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DOES HIGH CAREGIVER STRESS LEAD TO NURSING HOME ENTRY?

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ABSTRACT

Understanding the role of informal caregiving in preventing or delaying nursing home entry among chronically disabled elders is increasingly important for policy. Continued aging of the population and other demographic shifts are likely to increase the caregiving burden for a smaller number of caregivers per elder in the coming decades. The success of state and federal policies to prevent or defer admission to nursing facilities or help nursing facility residents return to the community will depend in part on the willingness and ability of informal caregivers to maintain disabled elders in their homes. In this study, we examine how informal care, paid formal care, and stress or burden experienced by caregivers relates to nursing home placement. We use data from the 1999 National Long Term Care Survey and its companion Informal Caregiver Survey merged with Minimum Data Set and other external data and instrumental variables estimation methods to estimate nursing home entry. We also estimate a richer probit model to explore the factors associated with high caregiver stress. We find that stress is a strong predictor of entry over follow-up periods of up to two years, and that caregiving-related physical strain and financial hardship and recipient behavior problems are important predictors of high levels of caregiver stress. Reducing important stress factors such as physical strain and financial hardship would significantly reduce caregiver stress and, as a result, nursing home entry. Our analysis provides support for initiatives to reduce caregiver stress as a strategy to avoid or defer nursing home entry and to underpin current efforts to return nursing home residents to community-based care.

EXECUTIVE SUMMARY

Understanding the role of informal caregiving in preventing or delaying nursing home entry is increasingly important for policy. The continued aging of the population and other demographic shifts are likely to reduce the supply of informal caregivers and increase the caregiving burden for a smaller number of caregivers per elder with disability in the next several decades. The success of state and federal policies to prevent or defer admission to nursing facilities or help nursing facility residents return to the community will depend in part on the willingness and ability of informal caregivers to maintain disabled elders in their homes.

In this study, we consider the role of caregiver stress in nursing home placement among a nationally representative sample of community residing elders with chronic disability and their primary informal caregivers. Our data include detailed information on the care recipient, information from caregivers about their caregiving experiences and administrative data that allows us to observe both nursing home entry and duration of nursing home use.

We begin with a descriptive profile of caregivers who report that they experience high stress from caregiving and those reporting lower levels of stress. We then use multivariate models to examine the link between caregiver stress and the likelihood of long-term admission to a nursing home. We address the following questions:

- Does a high level of primary caregiver stress predict nursing home entry?
- What factors are associated with high levels of caregiver stress?

We also simulate the potential impacts of reducing overall caregiver stress and specific factors associated with caregiver stress on nursing home entry.

Methods

We model nursing home entry over follow-up periods of up to two years as a function of baseline informal care, paid formal care, and caregiver stress. Because the levels of informal and formal care are jointly decided, and these levels of care affect and are affected by caregiver stress, these three factors are endogenous to the nursing home decision. Failing to account for endogeneity could bias estimates of the role of caregiver stress in nursing home entry. To address endogeneity, we use a two-stage instrumental variables (IV) model in which the first stage equations predict informal care, formal care, and caregiver stress. The predicted values from these first stage regressions then are substituted into the main equation for nursing home entry. To further explore the sources of caregiver stress, we also estimate a probit model including a larger number of potential stress factors.

Data

Our data are from the 1999 National Long Term Care Survey (NLTC) and its Informal Care Supplement (ICS). The NLTC is a nationally representative survey of the Medicare elderly that collects detailed information on the health, disability, long-term care, and living situation of the older population. The 1999 ICS interviews the primary informal caregiver of chronically disabled respondents who receive informal help with disability. ICS respondents provide information about a range of caregiving issues and experiences, the amount and types of care provided, basic demographic information, and their living arrangements and family.

Our NLTC file is augmented by Medicare administrative data and other external files. Minimum Data Set assessments provide all nursing home admissions between the 1999 interview date and July 2004. Medicare claims allow us to control for recent events such as hospitalizations to better characterize the health of sampled elders. Medicare denominator files allow us to identify recipients who are also eligible for Medicaid as well as Medicare managed care enrollees. Vital Statistics files provide reliable information on whether and when care recipients die. County-level data from the Area Resource File allow us to characterize local nursing home and home health market characteristics, as well as more general health system and area characteristics.

Our sample is approximately 1,000 chronically disabled elders who receive informal help with at least one activity of daily living or instrumental activity of daily living and their primary informal caregivers. Chronic disability is defined as lasting at least 90 days, which excludes persons from our sample who may have a short period of disability prior to death or recovery from their disability.

We measure high stress from caregiving as a caregiver assessment of six or higher on a scale of one to ten. To focus on nursing home admissions that are or may become permanent placements, we define relevant admissions as admissions to episodes lasting at least 60 days with no intervening period of 30 days or longer outside the nursing home.

Key Findings

Our profile of personal and informal care characteristics of caregivers reporting high stress and those reporting lower levels of stress indicates that there are few differences in the personal characteristics of caregivers reporting high and low stress, but large differences in the amount and conditions of their caregiving. Notably, highly stressed caregivers are more likely to report being in fair or poor health and to have experienced a decline in health since becoming a caregiver. Relative to lower stress caregivers, highly stressed caregivers provide larger amounts of care, are far more likely to be caring for elders who require near constant supervision or exhibit behavior problems, to report that caregiving is a physical strain, and to report that caregiving is a financial hardship. They also are more likely to report having used paid help with

caregiving, assistive devices, or home modifications and to need help, respite, or financial assistance. Interestingly, highly stressed caregivers are no more likely to be the sole caregiver and are similar to low stress caregivers in the duration of their caregiving, but they are far more likely to report that the level of caregiving has increased.

The Link between High Stress and Nursing Home Entry

Our IV estimates indicate that caregiver stress is an important and highly significant predictor of nursing home entry, and that its impact increases in magnitude with the length of follow-up. Specifically:

- Having a highly stressed caregiver at baseline increases the likelihood of nursing home entry within one year by 12 percentage points, rising to about 17 percentage points for the two-year follow-up.
- Simulations suggest that if a hypothetical intervention could eliminate high stress, the rate of admission among elders with highly stressed caregivers could be reduced from about 27 percent to about 10 percent over a two-year follow-up.
- The reduction among all care recipients would be 3.3 percentage points over two years, which represents 73,914 elders--about a quarter of all nursing home admissions expected within two years.

