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Racial Disparities in Health Care Access and Cardiovascular Disease Indicators in Black and White Older Adults in the Health ABC Study

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Abstract

Black adults consistently exhibit higher rates and poorer outcomes of cardiovascular disease (CVD) relative to other racial groups, even after accounting for differences in socioeconomic status (SES). Whether factors related to health care access can further explain racial disparities in CVD have not been thoroughly examined. Using logistic regression we examined racial and health care [i.e. health insurance and access to care] associations with CVD indicators [i.e. hypertension, low ankle-arm index, and left ventricular hypertrophy] in the Health, Aging, and Body Composition study, a longitudinal study of 3,075 well-functioning adults aged 70–79 in 1997. We found older Black versus White adults had significantly worse health care. Overall, health care only slightly reduced the significant association between being Black and CVD, while race remained strongly associated with CVD after adjusting for demographics, SES, body mass index, and comorbidity. Research on health care quality may contribute to our understanding of these disparities.

Keywords

United States of America; racial disparities; health insurance; access to care; socioeconomic status; cardiovascular disease

Substantial racial disparities in health exist between older Black and White adults, often as a reflection of an earlier age at onset of chronic conditions, more rapid declines in health, and higher rates of co-morbid conditions, disease-related disability, and mortality in Black adults

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(Bulatao and Anderson 2004; Ferraro and Farmer 1996; Martin and Soldo 1997). Access to quality health care is associated with better prevention, detection, and control of chronic disease processes and consequently improved physical functioning outcomes (Brown, Bindman, and Lurie 1998; Satish et al. 1997; Satish et al. 1998; Tan et al. 2003). Health care may be even more important in health outcomes of older adults, as they rely on these resources more frequently to cope with chronic disease than younger adults (Freeborn 1990; Gold 1996; Wolinsky, Mosely, and Coe 1986). Therefore, if quality health care can improve chronic disease risk and outcomes, then it may help explain racial disparities in health.

Previously, we identified racial disparities in cardiovascular disease (CVD) indicators [i.e. elevated systolic blood pressure (SBP), low ankle-arm blood pressure index (AAI) as an indicator of peripheral arterial disease, and left ventricular hypertrophy (LVH)], that persisted after accounting for socioeconomic status (SES) [i.e. education, family income, home ownership, and other financial assets] (Rooks et al. 2002). Although SES had little direct impact on reducing the racial association with the CVD indicators, we believe access to affordable health care, another dimension of SES, may further explain why racial disparities in heart disease continue to exist.

Health insurance is believed to be associated with better health by improving the quality and quantity of access to health care (Brown et al. 1998). For older adults with near universal coverage through Medicare, they face variable access to health care dependent on their purchase of supplemental insurance coverage through Medicare or private companies and selection of a regular source of health care. In the Program of All-inclusive Care for the Elderly (PACE), Tan et al. (2003) examined the relationship between race and mortality in a frail, community-dwelling, older Black and White sample by increasing their access to a comprehensive health care system program. They found that Black compared to White patients had worse physical and cognitive functioning at baseline enrollment and had better survival rates after the first and fifth years of the study. Their research suggests that PACE enrollment may be beneficial to older Black patients because they had poorer access to care prior to enrollment that could have increased their risk for mortality. They also showed that even in a frail sample of older adults, improving the quality of medical care reduced racial health disparities for survival.

As a marker for health care access, health insurance status has been studied for its relationship to hypertension and other chronic disease. Brown et al. (1998) suggest that there is a small, positive effect of insurance coverage on hypertension among groups who are most likely to utilize public health insurance coverage, including older adults, poor people, and/or racial and ethnic minorities. Ross and Mirowsky (2000) found that older adults with private insurance did not have significantly fewer chronic conditions than the uninsured, but they suggest that health insurance, which protects household budgets from expensive care and reduces economic hardship on individuals or families, may indirectly improve health outcomes.

Health insurance may be related to health outcomes, such as hypertension, by improving access to a regular source of care. For example, Plasencia, Ostfeld, and Gruber (1988) found that adults who were aware of their hypertension were more likely to have a private doctor or a health care center as a usual source of care. They found that controlling hypertension through medications was marginally associated with having a usual source of care. Moy, Bartman, and Weir (1995) also found that adults without a usual source of care received less screening, follow-up care, and pharmacologic treatment for hypertension. Health care is believed to underlie improvements in hypertension because it improves patient-provider communication, disease awareness, treatment, and control (Plasencia et al. 1988).

