Influences of Gender on Transitional Care and Living Arrangements after Nursing Home Discharge

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Abstract

This study investigates how demographic, health, socioeconomic, and family characteristics are related to nursing home discharge and post-discharge living arrangements, focusing especially on gender. We use the Health and Retirement Study to estimate a competing-risks survival regression for individuals admitted to nursing homes between 2000 and 2010 (N=3,645) and a multinomial logistic regression model of post-discharge living arrangements. The results reveal that women are more likely than men to be discharged from a nursing home. Discharged women are more likely to live alone or with kin, whereas men are more likely to live with a spouse or transition to another institution. Following a long duration of nursing home stay, men are more likely than women to live alone. Our findings suggest that gender differences in nursing home care extend to nursing home discharge and post-discharge living arrangements. We discuss policy implications of these findings for the provision of transitional care.

Key words: nursing home discharge, post-discharge living arrangements, duration of stay, gender, Health and Retirement Study

Introduction

The U.S. population age 65 and older is projected to more than double over the next half century, growing from around 40 million individuals in 2010 to 92 million in 2060 (U.S. Census Bureau, 2012). The older population itself is aging, and its fastest growing segment, age 85 and over, is expected to more than triple by mid-century (Houser, Fox-Grage, & Ujvari, 2013). As a consequence, the need for all types of long-term care, including nursing homes, will inevitably grow in the coming decades (Lakdawalla et al., 2003). Data on placement in nursing facilities suggest that the risk of placement for a population 65 and older is over 40 percent with expected growth as life expectancy increases (Gassoumis, Fike, Rahman, Enguidanos, & Wilber, 2013). Parallel to these trends, the U.S. government is increasing efforts to shift the focus of long-term care from nursing homes and other formal long-term care facilities to home and community-based care. While the majority of long-term care spending is still directed toward nursing homes, options like the 1915(c) home- and community-based waivers represent a cost-effective mechanism for states to support aging in place by providing medical and non-medical services. The waivers would, therefore, decrease the need for older individuals to use nursing homes and other formal long-term care facilities (Angel & Mudrazija, 2010).

In recent years, the government has also intensified efforts to support the transition of nursing home residents back to the community (Gassoumis et al., 2013). In spite of these policy efforts to encourage community-based alternatives to institutional long-term care, there has been little research exploring the sociodemographic factors which predict post-discharge living arrangements. Relatedly, we know little about the sociodemographic characteristics associated with nursing home discharge, which are likely related to post-discharge living arrangements. We

know that nursing home discharge is primarily a function of health status (Mehr, Williams, & Fries, 1997; Murtaugh, 1994; Thomas, Gassoumis, & Wilber, 2010). Furthermore, younger age and use of rehabilitation services are positively associated with nursing home discharge (Mehr et al., 1997) while the likelihood of discharge decreases for residents with multiple nursing home entries (Engle & Graney, 1993). Thus the purpose of this paper is to investigate how gender, health, socioeconomic resources, and family are related to nursing home discharge and post-discharge living arrangements, focusing especially on gender.

Although gender differences in nursing home admission have been well documented (Akamigbo & Wolinsky, 2007; Wallace, Levy-Storms, Kington, & Andersen, 1998), their links to the length of nursing home stay and discharge and post-nursing home living arrangements is poorly understood. From previous research we know that nursing home residents are predominantly white, widowed, and functionally dependent women (Gabrel, 2000). Accordingly, a study by Case and Paxson (2005) suggests that women, in general, are more functionally dependent than men. Moreover, women are on average poorer than men: In 2008, there were over 35 million women on Medicaid compared to approximately 24 million men (Kaiser Family Foundation, 2008), and as the major source of long-term care funding, Medicaid is an important determinant of nursing home use (Cagney & Agree, 1999). This reliance on Medicaid, however, would imply lower likelihood of discharge for women compared to men, which is not supported by empirical evidence. In fact, women are found to have higher likelihood of discharge than men (Gassoumis et al., 2013). The relationship of gender, nursing home discharge, and post-discharge living arrangements, therefore, deserves particular attention and is in the focus of this article.

Furthermore, nursing home discharge and duration of stay are linked to the availability of community alternatives (Mor et al., 2007). The key community alternative is the family (Charles

& Sevak, 2005), and the discharge from the formal care system, including nursing homes, to the community is positively associated with availability of family caregiving (Arling, Kane, Cooke, & Lewis, 2010; Penrod, Kane, & Kane, 2000). Nevertheless, among the population age 85 and older, which is the fastest-growing segment of the U.S. population (Houser et al., 2013), around 29 percent of men and 56 percent of women live alone (Crescioni, Gorina, Bilheimer, & Gillum, 2010), which suggests that women are less likely to have spouses/partners that can provide them with long-term care. On the other hand, studies of intergenerational family relationships suggest that the relationships of mothers and children, in particular daughters, are stronger than the relationships of fathers and children (Bengtson, 2001; Silverstein & Bengtson, 1997; Suitor & Pillemer, 2006). Older mothers receive more financial help (Fritzell & Lennartsson, 2005) as well as more practical support (Ingersoll-Dayton, Starrels, & Dowler, 1996) from their adult children compared to older fathers. Thus studies find that grown children decrease the need for nursing home care use more so for mothers than for fathers (Freedman, Berkman, Rapp, & Ostfeld, 1994; Noël-Miller, 2010). With these findings, therefore, it is difficult to discern whether the availability of family support is greater for men, who are more likely to have living partners as primary caregivers, or women, who enjoy larger support from children and relatives.

This study builds on previous research on the nursing home discharge process. It explores how the intersection of health, economic factors, population factors, and availability of a family-support network affect nursing home discharge for women and men. Furthermore, the study examines how post- nursing- home living arrangements differ across gender. While most of prior studies use a 3-month cutoff point to distinguish between short- and long-term nursing home residents (Gassoumis et al., 2013), which can be linked with the existing policies that support such distinction, this study attempts to empirically distinguish between short- and long-term

stays by using both 1- and 3-month cutoff points. This approach can help distinguish between the characteristics of nursing home residents with very short post-acute or rehabilitative stays, long-term stays, and those that may exhibit some combination of characteristics of these two distinct groups of nursing home residents. The latter group may be of particular interest to policymakers interested in identifying the segments of nursing home population that prefer to transition back to the community, but may need public support to do it successfully.