Factors Associated with High Stress

Our probit model of caregiver stress indicates that factors associated with the level and intensity of the recipient's care needs were important predictors of high caregiver stress, while the caregiver's personal characteristics and living situation generally were not. We find that:

- Physical strain from caregiving is by far the strongest predictor, raising the likelihood that a caregiver is highly stressed by 22 percentage points.
- Other important predictors are frequently having sleep disturbed by caregiving responsibilities or dealing with a recipient's problem and financial hardship from caregiving.
- Simulations indicate that interventions that reduced both physical strain and financial hardship would reduce high stress from about 19 percent to 8 percent of all caregivers.
- Reducing the number of high stress caregivers to 8 percent would reduce nursing home entry by 2 percentage points, or about 42,000 elders by the end of

two years--nearly 60 percent of the reduction if high caregiver stress could be eliminated.

Discussion and Conclusions

Our analysis provides support for initiatives to reduce caregiver stress among persons caring for chronically disabled elders as a strategy to reduce or defer nursing home entry and perhaps to underpin current efforts to return nursing home residents to community-based alternatives.

Physical strain from caregiving was by far the most important predictor of high levels of stress, but indicators of the disruptive aspects of caregiving--frequently disturbed sleep and recipient problem behaviors--and financial hardship also were important. Strategies for reducing caregiver stress could include greater availability of respite care, caregiver training and more information about and access to devices such as chair and bed lifts that might reduce the physical toll from strenuous tasks, assistance in managing recipient behaviors that are disruptive and increase the physical and emotional strain of caregiving, and/or financial assistance.

Additional research is needed to further explore the paths by which policies to support caregiving could reduce caregiver stress and, by doing so, nursing home entry. Our simulations considered only direct impacts of selected stress factors. It would be useful to replicate the analysis using alternative measures of stress and considering interactions between different sources of stress to better understand the role of caregiver stress in long-term nursing home entry, as well as other outcomes, such as other health care spending.

INTRODUCTION

Informal, unpaid care provided by family and friends is universally recognized as the mainstay of long-term care for older persons in the United States. From prior research, we know that more than 90 percent of chronically disabled elders remaining in community residence receive informal help with activities of daily living (ADLs), primarily from their spouses or children, and nearly two-thirds receive all such help from informal caregivers (Spillman and Black 2005). Altogether, informal caregivers to chronically disabled elders provided 94 million hours of care per week in 1999--nearly three-quarters of the 130 million hours of care provided each week to community residing disabled elders (Spillman 2005). At any point in time, persons with greater informal care resources--specifically with a spouse or children--are less likely to reside in nursing homes (Spillman and Black 2005).

Understanding the role of informal caregiving in preventing or delaying nursing home entry is increasingly important for policy because of the continued aging of the population and other demographic shifts, such as smaller family size, increased female labor force participation, and delayed childbearing. All are likely to reduce the supply of informal caregivers and increase the caregiving burden for a smaller number of caregivers per elder with disability in the next several decades. This has implications for state policies that increasingly are focused not only on preventing or deferring admission to nursing facilities through increased Medicaid home and community-based services but also on helping nursing facility residents to return to the community. The success of these efforts is likely to depend in large part on the willingness and ability of informal caregivers to maintain disabled elders in their homes.¹

A number of recent studies have examined the relationship between informal caregiving and the use of nursing homes among older persons and found evidence that having family members who could serve as informal caregivers, receiving informal care, and hours of informal care are associated with reduced nursing home entry (Charles and Sevak 2005; LoSasso and Johnson 2002; Van Houtven and Norton 2004; Waidmann and Thomas 2003)). Other recent studies have found that various measures of stress or burden resulting from caring for elders with dementia predict nursing home entry (Gaugler et al. 2000, 2003, 2005).

In this study, we draw from and build on this work to consider the role of caregiver stress in the nursing home entry decision among a nationally representative sample of community residing elders with chronic disability and their primary informal caregivers.

¹ All states have some programs aimed at supporting caregivers with services including information, help in identifying and accessing available services, counseling, training, respite services, and, in some cases, financial support, either independently or through the federal Administration on Aging's National Family Caregiver Support Program (NFCSP) (Link et al. 2006), but the level of support so far has been modest. The NFCSP provided \$128 million in grants to states in fiscal 2002 and served 250,000 family caregivers, an average of \$512 per caregiver served (New Freedom Initiative Caregiver Support Workgroup 2003).

Our data include not only detailed information on the care recipient, but also information from caregivers about their caregiving experiences and information from administrative data that allows us to observe both nursing home entry and duration of nursing home use. We examine a comprehensive model of how formal care, informal care, and the caregiver's perceived stress from caregiving relate to future nursing home placement. Evidence from such a model can contribute to a better understanding of where policy may be able to intervene to provide support and incentives for informal caregivers and the potential impacts of increased public caregiving supports on nursing home entry.

We begin with a descriptive profile of the personal and caregiving characteristics of the caregivers, comparing those who report that they are under high stress to those with lower levels of stress. We then use multivariate modeling to examine the link between caregiver stress and the likelihood of long-term admission to a nursing home. We address the following questions:

- Does a high level of primary caregiver stress predict nursing home entry?
- What factors are associated with high levels of caregiver stress?

We also use the multivariate models to simulate the potential impacts of reducing overall caregiver stress and specific factors associated with caregiver stress on nursing home entry.

METHODS

Drawing on the Grossman (1972) model of health demand, we assume that the demand for care (whether informal care, formal care, or nursing home care) is a function of the care recipient's care needs, ability to pay for care, access to providers of care, and the cost of care. The relationship between care decisions is complex and dynamic, with the recipient and family making joint decisions about informal and formal care, which, in turn, affect decisions about nursing home care. Caregiver stress enters the model through its relationship with the formal and informal care decisions and, we hypothesize, through a direct effect on the nursing home entry decision.

We start with baseline care arrangements and the level of stress observed at the time of interview. This baseline situation reflects the outcome of past decisions, and the factors affecting these past decisions are assumed also to affect the future decision to use nursing home care. We do not directly observe changes occurring after the interview in functional status of the care recipient, care arrangements, or other factors that may affect the nursing home entry decision. We assume, however, that for any individual primary caregiver, stress tends to be cumulative, increasing as the frailty and care needs of the recipient increase over time. We examine admissions to episodes of nursing home care lasting at least 60 days within one year, within 18 months, and within two years.

The model we estimate can be summarized as follows:

- (1) *Long-stay nursing home entry* =
f1 (*level of informal care, level of formal care, level of caregiver stress, health and other care recipient characteristics, availability and cost of nursing home care*).
- (2) *Level of informal care* =
f2 (*level of formal care, level of caregiver stress, health and other care recipient characteristics, potential availability of informal care*).
- (3) *Level of formal care* =
f3 (*level of informal care, health and other care recipient characteristics, potential availability and cost of formal care*).
- (4) *Level of primary caregiver stress* =
f4 (*level of informal care, level of formal care, health and other care recipient characteristics, characteristics of the primary caregiver, including family and caregiving situation*).

