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Racial/Ethnic Differences in the Relationship Between the Use of Health Care Services and Functional Disability: The Health and Retirement Study (1992–2004)

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Abstract

Purpose—The purpose of this study was to examine racial/ethnic differences in the relationship between functional disability and the use of health care services in a nationally representative sample of older adults by using the Andersen behavioral model of health services utilization.

Design and Methods—The study used 12 years of longitudinal data from the Health and Retirement Study (1992–2004), a nationally representative sample of community-dwelling adults older than 50 in 1992 ($N = 8,947$). Nonlinear multilevel models used self-reported health care service utilization (physician visits and hospital admissions) to predict racial/ethnic differences in disability (activities of daily living and mobility limitations). The models also evaluated the roles of other predisposing (age and gender), health need (medical conditions and self-rated health), and enabling factors (health insurance, education, income, and wealth).

Results—Blacks and Latinos utilizing physician visits and hospital admissions were associated with significantly more activity of daily living disability than Whites ($p < .001$). Blacks utilizing physician visits ($p < .001$) and hospital admissions ($p < .05$) and Latinos utilizing hospital admissions ($p < .05$) were associated with more mobility disability than Whites. Other predisposing, health need, and enabling factors did not account for these racial/ethnic differences.

Implications—Nationally, health care use for Blacks and Latinos was associated with more disabilities than for Whites after we accounted for predisposing, health need, and enabling factors. The findings suggest that improving health care quality for all Americans may supersede equal access to health care for reducing ethnic and racial disparities in functional health.

Keywords

Activities of daily living; Mobility; Health disparities; Andersen behavioral model of health services utilization; Multilevel modeling

About 20% to 30% of community-dwelling older adults report disability, or difficulties performing activities of daily living (ADLs; Adams, Hendershot, & Marano, 1999). Disabilities in self-care and physical functioning are associated with a loss of independence, an increased need for health care services, and subsequently higher health care costs (Liu, Wall, & Wissoker, 1997; Sands et al., 2006). For example, older adults with these

disabilities have 3 times the medical expenditures of those without these disabilities (Trupin, Rice, & Max, 1996). The leading cause of disability is chronic disease, with disease type and severity varying the level of functional disability and the need for health care services (Fried & Guralnik, 1997). In a widely used behavioral model of health services use, Andersen and Newman (1973) suggested that economic access to health care (or enabling factors) and predisposing factors (e.g., age, gender, and race/ethnicity) also influence disability and the use of health care services.

Advancements in medical technology and treatment have led to a compression of morbidity and subsequent declines in disability rates (Cutler, 2001; Fries, 2003; Manton & Gu, 2001; Schoeni, Martin, Andreski, & Freedman, 2005). Although disability rates among elders have been declining overall, racial/ethnic differences in disability persist (Schoeni et al., 2005). This may be because Blacks and Latinos have more underlying medical problems than Whites, including diabetes and heart conditions, poorer self-rated health (Angel & Angel, 1998; Farmer & Ferraro, 2005; Kington & Smith, 1997; Schoenbaum & Waidmann, 1997), and fewer economic resources to pay for needed health care services (Gornick et al., 1996; Schoenbaum & Waidmann, 1997; Weinick, Zuvekas, & Cohen, 2000). Racial/ethnic differences in disability may also result from differences in health care treatment and quality, with older Blacks and Latinos disadvantaged relative to Whites (Ayanian, Cleary, Weissman, & Epstein, 1999; Escarce, Epstein, Colby, & Schwartz, 1993).

This study used the Andersen (Andersen & Newman, 1973) behavioral model of health services utilization to conceptualize the relationship between racial/ethnic differences in disability and the use of health care services, accounting for other predisposing (age, gender), health need (medical conditions and self-rated health), and enabling (economic access to health care services) factors.