Furthermore, the study highlights the characteristics of individuals who live alone after nursing home discharge, given that living alone is among the leading risk factors associated with lower stability of informal care network that leads to more frequent changes of community-based, primarily family, caregivers (Allen, Lima, Goldscheider, & Roy, 2012) and with readmission into the intensive formal care (Strunin, Stone, & Jack, 2007), which are both associated with high financial costs for the individuals, their families, and the healthcare system. With this in mind, the study also discusses important recent efforts that focus on curbing the high costs of Medicaid long-term care systems and improving the health outcomes for individuals who need long-term care by promoting home- and community-based alternatives through the initiatives such as the MFP demonstration program. It discusses how the findings on gender differences in nursing home discharge and post-discharge living arrangements can inform policymaking by providing important information about the transition pathways and the characteristics of the population that transition out of formal long-term care.

Data and Methods

Data come from the Health and Retirement Study (HRS), a nationally representative biennial longitudinal survey of over 26,000 Americans age 51 and above and their spouses, first interviewed in 1992. It oversamples non-Hispanic blacks, Hispanics, and married couples. The HRS data are uniquely suited for the study of nursing home length of stay, discharge, and post-discharge living arrangements as they offer detailed information on respondents' health, health insurance coverage, socio-economic status, family ties, and household composition. The analytic sample consists of 3,645 respondents 51 and older first admitted to nursing homes between 2000 and 2010. Approximately 10 percent of the sample has missing values on at least one predictor, and these values are imputed in a multiple-imputation procedure. While respondents with missing information are on average two years older than the rest of the sample and therefore somewhat more likely to die in a nursing home, they do not significantly differ on other important characteristics like gender, race/ethnicity, health, number of living children, Medicaid use, or homeownership rates.

Variables

Dependent Variables

The outcomes of interest are: (1) nursing home discharge probability and, (2) for the subset of discharged individuals, post-discharge living arrangements. The first outcome measure, nursing home discharge probability, is ascertained by subtracting the respondent's birth year and month from the year and month of nursing home admission to define the age at the onset of the risk of discharge, and subtracting the respondent's birth year and month from the year and month of nursing home discharge to define the age at the time of discharge. The analysis focuses on first discharge because the initial stay in the nursing home marks the onset of reliance on the

formal long-term care system (Freedman, 1996). For the second outcome of interest, post-discharge living arrangements, we distinguish between placement in formal-care institutions (including retirement center, another nursing home, hospital, assisted living or rehab center), living alone, and living with others (i.e., spouse, child and child's family or other relatives).

Independent Variables

The main predictor variable is gender. We stratify models of nursing home discharge by gender to test whether the underlying processes explaining nursing home discharge significantly differ for women and men as the results of preliminary analyses show multiple interaction terms of gender with other covariates to be statistically significant.

Sociodemographics. Given its importance for nursing home admissions, we pay close attention to the impact of race/ethnicity on the outcomes of interest. We define race/ethnicity as a categorical variable with the following categories: non-Hispanic white (reference category), non-Hispanic black, and Hispanic. We also control for respondents' birth year that, unlike age, does not vary with time.

Family support network. Family support network control variables include marital status, household size, any living children, and any living siblings. Marital status is coded as 1 for all respondents who reported being currently married or partnered and 0 otherwise. Household size is a count variable of all household members including the respondent. In the models of post-discharge living arrangements, we exclude the measure of household size given that it is used to define outcome categories of living alone and living with others.

Socioeconomic status. All models include an indicator of low educational attainment (1 if a respondent has less than a high school education and 0 otherwise, i.e., high school graduate or

more), an indicator of homeownership (1 if a respondent owns a home and 0 otherwise), log value of total annual income, and an indicator of Medicaid coverage (1 if a respondent is covered by Medicaid; 0 otherwise).

Health and health services. The models control for the use of the following health services: home health services, special facilities/services, and hospitals. Home health services refer to any help received at home by professionally trained medical personnel. The use of special facilities/services refers to the use of adult care centers, social workers, outpatient rehabilitation programs, physical therapy or transportation for elderly and/or disabled while the use of hospitals is limited to overnight stays only. All health services variables are indicator variables with the value of 1 assigned if a service has been used at any time in the two years prior to the interview. Health controls include indicators of having been diagnosed with cancer, heart condition, stroke, and memory-related problems like dementia or Alzheimer's disease (in each case, "yes" is coded as 1 and "no" as 0). In addition, the models control for difficulties with the activities of daily living (ADL) that measures difficulties in respondents' ability to perform bathing, eating, dressing, walking across a room, getting out of bed without assistance, and using the toilet, with the values ranging from 0 (i.e., no difficulties with ADLs) to 6 (i.e., difficulties with all ADLs). Another important control variable is cognition score, which ranges from 0 to 35 (where higher number indicates better cognition) and includes total word recall score (which is derived as a sum of immediate and delayed word recall, each with a 0-10 range, resulting in a 0-20 range for the total word recall) and mental status score (with a 0-15 range, that consists of the number of correct subtractions in the Serial Sevens Test with scores ranging from 0 to 5, correct naming of date including the day of month, month, year, and day of week (0-4 range), and backward counting, object naming, and President/Vice-President naming, each with a 0-2 range).

Finally, the measure of depression is defined as a score ranging from 0 to 8 that summarizes responses to following Center for Epidemiological Studies Depression Scale (CES-D) items asked of respondents about the period in the week prior to the interview: feeling depressed, everything an effort, sleep was restless, felt happy, felt lonely, felt sad, could not get going, and enjoyed life, each defined with a "yes" (=1) or "no" (=0) indicator.

Analysis

The analysis begins with a depiction of the outcomes (i.e., discharge, death, continuous nursing home residence, and type of post-discharge living arrangements for discharged individuals) experienced by nursing home residents over the study period. It is followed by an overview of sample characteristics of nursing home residents by gender with particular attention to differences in the likelihood of discharge over time. Descriptive statistics for the models of nursing home discharge are recorded at the onset of the risk of being discharged.

Next, we fit a competing-risk regression of nursing home discharge. As death is a competing event that can impede the occurrence of a nursing home discharge, competing-risk regression takes this information into account and produces appropriate estimates. It posits a model for the subhazard function of nursing home discharge where the baseline subhazard is unspecified while the effects of covariates are treated as proportional. The model is stratified by the duration of nursing home stay to short- and long-term stays using two alternative cutoff points, 1 month and 3 months. This analysis is conducted for the full sample, as well as separately by gender as we hypothesize that women and men differ in important ways with respect to the likelihood of nursing home discharge, a supposition that finds support in preliminary analyses as already explained. Furthermore, supplementary analysis indicates that

these stratified models are indeed statistically distinct, and coefficients on family support network (e.g., marital status), health (e.g., number of ADL difficulties), and health services utilization (e.g., overnight hospital stays) all significantly differ across the two models.

