Why are White Nursing Home Residents Twice as Likely as African Americans to Have an Advance Directive? Understanding Ethnic Differences in Advance Care Planning

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ABSTRACT

Objectives. To determine the extent to which observed differences between White and African American nursing home residents in having an advance directive are attributable to differences between the groups in personal characteristics, facilities, or the counties in which the facilities are located.

Methods. Using the Medical Expenditure Panel Survey Nursing Home Component matched with county-level measures from the Area Resource File, the probability of having an advance directive is modeled as a function of nursing home resident, facility, and county characteristics for African American and White residents.

Results. The probability of having an advance directive is 27% for African Americans and 63.6% for Whites. Nearly half of this 36.6 percentage point gap can be explained by group differences in personal, facility, and county characteristics.

Discussion. County characteristics play a more prominent role than personal or facility measures in explaining the observed ethnic gap in having an advance directive. Additional studies should focus further on geographic, health status, and attitudinal variations among nursing home residents that may account for the remaining ethnic difference in advance directives among nursing home residents.

Key words: advance care planning, advance directives, long-term care, ethnic differences

INTRODUCTION

Ideally, well before someone in long-term care begins entering a trajectory toward death, the individual, family members, and health care providers should engage in ongoing discussions about treatment options (Travis, et al., 2002). A part of this advance care planning process may be the establishment of one or more advance directives--documents that specify someone's wishes regarding treatment decisions or identify a proxy for healthcare decisions if the individual should become incapable of making decisions. Proponents of advance care planning and advance directives have argued that they extend autonomy (Davidson, Hackler, Caradine, & McCord, 1989; High, 1987), an argument that contributed to the passage of the Patient Self-Determination Act of 1991. The Act requires that persons in healthcare and long-term care institutions reimbursed by Medicare or Medicaid, including nursing homes, be informed of their rights to advance care planning and to establish advance directives. Recent studies have found that efforts to encourage advance care planning in nursing homes increased markedly after passage of the Act (Molloy et al., 2000).

Since the promulgation of the legislation, several authors have documented ethnic differences in advance directives (Castle & Mor, 1998; Degenholtz, Arnold, Meisel, & Lave, 2002; Kellogg & Ramos, 1995; Kiely, Mitchell, Marlow, Murphy, & Morris, 2001; McAuley & Travis, 2003; O'Brien et al., 1997; Suri, Egleston, Brody, & Rudberg, 1999). African American nursing home residents, in particular, tend to be much less likely to have an advance directive and are more likely to desire aggressive interventions near the end of life. This finding is robust, even when controlling for other pertinent factors. Clearly, there are many reasons why African Americans may be less likely to establish an advance directive, including their historical mistreatment in healthcare and their resulting mistrust of health professionals (Caralis, Davis, & Wright, 1993,

Dula, 1994) and their religious beliefs (McAuley, Pecchioni, & Grant, 2000). Such factors should be should be understood at the individual level and respected. However, knowing more about the basis for group differences in advance directives between White and African American is also important. Therefore, the major objective of this research is to determine the extent to which ethnic differences in advance care planning are attributable to differences in the personal characteristics of African American and White nursing home residents, the facilities in which they reside, and the counties in which the facilities are located. To our knowledge, this is the first study to consider the factors that may underlie White-African American differences in advance care planning with a nationally representative sample of nursing home residents while controlling for resident, facility, and county characteristics.

The conceptual framework for this investigation is founded on the assumption that the process of advance care planning in long-term care is both multifaceted and complex and, as a result, investigations of the probability of having an advance directive must take into account several categories of variables. Specifically, decisions about advance directives in nursing homes are potentially influenced by: (a) numerous personal factors, (b) the micro-environmental characteristics of the facility, and (c) the broader social and economic environment represented by the county in which the facility is located. We discuss each of these three factors below.