Health Care Service Utilization

Minorities may have more economic barriers to health care and may use fewer health care services than Whites (Gornick et al., 1996; Kington & Smith, 1997). As a result of delayed care, Blacks and Latinos may enter the health care system with more severe medical conditions and more preventable hospitalizations than Whites (Ebell, Smith, Kruse, Drader-Wilcox, & Novak, 1995; Gaskin & Hoffman, 2000; Gourin & Podolsky, 2006; Horner, Lawler, & Hainer, 1991), though this is contested (Blustein, Hanson, & Shea, 1998). Some studies have argued that economic access to health care services does not explain racial/ethnic differences in health service use. For example, Fiscella, Franks, Doescher, and Saver (2002) reported that racial/ethnic differences in the use of health care services persisted after the researchers accounted for health insurance type and income. Dunlop, Manheim, Song, and Chang (2002) reported similar results among an older adult population.

Cultural differences in care-seeking behaviors may influence health care service utilization. Though some studies have found no racial differences in the willingness to use health care services (Schnittker, Pescosolido, & Croghan, 2005), other studies have shown that Black and Latino adults have more distrust than Whites of medical research, clinicians, and a physician's judgment (Corbie-Smith, Thomas, Williams, & Moody-Ayers, 1999). As a result, minority group members may rely more than Whites on hospital-based and community health clinics, which have been associated with lower quality care than private physicians (Henry J. Kaiser Family Foundation, 2007). Minorities may also be less likely than Whites to adhere to prescribed medications, which may negatively influence health outcomes (Hall, Dugan, Zheng, & Mishra, 2001; Petersen, 2002).

Disparities in the Health Care System

Racial/ethnic differences in the use of health care services may not explain some disparities in the health care system, however. There are notable differences in health care treatment and quality among older Black, Latino, and White patients. For example, older Black patients receive poorer management of chronic conditions than older Whites (Ayanian et al., 1999; Davis, Liu, & Gibbons, 2003). Studies examining hospital discharge data have found that older Blacks and Latinos are also less likely than Whites to receive a wide range of medical procedures, including revascularization after coronary angiography (Ayanian, Udvarhelyi, Gatsonis, Pashos, & Epstein, 1993; Harris, Andrews, & Elixhauser, 1997; Peterson, Wright, Daley, & Thibault, 1994), surgical resection for early-stage lung cancer (Bach, Cramer, Warren, & Begg, 1999), bone marrow transplants for leukemia and lymphoma (Mitchell, Meehan, Kong, & Schulman, 1997), beta blocker medications for heart attack, and eye examinations for diabetes (Schneider, Zaslavsky, & Epstein, 2002). Additionally, these racial/ethnic differences in treatment have not been explained by hospital size, type, or location; health insurance; or disease severity (Giles, Anda, Casper, Escobedo, & Taylor, 1995; McBean, Warren, & Babish, 1994). Older minority group members may also benefit less than Whites do from improvements in health care treatments. For example, Escarce and colleagues (1993) showed that older Whites have better access to new procedures and other specialized and high-technology services than do older Blacks.

Racial/ethnic differences in access to quality physicians and medical care may partly explain these individual differences in health care treatment and quality. Blacks are more likely than Whites to rely on neighborhood health centers, outpatient hospital care, or emergency rooms for health care, whereas Whites are more likely to have private physicians (for a review, see Mayberry, Mili, & Ofili, 2000; Walls, Rhodes, & Kennedy, 2002). In addition to less satisfactory patient–physician relationships, the health care settings used predominantly by minorities are characterized by longer wait times, overcrowding, and less continuity of care (Derlet, Richards, & Kravitz, 2001). Older Blacks, Whites, and Latinos may also have different physicians and seek care in different hospitals (Bach, Pham, Schrag, Tate, & Hargraves, 2004; Barnato, Lucas, Staiger, Wennberg, & Chandra, 2005; Hasnain-Wynia et al., 2007). The physicians serving predominantly minority patients are less likely to be board certified and have less access to clinical resources (Bach et al., 2004). Additionally, hospitals serving predominantly minority patients are more likely to have nursing shortages and to be inadequately funded (Mannion, Davies, & Marshall, 2005).