For the analysis of post-nursing home discharge living arrangements, we specify a multinomial logistic regression model with the following outcome categories: (1) living in another institution, (2) living alone, or (3) living with others (includes spouse, child, child's family or other relatives). Again, the model is stratified by the duration of nursing home stay (with 1 and 3 months as alternative cutoff points). Additionally, the model is estimated for the subsample of unmarried individuals to examine the characteristics of the group of people who cannot rely on their spouse as a primary provider of care after nursing home discharge and whom the literature identified as particularly vulnerable (Freedman, 1996).

Sociodemographic characteristics – gender, race, and year of birth – are fixed across waves, whereas other covariates in the competing-risk survival models of nursing home discharge vary with time. In the models of post nursing home placement the values of all covariates correspond to the values recorded at the wave in which nursing home discharge and post-discharge placement are first reported.

Results

Figure 1 depicts the flow of nursing home residents over the study period. It tracks deaths and discharges as well as post-discharge living arrangements (another institution, living alone, and living with others) at different times (i.e., within a month, within three months, and beyond three months) since nursing home admission.

[Figure 1 about here]

The descriptive statistics demonstrate that an overwhelming majority (over 80 percent) of all discharges happens within the first three months following the initial admission to a nursing home, with approximately the same number of discharges recorded within the first month and the following two months. On the other hand, death is much more common outcome among long-term nursing home residents. Therefore, while short-term nursing home residents are about three times as likely to be discharged than to die in a nursing home, long-term residents are almost twice as likely to die than to be discharged. Following discharge, the descriptive statistics show that former nursing home residents mostly return to the community and live with somebody (e.g., spouse, child, child's family or other relatives) who, presumably, can provide them with some level of assistance. However, a substantial minority of short-term (30%) and long-term (17%) former residents report living alone after discharge, while the rest (approximately 16% of short-term and 37% of long-term former residents) report being placed in another institution of formal care.

A graph of the Kaplan-Meier survival estimates (Figure 2) shows that women are more likely to be discharged from a nursing home than men during the first several months of nursing home stay and that this difference persists during at least the first year of stay after which the difference starts slowly diminishing. While much of the observed difference can be explained with the difference in mortality profiles of men and women admitted to nursing homes as descriptive statistics (shown in Table 1) suggest 37 percent of male nursing home residents die compared to 30 percent of women, women remain slightly more likely to be discharged when mortality profiles are controlled for, despite being on average older than men, less likely to have a living spouse or siblings, have fewer economic resources (i.e., lower incomes and

homeownership rates), and similar health outcomes compared to their male counterpart. As for difference in health patterns, women experience more ADL difficulties and report more depressive symptoms than men, but they are also less likely to have ever been diagnosed with cancer or a heart condition or to have suffered a stroke. At the same time, they are more likely to have received home health services, used various special health facilities and services, or to have stayed overnight in hospital in the two years prior to the interview, which may be indicators of their greater need for medical support.

[Figure 2 about here]

[Table 1 about here]

Next, we examine the factors associated with gender differences in nursing home discharges (Table 2). The results of competing-risk survival analysis reveal that, controlling for the risk of death, women are more likely than men to be discharged from a nursing home for both short- and long-term stays. Subhazard ratio (SHR), that is, the effect of being a woman on the cumulative incidence of nursing home discharge, ranges from 1.15 to 1.19. Therefore, all else equal, women are approximately 15-19 percent more likely to be discharged from a nursing home than men, and the results are fairly constant regardless of the duration of nursing home stay. Age is an important predictor of discharge only for long-term nursing home residents, with younger residents being more likely to be discharged (SHR=1.03 for stays over three months). Similarly, household size is positively associated with the discharge outcome, whereas Medicare coverage, less than high-school education, memory-related problems, and the number of ADL limitations are negatively related with nursing home discharge for long-term residents. Short-term residents, conversely, are less likely to be discharged if they were diagnosed with cancer, but more likely if they are of Hispanic origin. Receiving professional health services at home,

using special health facilities, and staying in hospital overnight are all positively associated with discharge for all nursing home residents, albeit the magnitude is somewhat larger for individuals with longer term stays.

[Table 2 about here]

Models stratified by gender reveal that the majority of predictors of nursing home discharge operate similarly for women and men. However, Hispanic origin is highly predictive of discharge within a month of admission for men only (SHR=1.54), whereas among women being Hispanic is related with marginally higher discharge likelihood within 3 months after the nursing home admission (SHR=1.23), suggesting that Hispanic-origin women are more likely to be discharged between 1 and 3 months after admission than during the first month. Household size and presence of living children are positively associated with discharge for women, whereas having a living spouse or partner is positively associated with discharge for men, in both cases, however, only for long-term nursing home residents. Low education levels are only predictive of discharge for women who stay in nursing homes long-term. For resident staying longer than a month, number of ADL difficulties is more predictive of lower risk of nursing home discharge for women (SHR=0.90) than men (SHR=0.95), whereas memory-related problems are comparatively more important predictor for men (SHR=0.73 vs. SHR=0.84 for women). The use of special facilities or services is positively associated with discharge for women only, and the indicator of overnight hospital stays is more strongly associated with discharge for women. The opposite is true of the indicator of home health services use, except for residents staying over three months (SHR=1.64 for women vs. SHR=1.52 for men).

Once discharged from a nursing home, former residents either transfer to another formal care institution or return to the community where they live alone or with their spouses, children,

children's families, or other relatives. Table 3 provides an overview of post-discharge living arrangements for women and men with various durations of nursing home stay.

[Table 3 about here]

An overwhelming majority (over 80%) of discharged individuals returns to the community, but among long-term nursing home residents about 37 percent transfer to another formal care institution. Men are more likely than women to transfer to another formal-care institution after shorter nursing home stays, but the gender difference disappears for population that stayed in a nursing home for over 3 months. While approximately 3 out of 5 men who stayed in a nursing home for less than 3 months live with their spouses, children, or other relatives, among men with longer duration of nursing home stay only 2 out 5 have such living arrangements. On the other hand, the proportion of women living with others following the discharge is fairly stable with half of women having this type of living arrangement. Overall, one-third of women and one-fifth of men live alone. However, the proportion of women living alone sharply decreases as length of duration of nursing home stay increases (15% of long-term residents compared to 36% of short-term residents). Conversely, proportion of men who live alone slightly increases with longer duration of nursing home stay, from 17 percent for those who spent less than a month in a nursing home to 21 percent for others.

