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Reported Expectations for Nursing Home Placement Among Older Adults and Their Role as Risk Factors for Nursing Home Admissions

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Abstract

Purpose—Individual expectations among community-dwelling older adults and their subsequent effect on placement status have recently been considered. Previous studies, however, have been limited by eligibility and exclusion criteria, treating expectations as a continuous measure, omitting potential confounders, and ignoring Race × Gender interactions.

Design and Methods—We used data on 6,242 Black or White self-respondents who were 70 years old or older when they were enrolled in the survey of Assets and Health Dynamics Among the Oldest Old. We modeled expectations for nursing home placement over the next 5 years, as well as actual placement status, by using multivariable multinomial and binomial logistic regression models.

Results—Expectations are not normally distributed: 14% of the participants refused to answer, 51% estimated no chance, 10% indicated a 1% to 50% chance, 21% indicated an 11% to 50% chance and 4% indicated a 51% to 100% chance. Age, gender, education, social supports, and health status were associated with expectations, as well as an interaction effect for Black men. Age, social supports, health status, prior hospital or nursing home use, and expectations were associated with subsequent placement.

Implications—Black and White older adults' expectations for nursing home placement rationally reflect their individual risk profiles and are associated with subsequent placement status. The expectations question may facilitate the early identification of high-risk individuals for further evaluation.

Keywords

African American elders; Health services research; Logistic modeling; Nursing homes; Long-Term care

The most frequently used conceptualization for studying the risks associated with nursing home placement is Andersen's (1968) behavioral model of health services use. This framework focuses on individual characteristics relevant to the decision to seek health care (Andersen & Newman, 1973), and it posits that the determinants can be classified into three components:

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the predisposing, enabling, and need (illness) characteristics of the individual. These three components are very appropriate for studying the use of long-term care among older adults, and recent applications have demonstrated that attitudes and beliefs, which are aspects of the predisposing characteristics, play a significant role in determining long-term care use by older adults (Andersen, 1968; Bradley et al., 2002; Wolinsky, 1990). Our purpose in this article is to further evaluate the role of attitudes and beliefs by exploring the antecedents and consequences of expectations for nursing home placement among older adults.

A recent and interesting development in the nursing home literature is the consideration of individual expectations, that is, a reflection of one's attitudes and beliefs, and how these relate to actual nursing home placement. The analyses of expectations have been greatly facilitated by the sponsorship by the National Institute on Aging of the Health and Retirement Study (HRS) and the survey on Assets and Health Dynamics Among the Oldest Old (AHEAD). Both the HRS and the AHEAD survey assess expectations regarding future wealth transfers, retirement, and health services use. To date, three investigative teams have examined the expectations assessments in these studies (Holden, McBride, & Perozek, 1997; Lindrooth, Hoerger, & Norton, 2000; Taylor, Osterman, Acuff, & Østbye, 2005). They have shown that the main antecedents of expectations are the standard risk factors for placement, such as limitations in activities of daily living (ADLs), absence of social supports, and advancing age, leading these investigators to conclude that expectations for placement are rationally based (Greene & Ondrich, 1990; Holden et al., 1997; Lindrooth et al., 2000; Salive, Collins, Foley, & George, 1993). However, some evidence for an independent association of expectations on actual nursing home placement has also been reported (Taylor et al., 2005).

These initial studies of expectations regarding placement have made important contributions to the literature. They are not, however, without limitations. These include the absence of age as a selection criterion, the treatment of expectations as a continuous measure, the absence of several potential confounders, and the decision to consider race and gender as having only additive effects. Our purpose in this article is to contribute to the literature by addressing these four limitations. First, our analysis is limited to older adults who are 70 years of age or older at baseline. This is the most appropriate population from which to draw conclusions about the role that expectations may play in eventual placement for older adults, because placement is on their immediate time horizon. The 51- to 61- year-old HRS individuals that Holden and colleagues studied were sufficiently younger that their perceptions of the potential risk for being placed in a nursing home might have been inherently different (i.e., more hypothetical) than the perceptions of those 10 to 20 years their senior. Simply put, the risk of nursing home placement is not yet on the radar of individuals in their fifth decade, and their reports may not generalize to those in their seventh or eighth decade. Although Lindrooth and colleagues (2000) and Taylor and colleagues (2005) focused on older adults, both claim to have included non-age-eligible spouses (i.e., participants younger than 70 years of age) and proxy respondents. Because proxy respondents were not asked the risk perception questions, it is not clear how they could have been included in those prior analyses.