Much of the prior work on ethnic differences in advance directives has focused on personal characteristics of the individual. Several studies (Bradley, Wetle, & Horwitz,, 1998; Castle & Mor, 1998; McAuley & Travis, 2003) have identified positive associations between age and having an advance directive. Prior work (Bradley et al., 1998; McAuley & Travis, 2003) has also shown that individuals with the following personal characteristics are more likely than others to have an advance directive: (a) more educated individuals (McAuley & Travis, 2003), (b) men

(O'Brien et al., 1997), (c) residents whose stay is reimbursed by Medicaid (Bradley et al., 1998; McAuley & Travis, 2003; Suri et al., 1999), and (c) those with a living child (Eleazer et al., 1996; McAuley & Travis, 2003). Furthermore, longer stays may be correlated with age, having more time to implement an advance directive, or enhanced relationships with staff—all factors that could influence whether or not and advance directive is established. Some diagnoses/conditions that are correlated with terminal decline of the resident, such as cancer, have also been shown to be related to having an advance directive (Castle & Mor, 1998; McAuley & Travis, 2003).

Regarding facility characteristics that may be associated with having advance directives, there is evidence of ethnic segregation of residents into different types of nursing homes, with African Americans being far more likely to reside in facilities with higher percentages of residents funded by Medicaid and with relatively fewer nurses (Mor, Zinn, Angelelli, Teno, & Miller, 2004). Lower staffing levels, especially professional staff, may result in less time with residents in general and limited supportive communication about advance care planning, thereby limiting the likelihood of having an advance directive. Castle and Mor (1998) used a large sample of nursing home residents in ten states to consider how characteristics of facilities influence the probability that residents have an advance directive. They found that ownership type, chain affiliation, size of the facility, occupancy rate, nurse staffing levels, and the proportion of residents funded by Medicaid all impact the probability that a resident adopts an advance directive. Therefore, notwithstanding the probability that some individuals enter the facility with previously established advance directives, the nursing home environment may impact the overall prevalence of advance directives among residents.

Geographic characteristics clearly play a role in whether a nursing home resident establishes an advance directive. Castle and Mor (1998) found that the level of concentration in the local nursing home market and whether the state in which the facility was located had a prospective or retrospective Medicaid reimbursement scheme were significant for some types of advance directives. Others have identified significant state (Kiely et al., 2001) and regional (Levin et al., 1999) differences in advance directives. Buchanan and colleagues (2004) found that nursing home residents in rural facilities were, on average, much more likely to have an advance directive and that African American residents were more likely to be in urban facilities. Given the strong evidence of geographic variation in the prevalence of advance directives among nursing facility residents, and the fact that both staff and residents are likely to originate relatively near facilities, it is reasonable to assume that there are geographic differences in such factors as income, poverty, education, or ethnic and age composition that could at least partially explain ethnic differences in having an advance directive by residents. The work of Fisher (Fisher and Wennberg, 2003; Fisher et al., 2000) demonstrates the power of location variables in the utilization and quality of acute care. Therefore, although prior research has not specifically investigated this line of reasoning, we view geographic characteristics as potentially important factors in explaining African American-White differences in advance directives.

METHODS

Data

Our analysis is based upon Round 1 of the Medical Expenditure Panel Survey Nursing Home Component (MEPS-NHC) matched with county-level measures obtained from the Area Resource File (ARF). The MEPS-NHC is a nationally representative sample of individuals who were residents on January 1, 1996. Its sample size (3,209 residents) is sufficiently large to allow

for an in-depth study of the two target ethnic groups: Whites and African Americans, and it has a battery of items regarding both residents and facilities. Furthermore, the MEPS-NHC can be merged with information regarding the county in which the facility is located. For detailed information on the design and methods of the MEPS-NHC survey, see Potter (2001). Ninety-three residents (3%) were of an ethnicity other than African American or White and were therefore excluded from the research sample. In addition, 320 records had missing data for some of the resident characteristics. Of the remaining 2,796 records, 131 observations with missing facility data were eliminated. The research dataset include 2,665 residents in 730 facilities.

Measures

All results presented in this paper take into account the complex sample survey design of the MEPS-NHC by using the appropriate survey weights (to give unbiased estimators for all nursing home residents in the U.S.) and accounting for cluster sampling and stratification (to eliminate bias in standard error estimates). The Stata statistical software package (StataCorp, 2003) was use for all analyses. The presence of an advance directive was indicated if at least one of the following four types of advance directives was found in the resident's record or chart on January 1, 1996: 1) a living will, 2) a do not resuscitate order, 3) a do not hospitalize order, or 4) limits on feeding, medication, or other treatments.