The results in Table 4 describe the determinants of post-discharge living arrangements using the same (1 month and 3 months) cutoff points as in the analysis of nursing home discharges to distinguish between the short- and long-term former nursing home residents. In addition to the results for the full sample, the analysis also provides estimates for the subsample of unmarried individuals who cannot rely on spouses as primary providers of informal support and may therefore be comparatively more vulnerable.

[Table 4 about here]

The results reveal that women are more likely than men to live with others as opposed to being placed in another institution, and this finding holds both for short- and long-term former nursing home residents. Relative risk ratio (RRR), or the probability of choosing "living with others" category over the probability of choosing "living in another institution" category, equals 2.28 for women who stayed in a nursing homes longer than 3 months, whereas it is substantially lower (RRR=1.56) for women who stayed in a nursing home for a month or less. This finding is particularly important when the fact that twice as many men have a living spouse is taken into account as it suggests that women are much more likely than men to live with children, their families or other relatives after the discharge. Institutional placement, in comparison, is more common among men. The likelihood of living alone is also higher for women than men for the short-term residents, especially among the unmarried subsample (RRR=1.99 for women who stayed in nursing homes a month or less), but the relationship reverses for the long-term residents (RRR=0.87, suggesting unmarried women may be somewhat less likely to live alone than unmarried men, but this result is not statistically significant).

Hispanics and non-Hispanic blacks are substantially more likely to live with others after nursing home discharge than non-Hispanic whites, and the magnitude of this difference is particularly strong for former long-term residents (RRR=6.02 and RRR=3.00 for Hispanics and non-Hispanics blacks staying in nursing homes over a month, respectively), whereas among the population with short-term nursing home stays the observed difference is not statistically significant. Similarly, predictors for birth year and less than high school education are positively associated with non-formal living arrangements after long-term nursing home stay. Therefore, younger and less educated individuals appear to be less likely than their older and more educated

counterparts to transfer to another formal-care institution following longer stay in a nursing home.

Health status and health services use exhibit mixed results with respect to their effect on the type of post-discharge living arrangements by duration of nursing home stay. Individuals diagnosed with a heart condition or cancer with less than 3-month stay in a nursing home are substantially less likely to return to community as opposed to being placed in another institution, while the same is true for those diagnosed with memory-related problems who were patients in a nursing home for a longer period of time. Increasing number of ADL difficulties is associated with lower likelihood of informal living arrangements after discharge regardless of the duration of nursing home stay. Prior use of various health services is significantly positively associated with living alone or with other following discharge for short-term nursing home residents. For individuals with stay over 3 months, however, the relationship is of lesser magnitude and largely insignificant.

Finally, having a living spouse or partner substantially decreases the likelihood of living alone and increases the likelihood of living with others compared to being placed in another institution following both short- and long-term nursing home stays. This is not surprising given that an overwhelming majority of individuals with living spouses/partners lives with another person, although many of married/partnered individuals also transfer to another formal-care institution for a variety of reasons. Accounting for marital status, the presence of living children and siblings are not statistically significant predictors of post-discharge living arrangements. However, in the model limited to a subsample of unmarried individuals, the presence of living children is strongly predictive of living with others for individuals who are discharged after more than 3 months spent in a nursing home (RRR=5.07). With respect to other predictors, unmarried

subsample largely mirrors the findings for the full sample of married and unmarried individuals, although fewer coefficients are found to be statistically significant given that the unmarried sample is only slightly over a half of the size of the full sample.

Discussion

This study investigates nursing home discharges and post-nursing home living arrangements for older Americans, focusing particularly on gender differences and distinguishing between short- and long-term nursing home stays using 1 and 3 months as critical cutoff points. The findings add to the literature by identifying the central role that gender, along with other key sociodemographic variables, plays in both discharge and post-discharge living arrangements. We discuss these findings in the context of the social determinants of long-term care and their implications for public policy.

The study provides new evidence that women in the United States are more likely than men to be discharged from a nursing home, even after controlling for various predisposing (e.g., age, race, marital status), enabling (e.g., education level, income, presence of living children and siblings), and need factors (e.g., ADLs, various health conditions) and accounting for the competing risk of dying in a nursing home. The observed difference is similar in magnitude for both for short- and long-terms stays. This finding is particularly important in light of the fact that women in our sample appear more vulnerable than men as they are on average older, are less likely to have a living spouse or sibling, have lower incomes and are less likely to own a home, and, in general, have similar health statuses as men. It is, furthermore, in contrast with findings

for some other developed and aging countries like Finland where women experience lower rates of nursing home exit (Martikainen et al., 2009).

Given that it seems implausible that women in the United States have lower care needs than women in other developed countries based on epidemiological data which indicates greater health problems including disability among Americans compared to many other developed nations (National Research Council, 2013), possible explanation for the observed gender differences in nursing home discharge may include system-specific factors in unique to each country like affordability of long-term care, availability of informal (primarily family) support system as an alternative to formal care, and individual preferences for family versus formal care provision. While further study is needed to fully explain the sources of this systematic gender difference in long-term care use, models stratified by gender suggest that family support network operates somewhat differently across gender and this may at least partly account for the observed differences. Among long-term nursing home residents, household size and availability of living children are positively associated with discharge only for women, while having a living spouse is important determinant of discharge for men. This is consistent with studies that show men almost always rely on their spouses for informal care while women rely on a wider support network rather than on their husbands (Antonucci, 2001). Furthermore, these findings mirror the research on nursing home admission that finds children and siblings to be more protective against the risk of entering a nursing home for women than for men (Freedman et al., 1994; Noël-Miller, 2010). Therefore, the same factors that protect women from entering nursing homes may contribute to their earlier discharge.