The challenge in estimating this model is that the levels of informal and formal care are jointly decided, and these levels of care affect and are affected by caregiver stress, making them endogenous to the nursing home decision. In addition, unobserved

differences across individuals and families may affect formal care, informal care, and caregiver stress as well as nursing home entry. Failing to account for both endogeneity and unobserved differences could bias estimates of the role of caregiver stress in the nursing home entry decision.

To address these complexities, we estimate the system of equations using a two-stage instrumental variables (IV) model. The success of IV estimation relies on the ability to find good “instruments,” which are variables that are highly correlated with informal care, formal care, and stress, respectively, but not correlated with the error term in the nursing home entry equation (Wooldridge 2002). In practice, the model is statistically identified by variables that predict the three endogenous variables (the “first stage” of the two-stage model) but have no direct effect on nursing home use. The predicted values from these first stage regressions then are substituted into the main equation (equation (1)) for nursing home entry.

Because of the relatively small sample size for the study (discussed below), we estimated parsimonious first stage models, focusing on achieving identification with the minimal set of instruments to allow us to correctly estimate the impact of formal care, informal care, and caregiver stress on nursing home entry. We also estimated a richer reduced form model of caregiver stress to help us determine likely candidate measures for identification in the IV model, and in order to examine the potential impacts of policy interventions to address factors associated with higher stress.

All of our estimates are obtained using the survey (svy) procedures in Stata (StataCorp 2005). The survey procedures in Stata are designed to produce correct standard errors for complex survey designs. We used the Stata ivreg procedure to estimate our IV model, the mean procedure to produce descriptive statistics, and the probit procedure to estimate our richer reduced form model of caregiver stress. Because tests of the IV model are not yet available for survey procedures in Stata, we used weighted regression with a general correction for clustering under the ivreg2 procedure for those tests.

Our set of instruments has good predictive power in the formal care, informal care and caregiver stress equations as measured by partial R^2 , indicating that the instruments are strongly correlated with those outcomes. Further, we find that the instruments have no independent effects on nursing home entry outcomes as indicated by the Hansen’s J test. The Hansen’s J test is a test of the joint null hypothesis that the instruments are valid instruments (i.e., uncorrelated with the error term), and that the excluded instruments are correctly excluded from the nursing home equation.² These tests suggest that the influence of the instruments is only through their effect on formal care, informal care and caregiver stress and not through any direct effect on nursing home entry. In addition, our results are robust to sensitivity analyses in which we used

² These test results are reported in Appendix Table 1. Although we do not review them here, Stata also provides the results for a number of other tests of different aspects of the IV model. Those results of those tests provide further support for our model specification. See StataCorp (2005) for more information on the specific tests available for instrumental variables models.

alternative sets of instruments for formal care, informal care and caregiver stress. We discuss these sensitivity analyses in more detail in a later section. We present the results here for a relatively parsimonious model.

We also conducted a Davidson-MacKinnon test of the endogeneity of formal care, informal care and caregiver stress in the nursing home equation (Wooldridge 2002). The null hypothesis is that they are exogenous, in which case ordinary least squares would be consistent and fully efficient. We do find evidence to support the endogeneity of formal care, informal care and caregiver stress for each of the follow-up periods modeled. The findings from the test are sensitive, however, to the number of instruments included in the model. This is likely due to the presence of multicollinearity and relatively large standard errors in our analysis (Wooldridge 2002). Given that we do reject the null hypothesis that formal care, informal care and caregiver stress are exogenous to nursing home entry at one year, 18 months, and two years, in a number of the equations, we focus on the IV model in presenting our results.

DATA

Our data are from the 1999 National Long Term Care Survey (NLTCS) and its Informal Care Supplement (ICS). The NLTCS is a nationally representative survey of the Medicare elderly designed to collect detailed information on the health, disability, long-term care, and living situation of the older population. The 1999 ICS interviews the person identified as the primary informal caregiver of community respondents who receive informal help with disability. ICS respondents are asked about a broad range of caregiving issues and experiences, in addition to the amount and types of care provided, basic demographic information, and information on the caregiver's living arrangements and family.

In addition to the survey data, our NLTCS file has been merged with Medicare fee-for-service claims from 1991 through 2003, and other administrative data. Of key importance are Minimum Data Set (MDS) assessments, which allow us to observe all nursing home admissions between the 1999 interview date and July 2004. The Medicare claims files allow us to control for recent events such as hospitalizations that help us better characterize the health of care recipients, and Medicare denominator files allow us to identify recipients who are also eligible for Medicaid as well as Medicare managed care enrollees. Fee-for-service claims are not available for any periods during which recipients are enrolled in managed care. Vital Statistics files also merged with the NLTCS sample provide reliable information on whether and when care recipients die. County-level data from the Area Resource File allow us to characterize local nursing home and home health market characteristics, as well as more general health system characteristics such as the local supply of hospital beds and physicians.

Our sample consists of approximately 1,000 chronically disabled elders who receive help with at least one ADL or instrumental activity of daily living (IADL) and their primary informal caregivers. Chronic disability is defined as lasting at least 90 days, which excludes persons from our sample who may have a short period of disability prior to death or who recovered from their disability. The included ADLs are eating, transferring, getting around inside, dressing, bathing, and toileting. The included IADLs are light housework, laundry, meal preparation, shopping, getting around outside, managing money, taking medicines, and telephoning.

Disability Help and Caregiver Characteristics

The main NLTCS creates a roster of all household members, all children living outside the household, and all persons who provide help with ADLs or IADLs. The sampled elder and/or a proxy is the respondent for the main survey. Information collected for roster members includes basic information, such as age, gender, and relationship to the sampled elder, and, for persons providing disability help, the number of hours of care provided in the last week and whether the caregiver was a paid formal

caregiver³ or an informal caregiver. The main survey information on total hours of each type of care provides the dependent variables for the formal and informal care equations (equations (2) and (3)) in our IV model. On average, our sample members received about seven hours of formal care and 35 hours of informal care in the last week.

The primary informal caregiver is identified as the person who provided the greatest number of hours of care in the last week. The primary caregiver selected for interview is then asked in more detail about a broad array of objective characteristics and subjective assessments of the caregiving experience, generally covering the range of factors identified in the most commonly used indices in the literature (Zarit, Reever, and Bach-Peterson 1980; Robinson 1983). For our descriptive profile of highly stressed caregivers and in our model predicting high caregiver stress (equation (4)), we focused primarily on more objective measures. These include the type and amount of care provided in a typical week; special conditions of caregiving, such as the frequency of problem behaviors by the care recipient and the frequency with which the caregiver's sleep is disturbed by caregiving responsibilities; types of assistance with caregiving the caregiver has ever received; reasons why assistance was not used; and supports the caregiver needs. The caregiver is also asked to rank the level of physical strain and financial hardship caregiving causes on a scale of one to five, where one is no physical strain or financial hardship and five is very much of a strain or hardship.