More research is needed to understand the role of health care access in explaining disparities in heart disease among Black and White older adults. Examining racial differences in hypertension, Gold et al. (1996) found that after adjustments for demographics, SES, utilization, and biomedical measures, being Black and higher health service utilization (i.e. physician visits) were associated with a greater likelihood of hypertension in the Duke, North Carolina Established Populations for Epidemiologic Studies of the Elderly (EPESE). Even among a well-functioning sub-sample (Duke Successful Agers EPESE), these adjustments did not eliminate racial disparities; instead, racial disparities grew larger but there were no longer differences in physician visits. Larger racial disparities in hypertension could be attributed to inadequate hypertension control, although physician visits were similar amongst older Black and White adults. The authors suggest that increased utilization should reflect greater access to adequate medications to control hypertension; however, they could not assess whether older Black adults were taking an adequate dosage of medications to lower their blood pressure sufficiently or if patients were able to affordably fill their prescriptions, regardless of their number of physician visits. The authors remarks are consistent with the health commodity hypothesis (Ross and Mirowsky 2000), suggesting that higher SES brings health and longevity partly because it allows people to purchase health insurance, which allows individuals to buy more and/or better quality access to care, in terms of providers, medications, and treatments, to improve their health outcomes.

Racial disparities in chronic disease develop over a lifetime. The political economy perspective on aging (Quadagno and Reid 1999) suggests that differential exposure to decades of racial and socioeconomic inequalities in education and employment helps determine long-term availability of and access to health care. Older Black adults are more likely than older White adults to suffer disadvantages in health care in the past, where their greater likelihood of having public or poorer quality private health insurance and access to care may negatively impact their current health status (Blendon et al. 1989; Quadagno 2000; Wallace 1990). Even today, older Black adults encounter a variety of difficulties in accessing medical care, including preventive and acute care, surgeries, prescription medications, and long-term care that are likely to impact their current health (Fillenbaum et al. 1993; Lee et al. 1997; Mui and Burnette 1994; Schulman et al. 1999; White-Means 1995, 2000; Wallace et al. 1998). In addition, compared to older White adults, they are more likely to experience structural barriers to medical care, such as residential segregation, limited income and health insurance, and distant proximity to medical facilities, as well as a lack of knowledge about available services and new medical procedures (Wallace 1990).

This study addresses the following hypotheses: 1) Black older adults will have poorer health care access, in terms of having no supplemental health insurance and no access to care from private doctors or health maintenance organizations (HMO), than White older adults; 2) poorer health care access will be associated with a higher prevalence of CVD indicators (i.e. hypertension, low AAI, and LVH); and 3) accounting for poorer health care access will reduce differences in the observed prevalence of CVD indicators between Black and White older adults beyond adjustment for differences in SES.

Method

Sample

Health ABC is a longitudinal cohort study developed and supported by the Laboratory of Epidemiology, Demography, and Biometry of the National Institute on Aging. The study population consists of 3,075 well-functioning, community-dwelling, Black (42%) and White, men and women (52%), between the ages of 70 and 79, from Pittsburgh, Pennsylvania and Memphis, Tennessee. Freedom from difficulties with activities of daily living and lower-extremity, functional limitations define participants as well-functioning. Baseline data,

collected between April 1997 to June 1998, include an in-person interview and a clinic-based examination, with evaluations of body composition, clinical and subclinical diseases, and physical functioning. A detailed description of the Health ABC sample has been described previously (Rooks, et al. 2002).

Measures

Dependent variables—Three objectively determined cardiovascular disease indicators are examined, including hypertension, low AAI, and LVH. Participants with greater than 140 mmHg systolic blood pressure (SBP) or greater than 90 mmHg diastolic blood pressure (DBP), based on an average of two sitting measurements from either arm, are defined as hypertensive. This definition of hypertension varies slightly from our previous research, by including those with elevated DBP who are at-risk as well. AAI, a well established indicator of peripheral arterial disease, is defined as the ratio of either the right or left ankle artery SBP to the right upper-arm SBP. Participants are categorized as having low AAI if this ratio is less than or equal to 0.9 (Newman, Sutton-Tyrrell, and Kuller 1993). LVH, meaning enlargement of the left ventricle of the heart, reflects adaptations by the heart to overcome increased resistance in the peripheral arterial system due to conditions such as long-standing hypertension, obesity, and coronary artery disease (Benjamin and Levy 1999; Kannel et al. 1999). LVH was determined from a resting electrocardiogram using 10 chest and limb electrodes to digitally record electrical conduction in the heart, which directly shows abnormalities in rhythm. Patterns of delayed or accelerated conduction are associated with an underlying structural abnormality of the heart.

Independent variables—Race is determined by participant self-identification as either Black or White. Race is used in this analysis as a social, economic, and cultural construct, which often determines social identity and has been linked to access to societal rewards and resources in the United States (Williams 1997). Health care access includes health insurance and access to care. Basic health insurance coverage was defined as having Medicare and/or Medicaid only versus supplemental insurance purchased from the federal government, a private agency, or provided through current or past employment. Poor access to care was defined as reporting no usual source of health care, utilizing emergency rooms, public or hospital outpatient clinics, or other places of care versus naming an HMO or private doctor's office.

