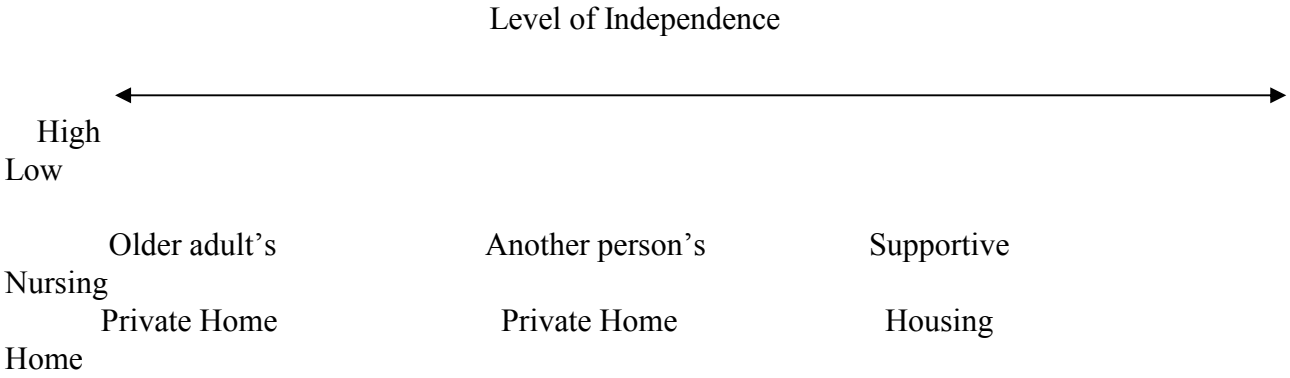

Figure 3. Older Adult Housing Transitions

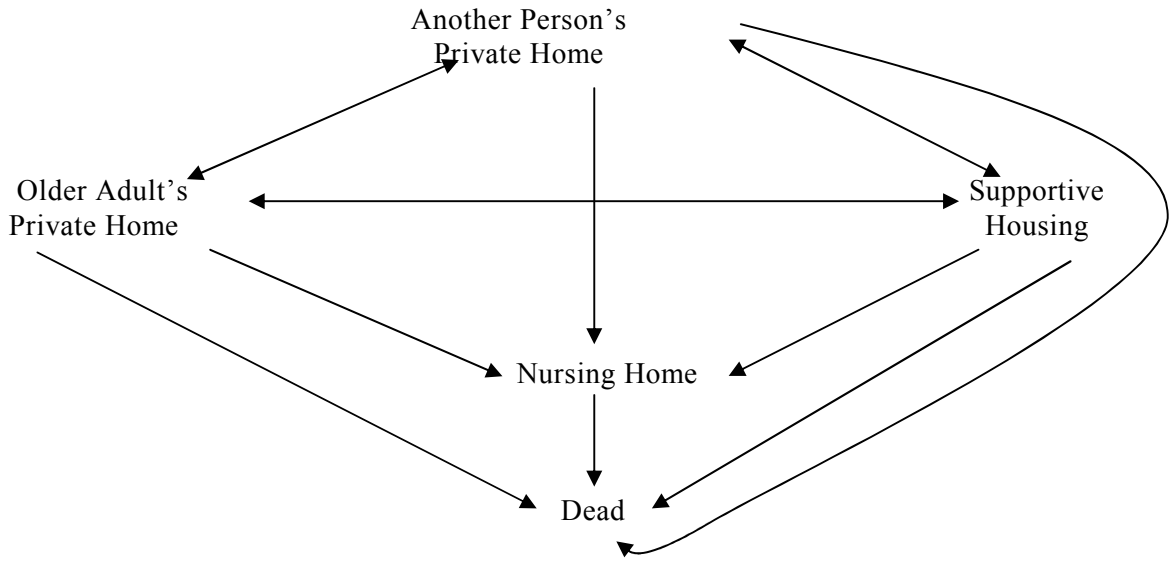

Figure 4. Percent distribution of housing transitions among baseline respondent living in their own private home

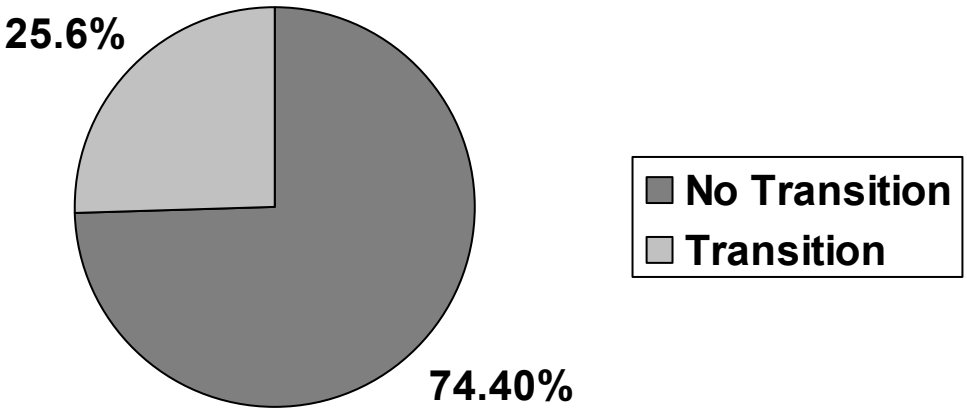

Figure 5. Destinations among respondents living in their own private home who experienced a housing transition