We selected the overall level of stress the caregiver experiences from caregiving responsibilities, which is reported on a scale of one to ten, as our stress outcome measure (equation (4)). We identify highly stressed caregivers as those rating their overall stress as 6 or higher.⁴ Nineteen percent of our sample have primary caregivers who report high stress.

Nursing Home Entry

We constructed our measure of nursing home entry from the MDS assessments merged with the NLTCs sample. Our interest in this analysis is in longer nursing home episodes that may be or become permanent placement, rather than short-term post-acute stays. We therefore considered only episodes lasting at least 60 days and occurring within follow-up periods of up to five years after the interview date.⁵ We found that for all follow-up periods, about 85 percent of the episodes meeting this 60-day criterion lasted more than 90 days, and about half lasted at least one year. For

³ These formal caregivers include all nonfamily caregivers who are paid either publicly or privately--that is, they are not limited to home health workers paid through Medicare or Medicaid. Although recipients, some state Medicaid programs, and some private long-term care insurance policies pay family members for caregiving, the NLTCs does not ask if relatives are paid. Thus, in our analysis all relatives providing care are considered informal caregivers.

⁴ The basic findings are not sensitive to using a slightly higher or slightly lower cut-off.

⁵ We define an episode as a period of nursing home residence with no intervening periods of 30 days or longer outside the nursing home.

simplicity, we refer to the entry into these long-stay nursing home episodes as “nursing home entry” in the remainder of the paper.

Nursing home entry is a relatively rare event, even among our sample of chronically disabled elders. In choosing among the feasible follow-up periods, we considered the tradeoff between the number of eligible admissions, which increases as the length of the follow-up period increases, and the likelihood that the predictive power of baseline characteristics would diminish as the follow-up period increases. For example, only 4 percent of our sample had an episode of at least 60 days beginning within the six months following interview, compared with 22 percent within five years. In the end we selected follow-up periods of one year, 18 months, and two years. For the full sample the rate of nursing home entry rose from about 7 percent within one year to 13 percent within two years. Nursing home entry was significantly higher for sample members whose caregivers reported high stress. These sample members had a nursing home entry rate of 11 percent within one year and 17 percent within two years.

PROFILE OF PRIMARY INFORMAL CAREGIVERS

Table 1 provides a profile of personal and informal care characteristics of caregivers reporting high stress and those reporting lower levels of stress. There are few differences in the personal characteristics of caregivers reporting high and low stress, but large differences in the amount and conditions of their caregiving.

Caregivers reporting high stress are more likely to be spouses or children of the care recipient and more likely to be female. There are no significant differences, however, in the proportions of high and lower stress nonspouse caregivers who have minor children or are married, two potential indicators of competing demands on caregiver time. The two personal characteristics where high stress caregivers are dramatically different are being in fair or poor health and having had a decline in health since becoming a caregiver. Nearly half of high stress caregivers report fair or poor health, almost twice the proportion of lower stress caregivers, and 43 percent report a health decline since becoming a caregiver, about seven-fold the proportion of lower stress caregivers reporting a decline.

There are large differences in virtually all measures of the amount and intensity of caregiving. Nearly three in four high stress caregivers provide at least 20 hours of care per week, and they help with an average one additional ADL and IADL activity per week. They also are far more likely to be caring for recipients who require nearly constant oversight or who frequently exhibit behavior problems and to regularly have their sleep disturbed because of caregiving. High stress caregivers also are far less likely to report that there is someone else who could take over for them if they could not continue caregiving, but they are no more likely to be the only caregiver or the only informal caregiver.

Interestingly, there is no difference in the average duration of caregiving, with and about 70 percent of both high and lower stress caregivers reporting that they have been providing care for at least two years. High stress caregivers, however, are far more likely to report that the level of caregiving has increased. They also are far more likely to have ever used paid help with caregiving--respite, day care, or ADL assistance--or assistive devices and to have home modifications.

More than half of high stress caregivers report that caregiving is a financial hardship, and three in four report that caregiving is a physical strain, compared with roughly one in five lower stress caregivers reporting financial and physical hardship. Not surprisingly, only one in ten high stress caregivers report that they do not need any kind of support, compared with nearly four in ten lower stress caregivers. High stress caregivers also are far more likely to report needing help with caregiving, a break from caregiving, or financial aid.

THE LINK BETWEEN HIGH STRESS AND NURSING HOME ENTRY

To better understand the link between high caregiver stress and nursing home entry, we estimate a multivariate model based on equations (1)-(4) outlined above, where nursing home entry is determined by hours of formal care, hours of informal care and caregiver stress among other factors. We address the endogeneity of formal hours, informal hour, and caregiver stress in the nursing home entry decision, by estimating an IV model.

Table 2 summarizes the variables that we use to identify the model. These are variables that are strong predictors of formal care, informal care, and caregiver stress, respectively, but have no direct effect on nursing home entry. Our identifying variables for hours of formal care are the local supply of home health agencies and whether the recipient lives in a community residential care setting. Our instruments for hours of informal care are whether the recipient lives alone and the number of daughters who live nearby. Finally, our instruments for caregiver stress are frequent recipient behavior problems and caregiver-reported physical strain from caregiving.⁶

Table 3 summarizes the exogenous variables included in our model to control for the other factors that affect nursing home entry, including characteristics of the recipient and the local health care market. We also include the proportion of the follow-up period survived in each time period (i.e., one year, 18 months, two years) to control for differences in exposure.

Table 4 reports the results of our estimation of the impacts of formal care hours, informal care hours, and high caregiver stress on nursing home entry within the three follow-up periods. We report both OLS and IV results for comparison. The OLS estimates, which ignore the endogeneity of formal care, informal care and caregiver stress, indicate that only formal care hours at baseline significantly affect nursing home admission, slightly *increasing* the likelihood for all three follow-up periods. Although both informal care hours and caregiver stress have the expected signs, with informal care reducing and caregiver stress increasing the likelihood of nursing home entry, neither is significant or of consequential magnitude.

