

Brief Communication: The Relationship between Having a Living Will and Dying in Place

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Background: Living wills, a type of advance directive, are promoted as a way for patients to document preferences for life-sustaining treatments should they become incompetent. Previous research, however, has found that these documents do not guide decision making in the hospital.

Objective: To test the hypothesis that people with living wills are less likely to die in a hospital than in their residence before death.

Design: Secondary analysis of data from a nationally representative longitudinal study.

Setting: Publicly available data from the Asset and Health Dynamics Among the Oldest Old (AHEAD) study.

Patients: People older than 70 years of age living in the community in 1993 who died between 1993 and 1995.

Measurements: Self-report and proxy informant interviews conducted in 1993 and 1995.

Results: Having a living will was associated with lower probability of dying in a hospital for nursing home residents and people living in the community. For people living in the community, the probability of in-hospital death decreased from 0.65 (95% CI, 0.58 to 0.71) to 0.52 (CI, 0.42 to 0.62). For people living in nursing homes, the probability of in-hospital death decreased from 0.35 (CI, 0.23 to 0.49) to 0.13 (CI, 0.07 to 0.22).

Limitations: Retrospective survey data do not contain detailed clinical information on whether the living will was consulted.

Conclusion: Living wills are associated with dying in place rather than in a hospital. This implies that previous research examining only people who died in a hospital suffers from selection bias. During advance care planning, physicians should discuss patients' preferences for location of death.

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Living wills are a type of advance directive used to document competent patients' preferences for life-sustaining medical treatments should they become incompetent. Public opinion surveys show that people generally favor the idea of completing living wills (1, 2) and prefer limiting some forms of treatment if they are terminally ill (3). However, only 20% of the population has a living will. Moreover, evidence that these documents influence end-of-life care is mixed (4–9).

Most research on the effect of living wills has used convenience samples of hospitalized patients (4, 6, 10, 11), nursing home residents (12–16), or outpatients (1, 3, 8). Most studies examine whether living wills change the pattern of care after hospitalization. These documents may also influence the hospitalization decision. If this is the case, the null findings in previous studies may be due to selection bias, whereby people who prefer less aggressive treatment avoid going to a hospital. The higher prevalence of living wills in population-based studies compared with hospital-based studies supports this argument (17–19). Indeed, the few studies that found an effect of advance directives on resource use considered only those directives present on hospitalization or written early during a terminal stay (6, 10, 11, 20). We hypothesize that people with living wills are less likely to die in a hospital than those without living wills. We believe that ours is the first study to examine the association between living wills and location of death by using a nationally representative, community-based sample.

METHODS

Sample

Data are from the Asset and Health Dynamics Among the Oldest Old (AHEAD) study, a biannual, longitudinal study of community-dwelling elderly people conducted by the University of Michigan Institute for Social Research, Ann Arbor, Michigan (21, 22). A multistage area probability sample was used to identify participants (21). To be eligible for the baseline survey in 1993, households had to have a person born in 1923 who was not in a nursing home or other institution (response rate, 80%). Sample weights were computed to adjust for the complex design and were calibrated by using the 1990 U.S. Census data to enable population inferences. The **Figure** presents the construction of the sample for the present study. The analytic sample is based on 539 informants for people who did not die suddenly or unexpectedly, representing 1 590 892 people older than 70 years of age who lived in the community in 1993 and died by 1995. The original survey staff obtained informed consent from participants. The University of Pittsburgh Institutional Review Board approved the study.

Dependent Variable

The dependent variable is death in a hospital versus death in a nursing home or at home. Too few individuals died in a hospice ($n = 18$) or other setting ($n = 32$) for these categories to be used in the analysis. The distribution of location of death was consistent with data from the 1993 National Mortality Followback Study (23).

Context

Do living wills affect where people die in the United States?