The aim of this study was to adapt the Andersen (Andersen & Newman, 1973) behavioral model of health services utilization to examine racial/ethnic differences in the relationship between functional disability and the use of health care services. Though researchers have widely used this model to predict health service utilization, our application of this model extends beyond its original scope. Previous work has shown greater health need, fewer enabling resources, and poorer health care treatment and quality among older minorities compared to Whites. Based on the literature documenting disparities in health care treatment and quality, we hypothesized that older Blacks and Latinos utilizing health care services would have more functional disability than Whites independent of other predisposing (age, gender), health need (medical conditions and self-rated health), and enabling (education, income, and wealth) factors. Because we lacked data to explicitly examine racial/ethnic differences in the quality of health care services, we made the assumption that some of the racial/ethnic differences in functional disability may be associated with racial/ethnic differences in health care service treatment and quality.

Methods

Data

The Health and Retirement Study (HRS) is a nationally representative ongoing longitudinal multistage probability survey of community-dwelling older adults. The first wave of the HRS occurred in 1992 with a 51- to 61-year-old cohort that has been interviewed subsequently every 2 years. Further details on the HRS design and methods have been published previously (see Heeringa & Connor, 1995). We analyzed seven waves of data (1992–2004) from the HRS that were prepared by the RAND Center for the Study of Aging (RAND HRS). The benefits of using the RAND HRS data include a collection of detailed health, socioeconomic status, and utilization information and the use of bracketing methods to minimize nonresponse for these data (RAND HRS Data, 2006). In order to generalize our findings to the community-dwelling older adult population, we excluded from this study respondents with sampling weights of zero (indicating they were institutionalized or deceased).

Previous work has suggested that attrition rates in the HRS are comparable to those of other panel surveys (Groves & Couper, 1998) and that sample attrition has not significantly influenced the representativeness of the remaining sample based on demographic, economic, and health measures (Cao & Hill, 2005). Data were weighted using HRS respondent-level sampling weights to account for the sample design in the HRS (Heeringa & Connor, 1995). Approximately 71.5% of respondents participated in all seven waves of the HRS (1992–2004). By 2004, 12.9% of respondents were deceased and 15.6% were lost to follow-up. There were 8,947 adults in our sample after we excluded proxy interviews from respondents unable to answer survey questions independently at baseline. More than 80% of the sample was White, 11.5% was Black, 6.3% was Latino, and 2% identified as “other.”

Variable Measurement

In this study, the main variables of interest were measured at baseline (1992) and subsequently every 2 years except for gender, race/ethnicity, and education, which were fixed. This allowed us to examine intraindividual changes in health need, enabling factors, and associated disability over the course of the survey.

Dependent Variables

As this study was primarily interested in disabilities in self-care and functioning that are associated with a loss of independence and increased health care costs (Clark, Stump, Hui, & Wolinsky, 1998; Liu et al., 1997), we measured disability by ADLs and mobility. Respondents were asked if they needed assistance (yes/ no) performing any of five basic ADLs (walking across a room, bathing, eating, dressing, and getting into and out of bed) and if they had some difficulty (yes/no) walking one block, walking several blocks, walking across a room, climbing one flight of stairs, and climbing several flights of stairs. Based on responses to these questions, we scored respondents on two scales ranging from 0 to 5, with 5 indicating the most disabilities on each scale. We did not examine further instrumental ADLs because these questions were asked inconsistently over the course of the survey.