Resident Characteristics

Variables used in the analysis are presented in Table 1. Two broad types of resident characteristics were included: demographic measures and measures of health status and functional ability. Due to the large number of missing values for education, resident education in this study is measured using two binary variables: one for whether education was recorded and one for whether graduation from high school was recorded.

Because most nursing facilities are required to complete Minimum Data Set (MDS) forms for residents, the MEPS-NHC survey was designed to collect information on health status and functioning from the MDS forms, when available. The MDS data were supplemented with information from medical records. The health status measures used in this analysis consist of a series of thirteen binary variables, indicating the presence or absence of a particular diagnosis or condition. The MDS forms were also the primary source for measures of cognitive function and physical disability, which may be more directly indicative of capacity than conditions/diagnoses. In particular, the models include information on modes of transfer (Bed Rails), psychosocial well-being (Goals), and memory/cognitive skills (Memory) using a 7-day look back period.

[Table 1 about here]

Facility Characteristics and County Characteristics

We used measures similar to those employed by Castle and Mor (1998), discussed above, to address group differences in facilities. As was previously noted, although there is evidence of geographic variation in advance directives, virtually no research has examined whether county characteristics are useful in explaining the African American-White difference in having an advance directive. Counties are useful geographic divisions to employ in this type of analysis, because of the widely available county-level measures through the ARF. In addition to an indicator of whether the nursing home is in a metropolitan versus non-metropolitan county, we considered per capita income, education, poverty levels, racial composition, and the proportion of the population age 65 and older in the facility's county. Most, but not all nursing home residents originate in the county in which the facility is located (McAuley, Pecchioni, & Grant 1999; McAuley and Usita, 1998). Therefore these measures are acceptable controls for the socio-

economic differences at the county level that may shape the geographic environment in which communication and decision-making about advance directives is occurring.

Descriptive Statistics

Table 1 presents sample means for African American and White residents for each of the analytical variables. As shown, 63.4% of all White residents had at least one advance directive, but only 27% of African Americans had any advance directive. This implies that without controls Whites are 2.35 times more likely than African Americans to have an advance directive. Other differences in the average characteristics of African American and White residents displayed in Table 1 suggest that it would be useful to explore empirically how these differences affect the probability of having an advance directive.

Probit Estimates: Full Sample

To more closely examine the effect of ethnicity itself on the gap in the proportion of Whites and African Americans with advance directives, first, the probability of having an advance directive was modeled as a function of resident, facility, and geographic characteristics for all African American and White residents. The estimated marginal effect associated with the African American binary variable can reveal the degree to which being African American decreases a resident's probability of having an advance directive when controlling for other factors, for a resident with average characteristics.

Probit Estimates Using Sub-Samples: African American and White

Following the single-equation probit estimation, the data were subdivided into two samples: White residents and African American residents. Using these sub-samples, probit estimates of the probability of having an advance directive were estimated separately for two reasons. First, separate estimates of marginal effects can reveal whether personal, facility, and county

characteristics have the same impact on the likelihood of having an advance directive for the two groups. Second, the separate estimates may be used in conjunction with sub-sample means to determine how much of the white-African American difference in the probability of having an advance directive may be attributable to differences in measured average group characteristics.

More formally, the outcome of interest is whether or not the resident has any advance directive. The probability of having an advance directive is specified as follows:

$$Pr(Y_{iR} = 1 | X_{iR}) = \Phi(X_{iR}\beta), \quad (1)$$

where X_{iR} represents individual, facility, and county characteristics attributable to individual *i* with ethnicity type *R*, $Y_{iR} = 1$ implies that the individual has an advance directive, β is the vector of parameters, and Φ represents the cumulative density function for the standard normal. The estimated coefficients, $\hat{\beta}$, and sample means were used to compute estimated marginal effects. For continuous variables in X_{iR}, such as county-level per capita income, the marginal change in the k^{th} continuous variable, x_k, on the probability that $Y_{iR} = 1$ is

$$M_{ik} = \hat{\beta}_k \phi\left(\overline{X}\hat{\beta}\right) \quad (2)$$

where ϕ is the normal probability density function and $\overline{X}$ is the mean value of *X* over the sample used to estimate the model. For binary variables in X_{iR}, the effect of switching the k^{th} binary variable from 0 to 1 is