The second limitation that we address is the treatment of expectations as a continuous measure. HRS and AHEAD participants were asked at baseline to report the chance, in percentages, that they believed they had of being placed in a nursing home over the next 5 years. The resulting distribution was nonnormal. Indeed, in the AHEAD sample there is a clustering (or heaping) of responses at several specific (but not uniformly cyclical) points throughout the full range. Moreover, 14% of the AHEAD participants chose not to report their expectations. Of those who did respond to the expectation question, 51% estimated no chance of nursing home placement within 5 years, 6% indicated a 10% chance, and 10% indicated a 50% chance. Modeling these expectations as a continuous variable is ill advised given this pronounced clustering. Especially problematic is the selection bias that results from the exclusion of the

substantial number of participants who did not report their expectations at all. To overcome this limitation, we adopt a categorical approach in which the cumulative distribution of expectations serves as a guide for the categorization and incorporates the nonresponders as a separate group.

The third limitation we address involves the set of covariates employed to address potential confounding. The AHEAD survey includes many measures that were previously unavailable in prior data sets used to estimate the risk for placement among older adults. Despite the availability of these potential confounders, few have been included in previous analyses of expectations for nursing home use. The less comprehensive nature of the covariate set may have resulted in the findings reported by Taylor and associates (2005) regarding a marginal independent effect of expectations on subsequent placement.

The fourth limitation of the previous studies of expectations for placement involves the treatment of race and gender. A large body of literature has identified race and gender, along with ADLs and incontinence, as prime risk factors for nursing home placement (Kemper & Murtaugh, 1991; Liu, Coughlin, & McBride, 1991; Liu, McBride, & Coughlin, 1994; Murtaugh, Kemper, & Spillman, 1990; Salive et al., 1993; Wolinsky, Callahan, Fitzgerald, & Johnson, 1992, 1993). Women generally outlive men and thus are more likely to survive until very old age, when the risk for placement increases. For married men, the risk is reduced because their spouses outlive them, and women generally serve as caretakers; this makes it possible for men to remain in the community for a longer period (Freedman, Berkman, Rapp, & Ostfeld, 1994). The mechanism that explains observed racial differences in placement is less clear. Many studies have found that African Americans are at a reduced risk for placement even though older Blacks have poorer health status than older Whites (Kemper & Murtaugh, 1991; Wallace, Levy-Storms, Kington, & Andersen, 1998; Wolinsky et al., 1992). Despite what is known about the individual effects of race and gender, to our knowledge the interaction between these two variables and how this affects perceptions or eventual nursing home use has never been studied. In this article, we carefully consider the Race \times Gender interaction, and its observed effects on expectations for placement, as well as nursing home placement itself.

Methods

Data Source

Data for the analysis are from the AHEAD public use files. The AHEAD survey is a panel data collection effort to monitor the levels of resource availability, economic behaviors, and the changes in physical, functional, and cognitive health among the oldest old. It emphasizes the interplay of these factors and their effects on subsequent changes in health (Soldo, Hurd, Rodgers, & Wallace, 1997). The AHEAD survey includes a nationally representative sample of older adults born in 1923 and earlier; however, baseline interviews were completed for 8,222 community-dwelling individuals, including age-ineligible spouses. Follow-up interviews are conducted every 2 years, except in 1998 when joint data collection efforts for the HRS and all other cohorts began.

The AHEAD survey includes a total of 7,447 participants who were 70 years of age and older in 1993 during baseline interviews. This study is restricted to nonproxy respondents and individuals identified as being Caucasian or African American. Any nursing home admission for these individuals that occurred after their baseline interview was captured during each wave of data collection or during exit interviews with collaterals previously identified by the respondent. The final analysis includes 6,242 individuals, 5,363 of whom are White and 879 of whom are African American.

Expectations

At baseline, the AHEAD survey addressed a variety of expectations, including the chance of moving to a nursing home within 5 years. This is the question we focus on for this analysis: Of course nobody wants to go to a nursing home, but sometimes it becomes necessary. What do you think are the chances that you will move to a nursing home in the next 5 years?

Response options ranged from 0% to 100%. A response of 0 indicates absolute certainty that one will not be placed in a nursing home, whereas a response of 100 indicates absolute certainty of placement. A response of 50 suggests maximal uncertainty about future placement. Individuals also had the option of not indicating their chances, with response options for “don’t know,” “refused,” and “inappropriate”. In these analyses, we examined expectations as a categorical variable with a set of four dummy variables (1%–10%, 11%–50%, 51%–100%, and no response, vs the reference category of 0%). We selected these categories on the basis of question response clustering (see the paragraphs that follow).