The results are considerably different when we control for the endogeneity of formal care, informal care and caregiver stress in our IV model.⁷ The IV estimates indicate that caregiver stress is an important and highly significant predictor of nursing home entry, and that its impact increases in magnitude with the length of follow-up. This is consistent with the hypothesis that caregiver stress or burden is persistent and

⁶ As noted above, our estimates are not sensitive to the set of identifying variables. Other identifying variables we tested included local home care wage rates, concurrent child care responsibilities of the caregiver, caregiver age and relationship to care recipient, fair or poor caregiver health, and recipient's need for near continuous supervision.

⁷ Full regression results are provided in Appendix Table 1.

cumulative over time. The estimates suggest that after controlling for the characteristics of the elder and local area and the endogeneity of caregiver stress, having a highly stressed caregiver at baseline increases the likelihood of nursing home entry within one year by 12 percentage points, rising to about 17 percentage points for the two-year follow-up. Although the impact of baseline informal care hours is not significant for any of the follow-up periods, the coefficients for each time period are far larger than in the OLS estimation and, as before, have the expected negative sign. Within the IV specification, baseline formal care hours are not significantly related to nursing home entry in any time period.

Simulated Impacts of Reducing Stress

The estimates in Table 4 provide strong evidence that higher caregiver stress increases the likelihood of nursing home entry. In order to quantify the magnitude of potential impacts from reducing caregiver stress, we simulate the impacts of a hypothetical intervention that reduced stress among all caregivers below the high stress level, leaving all other characteristics as they actually are within the sample. The results, shown in Table 5, suggest that if such a hypothetical intervention could eliminate high stress, it could dramatically reduce the rate of admission among elders with highly stressed caregivers, with the largest impact being the reduction from about 27 percent to about 10 percent over a two-year follow-up. Because less than 20 percent of elders have highly stressed caregivers, the overall impact on the admission rate is less dramatic--a reduction of 3.3 percentage points. However, the reduction in nursing home entry from 12.6 percent of all elders receiving informal care to 9.3 percent over the two year follow-up period represents 72,913 persons, which is about a quarter of all nursing home admissions expected within two years.

FACTORS ASSOCIATED WITH HIGH STRESS

Our simulations of potential reductions in nursing home entry do not consider how a reduction in caregiver stress might be accomplished. In this section, we examine the factors associated with high caregiver stress, with a focus on those that have the largest impacts and may be most amenable to policy interventions.

Stress Model Estimation Results

In exploring the factors associated with high caregiver stress, we estimated a richer model that included both the factors included in the models underlying Table 5 and additional measures intended to capture other dimensions of caregiver stress. Table 6 provides the marginal effects of significant predictors from that model, in order of the magnitude of their effect on caregiver stress. Full regression results are provided in Appendix Table 2. We included recipient characteristics, instruments for formal and informal care hours, and a rich array of caregiver characteristics sequentially. We found that the few recipient and local area characteristics that were significant predictors of high stress before caregiving characteristics were added became insignificant as the more targeted caregiver and caregiving characteristics entered the model.

Physical strain from caregiving is by far the strongest predictor, raising the likelihood that a caregiver is highly stressed by 22 percentage points (Table 6). Frequently having sleep disturbed by caregiving responsibilities or dealing with a recipient's problem behaviors each increase the likelihood of high caregiver stress by about 10 percentage points, and financial hardship because of caregiving and being the recipient's child are only slightly less important, each increasing the likelihood by about 9 percentage points. We also include fair or poor caregiver health, which increases the likelihood of high stress by about 6 percentage points. Although the marginal effect of being in fair or poor health is not quite significant at the 10 percent level, the probit coefficient is. We note that the estimated impact of fair or poor caregiver health is large and highly significant prior to the addition of physical strain from caregiving to the equation (see Appendix Table 2), suggesting that stress is more likely to result from a mismatch between health and caregiving demands than from fair or poor health alone.

Simulated Reductions in Stress from Eliminating Stress Factors

To illustrate potential reductions in caregiver stress from reducing factors associated with stress, we focused on physical strain and financial hardship, two factors perhaps most obviously associated with specific interventions, such as caregiver training, direct formal services, home modifications, assistive devices, or financial aid. Simulation results are provided in Table 6 for reducing physical strain and financial hardship individually and the combined effect of reducing both. An individual is assumed to experience physical strain or financial hardship if he or she reports reports

a level of three or higher on a scale of one to five, where one is no physical strain or financial hardship. As in the earlier simulations for nursing home entry, all other characteristics are held at their actual levels.

Over all primary caregivers, the likelihood of reporting high stress is 18.9 percent. Physical strain has the greatest association with high stress. The likelihood that caregivers reporting physical strain are highly stressed is nearly 47 percent, compared with only 6.4 percent for caregivers reporting little or no physical strain. Interventions that could reduce physical strain would reduce the likelihood of high stress from caregiving to 18.8 percent among caregivers reporting physical strain and to 10.2 percent among all caregivers, an overall reduction of 8.7 percentage points. The impact of reducing financial hardship is more modest, although still substantial for caregivers experiencing it. For the group reporting financial hardship the likelihood of high stress would be reduced from about 42 percent to 30 percent, and the overall reduction in the likelihood of high stress would be 3 percentage points. The combined impact of interventions addressing both physical strain and financial hardship would be to reduce the likelihood of high stress by about 11 percentage points to 8 percent of all caregivers.

Simulated Impacts on Nursing Home Entry from Eliminating Stress Factors

As a final simulation, we trace the effects of these levels of stress reduction on nursing home use. To do so, we use our nursing home model and the predicted likelihoods of high caregiver stress after interventions targeting physical strain and financial hardship. As shown in Table 7, if both physical strain and financial hardship were eliminated, the share of caregivers who were highly stressed would be reduced by about 8 percentage points, and, as a result, nursing home entry would be reduced by about 2 percentage points at the end of two years. The reduction from addressing these two sources of high stress represents 42,279 elders, or about 15 percent of all nursing home entrants--about 60 percent of the reduction if high stress could be eliminated. Of course, this simulation, like the earlier simulations, estimates only the direct effect of a change in the stress factor, leaving all other characteristics as they occur in the sample. Given the complexity of the relationships between caregiver stress and nursing home entry, it may well be that eliminating physical strain or financial hardship also could have an indirect effect on nursing home entry through other routes.

DISCUSSION AND CONCLUSIONS

Our analysis provides support for initiatives to reduce caregiver stress among persons caring for chronically disabled elders as a strategy to reduce or defer nursing home entry and perhaps to underpin current efforts to return nursing home residents to community-based alternatives. After addressing the possibility of biases in the estimates that can occur when regressors are endogenous, we found that elders with highly stressed primary caregivers were more likely than their counterparts with less stressed caregivers to have a long-term nursing home placement over follow-up periods up to two years. Furthermore, we find that the level and intensity of the recipient's care needs were important predictors of high caregiver stress, while personal characteristics and living situation were not.