Independent Variables

The main independent variables of interest in this study were race/ethnicity and the use of health care services. We measured race/ethnicity by using three mutually exclusive racial/ethnic classifications: (non-Latino) Black, Latino, and (non-Latino) White. We used HRS respondents from the other racial/ethnic groups as controls in our analysis and do not report their results here. We measured health care service use by self-reports of physician visits and hospital admissions. Respondents were asked how many times they had visited a physician

or had a hospital admission in the past 12 months (at baseline) and between survey interviews (every 2 years). There is evidence that older adults underreport their use of health care services and that distributions of health service use are non-normal (Roberts, Bergstralh, Schmidt, & Jacobsen, 1996; Wallihan, Stump, & Callahan, 1999). In an attempt to address this issue, we log-transformed reports of service use. Through log-transformations, we captured the variance in health service use over time while also drawing outlying data from a skewed distribution closer to the bulk of the data.

Guided by the Andersen (Andersen & Newman, 1973) model of health services utilization, we accounted for other predisposing factors associated with the use of health care services, including gender (male = 0, female = 1) and age (which was group mean centered at age 65 for ease of interpretation and to restrict problems with collinearity; Raudenbush & Bryk, 2002). To account for health need, we included self-reports (yes/no) of doctor-diagnosed medical conditions including diabetes or high blood sugar; cancer or a malignant tumor of any kind except skin cancer; chronic lung disease except asthma, such as bronchitis or emphysema; heart problems (heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems); and stroke (Angel & Angel, 1998; Kington & Smith, 1997; Schoenbaum & Waidmann, 1997). Researchers have reported reasonable concordance values between self-reports of medical conditions and medical chart reviews (Bush, Miller, Golden, & Hale, 1989; Pasty et al., 1995). We also accounted for self-rated health (a Likert scale ranging from 0–4, where 4 is poor health), as it is highly correlated with physician-assessed health conditions and is a global evaluation of health status (Idler & Kasl, 1991). We measured enabling factors by education (0–17+ years), income (logged value of total household income, including earnings, pensions, and Social Security), wealth (logged value of wealth, including all assets minus the sum of all debt, including mortgages), and health insurance (Medicare, Medicaid, Veterans/other governmental, employer provided, private, and no insurance).

Data Analysis

We used multilevel statistical modeling using Hierarchical Linear Modeling software Version 6.02 (HLM; Scientific Software International, Lincolnwood, IL) to examine individual and aggregate levels of data over time and to account for the complex HRS sampling design and the subset analyzed. Basically, multilevel modeling in HLM conceives of each individual as having his or her own regression equation. Multilevel modeling in HLM has several benefits. When used to examine growth curve models, HLM provides a powerful statistical tool to test hypothesized models of growth or change. Also, because multiple observations are nested within each person over time, the number and spacing of time points can vary across cases (Raudenbush & Bryk, 2002). HLM also handles missing data through iterative, numerical approaches.

Many functional disability distributions, such as those used in this study, can be non-normal, reflecting the higher frequency of intact functioning among the general older adult population. As such, we considered alternative disability distributions in HLM. Nonlinear models that modeled Poisson distributions of the ADL and mobility data fit better than the linear models. We report here the results of the nonlinear analyses. In each of the disability models, we tested a growth term (age^2) for growth curve analysis (Raudenbush & Bryk, 2002) and accounted for other predisposing factors (age and gender) to examine racial/ethnic differences in the relationship between the use of health care services and functional disability. Next we sequentially added health need (medical conditions and self-rated health) and enabling (education, income, and wealth) factors to the disability models.

Results

Bivariate Results

As shown in Table 1, there were racial/ethnic differences in medical conditions and self-rated health, with Blacks and Latinos disadvantaged relative to Whites. Minority group members were also more likely than Whites to have Medicaid or no insurance and were less likely than Whites to have private or employer insurance. Blacks and Latinos also had fewer years of education, less income, and less wealth than Whites. In this study, ADL and mobility disabilities were modestly correlated with each other ($r = .52$), self-rated health (ADL, $r = .30$; mobility, $r = .51$), and medical conditions (ADL, $r = .51$; mobility, $r = .41$).