Contribution

Among a nationally representative sample of 539 people older than 70 years of age who died in the early 1990s, 40% had living wills. Living wills almost always addressed wishes to limit or withhold treatments in certain circumstances and to prevent pain. Compared with those without living wills, decedents with living wills more often died outside of the hospital, had particular treatments withheld, and received palliative treatment to keep them pain-free and comfortable.

Implications

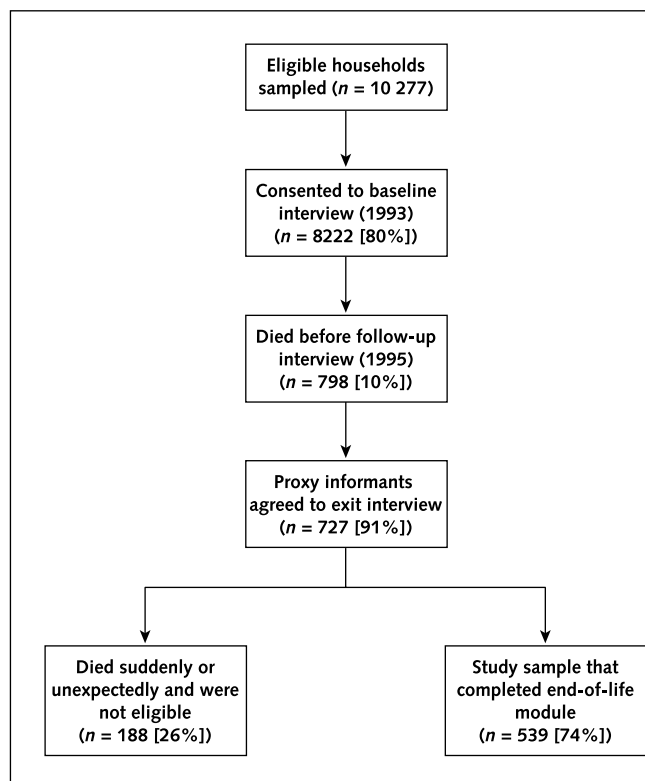
Living wills seem to be associated with dying in a setting other than a hospital.

—The Editors

Independent Variables

The main independent variable was whether the decedent had provided written instructions about treatment or care at the end of life (living will). Covariates were selected on the basis of careful review of the literature to identify factors that may confound the association between living wills and hospitalization.

Figure. Flow diagram of study sample.



Diagnoses of cancer, chronic lung disease, heart disease, and stroke were taken from both the baseline and exit interviews to measure prevalent and incident disease. Physical function was measured by counting limitations in basic (walking, dressing, bathing, eating, bed transfer, and toileting) and instrumental (preparing meals, shopping, using the telephone, taking medications, and managing money) activities of daily living at baseline (24).

Cognitive function at baseline was measured with different scales for people who were capable of self-report (75%) and those for whom a proxy informant was used (25%) (25). We converted each scale into *z* scores, which were combined into 1 variable. An interaction term was included to adjust for any systematic differences between the 2 scales.

Sociodemographic measures include sex, age, race or ethnicity, religion, and educational attainment. We included several measures of decedents' social networks: marital status (married vs. single, divorced, or widowed), living with people other than a spouse, and living nonresident children.

Statistical Analysis

To analyze bivariate relationships, we used *t*-tests and chi-square tests as appropriate for continuous and categorical variables. Preliminary analysis indicated that nursing home residence is a critical factor in determining the setting where people die. Nursing home residents rarely die at home ($n = 2$), and persons living in the community rarely die in a nursing home ($n = 5$). Multivariate logistic regression with robust standard errors was therefore used to examine factors that predict dying in a hospital versus dying "in place" (either at home or in a nursing home). Sample weights were used to account for the complex survey design and to make population inferences. No cases were missing data. All analyses were conducted by using Stata software, version 8.0 (Stata Corp., College Station, Texas).