Physical strain from caregiving was by far the most important predictor of high levels of stress, but indicators of the disruptive aspects of caregiving--frequently disturbed sleep and recipient problem behaviors--also were important, as was financial hardship. Reducing such stress factors would significantly reduce caregiver stress and, as a result, nursing home use for chronically disabled elders. Strategies for reducing caregiver stress could include greater availability of respite care, caregiver training and more information about and access to devices such as chair and bed lifts that might reduce the physical toll from strenuous tasks, assistance in managing recipient behaviors that are disruptive and increase the physical and emotional strain of caregiving, and/or financial assistance.

Additional research is needed to explore the potential paths by which policies to support caregiving could reduce caregiver stress and, by doing so, nursing home entry. It would be useful to replicate the analysis using alternative measures of stress and considering interactions between different sources of stress to better understand the role of caregiver stress in long-term nursing home entry, as well as other outcomes, such as other health care spending. Finally, although our estimates are quite robust to alternative model specifications, the relatively small sample size for the study made it necessary for us to estimate parsimonious models. Expanding the analysis to include an additional round of the NLTCS would expand the sample size available for study and support a richer analysis.

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TABLE 1. Personal and Caregiving Characteristics of High and Lower Stress Primary Informal Caregivers			
	Low to Moderate Stress	High Stress^a	Difference
PERSONAL CHARACTERISTICS			
Caregiver Demographics			
Age	62.5	60.6	-1.9
Relationship to Recipient			
Son	13.0	15.7	2.7
Daughter	35.1	39.5	4.4
Spouse	37.1	36.9	-0.1
Other	14.8	7.9	-0.69**
Female	65.3	73.5	8.2**
Family Situation of Nonspouse Caregivers			
Has minor children	9.1	12.4	3.3
Is married	34.0	34.7	0.7
Caregiver Health			
Health is Fair or Poor	25.8	49.9	24.1**
Health is Worse Since Began Caregiving	6.1	43.0	36.9**
CAREGIVING CHARACTERISTICS			
Amount of Care Provided			
20 Hours or More in a Typical Week	43.4	73.1	29.6**
Number of ADLs Caregiver Helps With	1.3	2.5	1.2**
Number of IADLs Caregiver Helps With	5.1	6.5	1.4**
Intensity of Caregiving Demands			
Recipient can be Left Alone at Home < 2 Hours	29.4	56.7	27.3**
Recipient can be Left Alone in Room < 2 Hours	15.5	30.7	15.3**
Caregiver Sleep Disturbed 3+ Times Last Week	11.5	42.0	30.5**
Recipient had Behavior Problems 3+ Times Last Week	27.5	68.9	41.4**
Caregiver has Backup if Needed	60.9	47.7	-13.2**
Caregiver is Sole Caregiver	53.1	50.2	-2.9
Caregiver is Sole Informal Caregiver	68.6	69.6	1.0
Caregiving History			
Has Provided Caer for 2+ Years	70.0	70.9	0.9
Level of Caregiving has Increased	46.6	69.4	22.8**
Types of Help Caregiver Has Ever Used			
Paid Help with Caregiving	37.5	55.2	17.7**
Paid Help with IADLs	32.2	30.9	-1.3
Assistive Devices or Home Modifications	53.0	75.5	22.6**
Physical and Financial Demands of Caregiving			
Caregiving is a Financial Hardship (3+ on a Scale of 5)	18.1	56.1	38.0**
Caregiving is a Physical Strain (3+ on a Scale of 5)	21.2	75.7	54.6**
Caregiver's Reported Needs			
Nothing Needed	38.8	10.0	-28.8**
Help with Caregiving	17.9	31.3	13.4**
A Break from Caregiving/Free Time	17.8	34.6	16.8**
Financial Help	28.8	47.7	18.8**
SOURCE: Tabulations of data from the NLTCs and companion ICS.			
** (*) Difference is significant at the 5 (10) percent level in a two-tailed test.			
a. Caregiver rating of six or higher on a scale of one to ten.			

TABLE 2. Formal Care, Informal Care, and High Caregiver Stress and Their Identifying Variables for the IV Model	
	Mean
ENDOGENOUS REGRESSORS	
Total Formal Care Hours Recipient Received Last Week ^a	7.10
Total Informal Care Hours Recipient Received Last Week ^a	34.59
Caregiver Reports High Caregiving-Related Stress (6-10 on a scale of 10)	0.19
INSTRUMENTS FOR ENDOGENOUS REGRESSORS	
<i>Formal Care</i>	
Home Health Agencies per 1,000 Persons 65+	0.24
Recipient Lives in Community Residential Care	0.04
<i>Informal Care</i>	
Recipient Lives Alone	0.22
Number of Daughters Within 1 Hour	1.00
<i>High Caregiver Stress</i>	
Caregiver Reports Caregiving is a Physical Strain ^b	0.31
Recipient had Behavior Problems 3+ Times Last Week	0.35
SAMPLE SIZE	1,006
SOURCE: Tabulations of data from the NLTCs and companion ICS.	
a. Value is logged in models.	
b. Caregiver rating is three or higher on a scale of one to five.	

TABLE 3. Care Recipient Sample Characteristics Included in the IV Model	
	Mean
RECIPIENT CHARACTERISTICS	
Age	80.04
Female	0.68
White Race	0.86
High School Graduate	0.23
Some College	0.20
Enrolled in Medicaid	0.20
HMO Enrollee Any Month in the Last 6	0.12
Number of ADL and IADL Disabilities (out of 14) ^a	7.17
Receives Help with Transfer/Mobility Most of the Time	0.55
Disability has Lasted 1-5 Years	0.48
Disability has Lasted 5 Years or Longer	0.37
Cognitively Impaired	0.37
Obese	0.20
Total Inpatient Hospital Spending Last 6 Months ^b	2,122
NURSING HOME MARKET AND AREA CHARACTERISTICS	
Nursing Home Beds per 1,000 Persons 65+	53
Medicare Nursing Facility Reimbursement per Diem/Median	1.01
Physicians per 1,000 Persons	1.99
Hospital Beds per 1,000 Persons	3.47
Area is in an MSA	0.71
PROXY RESPONDENT AND SURVIVAL	
Respondent is a Proxy for Sampled Person	0.37
Months of Follow-up Period Survived ^b	
1 year follow-up	11
18 month follow-up	16
2 year follow-up	21
SAMPLE SIZE	1,006
SOURCE: Tabulations of data from the NLTCS and companion ICS.	
a. Included ADLs are eating, getting in/out of bed, getting around inside, dressing, bathing, and toileting. Included IADLs are light housework, laundry, meal preparation, shopping, getting around outside, taking medicines, and telephoning.	
b. Value is logged in models.	