Following discharge, former nursing home residents are more likely to return to the community than to live in another formal-care institution where only one in five discharged

persons lives. However, almost 37 percent of individuals who stayed in a nursing home for three months or longer transfer to another institution, while this is true of less than 16 percent of those who stayed in nursing home shorter than three months. Gender differences in post-discharge living arrangements are evident as men are more likely than women to move to another formal-care institution, whereas women are comparatively more likely to return to the community. Differences between women and men who live in informal settings following nursing home discharge are importantly related to the time spent in a nursing home. While women and men primarily live with others (spouse, children and their families, or other relatives), proportion of men with such living arrangements decreases with the duration of prior nursing home stay and it remains constant for women. Conversely, the proportion of men living alone remains constant regardless of the time they spent in a nursing home, whereas for women with long nursing home stays it substantially decreases.

Therefore, while women are overall more likely than men to live alone, the pattern is magnified for women, but not men, who remained in a nursing home for a relatively short period of time (less than three months). This is an important observation considering the evidence from the literature that living alone is associated with insufficient care, elevated possibility of health deterioration, and increased probability of readmission to the formal-care system (Strunin et al., 2007), specifically for individuals discharged from long-term nursing home stays (Howell, Silberberg, Quinn, & Lucas, 2007). Whereas it is true that women are overall more likely to live alone after leaving a nursing home, men seem to be overly represented in the highest-risk category of individuals living alone with respect to the risk of possible future readmissions to the formal-care system. Women in our sample rely on their family members, primarily children, for care much more than men who, in the absence of a spouse able to provide care or material

resources to pay for professional care, may become particularly susceptible to the receipt of inadequate care, health deterioration, and (re)admission to a hospital or a nursing home.

Although discharged Hispanics and non-Hispanic blacks rely on their immediate and extended family for care more than non-Hispanic whites, they also appear to be somewhat more likely to live alone, especially among those with previous long-term nursing home stay. This implies that minorities, and minority men in particular, are at comparatively higher risk of receiving insufficient care following their nursing home discharge and return to community.

In addition to the careful consideration of gender differences in nursing home discharge and post-discharge living arrangements, this study also contributes to better distinction between short- and long-term nursing home residents and their unique transition pathways. The modeling approach that partitions the sample using both 1- and 3-month cutoff points reveals that the sample of nursing home residents with the duration of stay between 1 and 3 months is more similar to short-term (i.e., less than a month) than long-term (i.e., over three months) residents. Similar to the model of nursing home discharge, the outcomes for post-discharge living arrangements model by duration of stay suggest that individuals staying in nursing homes between 1 and 3 months are generally similar to individuals with stays of less than 1 month. Yet, the observed differences in the model of nursing home discharge in variables like race/ethnicity, marital status, presence of living children, and various indicators of healthcare services utilization suggest that while the 3-month cutoff point is an acceptable line of division between short- and long-term stays, based on both empirical evidence and policy-related reasons, the analysis can profit from specifying multiple cutoff points that allow uncovering characteristics of various nursing home residents and potential candidates for community transition with more precision. This can be particularly useful when trying to devise an effective strategy for

identifying nursing home residents who may be able to successfully transition out of formal long-term care.

The results of this study, therefore, have important policy implications. As the nation ages and the costs of health care increase, using the available resources in the most efficient and effective way becomes imperative. Among the most prominent proposals to stem the rise of long-term care costs is a proposal to transfer nursing home residents with low care needs to the community, where their families and larger support networks could provide them with the appropriate level of care for successful living (Mor et al., 2007). This claim is supported by the evidence that nursing home residents with a larger informal support network are more likely to be discharged sooner and to receive the appropriate level and quality of care in a family environment (Penrod et al., 2000). Moreover, about half of all long-term nursing home residents indicate a preference for transition to community (Nishita, Wilber, Matsumoto, & Schnelle, 2008). While this solution may seem to be positive given that deinstitutionalization and community placement may reflect the preferences of older individuals and be more cost-efficient for the healthcare system, the challenges of pursuing such a strategy are substantial.

In order to be successful, a deinstitutionalization and community-placement strategy would have to be able to identify low care needs nursing home residents and to have detailed knowledge of the available family and community support network, yet this can be challenging daunting task. For example, between a third and a half of all nursing home residents with no or low ADL difficulties, a group often considered best fit for transition to community care, suffered from dementia or serious mental disorders (Kasper, 2005). Furthermore, the process of transition between formal and community care represents a risk factor for receiving insufficient care (Coleman, 2003), but the cost of that risk is hard to estimate and is often not accounted for when

assessing the effects of deinstitutionalization (Mor et al., 2007). Finally, informal caregivers may change fairly often in correlation with the caregiver's gender and the relationship to the care receiver, which can negatively affect the quality of care (Allen et al., 2012).

Despite these challenges, both states and federal government are increasing their efforts to promote aging in place and deinstitutionalization including transition of nursing home residents back to the community, motivated by people's preferences and fiscal challenges governments are facing (Gassoumis et al., 2013). Moreover, the analysis of the current incentive structure in the healthcare system suggests that the bias toward overuse of institutional care persists (Golden, Martin, da Silva, & Roos, 2011), which provides further reason for the rebalancing efforts. States are increasingly implementing programs like *Home and Community-Based Services* (HCBS) despite occasional challenges related to program costs, lack of qualified staff and appropriate infrastructure, and resistance from various stakeholders (Doty, Mahoney, & Sciegaj, 2010). Estimates show that spending $25 billion on Medicaid 1915(c) HCBS in 2006 resulted in savings of between $21 billion and $57 billion (Harrington, Ng, & Kitchener, 2011), making it a very cost-effective program. However, recent efforts to contain the growth of costs due to increased demand for HCBS waivers, which focused primarily on establishing more stringent level-of-care criteria and increasing restrictiveness of eligibility requirements, raise questions of the extent to which the waivers can truly be considered a long-term viable alternative to nursing home care and who will benefit from them (Angel & Mudrazija, 2010). Furthermore, states are increasingly implementing *Money Follows the Person* (MFP) demonstration programs, first established by Congress in 2005 and designed to facilitate transition of Medicaid beneficiaries with longer (over 90 days) duration of stay in long-term care facilities back to the community. Early evaluation of the results of MFP suggests individuals

who transition from long-term care facilities to community enjoy increased life satisfaction while the rate of readmission to formal-care institutions remain relatively low, currently at about 5% for population 65 and older (Irvin et al., 2013; Williams et al., 2013).