$$M_{ik} = \Phi(x_{ik1}\hat{\beta}) - \Phi(x_{ik0}\hat{\beta}) \quad (3)$$

where x_{ik1} indicates that the binary variable takes a value of one, x_{ik0} indicates that the variable takes a value of zero, and the remaining elements of X_{iR} are set at the sample mean. For example, the estimated marginal effect associated with the African American binary variable reveals the

degree to which being African American increases (or decreases, if negative) a resident's probability of having an advance directive for a resident with otherwise average characteristics. Using the estimates of β, which for the African American sample is $\hat{\beta}_B$ and for the White sample, $\hat{\beta}_W$, the vectors of African American (X_{iB}) and White (X_{iW}) characteristics, and the size of the African American (n_B) and White (n_W) samples, the degree to which the gap in the probability of having an advance directive is explained by differences in measured characteristics of African American and White residents as follows:

$$Explained = 1/n_W \sum_{i=1}^{n_W} \Phi\left(X_{iW}\hat{\beta}^*\right) - 1/n_B \sum_{i=1}^{n_B} \Phi\left(X_{iB}\hat{\beta}^*\right), \quad (4)$$

where $\hat{\beta}^* = \frac{n_W}{(n_W + n_B)}\hat{\beta}_W + \frac{n_B}{(n_W + n_B)}\hat{\beta}_B$ (5).

In words, *Explained* indicates the degree to which the gap in the probability of having an advance directive is explained by differences in the measured characteristics of African American and White residents and the facilities and counties in which they are situated. Similar to methods presented by Cotton (1988) and Neumark (1988) for continuous dependent variables, a technique for use with binary dependent variables found in Troyer (2002) was used to further decompose equation (4). Doing so allows us to determine the amount of the Explained portion of the gap that is attributable to each explanatory variable, where the contribution of each explanatory variable depends on the ethnic group differences in the means for that variable and the effect of that variable on the probability of having an advance directive.

RESULTS

The marginal effects and the p-values from the probit model for the full sample are contained in the first and second columns of Table 2. When compared to White residents, African

American residents are approximately 23% less likely to have an advance directive, when controlling for other factors that may affect having an advance directive and assuming that the characteristics of White and African American residents have the same impact on advance directive adoption.

[Table 2 about here]

Turning to the sub-sample estimates, the experiences of African American and White residents are similar in some respects and different in others. Residents from both groups with Alzheimer's disease or dementia are more likely to have an advance directive, while living in a facility located in a county with a higher proportion of poverty and more seniors per capita decreases the probability of having an advance directive for both. In terms of sub-sample differences, being in the nursing home for at least two years has no effect on the likelihood of having an advance directive for Whites but a positive effect for African Americans. There are also differences in the effect of county characteristics; being in a metropolitan area and in an area with a higher proportion of individuals living in poverty markedly decreases the probability of having an advance directive for African Americans, while the effect is close to zero for Whites.

Given the relatively large number of explanatory variables and the relatively small number of African American residents in the sample (218), many of the coefficients for the explanatory variables are not significant at the conventional .05 level. Like the problem of multicollinearity, when one has a micronumerosity problem, the estimated coefficients on the explanatory variables remain unbiased, but the confidence intervals tend to be wide. However, the decomposition of the gap in the probability of having an advance directive does not require statistically significant coefficient estimates.

Table 3 contains information on the size of the ethnic gap in the probability of having an advance directive, the extent to which the gap is explained by differences in personal, facility, and county characteristics, and the degree to which each explanatory variable helps to explain group differences in the probability of having an advance directive. Of the 36.6% gap in the probability of having an advance directive between African Americans and Whites, 44% (or 16 of the 36.6 percentage points) can be explained by differences in the average characteristics of African American and White residents.