TABLE 4. Estimated Impacts of Formal Care, Informal Care, and High Stress on the Likelihood of Longer Stay Nursing Home Entry						
	Within 1 Year		Within 18 Months		Within 2 Years	
	Coefficient	P> t 	Coefficient	P> t 	Coefficient	P> t
OLS						
Logged Hours of Formal Care	0.007	0.06	0.008	0.04	0.013	0.01
Logged Hours of Informal Care	-0.006	0.50	-0.007	0.43	-0.007	0.47
Caregiver Reports High Stress	0.015	0.53	0.015	0.57	0.023	0.48
IV Estimation						
Logged Hours of Formal Care	-0.005	0.82	0.001	0.98	0.013	0.68
Logged Hours of Informal Care	-0.041	0.48	-0.066	0.33	-0.039	0.61
Caregiver Reports High Stress	0.121	0.05	0.167	0.01	0.174	0.03
SOURCE: Analysis of data from the NLTCS and companion ICS.						

TABLE 5. Simulated Reduced Nursing Home Entry from Eliminating High Caregiver Stress						
	Predicted Likelihood of Entry					
	Within 1 Year		Within 18 Months		Within 2 Years	
	Percent	Number of Entrants	Percent	Number of Entrants	Percent	Number of Entrants
Probability of Nursing Home Entry with Current Levels of Caregiver Stress						
Full Sample	6.8	150,873	9.7	214,319	12.6	277,626
High Stress Group	17.7	75,009	23.5	99,323	27.3	115,475
Simulated Probability of Nursing Home Entry with the Elimination of High Stress						
Full Sample	4.5	99,816	6.5	143,784	9.2	203,998
High Stress Group	5.7	23,952	6.8	28,788	9.9	41,848
Reduction in Probability of Nursing Home Entry Due to the Elimination of High Stress						
Full Sample	2.3	51,057	3.2	70,535	3.3	73,628
High Stress Group	12.1	51,057	16.7	70,535	17.4	73,628
SOURCE: Analysis of data from the NLTCs and companion ICS.						

TABLE 6. Marginal Effects of Caregiver and Caregiving Characteristics on the Likelihood that the Primary Caregiver is Highly Stressed		
	Marginal Effect	P> z
Caregiver Reports Caregiving is a Physical Strain ^a	0.222	0.00
Caregiver Sleep Disturbed 3+ Times Last Week	0.104	0.04
Recipient had Behavior Problems 3+ Times Last Week	0.101	0.00
Caregiving is a Financial Hardship ^a	0.089	0.05
Caregiver is Recipient's Child	0.088	0.01
Caregiver is in Fair or Poor Health	0.059	0.11
SOURCE: Analysis of data from the NLTCs and companion ICS.		
a. Caregiver rating is three or higher on a scale of one to five.		

TABLE 7. Simulated Reductions in High Caregiver Stress from Reducing Physical Strain, Financial Hardship, or Both			
	Stress Factors		
	Physical Strain^a	Financial Hardship^a	Either Factor
Probability of High Caregiver Stress with Current Levels of Stress Factors			
Full Sample	18.9	18.9	18.9
Group that has stress factor now	46.9	41.9	40.2
Simulated Probability of High Caregiver Stress with the Elimination of Stress Factor			
Full Sample	10.2	15.9	8.0
Group that has stress factor now	18.8	30.1	12.3
Reduction in Probability of High Caregiver Stress due to the Elimination of Stress Factor			
Full Sample	8.7	3.0	10.9
Group that has stress factor now	28.0	11.8	27.9
SOURCE: Analysis of data from the NLTCs and companion ICS.			
a. Caregiver rating of three or higher on a scale of one to five.			

TABLE 8. Simulated Reduction in Nursing Home Entry from Reducing Sources of Caregiver Stress						
	Predicted Likelihood of Entry					
	Within 1 Year		Within 18 Months		Within 2 Years	
	Percent	Number of Entrants	Percent	Number of Entrants	Percent	Number of Entrants
Probability of Nursing Home Entry with Current Levels of Caregiver Stress	6.8	150,873	9.7	214,319	12.6	277,626
<i>Simulated Probability of Nursing Home Entry with the Elimination of Stress Factors</i>						
Eliminate Physical Strain	5.8	126,990	8.2	181,324	11.0	243,185
Eliminate Financial Hardship	6.4	142,175	9.2	202,303	12.0	265,083
Eliminate Both Physical Strain and Financial Hardship	5.5	121,129	7.8	173,227	10.6	234,733
<i>Reduction in Probability of Nursing Home Entry from Eliminating Stress Factors</i>						
Eliminate Physical Strain	1.1	23,883	1.5	32,995	1.6	34,441
Eliminate Financial Hardship	0.4	8,698	0.5	12,016	0.6	12,543
Eliminate Both Physical Strain and Financial Hardship	1.3	29,744	1.9	41,091	1.9	42,893
SOURCE: Analysis of data from the NLTCS and companion ICS.						