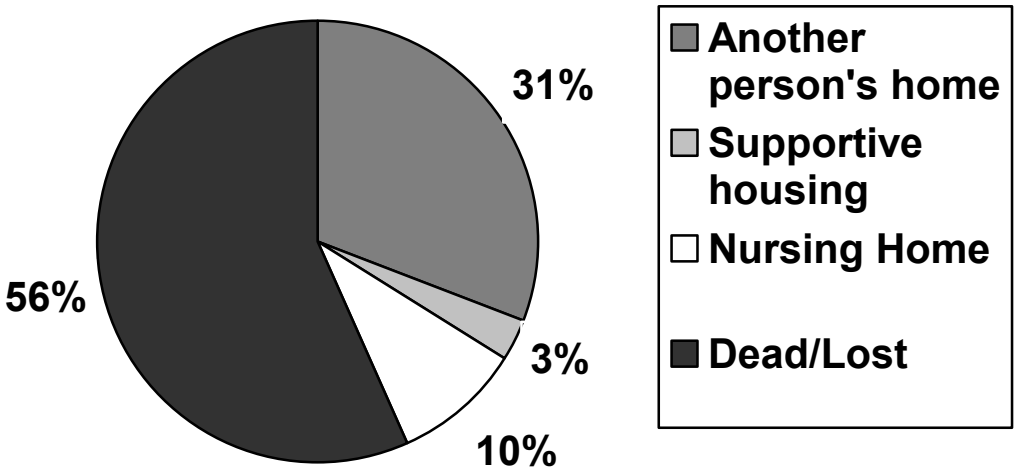

Table 1. Baseline descriptive statistics for the total sample and the sample living in their own private home.		
	Total	Living in own private home
Health		
Disease conditions	1.64	1.60
Number of conditions	(1.25)	(1.24)
Health event	11%	11%
Functional or Cognitive Limitations	1.55	1.43
Upper and lower body limitations	(1.65)	(1.61)
Cognition	16.57	16.80
	(3.96)	(3.90)
Social Support		
Living alone	33%	31%
Source of ADL/IADL assistance		
None	72%	75%
Informal sources	24%	23%
Formal sources	1%	1%
Informal and formal sources	3%	2%
Demographic characteristics		
Age	76.62	75.88
	(6.69)	(6.42)
Female	64%	61%
Non-Hispanic White	84%	85%
Number of children	2.75	2.72
	(2.39)	(2.32)
Household income	25,538	26,546
	(30.926)	(33,019)

Housing		
Location (1=rural)	24%	24%
Residence (1=10+ years)	74%	77%
Self-rated home condition	3.64 (1.04)	3.66 (1.03)
Accessibility of home	.63 (1.03)	.57 (.97)
Housing Status		
Own private home	79%	100%
Another person's private home	18%	0%
Supportive housing	2%	0%
N	8115	6437

Table 2. Cox regression model predicting transitions from living in one's own private home to living in another person's private home (N=6437)			
	Model 1	Model 2	Model 3
Health			
Disease conditions			
Number of conditions	0.0134	0.0138	0.0282
	(0.04)	(0.04)	(0.04)
Health event	-0.1113	-0.0901	-0.0847
	(0.15)	(0.15)	(0.15)
Functional and Cognitive Limitations			
Upper and Lower body limitations	0.0197	0.0272	-0.0080
	(0.03)	(0.03)	(0.03)
Cognition	-0.0635***	-0.0622***	-0.0469***
	(0.01)	(0.01)	(0.01)
Social Support			
Living Alone		0.3522***	0.1953
		(0.09)	(0.10)
Source of ADL/IADL assistance			
Informal sources		-0.1634	-0.1990
		(0.12)	(0.13)
Formal sources		-0.4589	-0.5039
		(0.46)	(0.46)
Informal and formal sources		0.0412	0.0737
		(0.31)	(0.31)
Demographic Characteristics			
Age			0.0300***
			(0.01)
Gender			0.2851**
			(0.10)
Non-Hispanic White			0.0735
			(0.13)
Number of children			0.0545**
			(0.02)
Household income			0.0080**
			(0.002)
Housing			
Location (1=rural)			0.2748**
			(0.10)
Residence (1=10+ years)			0.0862
			(0.11)
Self-rated home condition			0.0448
			(0.05)
Accessibility of home			-0.1132*
			(0.05)
-2 Log likelihood	7979.374	7960.904	7905.947
Likelihood ratio	41.68***	60.15***	155.11***
Event N	506	506	506