We estimated a single logistic regression equation for decedents who were living in nursing homes and those who were living in the community before death, including an interaction term between living will and living arrangement. To account for the effects of the interaction and simplify presentation, and because odds ratios can overstate the relative risk for an event when the baseline rate is high (26, 27), we estimated predicted probabilities and 95% confidence limits of dying in a hospital for nursing home and community residents from the logistic regression model. We considered interaction terms among living will and other covariates; however, the sample size limited the power to explore alternative specifications.

Role of the Funding Source

The funding source had no role in the collection, analysis, or interpretation of the data or in the decision to submit the manuscript for publication.

RESULTS

The most common setting for death was the hospital (47%), followed by home (29%), nursing home (18%), hospice (3%), and other (3%). Living wills were completed by 40% of the sample (Table 1). Nursing home residents were more likely to have living wills than people living at home (47% vs. 32%; $P = 0.0014$). In most cases, living wills expressed a desire to limit medical treatments in certain situations (95%), withhold certain treatments (83%), and keep the person comfortable and pain-free and forgo extensive measures to prolong life (91%). Compared with those without living wills, decedents with living wills were less likely to have received all life-sustaining medical treatments (5% vs. 30%; $P < 0.001$), more likely to have had treatments withheld (65% vs. 29%; $P < 0.001$), and more likely to have had efforts made to keep them comfortable and pain-free (94% vs. 86%; $P = 0.0051$). Most proxy informants indicated that the written instructions applied to the actual situation (86%) and that the forms were consulted (70%). About 81% of living wills were written 2 years or more before death, and 84% of nursing home residents' living wills were completed before relocation.

We estimated the association between living wills and the probability of dying in a hospital, controlling for sociodemographic characteristics, health status, and availability of proxy decision makers. For those living in the community, having a living will was associated with an odds ratio of in-hospital death of 0.57 (95% CI, 0.35 to 0.94; $P = 0.028$). This represents a decrease in the probability of in-hospital death from 0.65 (CI, 0.58 to 0.71) to 0.52 (CI, 0.42 to 0.62). Among nursing home residents, the odds ratio for having a living will was 0.08 (CI, 0.04 to 0.17; $P < 0.001$). This represents a decrease in the probability of in-hospital death from 0.35 (CI, 0.23 to 0.49) to 0.13 (CI, 0.07 to 0.22). There was no evidence of an interaction, on the multiplicative scale, between living location and living will ($P = 0.15$).

The association between living wills and location of death persisted when the data were reanalyzed by using only those decedents who were severely cognitively impaired (19%) or who were not involved in end-of-life decision making (39%). Among those who were severely cognitively impaired, the odds ratios for those living in the community and for those living in nursing homes were 0.25 (CI, 0.08 to 0.81; $P = 0.021$) and 0.10 (CI, 0.02 to 0.56; $P < 0.001$), respectively. Among decedents who were not involved in end-of-life decision making, the odds ratios for those living in the community and for those living in nursing homes were 0.47 (CI, 0.22 to 0.97; $P = 0.042$) and 0.031 (CI, 0.01 to 0.12; $P < 0.001$), respectively. The pattern of predicted probabilities of in-hospital death for these subgroups is consistent with the main analysis (Table 2).

DISCUSSION

We found that living wills are associated with a lower probability of in-hospital death for people older than 70

Table 1. Descriptive Statistics*

Variable	Value
Cognitive function	
Proxy informant (score range, 1–34)	16.3 ± 0.36
Self-respondent (score range, 1–26)	11.4 ± 0.37
Age, y	80.6 ± 0.3
Activities of daily living, <i>n</i>	1.7 ± 0.1
Instrumental activities of daily living, <i>n</i>	1.5 ± 0.1
Proxy interview at baseline, %	25
Women, %	53
Education, %	
High school diploma	38
College degree or higher	10
White, %	85
Married, %	45
≥1 nonresident children, %	82
Nursing home resident in last 2 years of life, %	27
Religion, %	
Jewish	3
Protestant	63
Catholic	25
Health status, %	
Prevalence at baseline	
Heart disease or heart attack	41.1
Lung disease	19
Stroke or transient ischemic attack	21
Cancer	20
Incidence before death	
Heart disease or heart attack	14
Lung disease	5
Stroke or transient ischemic attack	13
Cancer	16
Living will, %	40