[Table 3 about here]

Approximately half of the explained portion of the gap in advance directives is attributable to differences in county characteristics. For example, the average African American resident is more likely to live in a metropolitan facility (77.9%) than a White resident (69.7%) and in a county with a higher proportion of individuals in poverty (16.7% for African Americans and 12.9% for Whites), which is consistent with findings by Mor et al. (2004). As the probit estimates reveal, residents of facilities in metropolitan areas and counties with more poverty are less likely to have an advance directive. Thus, part of the gap between the two ethnic groups can be explained by group differences in metropolitan/nonmetropolitan location (1.21%) and the percentage in poverty in the facility county (6.44%).

Among facility characteristics, the most important variable in explaining the probability gap is the proportion of Medicaid recipients in the nursing home. A higher Medicaid census is associated with a lower probability of having an advance directive, and African Americans tend to be in homes with higher proportions of Medicaid residents.

In general, demographic differences are more important in explaining the probability gap between groups than the resident health status variables. The three most important demographic

measures are possession of a high school diploma, the presence of a living child, and being age 85 or older. In all three cases, these factors increase the probability of having an advance directive, and White residents are more likely to possess the characteristics.

It is important to note that some of the characteristics actually serve to increase the difference in advance directives (negative signs on the contribution value in Table 3). African American residents are on average more likely to be diagnosed with Alzheimer's disease, which has a small positive effect on the probability of having an advance directive. Thus ethnic group differences in the prevalence of Alzheimer's disease does not help to explain the lower average rates of adoption of advance directives for African American residents.

DISCUSSION

Building upon previous documentation of African American-White differences in the prevalence of advance directives among nursing home residents, this research was based upon a conceptual framework emphasizing the importance of examining the personal, institutional, and geographic factors that might explain these differences. Our work goes several steps further than prior research by using a nationally representative sample, incorporating all three levels of potential explanatory factors, and determining the relative impact of personal, institutional, and geographic factors on the African American-White difference in use of advance directives. Although group differences in the prevalence of advance directives persist under control for these factors, 44% of the gap in the probability of having an advance directive is explained by differences in the measured group characteristics.

A large portion of the explained difference comes from group differences in facility and county characteristics. Nearly all prior work on ethnic differences in advance directives has

failed to include facility-level measures, and, to our knowledge, this is the first study to attempt to quantify and assess the impact of a battery of county-level characteristics.

The most important facility characteristic in explaining the probability gap is the proportion of Medicaid recipients in the nursing home. A higher Medicaid census is associated with a lower probability of having an advance directive, and African Americans tend to be in homes with higher proportions of Medicaid residents. In the face of high Medicaid populations (and related lower average revenue), facilities may be unable to commit the resources necessary to support residents in advance care planning.

Given the impact of institutional and geographic characteristics, future research should focus on continuing to identify the underlying location- and facility-specific factors that influence differences in advance directives. Among the facility factors that may be important to consider are: (a) the type and amount of staff training and whether there are special internal policies or programs regarding when/how to provide information about advance care planning, (b) administrative and staff attitudes about advance directives, and (c) whether staff deal differently with Whites and African Americans in the presentation of advance directive options.

Among the underlying location-specific factors that may influence African American-White differences in the utilization of advance directives are social norms, differential availability of and access to healthcare and long-term care, and other factors that generate incentives or disincentives by ethnic group to engage in advance care planning. Along similar lines, future research should continue to pursue the development of richer measures that help to explain geographic differences in advance directives that are correlated with ethnicity in the U.S. Geographic variables such as physician supply, hospital characteristics, relationships of hospitals and nursing homes, and availability of home health agencies, may influence local nursing home

populations and their use of advance directives. One avenue for such research is the inclusion of information about the county of prior residence, in addition to characteristics of the county in which the facility is located, because the facility county is not always the nursing home resident's county of origin. Inclusion of appropriate state-level variables might also improve our understanding of African American-White differences in the use of advance directives. Still another avenue for research into geographic factors is the inclusion of finer geographic categories, such as census tracts, or zip codes, which should permit refinements in the definition of geographic location (Morrill, Cromartie, & Hart, 1999). Also, methods have been developed to determine nursing home markets based upon geographic units that are smaller than counties (Zwanziger, Mukamel, & Indridason, 2002). Inclusion of this finer geographic detail should improve the operationalization of both market areas of facilities and communities of residence.