Variables in the Model

The predisposing characteristics reflect an individual’s propensity to seek and use health services (Andersen & Newman, 1973; Greene & Ondrich, 1990), and they include demographic and social factors, as well as attitudes and beliefs. The demographic factors we included were age (dummy variables for 75–84 years of age and 85 and older vs the reference category of 69–74 years of age), race (0 = Whites, 1 = Blacks), gender (0 = women, 1 = men), and marital status (0 = married, 1 = unmarried, divorced, single, or separated). Our coding of these variables reflected tipping points in their distributions that maximize contrast in relation to the expectations. Some of these tipping points reflect the nonlinear relationships of these variables with either expectations or nursing home placement.

The social characteristics we included were education, social supports, geographic location, and population density. We measured education with a binary variable indicating whether the participant was a high school graduate (0 = no, 1 = yes). We added a number of social support variables, including binary markers for having children (0 = one child or none, 1 = two or more children), living with others in the household (0 = none, 1 = one or more people), and having access to informal or formal helpers (0 = no helpers, 1 = yes). Some researchers have found social supports to increase the risk of placement, whereas others have found that supports moderate the impact of stress on risk for placement (Aneshensel, Pearlin, & Schuler, 1993; Newman, Struyk, Wright, & Rice, 1990; Pearlman & Crown, 1992). We included three dummy variables for region of the country where a participant lived (South, North central, and East versus West as the reference category), and we used a binary indicator for population density (living in a metropolitan statistical area, or MSA).

The remaining measures of the predisposing characteristics reflect attitudes and health beliefs. We included markers for the propensity to institutionalize, and expectations for nursing home placement. The two markers for the propensity to institutionalize reflected nursing home use or hospitalization in the past 12 months (0 = no, 1 = yes). As already indicated, we coded expectations for nursing home placement as a set of four dummy variables (1%–10%, 11%–50%, 51%–100%, and no response, vs the reference category of 0%).

Enabling factors reflect the fact that although an individual may be predisposed to seeking and accessing health care services, the individual must have some means to facilitate their service utilization. These factors are usually measured by conditions that reflect access to resources that may be instrumental in accessing health care services. We used five binary variables (each coded as 0 = no, 1 = yes) to reflect having Medicaid, Medicare Part A, Medicare Part B, low household income, and low household assets. Although income and assets have been largely

insignificant in explaining variations in nursing home placement, we adjusted for these variables to account for the large disparities in income and wealth in the AHEAD sample that may impact expectations and eventual placement. We included Medicaid because at least 60% of nursing home expenditures are covered by states' Medicaid programs, and coverage by Medicaid can facilitate the use of long-term care (Intrator & Mor, 2004).

Given the presence of predisposing and enabling conditions, the level of illness perceived by an individual is the principal determinant of health services use. Generally referred to as the need component, these factors indicate the level of vulnerability a person may experience as a result of declining health status for which a nursing home may provide the best rehabilitative or restorative environment. We used a variety of self-rated disease history and functional status measures to adjust for need. We tapped self-rated health with three dummy variables (very good, good, and fair/poor vs excellent as the reference category). In the literature, most significant results find that worse self-rated health as indicated by "fair" or "poor" strongly predicts eventual nursing home use among older adults (Miller & Weissert, 2000). Our disease history markers (each coded as 0 = no, 1 = yes) included any prior heart condition, any history of cancer, incontinence experienced in the past 12 months, and any hip fractures. We included having any limitations with ADLs or instrumental ADLs (IADLs), traditionally strong predictors of nursing home placement (Wallace et al., 1998), as binary variables (0 = none, 1 = one or more limitations). We measured cognitive function by using a self-assessment of memory, immediate and delayed recall of 10 words, and other questions from the Telephone Interview for Cognitive Status (Brandt, Spencer, & Folstein, 1988). Scores ranged from 1 to 35, with 35 being the highest. We collapsed these scores into a set of two dummy variables reflecting the point where a maximum contrast was observed, with the inclusion of missing scores as a separate category (15–35 and no response vs 1–14 as the reference category).

Analytic Models

First we estimated a linear model to examine the impact of standard placement covariates on expectations, where the probability estimates are treated as continuous. Then we used multinomial logistic regression to further explore expectations, standard covariates, and the Race \times Gender interaction. Finally, we estimated a binary logistic regression model for placement with expectations added as a covariate in addition to other standard explanatory variables. We obtained crude and adjusted effects to fully examine the relationships between all of the covariates and nursing home placement. We performed analyses by using standard statistical software packages.