Control variables—We controlled for age, study site, anti-hypertensive medications, household family size, marital status (being married or not), SES [i.e. education (< 12, = 12, and > 12 years), family income (< \$10,000, ≥ \$10,000 to < \$25,000, ≥ \$25,000 to < \$50,000, and ≥ \$50,000), and owning any of seven assets (including: money market accounts, certificates of deposit/savings bonds/treasury bills, investment property or housing, business or farm, stock or stock mutual funds, IRA or KEOGH accounts, or other investments)], body mass index (BMI as height in kg/weight in m²), and a comorbidity index, totaling the number of self-reported, weight-related health conditions, such as diabetes, pulmonary disease, osteoporosis, osteoarthritis, and depression. We adjusted for the latter two measures because research has shown that health care expenditures increase as weight deviates below or above a normal weight and when weight-related diseases increase the need for medical care (Heithoff et al. 1997; Quesenberry, Caan, and Jacobson 1998). For more detail about anti-hypertensive medications and the SES measures, refer to Rooks et al. (2002).

Statistical Analysis

Descriptive and multivariate analyses utilized SAS for Windows, version 8.0. Bivariate cross-tabulations were calculated for health care access and the CVD indicators across combined racial and sex groups and two sites. Sex-specific logistic regression models were run to obtain odds ratios and 95% confidence intervals. Sex-specific analyses were performed due to

differences in heart disease prevalence. First, to evaluate whether racial disparities exist in health care access and if there are health care disparities associated with any of the CVD indicators in our study cohort, we ran models for race and health care access as an outcome as well as health care and the CVD indicators as outcomes. Second, to evaluate whether health care reduced the racial differences in the CVD indicators more than that seen using the SES measures we examined in our prior research and whether adjusting for both health care and SES further reduced or eliminated the racial differences in the CVD indicators, we included the following step-wise models with adjustments: race and each CVD indicator (Model 1), race, health care, and each CVD indicator (Model 2), race, SES, and each CVD indicator (Model 3), and race, health care, SES, and each CVD indicator (Model 4). Tests of co-linearity of the variables were negative.

Results

Table 1 shows the bivariate distribution of health care access and CVD indicators by race and sex. Almost one-third of Black men (32.9%) and women (30.5%) had no supplemental health insurance compared with 5.7% and 4.2% of White men and women, respectively. Similarly, more than one-third of Black men (35.7%) did not report a regular source of care through a HMO or private doctor, followed by about one-fourth of Black women (23.8%), in contrast to less than ten percent of White men (9.4%) and women (9.6%). As reported previously, Black men and women had a higher prevalence of hypertension, low AAI, and LVH compared with White men and women, despite having a higher percentage of Black versus White adults on anti-hypertensive medications.

In our multivariate analyses, we examined the association between race and health care access (*not shown*). Black compared to White women (almost 10.5 times), as well as Black compared to White men (almost 7.5 times), had a greater odds of utilizing only Medicare and/or Medicaid versus private supplemental health insurance ($p<0.001$). Similarly, Black compared to White women, as well as Black compared to White men, had a little more than 2.5 and 4.5 times respectively, greater odds of utilizing no or other usual places of care versus a HMO or private doctor ($p<0.001$). Moreover, while examining the association between health care access and CVD indicators independent of race (*not shown*), we found no association for women and only an association between no or other usual places of care versus a HMO or private doctor and increased low AAI prevalence (a 71% greater odds, $p<0.05$) for men.

Table 2 shows associations between race and hypertension, low AAI, and LVH by sex. Racial differences in women were not seen for hypertension and the coefficient was unaffected after including covariates of health care and SES. Significant racial differences were seen for low AAI and LVH in women and persisted after adjustments for health care and SES. Black women remained at two to four times higher risk than White women ($p<0.001$). Older Black men were significantly more at risk for hypertension, low AAI, and LVH than older White men. After adjusting for health care and SES, racial differences among men remained significant for hypertension and LVH ($p<0.01$). Racial differences in men's risk of low AAI were reduced by including either health care or SES and became non-significant after including both measures. With the exception of the relationship between race and low AAI in men, adjustments for health care in addition to SES had a negligible impact on reducing Black versus White disparities in CVD among older adults.

To understand whether the association between health care and CVD is specific to a racial group, we ran sex-stratified full models adjusting for interactions between race and health insurance, access to care, education, family income, owning assets, and anti-hypertensive medications, respectively (*not shown*). None of the interactions between race and health care, for women or men, were significant. However, two race and SES interactions were significant.