One of the limitations of this study is the incomplete set of resident characteristics in the MEPS-NHC. For example, if more detailed health status measures were available, one might find that differences in diagnoses would play a more prominent role in explaining ethnic group differences in the use of advance directives. In addition, the fact that a considerable percentage of the difference in White-African American adoption of advance directives remains in spite of the introduction of numerous individual, facility, and geographic variables point to the importance of ethnically relevant, health-related personal factors in the differential utilization of advance directives. These factors might include attitudes about death and dying (Waters, 2001); religious values (Gamble, 1993; Roberson, 1985, Waters, 2001); historically-based concerns on the part of African Americans about the true intentions of those who provide information about advance directives and related apprehensions about the implications of signing advance directives (Dula, 1994; Waters, 2001); and expectations that such decisions should be made by a

trusted friend or family member (Waters, 2001). Further research should consider the extent to which these issues affect the differences in the utilization of advance directives. This information could ultimately be used to generate more ethnically sensitive approaches to providing information about advance directives in long-term care facilities. In addition, the MEPS-NHC data were collected in January 1996. It would be very useful to consider more recent information on advance directives, though there is evidence that the percentage of nursing home residents with advance directives has not increased since this period (McAuley & Travis, 2003). Some imprecision in the analyses may be introduced by the fact that we did not statistically account for the multi-level data, although this problem is most likely to affect significance levels, which are not critical to our work. In a similar vein, it would be valuable to examine rates of use across similar counties and facilities, which would require a larger sample than the MEPS-NHC. Finally, we should also note that having an advance directive on file does not necessarily mean that it will be acted upon. Advance directives are, at best, limited indicators of the current outcomes of end of life discussions that should accompany healthcare and long-term care decision making in old age.

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Table 1: Description of Variables and Means

Variable	Definition	Mean Af.Am.	Mean White
Any Directive	Dummy variable, whether has any advance directive, including living will; do not resuscitate order; do not hospitalize order; and limit on feeding, medication, or other treatment (1)	0.270	0.634
Resident Characteristics: Demographic			
HighSchool Educ	Dummy variable, whether a high school graduate (1)	0.161	0.368
Missing Educ	Dummy variable, whether education level is recorded (1)	0.206	0.184
Early Admission	Dummy variable, whether admission before 1994 (1)	0.471	0.477
Live Child	Dummy variable, whether known to have at least one living child (1)	0.541	0.708
Male	Dummy variable for gender (male=1)	0.380	0.270
Medicaid	Dummy variable, whether covered by Medicaid on January 1, 1996, or at admission (1)	0.906	0.679
Very Old	Dummy variable, whether age 85 or older (1)	0.353	0.514
Resident Characteristics: Health Status			
Allergy[a]	Dummy variable, whether has hypersensitivity caused by exposure to a particular allergen (1)	0.065	0.184
Alzheimer's[a]	Dummy variable, whether has Alzheimer's disease (1)	0.164	0.149
Anemia[a]	Dummy variable, whether has anemia of any etiology (1)	0.249	0.170

Arthritis[a]	Dummy variable, whether has degenerative joint disease, osteoarthritis, and/or rheumatoid arthritis (1)	0.203	0.256
Cancer[a]	Dummy variable, whether has cancer (1)	0.076	0.071
Cardiac Dysr[a]	Dummy variable, whether has cardiac dysrhythmia (1)	0.039	0.105
Dementia[a]	Dummy variable, whether has diagnoses of organic brain syndrome or chronic brain syndrome, senility, senile dementia, multi-infarct dementia, or dementia related to neurologic diseases other than Alzheimer's (1)	0.418	0.356
Depression[a]	Dummy variable, whether has depression (1)	0.054	0.221
Emphysema[a]	Dummy variable, whether has emphysema or chronic obstructive pulmonary disease (1)	0.115	0.134
Heart Failure[a]	Dummy variable, whether has congestive heart failure (1)	0.204	0.215
Vascular[a]	Dummy variable, whether has peripheral vascular disease (1)	0.106	0.076
Seizure[a]	Dummy variable, whether the resident has seizure disorder (1)	0.120	0.078
Stroke[a]	Dummy variable, whether has had a cerebrovascular accident or stroke (1)	0.283	0.200
Bed Rails[b]	Dummy variable, whether uses bed rails daily (1)	0.633	0.620
Goals[b]	Dummy variable, whether able to establish own goals (1)	0.256	0.311
Memory[b]	Dummy variable, whether has a problem with long-term or short-term memory (1)	0.736	0.701
Facility Characteristics:			