Results

Sample Characteristics

Baseline summary statistics and comparisons by race are shown in Table 1. The 5-year expectations for placement are modestly lower for African Americans than for Whites, with mean responses of 12.8% and 14.5%, respectively. In addition, a higher percentage of Blacks than Whites do not provide their risk assessments for nursing home use. About 10% of the AHEAD participants (663 individuals) entered a nursing home at some time during the 5-year follow-up, including 550 Whites (10.3%) and 83 Blacks (9.4%). The mean age for Whites is 77.3 years ($SD = 5.6$) and for Blacks is 77.5 years ($SD = 5.8$). Predisposing characteristics indicate that a larger proportion of African Americans are women, did not attain a high school education, are not married, but have more access to helpers. Among the measures of resource availability, almost everyone is covered under Medicare Part A, but over 20% of African Americans have Medicaid, and more than 40% have low income and low assets. Whites generally report better personal health ($M = 1.9$, $SD = 1.2$) than do Blacks ($M = 2.4$, $SD = 1.1$),

even though more Whites report prior heart problems, prior cancer, and incontinence at baseline. More Blacks, however, have difficulties with ADLs, IADLs, and cognition.

Modeling the Risk of High Expectations

Figure 1 shows the cumulative response distribution on the expectations question for each race and gender group. With the majority in each group indicating no chance of placement (69% of Black women, 62% of Black men, 59% of White women, and 57% of White men), the response pattern is similar across all groups. These response patterns highlight the perceptible heaping at the 0%, 10%, and 50% levels, which served as the guide for determining the cut points for the multinomial logistic models.

Table 2 presents the results of a model that, using the standard predictors of placement, predicts expectations as a continuous variable. Although many of the assumptions required for such modeling are violated as a result of the noncontinuous nature and heaping of the expectations measure, the ordinary least squares model provides an illustration of the differences in methods. In this model, age, being a high school graduate, prior nursing home use, low income, low assets, self-rated health, incontinence, and low ADL and IADL levels are associated with higher expectations. Characteristics associated with lower expectations include being married, having children, living with others, having access to helpers, and living in an urban area. Race and gender are not statistically significant in this model, although Blacks and men generally have lower placement expectations. The interaction term for race and gender, however, is statistically significant, and it indicates that Black men have higher expectations of placement than would be assumed simply on the basis of the additive effects of race and gender.

To more accurately assess the association of standard nursing home placement risks on expectations, we estimated multinomial logistic regression models. This method allows for simultaneous estimates of the effects of predictors on the probability of belonging to the reference category (0%) as compared with each of the other categories of the dependent variable (1%–10%, 11%–50%, 51%–100%, and no response). Because of the large number of covariates, we first employed a binary logistic regression model to facilitate model building where expectations were dichotomized according to 0% versus all other responses. Medicare Part A, Medicaid, cancer, an existing heart condition, and prior hip fractures were consistently not significant throughout various iterations. Thus, we did not consider them further. We retained all of the other aforementioned variables in the multinomial logistic model. Table 3 contains the adjusted odds ratios (AORs) for these variables, and for the Race \times Gender interaction.

Overall, the predisposing, enabling, and need-based characteristics were most different in their associations with expectations of the 11%–50% and the no-response categories compared with the no-expectations (0%) group. For example, when the 11%–50% category is compared with the no-expectations group, the predisposing characteristics show that older age, with an observable gradient effect, is generally associated with higher expectations compared with individuals aged 69–74 years. The AORs for individuals aged 75–84 is 1.25 ($p < .01$), and 1.32 ($p = .03$) for individuals aged 85 and older. Men (AOR = 1.24; $p = .01$), high school graduates (AOR = 1.70; $p < .01$), and residence in the South (AOR = 1.69; $p < .01$) and Central (AOR = 1.39; $p < .01$) regions are all associated with higher odds of responding at the 11%–50% level versus 0%. Social support variables, including being married (AOR = 0.68; $p < .01$), having two or more children (AOR = 0.85; $p = .04$), living with at least one person (AOR = 0.74; $p < .01$), having access to helpers (AOR = 0.62; $p < .01$), and living in an urban area (AOR = 0.81; $p = .01$), are all significantly associated with lower odds of response at the 11%–50% level versus 0%. The enabling characteristics are significant only for this response level and show that low income (AOR = 1.55; $p < .01$) and coverage under Medicare Part B (AOR = 1.36; $p = .01$) result in higher odds of responding at the 11%–50% level versus 0%. The need

characteristics also discriminate, yielding AORs for self-rated health for the 11%–50% category of 1.33 ($p = .02$) for very good, 1.43 ($p < .01$) for good, and 1.83 ($p < .01$) for fair or poor. Incontinence (AOR = 1.38; $p < .01$), ADLs (AOR = 1.23; $p < .01$), and cognitive function (AOR = 1.59; $p < .01$) are also associated with higher expectations compared with 0%.