There were also racial/ethnic differences in the use of health care services and disability over the course of the survey (see Table 2). Throughout much of the survey period, Latinos were less likely than Whites to report a physician visit, and Blacks were more likely to report more frequent visits to physicians than Whites. In the early years of the survey, Blacks were more likely than Whites to report a hospital admission and reported more frequent hospital admissions. Minorities were also more likely than Whites to have ADL and mobility disabilities over the course of the survey.

Multivariate Results

The significance of the growth term indicated that ADL disability increased with age, and this model was maintained throughout the analysis (data not shown). As Table 3 shows, after we accounted for predisposing factors, physician visits (0.21; $p < .001$) were associated with ADL disabilities, though Blacks (0.14; $p < .001$) and Latinos (0.11; $p < .01$) with physician visits were associated with more ADL disability than their White counterparts. The additions of health need and enabling factors into the models did not account for the significant associations for Blacks and Latinos and ADL disability.

Overall, hospital admissions were associated with more ADL disability (0.89; $p < .001$); however, the associations were higher for Blacks (0.46; $p < .001$) and Latinos (0.20; $p < .01$) compared to Whites. With health need added to the model, the strength of the relationship between hospital admissions and ADL disability was substantially reduced (from 0.89 to 0.52). Introducing enabling factors did not account for the relationship between hospital admissions and ADL disability for Blacks and Latinos, who continued to have more ADL disability than Whites. The effect sizes for these models were medium to large (range = 0.31–1.52).

In the mobility disability model, the significance of the growth term indicated that mobility disabilities increased with age, and this model was maintained throughout the analysis (data not shown). Table 4 shows the relationship between the use of health care services and mobility disability. Physician visits were associated with mobility disability (0.69; $p < .001$), though Blacks (0.14; $p < .001$) and Latinos (0.11; $p < .01$) with physician visits were associated with more mobility disability than their White counterparts. After additional adjustments for health need and enabling factors, Blacks continued to have more mobility disability than Whites, though health need better explained this relationship among Latinos.

Hospital admissions were also associated with mobility disability (2.03; $p < .001$). The relationship between race/ethnicity, hospital admissions, and mobility disability approached significance ($p < .10$) in the predisposing model. When we accounted for health need, Blacks (0.23; $p < .05$) and Latinos (0.25; $p < .05$) with hospital admissions were associated with significantly more mobility disability than Whites. With health need in the model, the strength of the relationship between hospital admissions and mobility disability was substantially reduced (from 2.03 to 0.92). Even after we accounted for enabling factors,

Blacks and Latinos continued to be associated with more mobility disability than Whites. The effect sizes for these models were medium to large (range = 0.32–1.15).

Previous work has found that minorities, compared to Whites, underutilize health care services (e.g., Dunlop et al., 2002). We conducted an additional analysis using race/ethnicity to predict physician visits and hospital admissions. The purpose of this analysis was to isolate the extent to which racial/ethnic differences in the likelihood of utilizing health care services may statistically explain the observed racial/ethnic differences in ADL and mobility disability. After accounting for other predisposing, health need, and enabling factors, we found that Blacks with economic access to health care services were associated with more physician visits than their White counterparts ($p < .001$). There were no racial/ethnic differences in the use of hospital admissions after these adjustments (results available upon request).

Discussion

In this large, nationally representative longitudinal study of community-dwelling older adults, physician visits and hospital admissions for Blacks and Latinos were associated with more ADL disability than for Whites. In addition, physician visits and hospital admissions for Blacks and hospital admissions for Latinos were associated with more mobility disability than for Whites. We found that, over the course of this 12-year study, there were racial/ethnic differences in the relationship between the use of health care services and functional disability. These findings provide support for our hypothesis that racial/ethnic differences in functional disability may be associated with racial/ethnic differences in health care service treatment and quality. These findings were not accounted for by other predisposing (age and gender), health need (medical conditions and self-rated health), and enabling factors (economic access to health care), which have been shown to influence health service utilization (Andersen, 1995; Andersen & Newman, 1973).