APPENDIX TABLE 1. Instrumental Variable Estimation of Admission to a Nursing Home Episode of 60 Days of Longer						
	Within 1 Year		Within 18 Months		Within 2 Years	
	Coefficient	P> t 	Coefficient	P> t 	Coefficient	P> t
ENDOGENOUS REGRESSORS						
Number of Formal Care Hours Recipient Received Last Week ^a	-0.005	0.82	0.001	0.98	0.013	0.68
Number of Informal Care Hours Recipient Received Last Week ^a	-0.041	0.48	-0.066	0.33	-0.039	0.61
Caregiver Reports High Caregiving-Related Stress (6-10 on a scale of 10)	0.121	0.05	0.167	0.01	0.174	0.03
RECIPIENT CHARACTERISTICS						
Age	0.004	0.00	0.005	0.00	0.005	0.00
Recipient is Female	-0.024	0.27	-0.038	0.14	-0.032	0.23
White Race	0.021	0.52	0.015	0.72	0.012	0.80
High School Graduate	0.058	0.02	0.046	0.11	0.033	0.28
Some College	0.009	0.73	0.000	1.00	-0.029	0.41
Enrolled in Medicaid	0.027	0.47	0.017	0.69	0.028	0.61
HMO Enrollee Any Month in the Last 6	0.062	0.05	0.078	0.02	0.053	0.14
Number of ADL and IADL Disabilities (out of 14) ^b	0.009	0.51	0.009	0.57	0.002	0.92
Receives Help With Transfer/ Mobility Most of the Time	0.007	0.77	0.004	0.87	0.024	0.41
Disability has Lasted 1-5 Years	0.034	0.15	0.029	0.32	0.031	0.37
Disability has Lasted 5 Years or Longer	0.037	0.10	0.032	0.29	0.041	0.27
Cognitively Impaired	0.047	0.05	0.059	0.05	0.054	0.13
Obese	0.022	0.38	0.004	0.86	-0.012	0.68
Total Inpatient Hospital Spending Last 6 Months ^a	0.004	0.23	0.004	0.28	0.003	0.48
NURSING HOME MARKET AND AREA CHARACTERISTICS						
Nursing Home Beds per 1,000 Persons 65+	0.001	0.01	0.001	0.02	0.001	0.04
Medicare Nursing Facility Reimbursement per Diem/Median	-0.035	0.64	0.005	0.96	-0.002	0.98
Physicians per 1,000 Persons	0.009	0.39	0.009	0.42	0.008	0.57
Hospital Beds per 1,000 Persons	-0.001	0.86	0.004	0.69	0.000	0.96
Area is in an MSA	-0.040	0.16	-0.043	0.18	-0.019	0.59
PROXY RESPONDENT AND SURVIVAL						
Respondent is a Proxy for Sampled Person	0.005	0.86	0.007	0.80	0.027	0.37
Months Survived Within Follow-up Period ^a	0.066	0.00	0.070	0.00	0.076	0.00
Constant	-0.464	0.00	-0.523	0.00	-0.533	0.01
R ²	0.037		0.015		0.057	
SOURCE: Stata survey ivreg procedure estimation using NLTCs and companion ICS.						
a. Value is logged.						
b. Included ADLs are eating, getting in/out of bed, getting around inside, dressing, bathing, and toileting. Included IADLs are light housework, laundry, meal preparation, shopping, getting around outside, taking medicines, and telephoning.						
Tests of IV Model Specification						
Partial R ² in First Stage Equations						
Formal care hours	0.09		0.09		0.09	
Informal care hours	0.13		0.13		0.13	
High caregiver stress	0.18		0.18		0.18	
Hansen's J (H ₀ : Instruments are uncorrelated with the error term and correctly excluded from the main equation.)	P-value		P-value		P-value	
	0.53	0.91	1.28	0.73	0.14	0.99

APPENDIX TABLE 2. Probit Estimation of Reduced From Model of High Caregiver Stress

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t	Coefficient	P> t
RECIPIENT CHARACTERISTICS								
Age	-0.010	0.16	-0.014	0.08	-0.013	0.16	-0.012	0.19
Recipient is Female	-0.199	0.13	-0.233	0.11	-0.137	0.41	-0.081	0.66
White Race	0.078	0.64	0.085	0.61	0.104	0.60	0.092	0.68
High School Graduate	-0.096	0.53	-0.031	0.86	-0.041	0.82	-0.033	0.87
Some College	0.080	0.64	0.231	0.21	0.218	0.29	0.360	0.14
Enrolled in Medicaid	0.161	0.29	0.006	0.97	0.031	0.86	0.012	0.95
HMO Enrollee Any Month in the Last 6	-0.026	0.87	-0.066	0.68	-0.044	0.80	-0.028	0.89
Number of ADL and IADL Disabilities (out of 14) ^a	0.110	0.00	0.110	0.00	0.079	0.00	0.038	0.12
Receives Help With Transfer/Mobility Most of the Time	-0.131	0.37	-0.090	0.55	-0.101	0.52	-0.071	0.70
Disability has Lasted 1-5 Years	0.170	0.35	0.182	0.34	0.232	0.27	0.203	0.40
Disability has Lasted 5 Years or Longer	-0.072	0.69	-0.070	0.71	-0.022	0.92	-0.049	0.85
Cognitively Impaired	0.135	0.29	0.102	0.43	-0.045	0.75	-0.023	0.88
Obese	0.014	0.92	-0.002	0.99	0.079	0.64	0.034	0.86
Total Inpatient Hospital Spending Last 6 Months ^b	0.018	0.06	0.016	0.11	0.011	0.32	0.003	0.77
RESPONDENT IS A PROXY FOR SAMPLED PERSON	0.119	0.41	0.137	0.37	0.145	0.40	0.043	0.82
CONTROLS FOR OMITTED ENDOGENOUS VARIABLES								
Formal Care Hours								
Home Health Agencies per 1,000 Persons 65+	-0.049	0.85	0.017	0.95	-0.064	0.84	0.062	0.88
Recipient Lives in Community Residential Care	-0.509	0.03	-0.500	0.04	-0.385	0.15	-0.239	0.40
Informal Care Hours								
Recipient Lives Alone	0.028	0.85	-0.015	0.92	0.050	0.77	0.102	0.60
Number of Daughters Within 1 Hour	0.033	0.50	0.008	0.89	-0.015	0.82	-0.030	0.66
CAREGIVER CHARACTERISTICS								
Caregiver is a Recipient's Child			0.312	0.05	0.341	0.04	0.462	0.01
Caregiver is Female			0.138	0.32	0.117	0.43	0.105	0.55
Nonspouse Caregiver has Minor Children			0.312	0.15	0.299	0.18	0.248	0.36
Caregiver's Health is Fair or Poor			0.565	0.00	0.401	0.01	0.291	0.10
INTENSITY OF CAREGIVING DEMANDS								
Recipient had Behavior Problems 3+ Times Last Week					0.645	0.00	0.489	0.00
Recipient can be Left Alone at Home <2 Hours					-0.031	0.86	0.006	0.98
Caregiver Sleep Disturbed 3+ Times Last Week					0.523	0.00	0.463	0.03
Caregiver has Backup if Needed					-0.111	0.44	-0.003	0.99
PHYSICAL AND FINANCIAL DEMANDS								
Caregiver Reports Caregiving is a Physical Strain ^c							0.957	0.00
Caregiving is a Financial Hardship ^c							0.418	0.04
CAREGIVER'S REPORTED NEEDS								
Help with Caregiving							0.137	0.38
A Break from Caregiving/Free Time							0.181	0.31
Constant	-0.991	0.08	-0.117	0.09	-1.344	0.08	-1.774	0.05
F-test	5220	0.00	5.030	0.00	5.230	0.00	4.460	0.00

SOURCE: Stata survey probit procedure estimation using NLTCs and companion ICS.

- a. Included ADLs are eating, getting in/out of bed, getting around inside, dressing, bathing, and toileting. Included IADLs are light housework, laundry, meal preparation, shopping, getting around outside, taking medicines, and telephoning.
- b. Value is logged.
- c. Caregiver rating is three or higher on a scale of one or five.