When the no-response category is compared with the 0% expectations group, similar differences appear. Predisposing characteristics show that age is associated with no response compared with 0%, with AORs of 1.67 ($p < .01$) and 1.89 ($p < .01$) for 75–84 years and 85 and older age groups, respectively. Men are less likely to not respond than to report 0% (AOR = 0.65, $p < .01$), and Black men as indicated by the interaction term are more likely to not respond than to report 0% (AOR = 1.71, $p = .01$) than the additive effects for race and gender would have suggested. Race did not have a significant additive effect across response levels. Residence in the South (AOR = 1.57; $p < .01$) or Central (AOR = 1.56; $p < .01$) regions and nursing home use in the past year (AOR = 2.48; $p = .01$) were all associated with higher odds of nonresponse compared with 0% expectations. Being a high school graduate (AOR = 0.77; $p < .01$) and having children (AOR = 0.75; $p < .01$) and helpers (AOR = 0.79; $p = .01$) are associated with lower odds of nonresponse compared with 0% for predisposing factors. The need characteristics indicate that individuals who report their health as good or fair–poor are more likely to not respond compared with reporting 0% expectations, with AORs of 1.82 ($p < .01$) and 1.99 ($p < .01$), respectively. Limitations in IADLs (AOR = 1.37; $p = .01$) are associated with higher odds of nonresponse. Individuals with higher cognitive function are more likely to respond (AOR = 0.62; $p < .01$), whereas those who refused to answer the cognitive function questions were also more likely not to indicate their expectations (AOR = 2.53; $p < .01$).

Modeling the Risk of Nursing Home Placement

Of the 633 persons placed in a nursing home from 1993 to 1998, 83 were African Americans and 550 were White. Women accounted for about 66% of placements in both groups. Of the 633 placements, 272 were temporary, with individuals subsequently reinterviewed as community-dwelling residents at follow-up.

To determine the crude effects of expectations and the other covariates on placement within 5 years, we first estimated a series of univariable binary logistic regression models. We then used a multivariable model to estimate the adjusted effects. As shown in Table 4, twelve variables had statistically significant crude odds ratios that remained statistically significant after adjustment. Individuals who reported expectations of 11%–50% or refused to answer had a higher risk for placement compared with those who said 0%. Older age, prior hospitalization or nursing home use, lower self-rated health, and difficulties with ADLs or IADLs were also significant and strong risks for placement. Being married, having children, being in a particular geographic region, and having good cognitive function were all associated with lower placement risk. In addition, although race did not have a significant crude relationship with placement, the AOR from the final model shows that African Americans were at a significantly lower risk than Whites.

Discussion

In this article we further clarify those factors associated with baseline expectations for nursing home placement over 5 years among AHEAD respondents, as well as the independent role of those expectations on their risk for placement during that 5-year window. The results reported here confirm prior reports that expectations reported by older adults are rational—that is, individuals' expectations for placement reflect their personal risk profiles (Holden et al., 1997; Lindrooth et al., 2000; Taylor et al., 2005). Moreover, expectations are strongly associated with actual placement over the 5-year period, even after we adjusted for other covariates.

Interestingly, there were no additive differences in expectations between Whites and Blacks, although many prior studies have found that placement differs by race (Cagney & Agree, 1999; Falcone & Broyles, 1994; Liu et al., 1994). These results and the reported recent trend in the increasing prevalence of African Americans in nursing homes calls for further inquiry into racial differences in nursing home use (National Center for Health Statistics, 2004; Ness, Ahmed, & Aronow, 2004). Furthermore, we did not find significant differences by gender even though most prior studies have found that women—who are overrepresented among the oldest old, widowed, and frail—are at a greater risk for nursing home placement (Coughlin, McBride, & Liu, 1990; Greene & Ondrich, 1990; Miller & Weissert, 2000).

Although it has been largely ignored in the literature, the Race \times Gender interaction was significant when we contrasted the nonresponse versus 0% response categories in the multinomial multivariable logistic regression model of expectations (see Table 3). However, we observed no significant results when we added three-way Race \times Gender \times Expectations interactions (not shown), confirming that the level of expectations has the same effect on nursing home placement regardless of race or gender.

Nursing home use prior to baseline did not affect risk perception, except among those who chose not to provide their expectations. This result was unexpected, as prior use was assumed to result in higher expectation levels. Although the reasons for this are unclear, these findings cast doubt on the assumption that the definition of nursing home placement is homogenous across individuals. An important distinction about placement in a nursing home prior to baseline is that these were all temporary placements; that is, individuals had to be community dwelling at baseline in order to be enrolled in the AHEAD study. This suggests that when they are asked about their expectations for placement, respondents assumed that subsequent placement would be permanent. Accordingly, further inquiry is warranted into the typology of nursing home placement in light of the different types and lengths of stay individuals may experience.