Our study findings are consistent with those of Schoeni and colleagues (2005), who reported persistent racial/ethnic differences in disability. These findings are also consistent with those of Wolinsky and Johnson (1991), who reported that older minority group members were no less likely than older Whites to utilize health care services after the researchers accounted for health need and enabling factors. In this study, older Blacks with enabling factors conducive to accessing health care services were more likely than older Whites to visit physicians. These findings contrast with those of Dunlop and associates (2002), who found that older Blacks and Latinos were less likely than Whites to utilize health care services, even after the authors accounted for economic access. Our findings may differ because we examined respondent-level changes in health need, enabling factors, and health care service use over time and accounted for self-rated health in our analysis.

Several potential explanations for our findings should be considered. One explanation is that the observed racial/ethnic differences in disability reflect the severity of the medical conditions in our study population. In this study, health need better explained mobility disability among Latinos. However, health need did not explain the other racial/ethnic differences in functional disability found in this study. Although some studies have found that minority group members enter the health care system in worse health than Whites (Ebell et al., 1995; Gourin & Podolsky, 2006; Horner et al., 1991), other studies have argued that disease severity does not explain racial/ethnic differences in health outcomes (Giles et al., 1995; McBean et al., 1994; Schneider et al., 2002). We were unable to investigate this possibility directly because there are no data on the severity of respondents' medical conditions in the HRS. Nonetheless, because we captured prevalent and incident cases of medical conditions over the course of 12 years and this, along with enabling factors,

explained the racial/ethnic variance in service utilization, we believe that this explanation is unlikely, or at least that disease severity alone does not explain the robust association between service use and disability found in this study.

Another possible explanation for our findings is that there are racial/ethnic differences in quality of care. Previous work has shown that racial/ethnic groups receive poorer chronic disease management and fewer medical procedures and treatments than Whites (Davis et al., 2003; Escarce et al., 1993; Schneider et al., 2002). Focusing on the ways in which minority group members receive differential treatment than Whites may reduce disparities in health care services. Whites are also more likely than minority group members to have private physicians, whereas Blacks and Latinos are more likely to use neighborhood health centers, outpatient hospital care, or emergency rooms for their health care needs (Derlet et al., 2001; for a review, see Mayberry et al., 2000; Walls et al., 2002). Increasing minority access to primary care and dealing with issues such as overcrowding and longer wait times in emergency rooms may be effective strategies for reducing racial/ethnic disparities in health care (Derlet et al., 2001; Hasnain-Wynia et al., 2007). Older Blacks and Latinos may also seek care from different physicians and use different hospitals than Whites. Physicians serving predominantly White patients are more likely to be board certified and have access to more clinical resources than those physicians serving mostly minorities (Bach et al., 2004). Hospitals serving predominantly Whites are more likely to be nonprofit or major teaching hospitals than those serving minorities (Mannion et al., 2005; Yuan, Cooper, Einstadter, Cebul, & Rimm, 2000). The health care resources available to Whites compared to minorities are associated with better health outcomes. These differences in health care resources may explain the findings of this study.

There are several limitations worth considering when interpreting the results. First, we recognize that health care service use rates are incomplete indicators of access to health services and only record the number of contacts with health professionals. We attempted to address this issue in this study by applying the Andersen (Andersen, 1995; Andersen & Newman, 1973) model to account for health care access enabling factors, health need, and changes in these important factors over the 12-year study period. Second, information on adherence to treatment was not available in the HRS. Treatment adherence, which differs by race/ethnicity, could have affected disability rates in this study. Third, we were unable to examine cultural differences in careseeking behaviors with the available HRS data. Nevertheless, we found no evidence that older minority group members were less likely to utilize health care services than older Whites once important factors from the Andersen model were considered. If anything, there was evidence that economic access to physicians may increase utilization of health care services among older Blacks. Additionally, there is evidence that attrition is a persistent problem in longitudinal studies (Groves & Couper, 1998). The rates of attrition in the HRS are not unique compared to those of other panel surveys (see Interagency Household Survey Nonresponse Group, 1998). To address attrition issues in this study we examined a representative sample of community-dwelling older adults who were less at risk for mortality than institutionalized older adults and excluded proxy interviews at baseline.