For-Profit	Dummy variable, whether for-profit (1)	0.730	0.666
Non-Profit	Dummy variable, whether non-profit (1)	0.198	0.236
Chain	Dummy variable, whether part of a chain (1)	0.545	0.544
Beds	Number of nursing home beds in the facility	175.5	148.3
Occupancy	Proportion of nursing home beds occupied	90.4	90.5
% Medicaid	Proportion of residents in the facility funded by Medicaid	79.5	65.2
FTE RNs	Full-time equivalent RNs per patient per day	0.013	0.017
FTE LPNs	Full-time equivalent LPNs per patient per day	0.020	0.020
FTE Aides	Full-time equivalent Aides per patient per day	0.053	0.064
County Characteristics:			
Metro	Dummy variable, whether metropolitan (1)	0.779	0.697
Income	Per capita income	24299	23360
Pct High School	Proportion of those 25 and older with at least a high school diploma	70.0	74.5
Pct Poverty	Proportion of persons in poverty	16.7	12.9
Pct African Am	Proportion of the population that is African-American (non-Hispanic)	26.1	10.0
Pct 65+	Proportion of the population that is age 65 or older	13.1	14.0
Number of Residents		218	2447
Number of Facilities		730	

[a]Because most nursing homes are required to complete Minimum Data Set (MDS) forms for residents, the MEPS-NHC survey was designed to collect information on health status and

functioning from the MDS forms, when available. Data were supplemented with information from medical records.

[b]The MDS forms were also the primary source for the measures of modes of transfer (Bed Rails), psychosocial well-being (Goals), and memory/cognitive skills (Memory) using a 7-day look back.

Table 2: Probit Estimates of Probability of Any Directive

	Probit Marginal Effects					
	All	P-value	Af. Am.	P-value	White	P-value
African American	-0.2286	(0.00)				
Resident Characteristics: Demographic						
HighSchool Educ	0.0356	(0.26)	-0.4807	(0.22)	0.0403	(0.20)
Missing Educ	-0.0059	(0.83)	-0.0059	(0.99)	-0.0054	(0.81)
Early Admission	-0.0047	(0.81)	0.4787	(0.01)	-0.0163	(0.40)
Live Child	0.0558	(0.00)	0.1852	(0.44)	0.0543	(0.00)
Male	-0.0330	(0.13)	-0.3141	(0.14)	-0.0275	(0.25)
Medicaid	0.0036	(0.81)	0.3831	(0.46)	0.0074	(0.62)
Very Old	0.1067	(0.00)	-0.0138	(0.96)	0.1128	(0.00)
Resident Characteristics: Health Status						
Allergy	0.0298	(0.35)	-0.4789	(0.32)	0.0327	(0.31)
Alzheimer's	0.1173	(0.00)	0.3490	(0.16)	0.1195	(0.00)
Anemia	-0.0024	(0.94)	-0.0020	(0.99)	0.0002	(1.00)
Arthritis	0.0613	(0.00)	0.2014	(0.50)	0.0652	(0.01)
Cancer	0.0543	(0.30)	-0.1880	(0.58)	0.0586	(0.28)
Cardiac Dysr	0.0362	(0.12)	-0.0209	(0.95)	0.0360	(0.13)
Dementia	0.0394	(0.09)	0.4465	(0.09)	0.0325	(0.19)
Depression	0.0634	(0.00)	0.5101	(0.28)	0.0614	(0.00)
Emphysema	0.0340	(0.24)	-0.0473	(0.90)	0.0384	(0.22)