The significant and consistent relationship between expectations and actual placement suggests that the former may be an efficient and effective summary screening measure for use in identifying elders with elevated risks of nursing home placement. Specifically, individuals who chose not to answer the risk perception question had the highest odds of subsequent placement. Refusing to answer the expectations question can thus be taken as an indicator that further evaluation of the subject's medical risk profile is warranted, much like a "fair" or "poor" response to the traditional self-reported health question is indicative of elevated mortality risk.

The addition of expectations to the list of risk factors for nursing home placement has implications for care planning and policy directives. Policy makers at the state level are interested in refined instruments for determining older adults at risk for placement in order to better plan for resource allocation (Miller & Weissert, 2000). Care planning must take into account cost-effective options in order to accommodate the growing population of older adults who will use long-term care services (Spillman & Lubitz, 2000). In the face of rising nursing home costs for state Medicaid programs, early identification of elders at elevated risk for placement is important for policy formation.

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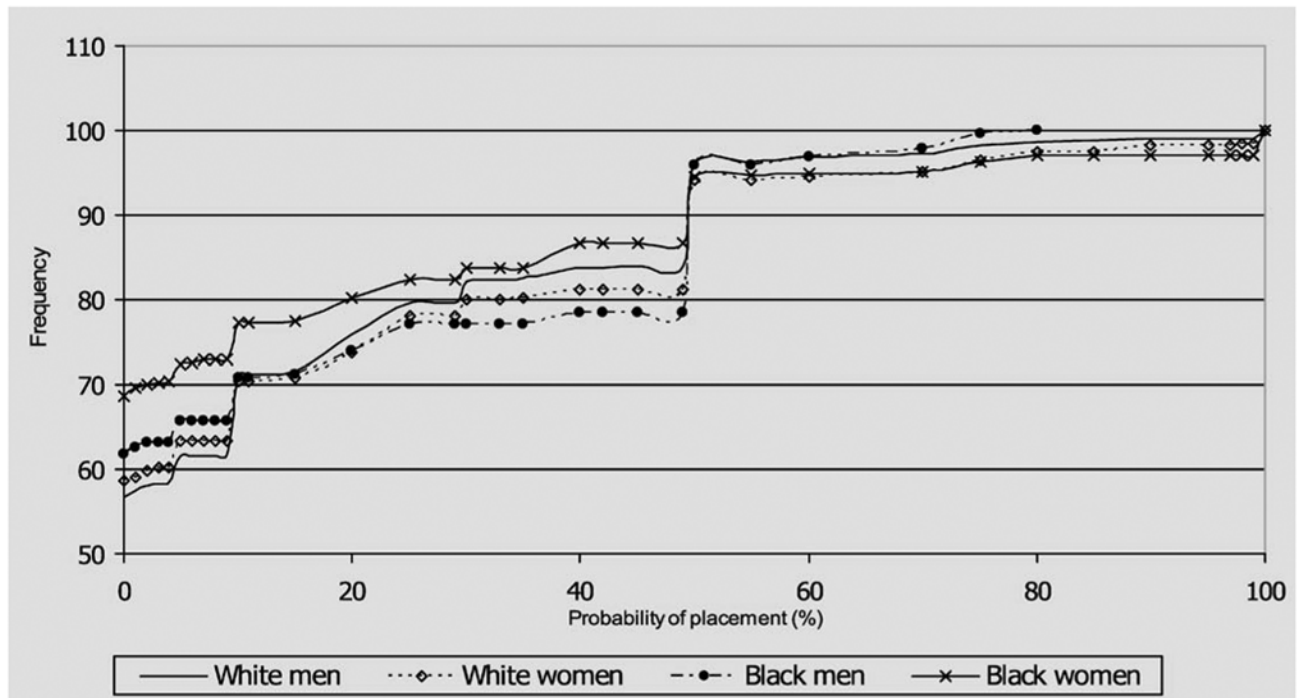


Figure 1.
Cumulative distribution of expectations for five-year placement among AHEAD respondents.