Despite these limitations, this study provides important health policy implications. Our findings indicate that although improving equality in economic access to health care can result in substantial reductions in disparities in the access to and use of health care services, racial/ethnic disparities in disability would remain. This suggests that improving economic access to health care services is important, but this may not be enough; the availability of health insurance does not guarantee equal access to high-quality care. These findings are consistent with clinic-based and hospital discharge reports suggesting that health policies are needed that address both the micro (patient/physician interaction) and macro (clinical

resources/access to high-quality physicians and hospitals) determinants of health care quality (Smedley, Stith, & Nelson, 2002). Future studies addressing racial/ethnic differences in individual treatment and structural access to high-quality clinicians, hospitals, and other health care services may effectively outline strategies for the reduction of disparities in the process and delivery of health care services.

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Table 1
Weighted Descriptive Statistics at Baseline by Race/Ethnicity

Variable	Total Sample	Whites	Blacks	Latinos
Predisposing factors				
Age, <i>M</i> (<i>SD</i>)	55.06 (3.2)	55.57 (3.2)	55.55 (3.2)	55.31 (3.2)
Female, <i>M</i>	0.54	0.53	0.59	0.56
Health need (ever had, yes/no) ^a				
Diabetes, <i>M</i>	0.09	0.08	0.16 ^{***}	0.12 ^{***}
Cancer, <i>M</i>	0.05	0.05	0.03 [*]	0.03 [*]
Lung disease, <i>M</i>	0.06	0.06	0.04 [*]	0.03 ^{**}
Heart problems, <i>M</i>	0.11	0.11	0.12	0.08 [*]
Stroke, <i>M</i>	0.02	0.02	0.04 ^{**}	0.04 ^{**}
Self-rated health, <i>M</i> (<i>SD</i>) ^b	1.51 (1.2)	1.40 (1.1)	2.02 ^{***} (1.2)	2.00 ^{***} (1.2)
Enabling factors ^c				
Medicare, <i>M</i>	0.04	0.04	0.07 ^{**}	0.06
Medicaid, <i>M</i>	0.03	0.03	0.11 ^{***}	0.17 ^{***}
Veterans/other government, <i>M</i>	0.06	0.06	0.08	0.04
Employer provided, <i>M</i>	0.73	0.75	0.60 ^{***}	0.46 ^{***}
Private insurance, <i>M</i>	0.14	0.15	0.12 [*]	0.6 ^{***}
No insurance, <i>M</i>	0.12	0.11	0.18 ^{***}	0.34 ^{***}
Education, <i>M</i> (<i>SD</i>)	12.33 (3.0)	12.72 (2.6)	11.34 ^{**} (3.2)	8.78 ^{***} (4.5)
Income (log transformed), <i>M</i>	4.47	4.54	4.21 ^{**}	4.08 ^{**}
Wealth (log transformed), <i>M</i>	4.49	4.75	3.20 ^{***}	3.66 ^{***}

Notes: The reference category is White.

^a Ever had (yes/no).

^b Scale (range = 0–4), where 4 = poor health.

^c Yes/no.