Heart Failure	0.0372	(0.01)	0.0665	(0.80)	0.0424	(0.03)
Vascular	-0.0133	(0.60)	-0.2879	(0.37)	0.0014	(0.95)
Seizure	-0.0601	(0.15)	-0.1844	(0.65)	-0.0676	(0.11)
Stroke	0.0299	(0.08)	-0.3665	(0.11)	0.0456	(0.03)
Bed Rails	0.1011	(0.00)	0.1782	(0.55)	0.1005	(0.00)
Goals	-0.0125	(0.49)	-0.1697	(0.63)	-0.0115	(0.47)
Memory	-0.0087	(0.79)	0.2703	(0.21)	-0.0149	(0.67)
Facility Characteristics:						
For-Profit	0.0141	(0.69)	-0.6426	(0.15)	0.0168	(0.62)
Non-Profit	0.0706	(0.13)	-0.1816	(0.73)	0.0753	(0.08)
Chain	-0.0187	(0.39)	-0.3465	(0.13)	-0.0049	(0.83)
Beds	0.0000	(0.97)	-0.0009	(0.58)	0.0000	(0.91)
Occupancy	0.0030	(0.00)	0.0076	(0.53)	0.0030	(0.00)
Pct Medicaid	-0.0019	(0.00)	-0.0081	(0.15)	-0.0019	(0.00)
FTE RNs	0.3420	(0.61)	2.0654	(0.67)	0.3511	(0.63)
FTE LPNs	-0.2689	(0.59)	-1.2221	(0.65)	-0.1977	(0.73)
FTE Aides	-0.1237	(0.77)	-4.0417	(0.41)	-0.1539	(0.70)
County Characteristics:						
Metro	-0.0556	(0.08)	-0.6047	(0.07)	-0.0486	(0.15)
Income (000s)	-0.0037	(0.02)	-0.0105	(0.60)	-0.0038	(0.06)
Pct High School	0.0053	(0.03)	-0.0358	(0.16)	0.0071	(0.00)
Pct Poverty	-0.0073	(0.00)	-0.0948	(0.00)	-0.0046	(0.05)
Pct African-American	-0.0021	(0.08)	-0.0089	(0.52)	-0.0022	(0.06)

Pct 65+	-0.0043	(0.03)	-0.0736	(0.04)	-0.0036	(0.10)
Number of Observations	2665		218		2447	

Table 3: Explained vs. Unexplained Differences in Advance Directives Between African-American and White Residents

Probability of Advance Directive: White	63.66%	
Probability of Advance Directive: African-American	27.03%	
Percentage Point Difference in Probability of Any Directive	36.63%	
	Total	Percent
Decomposition of Gap in Probability of Advance Directive	Gap	of Gap
Explained by Differences in Group Characteristics	16.02%	44%
Unexplained by Differences in Group Characteristics	20.61%	56%
Percentage Point Difference in Probability of Any Directive	36.63%	100%

Contribution of Resident, Facility, and County Characteristics to Explaining Gap

Resident Characteristics: Demographic		
HighSchool Educ	1.43%	
Missing Educ	0.04%	
Early Admission	-0.01%	
Live Child	2.42%	
Male	0.97%	
Medicaid	-0.65%	
Very Old	4.48%	
Portion of Gap Explained by Resident Characteristic: Demographic		8.68%
Resident Characteristics: Health Status		

Allergy	0.51%	
Alzheimer's	-0.47%	
Anemia	0.01%	
Arthritis	0.84%	
Cancer	-0.06%	
Cardiac Dysr	0.43%	
Dementia	-0.66%	
Depression	3.03%	
Emphysema	0.19%	
Heart Failure	0.11%	
Vascular	0.04%	
Seizure	0.75%	
Stroke	-0.75%	
Bed Rails	-0.32%	
Goals	-0.20%	
Memory	0.09%	
Portion of Gap Explained by Resident Characteristics: Health Status		3.54%
Contribution of Resident, Facility, and County Characteristics to Explaining Gap		
Facility Characteristics:		
For-Profit	0.00%	
Non-Profit	0.57%	
Chain	0.00%	
Beds	0.05%	

Occupancy	0.11%	
Pct Medicaid	7.33%	
FTE RNs	0.42%	
FTE LPNs	-0.02%	
FTE Aides	-0.71%	
Portion of Gap Explained by Facility Characteristics		7.75%
County Characteristics:		
Metro	1.21%	
Income (000s)	0.92%	
Pct High School	6.85%	
Pct Poverty	6.44%	
Pct African-American	9.65%	
Pct 65+	-1.04%	
Portion of Gap Explained by County Characteristics		24.03%