Table 3. Cox regression model predicting transitions from living in one's own private home to supportive housing (N=6437)			
	Model 1	Model 2	Model 3
Health			
Disease conditions			
Number of conditions	-0.0903	-0.0826	-0.0418
	(0.05)	(0.13)	(0.13)
Health event	-0.9502	-0.9164	-0.9695
	(0.72)	(0.72)	(0.73)
Functional and Cognitive Limitations			
Upper and Lower body limitations	0.1412	0.1453	0.0475
	(0.10)	(0.11)	(0.12)
Cognition	0.1625***	0.1621***	0.1803**
	(0.05)	(0.05)	(0.06)
Social Support			
Living Alone		0.4254	-0.2219
		(0.30)	(0.33)
Source of ADL/IADL assistance			
Informal sources		-0.8664	-1.1411*
		(0.55)	(0.56)
Formal sources		0.5469	0.1968
		(1.04)	(1.05)
Informal and formal sources		0.8430	0.1410
		(0.78)	(0.78)
Demographic Characteristics			
Age			0.0935***
			(0.02)
Gender			0.1953
			(0.33)
Non-Hispanic White			1.0308
			(0.75)
Number of children			-0.0909
			(0.08)
Household income			0.0035
			(0.002)
Housing			
Location (1=rural)			-1.6171**
			(0.60)
Residence (1=10+ years)			-1.3826***
			(0.30)
Self-rated home condition			-0.0702
			(0.16)
Accessibility of home			0.2955**
			(0.11)
-2 Log likelihood	817.426	809.431	834.52
Likelihood ratio	17.09**	25.09**	90.60***
Event N	50	50	50

Table 4. Cox regression model predicting transitions from living in one's own private home a nursing home (N=6437)			
	Model 1	Model 2	Model 3
Health			
Disease conditions			
Number of conditions	-0.1682*	-0.1889**	-0.1188***
	(0.07)	(0.07)	(0.07)
Health event	0.9529***	0.9669***	0.9368
	(0.18)	(0.18)	(0.19)
Functional and Cognitive Limitations			
Upper and Lower body limitations	0.4298***	0.2759***	0.2378***
	(0.05)	(0.06)	(0.06)
Cognition	-0.0979***	-0.0750***	-0.0661***
	(0.02)	(0.02)	(0.02)
Social Support			
Living Alone		0.7284***	0.4175*
		(0.16)	(0.18)
Source of ADL/IADL assistance			
Informal sources		0.9158***	0.6842**
		(0.20)	(0.21)
Formal sources		1.2430**	0.9060*
		(0.40)	(0.40)
Informal and formal sources		1.6399***	1.2703***
		(0.31)	(0.31)
Demographic Characteristics			
Age			0.0618***
			(0.19)
Gender			-0.1201
			(0.19)
Non-Hispanic White			0.1824
			(0.23)
Number of children			-0.0537
			(0.03)
Household income			-0.0054
			(0.005)
Housing			
Location (1=rural)			-0.1523
			(0.19)
Residence (1=10+ years)			-0.3276
			(0.18)
Self-rated home condition			-0.0084
			(0.08)
Accessibility of home			0.1028
			(0.07)
-2 Log likelihood	2462.142	2411.633	2374.878
Likelihood ratio	155.32***	205.83***	242.788***
Event N	157	157	157

Table 5 Cox regression model predicting transitions from living in one's own private home to death or lost-to-follow-up (N=6437)			
	Model 1	Model 2	Model 3
Health			
Disease conditions			
Number of conditions	0.0715**	0.0615*	0.0809**
	(0.03)	(0.03)	(0.03)
Health event	0.5618***	0.5460***	0.4965***
	(0.09)	(0.09)	(0.09)
Functional and Cognitive Limitations			
Upper and Lower body limitations	0.2092***	0.1342***	0.1581***
	(0.02)	(0.02)	(0.02)
Cognition	-0.0430***	-0.0322***	-0.0262**
	(0.01)	(0.008)	(0.01)
Social Support			
Living Alone		0.0221	0.0032
		(0.07)	(0.08)
Source of ADL/IADL assistance			
Informal sources		0.5405***	0.3927***
		(0.08)	(0.08)
Formal sources		0.4744*	0.3774
		(0.24)	(0.24)
Informal and formal sources		0.9944***	0.8874***
		(0.16)	(0.16)
Demographic Characteristics			
Age			0.0345***
			(0.006)
Gender			-0.3216***
			(0.07)
Non-Hispanic White			0.0228
			(0.09)
Number of children			-0.0010
			(0.01)
Household income			0.0001
			0.001
Housing			
Location (1=rural)			-0.1537
			(0.08)
Residence (1=10+ years)			-0.0987
			(0.08)
Self-rated home condition			0.0216
			(0.03)
Accessibility of home			-0.0690*
			(0.03)
-2 Log likelihood	15451.869	15390.484	15319.373
Likelihood ratio	272.49***	333.87***	404.99***
Event N	933	933	933