Given the increased policy emphasis on transition from institutional to community living as well as the challenges in developing comprehensive transition programs and identifying individuals who would be best served by participating in them, the results of this study provide important information to policymakers. The findings suggest that women and men differ in various aspects including their health profile and related needs, their material resources, and family support availability. Policymakers should incorporate these differences in gender into the design of current and future community-transition programs. Moreover, the analysis of post-discharge living arrangements by gender and duration of previous nursing home stay resulted in more nuanced depiction of pathways women and men follow after discharge. It was revealed that men, and minority men in particular, are more likely to live alone after long-term nursing home stay, which, as literature (Howell et al., 2007) suggests, places them at higher risk of readmission into the formal-care system. This finding, as well, can contribute to new policies and future program designs.

We also recognize several important limitations of this research. The definition of a nursing home facility in HRS includes nursing homes, convalescent homes, and other long-term health care facilities. Given that various types of long-term care are not necessarily close substitutes (Zimmerman et al., 2003), model estimates may somewhat differ from the results that would have been obtained if the sample could have been limited exclusively to nursing homes. Next, the HRS data on post-discharge living arrangements do not allow us to distinguish between family members (other than spouses and children) by gender and the relationship (e.g.,

aunt/uncle, grandchild, relative) to the person returning to the community, which limits the scope of inference regarding the impact of gender on living arrangements in the community. Moreover, "another institution" category of post-discharge living arrangements variable subsumes various types of formal-care institutions like retirement centers, assisted living facilities, and hospitals that in reality may imply different levels of care need. Unfortunately, both HRS questionnaire limitations and small sample sizes preclude us from more nuanced treatment of post-discharge placement in another formal-care institution. These limitations notwithstanding, this study contributes to the literature on transitional care by exploring both nursing home discharge and post-discharge living arrangements using a nationally representative sample of older Americans. Future research should focus on examining the full extent of informal support network available to older individuals who leave nursing homes and identify more precisely those with the highest risk of readmission into the formal care system.

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Figure 1. Flow chart of nursing home residents throughout the study period