* Values expressed with plus/minus signs are means ± SD. Data are based on 539 informants representing 1 590 892 people older than 70 years of age living in the community in 1993 and dying by 1995. Percentages may not sum up to 100% because of rounding.

years of age, after adjustment for health status and other factors. This association persisted when we restricted the sample to those who did not participate in end-of-life decision making. These findings suggest that proxy decision makers are influenced by living wills.

Our findings are consistent with previous studies using death certificate data that found that people who died at home or in a nursing home were more likely to have a living will than those who died in a hospital (18, 19). Our findings are also consistent with nursing home–based stud-

Table 2. Predicted Probability of In-Hospital Death for Community and Nursing Home Residents

Type of Resident	Predicted Probability (95% CI)	
	No Living Will	Living Will
Community residents	0.65 (0.58–0.71)	0.52 (0.42–0.62)
Not involved in decision making	0.70 (0.61–0.79)	0.53 (0.38–0.67)
Severely cognitively impaired	0.62 (0.50–0.73)	0.29 (0.12–0.55)
Nursing home residents	0.35 (0.23–0.49)	0.13 (0.07–0.22)
Not involved in decision making	0.26 (0.12–0.48)	0.07 (0.02–0.20)
Severely cognitively impaired	0.24 (0.10–0.46)	0.15 (0.03–0.46)

ies that found that completing an advance directive is associated with lower rates of dying in a hospital (15, 16). By contrast, other studies have found that dying in the hospital is influenced by the local delivery system (28, 29). One study suggested that living wills do not typically provide useful instructions for physicians because the patient's condition does not always match the situations described in the document (30).

How do we reconcile our findings with studies that show that living wills do not influence patient care? One explanation for our contrasting findings is that previous studies suffer from selection bias. In particular, research based on terminal hospitalizations exclude people who die at home. The fact that those people are hospitalized indicates that they (or their families) want some type of medical intervention. A living will may not be enough to outweigh the hospital's technological imperative. Using location of death as an outcome of having a living will reveals that these documents may influence medical care more than was previously thought. Our findings suggest that proxy decision makers interpret living wills that indicate limiting treatment as implicit instructions to avoid hospitalization. Appointing a durable power of attorney for health care decisions may avoid some of the difficulties in interpreting a specific living will. However, exploratory analysis revealed that having designated a durable power of attorney was not associated with location of death.

Our findings are broadly generalizable to the population of people older than 70 years of age who died during a 2-year period. While people who died suddenly are not represented, living wills are unlikely to play a role in those cases. To the extent that a fraction of those who died suddenly had living wills and died in a hospital, our results would be overstated. However, there is no reason to suspect that having a living will is associated with sudden death. Therefore, the people who died suddenly are probably a random subset of all decedents, suggesting that our findings are unbiased.

As with most survey data, no medical records are available to ascertain whether the living will was consulted. It is possible that the living will is a marker for a preference not to die in a hospital and that the actual decision was based not on the living will but on the expressed preference of the individual. This may occur if the living will was written very shortly before death or during a person's terminal hospitalization or if individuals made their own decisions about medical care in their final days. Further research using different methods and data is needed to investigate the deeper reasons for our findings.

Finally, data on health care utilization, costs, and quality are not available. We could not determine whether people who died at home had recently been hospitalized or had used in-home hospice or home health services. For example, if people with living wills are more likely to die in the community, home health and hospice services may be substituted for acute hospitalization. Further research is

needed to understand the effect of dying in place on cost and quality of care.

We examined the association between living wills and location of death. The findings indicate that people with living wills, both nursing home residents and community-dwelling elderly people, are more likely to die in place than those without living wills. Physicians should discuss patients' preferences for location of death during the advance care planning process.

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