Table 1
Baseline Characteristics of AHEAD Study Population (1993)

	Whites (<i>n</i> = 5,363)		Blacks (<i>n</i> = 79)		<i>p</i> Value *
	<i>M</i> or %	<i>SD</i>	<i>M</i> or %	<i>SD</i>	
Predisposing characteristics					
Expectations for NHP (1–100)	14.50	23.48	12.80	23.50	.09
0%	50.90		49.10		
1%–10%	11.20		6.50		
11%–50%	21.40		14.80		
51%–100%	4.40		3.80		
No response (%)	12.10		25.80		
Age (years)	77.30	5.63	77.50	5.83	.83
69–74 years (%)	38.70		38.90		
75–84 years (%)	48.90		47.90		
85 + years (%)	12.40		13.20		
Men	0.39	0.49	0.33	0.47	<.01
Married	0.56	0.50	0.33	0.47	<.01
High school graduate	11.63	3.11	8.52	4.03	<.01
Children (2+)	2.45	1.91	2.69	2.81	<.01
Others in household (1+)	0.24	0.71	0.72	1.30	<.01
Helpers	0.57	0.50	0.73	0.45	<.01
Region					<.01
West (%)	0.17		0.04		
South (%)	0.36		0.48		
Central (%)	0.28		0.24		
East (%)	0.19		0.23		
MSA (Non-urban = 0)	0.73	0.44	0.83	0.38	<.01
Prior hospital use	0.21	0.41	0.22	0.41	.72
Previous NHP	0.01	0.10	0.01	0.10	.86
Enabling characteristics					
Medicaid	0.05	0.22	0.24	0.43	<.01
Medicare A	0.98	0.15	0.96	0.20	<.01
Medicare B	0.90	0.30	0.78	0.41	<.01
Low income (≤\$10K) (%)	0.21		0.43		<.01
Low assets (≤\$20K) (%)	0.17		0.42		<.01
Need characteristics					
Self rated health status	1.92	1.15	2.36	1.14	<.01
Excellent (%)	11.60		6.30		
Very Good (%)	25.50		17.40		
Good (%)	32.10		28.20		
Fair and Poor (%)	30.80		48.10		
Heart condition	0.32	0.47	0.26	0.44	<.01
Cancer	0.15	0.35	0.10	0.30	<.01
Incontinence	0.19	0.39	0.16	0.36	.01
Hip fracture	0.05	0.21	0.04	0.20	.44
ADLs	0.12	0.33	0.19	0.39	<.01
IADLs	0.13	0.33	0.18	0.39	<.01
Cognitive score	20.52	5.38	14.77	6.07	<.01
1–14 (%)	12.60		46.20		
15–35 (%)	83.20		48.90		
Refused to answer (%)	4.20		4.90		

Notes: ADLs = activities of daily living; IADLs = instrumental activities of daily living.

* *p* Values are based on chi-squared or two-sample *t*-test as appropriate.

Table 2
OLS Model Results for Five-Year Expectations for Nursing Home Placement

	Unstandardized Regression Coefficients (β)	Standardized Regression Coefficients(β)	<i>p</i> Value
Predisposing characteristics			
Age	2.22	0.06	<.01
Men	0.43	0.01	.56
Blacks	-1.55	-0.02	.23
Race*Gender (Black men)	4.30	0.04	.03
High school graduate	3.95	0.08	<.01
Married	-4.08	-0.09	<.01
Children (2+)	-2.76	-0.05	<.01
Others in household (1+)	-3.98	-0.06	<.01
Helpers	-4.14	-0.09	<.01
Region	0.02	0.00	.94
MSA (urban)	-2.26	-0.04	<.01
Prior hospital use	-0.96	-0.02	.24
Prior nursing home use	7.18	0.03	.04
Enabling characteristics			
Medicaid	1.80	0.02	.19
Medicare A	3.88	0.03	.09
Medicare B	0.89	0.01	.44
Low income	2.57	0.05	<.01
Low assets	1.96	0.03	.03
Need characteristics			
Self-rated health	1.91	0.08	<.01
Heart condition history	-0.27	-0.01	.71
Cancer	-0.16	0.00	.86
Incontinence	2.80	0.05	<.01
Hip fracture	-0.07	0.00	.97
ADLs	3.92	0.07	<.01
IADLs	3.32	0.06	<.01
Cognitive function	0.74	0.01	.37
Constant	4.37		.10
<i>R</i>	0.25		
<i>R</i> ²	0.06		

Notes: ADLs = activities of daily living; IADLs = instrumental ADLs.

Table 3
Multinomial Logistic Regression Results for Predicting Expectations for Nursing Home Placement