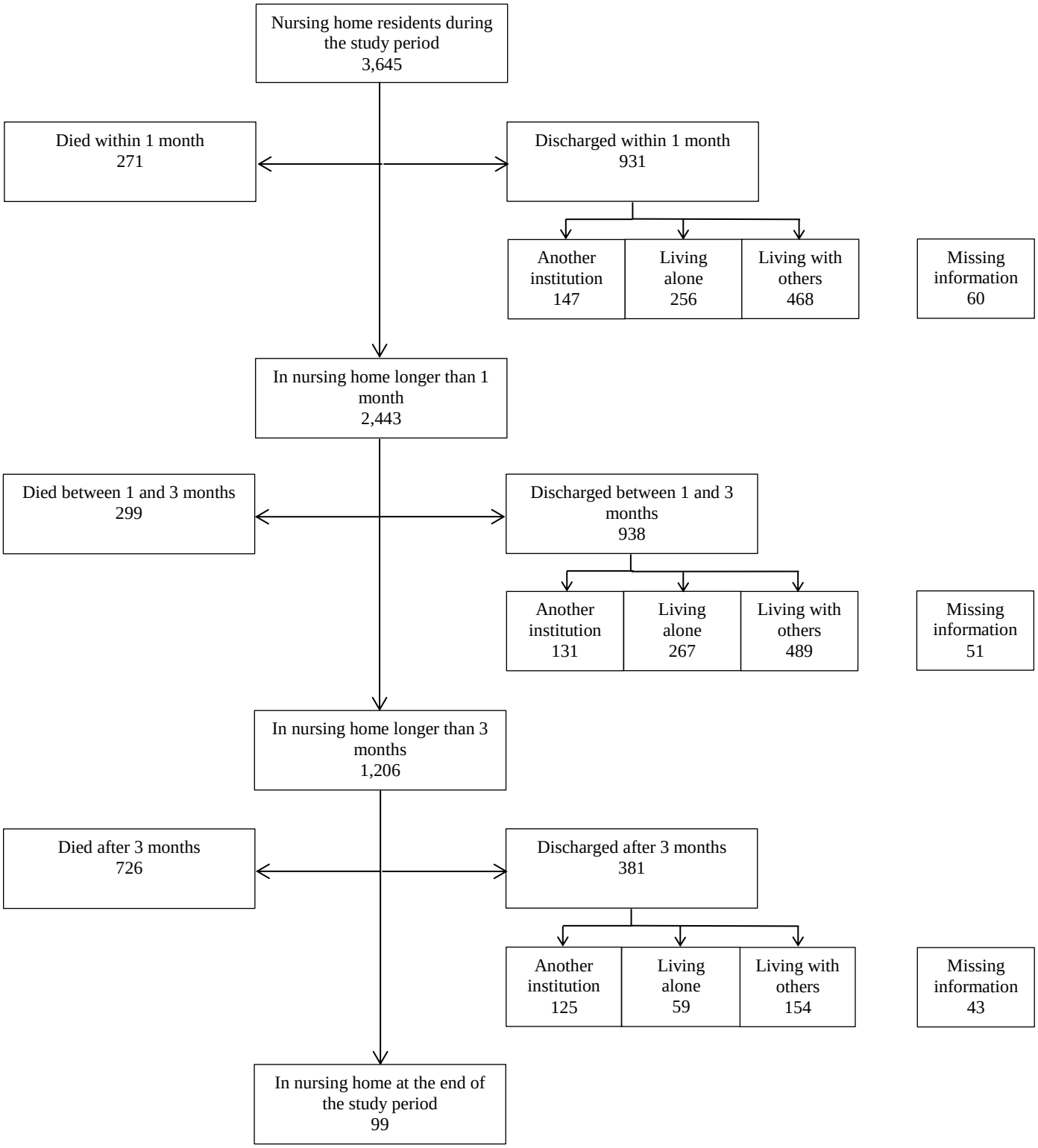

Figure 2. Time to discharge from a nursing home by gender

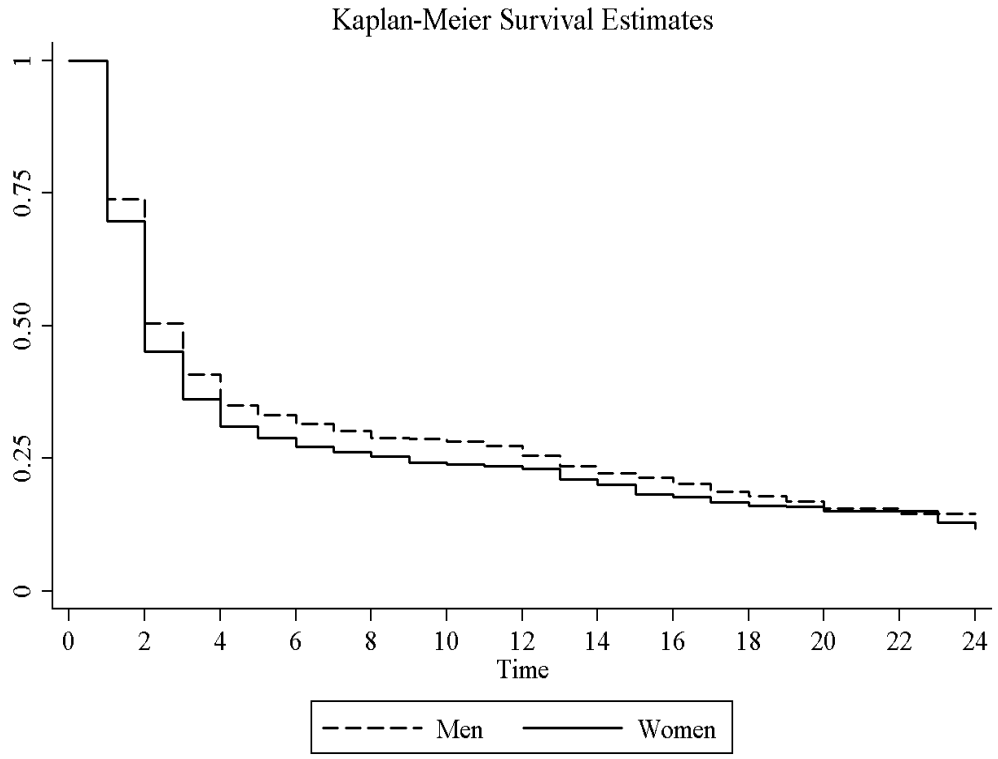

Table 1. Sample means, by gender

	Men	Women	
Discharged from nursing home	0.60	0.66	***
Race			
Non-Hispanic white	0.88	0.88	
Non-Hispanic black	0.09	0.08	
Hispanic	0.03	0.03	
Birth year	1926	1925	**
Married/partnered	0.58	0.26	***
Household size	1.95	1.74	***
Any living children	0.90	0.90	
Any living siblings	0.73	0.68	**
Less than high school	0.30	0.32	
Homeownership	0.68	0.56	***
Annual income (in $)	38,252	30,353	***
Any Medicaid	0.13	0.20	***
Home health services	0.39	0.47	***
Special facility or service	0.27	0.31	*
Hospital overnight	0.74	0.77	*
Cancer	0.27	0.22	**
Heart condition	0.51	0.45	***
Stroke	0.26	0.23	*
Memory problems	0.16	0.18	
ADL disability	1.63	1.87	**
Cognitive impairment	18.83	18.77	
Depression	2.20	2.36	**
N	1395	2250	

*** p<0.001, ** p<0.01, * p<0.05

Table 2. Competing-risk regressions of nursing home discharges

	Total sample								Men only								Women only							
	<= 1 month		> 1 month		<= 3 months		> 3 months		<= 1 month		> 1 month		<= 3 months		> 3 months		<= 1 month		> 1 month		<= 3 months		> 3 months	
Women (ref. Men)	1.16	***	1.15	**	1.19	***	1.18																	
Race (ref. non-Hispanic white)																								
Non-Hispanic black	1.06		1.07		1.01		1.20		0.99		0.90		1.04		0.94		1.10	+	1.17		0.99		1.37	+
Hispanic	1.18	**	0.93		1.18	+	0.94		1.54	***	0.85		1.12		1.03		1.09		0.96		1.23	+	0.86	
Birth year	1.00		1.01	***	1.00		1.03	***	1.00		1.02	***	1.00		1.04	***	1.00		1.01	*	1.00		1.03	***
Married/partnered	0.99		1.06		0.98		1.14		1.03		1.27	*	1.07		1.02		0.96		0.96		0.92		1.27	
Household size	1.01		1.07	*	1.03		1.11	+	1.04		1.05		1.06		1.06		1.00		1.08	*	1.02		1.13	*
Any living children	1.01		1.17	+	1.14	+	1.15		1.10		1.12		1.15		1.39		0.97		1.21	+	1.12		1.06	
Any living siblings	1.04		1.09		1.06		1.12		1.04		1.04		1.08		0.98		1.03		1.12		1.05		1.20	
Less than high school	0.95		0.87	*	0.98		0.70	**	0.94		0.94		0.96		0.76		0.94		0.83	*	0.98		0.66	**
Homeownership	1.04		1.08		1.05		0.82	+	1.12		1.04		1.12		0.82		1.02		1.10		1.01		0.84	
Annual income	1.01		1.03	+	1.02		1.03		1.02		1.02		1.02		1.06		1.01		1.03	+	1.02		1.02	
Any Medicaid	1.01		0.70	***	0.96		0.65	**	0.95		0.72	*	1.02		0.65	*	1.02		0.68	***	0.93		0.67	*
Home health services	1.09	*	1.39	***	1.14	***	1.57	***	1.21	**	1.46	***	1.21	*	1.52	*	1.04		1.36	***	1.09	*	1.64	***
Special facility or service	1.08	*	1.14	*	1.12	**	1.19		1.05		1.10		1.10		1.13		1.07	+	1.15	*	1.12	*	1.24	
Hospital overnight	1.49	***	2.75	**	1.99	***	2.28	***	1.37	**	2.27	***	1.70	***	2.14	**	1.59	***	3.15	***	2.26	***	2.45	***
Cancer	0.91	*	0.96		0.90	*	0.95		0.89	+	1.02		0.90		1.06		0.92	+	0.93		0.89	+	0.92	
Heart condition	1.03		0.92		0.99		0.91		0.97		0.90		0.95		0.89		1.05		0.93		1.01		0.92	
Stroke	1.02		1.03		1.01		1.11		1.03		0.99		1.01		1.02		1.00		1.05		0.99		1.15	
Memory problems	0.95		0.80	**	0.98		0.86		0.85		0.73	**	0.93		0.75		1.00		0.84	+	0.99		0.90	
ADL disability	1.01		0.92	***	0.99		0.92	***	1.02		0.95	*	1.01		0.97		1.00		0.90	***	0.98		0.88	***
Cognitive impairment	1.00		1.01	*	1.01	*	1.01		1.00		1.01		1.01		1.00		1.00		1.01	*	1.01	+	1.02	
Depression	1.00		1.00		0.99		1.02		0.99		1.01		0.99		1.04		1.00		1.00		1.00		1.00	
N	1202		2443		2439		1206		483		912		958		437		719		1531		1481		769	
Failed	931		1319		1869		381		333		485		680		140		598		834		1189		241	
Competing risk	271		1025		570		726		150		385		278		258		121		640		292		468	
F-value	4.78		22.25		9.35		9.65		2.45		6.59		3.67		3.07		2.69		17.16		5.89		7.05	