* $p < .05$

 $p < .01$

 $p < .001$

Table 2
Weighted Use of Health Services and Disability Measures by Year

Variable	1992	1994	1996	1998	2000	2002	2004
Health service, <i>M</i>							
Physician visit ^a							
White	0.79	0.90	0.92	0.93	0.94	0.94	0.95
Black	0.82*	0.91	0.93	0.93	0.94	0.94	0.93
Latino	0.69***	0.87	0.88**	0.86***	0.90*	0.89**	0.90**
Frequency physician visit							
White	4.05	6.72	7.79	8.88	8.92	9.74	10.16
Black	5.51**	8.66***	9.76**	11.8***	12.31***	11.38	11.70
Latino	4.60	7.10	8.56	9.74	9.04	11.36	12.36
Hospital admission ^d							
White	0.10	0.17	0.19	0.21	0.21	0.24	0.25
Black	0.15***	0.22***	0.23**	0.23	0.27**	0.23	0.26
Latino	0.12	0.20	0.20	0.23	0.22	0.25	0.26
Frequency hospital admission							
White	0.16	0.31	0.30	0.36	0.37	0.42	0.44
Black	0.27**	0.48*	0.42**	0.44	0.55*	0.41	0.46
Latino	0.19	0.50	0.36	0.40	0.40	0.48	0.60*
Disability, <i>M</i>							
Activities of daily living ^b							
White	0.07	0.09	0.16	0.18	0.18	0.19	0.20
Black	0.16***	0.25***	0.36***	0.43***	0.42***	0.40***	0.40***
Latino	0.14***	0.26***	0.35***	0.40***	0.40***	0.40***	0.42***
Mobility ^b							
White	0.48	0.60	0.70	0.74	0.80	0.88	0.98
Black	0.74***	0.94***	1.08***	1.13***	1.20***	1.24***	1.24***
Latino	0.72***	0.96***	0.91*	0.97**	1.04**	1.04	1.11

Notes: The reference category is White. See the text for a description of the scales.

^aWhether utilized.

^bScale (range = 0–5).

* $p < .05$

** $p < .01$

*** $p < .001$.

Table 3
Hierarchical Linear Model Predicting Activities of Daily Living

Variable	Predisposing Factors	Health Need	Enabling Factors
Physician visits	0.21* (0.01)	0.08* (0.01)	0.08* (0.01)
Black	0.14* (0.02)	0.14* (0.02)	0.14* (0.02)
Latino	0.11* (0.02)	0.08* (0.03)	0.08* (0.03)
Hospital admissions	0.89* (0.03)	0.52* (0.03)	0.50* (0.03)
Black	0.46* (0.06)	0.49* (0.06)	0.47* (0.06)
Latino	0.20* (0.08)	0.37* (0.07)	0.37* (0.07)
Model χ^2	325,781*	222,207*	214,287*

Notes: Data are unstandardized coefficients (*SE*). See definitions of activity of daily living scales in the text. The reference category is White. All models are adjusted for age, gender, and reported number of physician visits and hospital admissions. The health need model additionally adjusts for medical conditions; see definitions in the text for a description. The enabling factors model additionally adjusts for education, income, wealth, and health insurance; see definitions in the text for a description.

* $p < .001$.

Table 4

Hierarchical Linear Modeling Predicting Mobility

Variable	Predisposing Factors	Health Need	Enabling Factors
Physician visits	0.69*** (0.01)	0.30*** (0.01)	0.34*** (0.01)
Black	0.14*** (0.03)	0.13*** (0.03)	0.12*** (0.03)
Latino	0.11** (0.04)	0.03 (0.03)	0.02 (0.03)
Hospital admissions	2.03*** (0.05)	0.92*** (0.04)	0.88*** (0.04)
Black	0.15 [†] (0.11)	0.23* (0.10)	0.20* (0.10)
Latino	0.26 [†] (0.14)	0.25* (0.12)	0.26* (0.12)
Model χ^2	143,377***	110,272***	103,967***

Notes: Data are unstandardized coefficients (*SE*). See definitions of mobility scales in the text. The reference category is White. All models are adjusted for age, gender, and reported number of physician visits and hospital admissions. The health need model additionally adjusts for medical conditions; see definitions in the text for a description. The enabling factors model additionally adjusts for education, income, wealth, and health insurance; see definitions in the text for a description.

[†] $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$.