	Level of Expectation for Placement in Five Years ^a							
	1%–10%		11%–50%		51%–100%		No Response	
	OR	<i>p</i> Value	OR	<i>p</i> Value	OR	<i>p</i> Value	OR	<i>p</i> Value
Predisposing characteristics								
Age								
75–84 years	1.13	.19	1.25	<.01	1.27	.11	1.67	<.01
85 + years	0.84	.30	1.32	.03	1.83	<.01	1.89	<.01
Men	1.37	<.01	1.24	.01	0.91	.57	0.65	<.01
Blacks	1.00	.99	0.98	.88	1.01	.98	1.26	.07
Race*Gender (Black men)	0.87	.65	1.44	.10	1.13	.78	1.71	.01
High school graduate	1.69	<.01	1.70	<.01	1.62	<.01	0.77	<.01
Married	0.95	.65	0.68	<.01	0.62	<.01	0.90	.30
Children (2+)	0.83	.06	0.85	.04	0.63	<.01	0.75	<.01
Others in household (1+)	0.79	.07	0.74	<.01	0.45	<.01	0.92	.43
Helpers	0.83	.05	0.62	<.01	0.63	<.01	0.79	.01
Region								
South	1.58	<.01	1.69	<.01	1.19	.36	1.57	<.01
Central	1.10	.47	1.39	<.01	1.12	.53	1.56	<.01
East	1.45	.01	1.15	.25	0.98	.93	0.90	.53
MSA (urban)	0.90	.33	0.81	.01	0.75	.05	0.86	.11
Prior hospital use	1.10	.39	0.92	.34	0.99	.95	0.84	.10
Prior nursing home use	1.57	.36	1.80	.11	1.77	.25	2.48	.01
Enabling characteristics								
Medicare B	1.22	.18	1.36	.01	1.07	.75	0.99	.94
Low income	1.12	.37	1.55	<.01	1.15	.39	0.85	.09
Low assets	0.92	.53	1.13	.22	1.07	.70	0.92	.38
Need characteristics								
Self-rated health								
Very good	1.25	.13	1.33	.02	0.91	.70	1.42	.05
Good	1.23	.17	1.43	<.01	1.10	.69	1.82	<.01
Fair and Poor	1.06	.70	1.83	<.01	1.44	.14	1.99	<.01
Incontinence past year	1.53	<.01	1.38	<.01	1.34	.07	1.16	.17
ADLs	0.95	.66	1.23	.02	1.73	<.01	1.06	.57
IADLs	1.16	.22	1.15	.14	1.80	<.01	1.37	<.01
Cognitive function								
15 to 35	1.43	.02	1.59	<.01	0.99	.96	0.62	<.01
Refused to answer	1.11	.73	0.97	.91	0.81	.59	2.53	<.01

Notes: ADLs = activities of daily living; IADLs = instrumental ADLs; OR = odds ratio.

^aThe dependent category is 0% chance of nursing home placement in five years.

Table 4
Logistic Regression Model Results for Actual Nursing Home Placement

	Crude Effects ^a		Adjusted Effects ^a	
	OR	p Value	AOR	p Value
Predisposing characteristics				
Expectations				
1%–10%	0.85	.34	0.88	.46
11%–50%	1.50	<.01	1.37	.01
51%–100%	2.21	<.01	1.29	.19
No response	2.12	<.01	1.39	.01
Age				
75–84 years	2.73	<.01	2.10	<.01
85+years	7.71	<.01	4.15	<.01
Men	0.84	.04	1.23	.07
Blacks	0.91	.46	0.66	.02
Race*gender	0.86	.47	1.02	.95
High school graduate	0.73	<.01	1.19	.09
Married	0.49	<.01	0.67	<.01
Children (2+)	0.60	<.01	0.79	.01
Others in household (1+)	1.09	.39	0.84	.16
Helpers	1.42	<.01	1.10	.34
Region				
South	0.78	.03	0.63	<.01
Central	0.72	.01	0.67	<.01
East	0.64	<.01	0.57	<.01
MSA (Urban)	0.79	.01	0.89	.28
Prior hospital use	1.86	.01	1.26	.03
Prior nursing home use	8.99	.01	3.67	<.01
Enabling characteristics				
Medicaid	1.69	<.01	0.95	.75
Medicare A	0.69	.12	0.76	.35
Medicare B	0.70	<.01	0.94	.66
Low income	0.63	<.01	1.00	.97
Low assets	0.56	<.01	0.85	.16
Need characteristics				
Self-rated health				
Very good	1.44	.08	1.47	.08
Good	2.11	<.01	1.86	<.01
Fair and poor	3.61	<.01	2.34	<.01
Heart condition ever	1.43	<.01	1.07	.48
Cancer ever	0.99	<.01	0.82	.14
Incontinence	1.76	<.01	1.26	.04
Hip fracture	1.94	<.01	0.8	.24
ADLs	3.67	<.01	1.81	<.01
IADLs	2.86	<.01	1.25	.04
Cognitive function				
15 to 35	0.39	<.01	0.66	<.01
Refused to answer	0.91	.59	0.94	.76

Notes: ADLs = activities of daily living; IADLs = instrumental ADLs.

^aCrude odds ratios are based on a series of models with one predictor variable only; AOR = adjusted odds ratio; AOR refers to a model with all covariates adjusted for in one model.