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 3. Post-discharge living arrangements, by gender and duration of nursing home stay

	Men				Women			
	Institution	Alone	With others	Total	Institution	Alone	With others	Total
Less than a month	62	53	199	314	85	203	269	557
1-3 months	56	70	207	333	75	197	282	554
Over 3 months	46	27	55	128	79	32	99	210
Total	164	150	461	775	239	432	650	1321

Table 4. Multinomial logistic regression of post-discharge living arrangements

Post-discharge living arrangements (ref. living in another institution)	Total sample															
	<= 1 month				> 1 month				<= 3 months				> 3 months			
	Living alone		Living with others		Living alone		Living with others		Living alone		Living with others		Living alone		Living with others	
Women (ref. Men)	1.52		1.56	+	1.12		1.77	**	1.38	+	1.62	**	0.70		2.28	*
Race (ref. non-Hispanic white)																
Non-Hispanic black	1.18		1.42		2.23	*	3.00	***	1.42		1.52	+	2.74		11.40	***
Hispanic	0.85		1.76		3.17		6.02	**	1.35		2.27	*	4.25		15.56	*
Birth year	1.01		1.01		1.02	*	1.03	**	1.00		1.01		1.11	***	1.07	***
Married/partnered	0.11	***	4.30	***	0.13	***	3.85	***	0.14	***	4.29	***	0.07	***	3.28	**
Any living children	0.49		1.19		0.98		1.53		0.65		1.14		0.73		2.75	+
Any living siblings	1.37		1.09		1.02		1.05		1.16		1.08		1.52		1.14	
Less than high school	0.74		0.78		1.35		1.54	*	0.88		0.98		2.15		1.60	
Homeownership	1.39		1.25		1.88	**	1.22		1.65	**	1.20		1.33		1.08	
Log (annual income)	1.10		1.07		1.05		1.04		1.03		1.04		1.12		1.04	
Any Medicaid	0.84		1.33		0.95		0.94		0.92		1.15		0.64		0.61	
Home health services	2.69	***	2.24	**	2.16	**	1.83	*	2.62	***	2.10	***	1.96		1.96	
Special facility or service	2.65	***	2.03	*	1.20		1.00		1.52		1.27		1.21		1.07	
Hospital overnight	3.50	***	2.29	**	3.76	***	3.10	***	4.07	***	2.63	***	1.40		2.32	*
Cancer	0.77		0.66		0.78		0.90		0.59	**	0.63	**	3.26	*	1.53	
Heart condition	0.42	***	0.58	**	0.90		1.03		0.68	*	0.78	+	0.53		1.35	
Stroke	1.21		0.95		1.01		1.31		1.01		1.04		1.08		1.75	
Memory problems	0.45		1.31		0.26	***	0.46	***	0.43	**	0.80		0.08	***	0.39	*
ADL disability	0.80	**	0.89	+	0.75	***	0.92	+	0.81	***	0.95		0.75	*	0.90	
Cognitive impairment	1.01		1.02		1.05	*	1.03	+	1.04	+	1.03		1.03		1.06	*
Depression	1.05		1.02		1.01		0.99		1.03		1.03		1.08		0.94	
N	871				1225				1758				338			
F-value	5.95				8.24				11.63				2.59			

Post-discharge living arrangements (ref. living in another institution)	Unmarried sample															
	<= 1 month				> 1 month				<= 3 months				> 3 months			
	Living alone		Living with others		Living alone		Living with others		Living alone		Living with others		Living alone		Living with others	
Women (ref. Men)	1.99	*	2.08	*	1.03		1.67	+	1.43		1.72	*	0.87		2.37	
Race (ref. non-Hispanic white)																
Non-Hispanic black	1.34		1.96		2.05	*	3.16	***	1.41		1.75	+	2.72		15.41	***
Hispanic	0.69		1.53		2.47		4.47	*	1.18		1.83		10.57		119.36	
Birth year	1.03		1.03		1.03	*	1.03	*	1.01		1.02		1.13	***	1.07	*
Any living children	0.66		1.76		0.95		1.57		0.63		1.01		0.66		5.07	*

Any living siblings	1.26		1.04		0.94		1.02		1.16		1.17		1.17		0.80	
Less than high school	0.70		0.70		1.30		1.58	+	0.90		1.03		1.27		1.10	
Homeownership	1.23		0.90		2.23	***	1.18		1.76	**	1.05		1.62		0.99	
Log (annual income)	1.23		1.08		1.07		1.02		1.08		1.03		1.11		1.04	
Any Medicaid	0.75		1.15		1.11		0.99		0.92		0.99		0.67		0.75	
Home health services	2.95	***	2.26	*	2.39	**	1.77	*	3.33	***	2.41	***	1.52		1.36	
Special facility or service	2.10	*	1.61		1.43		1.22		1.41		1.18		1.76		1.71	
Hospital overnight	3.11	**	1.26		4.01	***	2.31	**	3.87	***	1.65	+	2.19		2.85	+
Cancer	0.81		0.75		0.78		0.82		0.59	*	0.62	+	3.49	*	1.54	
Heart condition	0.36	***	0.46	*	1.04		1.20		0.64	*	0.73		0.68		1.47	
Stroke	1.46		1.35		0.93		1.21		1.19		1.28		0.67		1.43	
Memory problems	0.38	+	1.37		0.23	***	0.47	**	0.34	***	0.75		0.12	**	0.57	
ADL disability	0.80	*	0.89		0.75	***	0.94		0.81	***	0.97		0.74	*	0.85	
Cognitive impairment	1.01		1.03		1.05	+	1.03		1.04	+	1.03		1.01		1.04	
Depression	1.03		0.96		0.99		1.01		1.00		1.01		1.10		0.93	
N	479				693				965				207			
F-value	2.19				3.50				3.73				1.61			

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1