Older Black women with between 1 to 2 assets had two and half times greater odds of low AAI than the rest of the sample (i.e. those with none or 3–7 assets) [$p < 0.05$, OR=2.54, 95% CI (1.02, 6.31)]. And, older Black men with a family income of greater than or equal to \$50,000 had more than two and half times greater odds of low AAI than the rest of the sample [$p < 0.01$, OR=14.78, 95% CI (2.23, 98.09)]. However, the latter significant racial association may not be reliable due to the small number of respondents with low AAI (193 out of 1377) and the need for subsequent racial and income group comparisons within this model.

Finally, to address the possibility that the association between the CVD indicators, race, and health care access may be driven by lower SES status or lower quality health care, we also ran SES and health care-stratified full models showing outcomes across high versus low SES and health care groups (Table 3). No significant racial disparity in hypertension existed for those with less than \$25,000 income, but older Black versus White adults had a significantly greater odds of hypertension in the greater than or equal to \$25,000 income group. The odds of Black versus White adults having low AAI is significantly greater for those with less than 12 years education compared to those with more education. But, the odds of Black versus White adults having low AAI is significantly higher for those with greater than or equal to \$25,000 income compared to those with less income, those with supplemental insurance compared to Medicaid and/or Medicare only, and those with private doctor or HMO access to care compared to none or other usual places of care. The odds of Black versus White adults having LVH is significantly greater for those with less than \$25,000 income compared to those with more income and those with private doctor or HMO access to care compared to none or other usual places of care. While some of the remaining SES and health care-stratified comparisons were significant between high and low groups, the racial disparity in the CVD indicators was not very different. Overall, we suspected that lower SES status or lower quality health care would help explain racial disparities in the CVD indicators; however, our results did not consistently show this. In fact, for the health care stratified models, we found significantly higher Black versus White racial disparities in the CVD indicators among the more advantaged groups.

Interestingly, there were no significant racial disparities in any of the CVD indicators among those with no supplemental health insurance and those with no or other usual places of care. The significant racial associations with LVH for those with no or other usual places of care were not reliable due to a sample size of 43 people with LVH in this model. Conversely, there were significant racial disparities in all of the CVD indicators among those with supplemental health insurance and private doctor or HMO access to care.

Discussion

This research focused on the role of health care in explaining racial disparities in three CVD indicators among older adults and found that race remained strongly associated with these indicators except for hypertension in women and low AAI in men. Previous research on racial disparities in health among older adults suggest that health care may explain some of the existing health disparities between Black and White adults (Satish et al. 1997; Satish et al. 1998; Tan et al. 2003), but contrary to expectations, health insurance and access to care had little impact on the CVD indicators and variably reduced and increased the association between race and these outcomes in well-functioning older adults.

One explanation may be that the association between health care and the CVD indicators may be attenuated in this sample because those who were sicker, and possibly poorer, were screened out of the Health ABC study. Second, cross-sectional health care measures in Health ABC reflect respondents' recent decisions, which may be contrary to the long history associated with factors contributing to the development of CVD. Third, the Health ABC study did not ask participants questions about their level of satisfaction with their usual medical care providers

which may inhibit some older adults from using a particular type of care, even if they have access to it. Finally, although we identify lower quality health care as a problem related to racial disparities in health outcomes, we also acknowledge that racial disparities can reflect health service utilization, such as physician visits, discrimination from and patient distrust of medical staff, and facility location and transportation difficulties (Collins, Tenney, and Hughes 2002; Corbie-Smith, Thomas, and St. George 2002; Schulman et al. 1999; Wallace 1990). However, these issues were not addressed in Health ABC.

We suspect that quality of care, not just having health care, drives racial disparities between older Black and White adults. This belief is based on our health care-stratified analyses in Table 3, where racial disparities in heart disease were significant in those with health care access but not in the disadvantaged groups with no or limited health care. In addition, in a recent *New England Journal of Medicine* article, Bach et al. (2004) suggested that racial disparities in disease may be related to quality of care, where older Black and White patients were generally treated by different physicians. They found that physicians treating Black patients were less likely to have board certification in their primary specialty and more likely to have difficulties in accessing higher quality clinical resources than physicians treating White patients.

The closest proxy in Health ABC for quality of health care, based on the association between doctors' recommendations of preventive care for patients and higher quality care, is whether or not participants had a flu shot in the last 12 months (Fiscella et al. 2000; Gornick et al. 1996). We stratified according to flu shot status and using the full model found that there were no racial disparities in hypertension for those who had a flu shot; however, Black adults had a greater odds of hypertension than White adults in the group without the flu shot [$p < 0.05$, $OR = 1.52$, 95% CI (1.07, 2.16)]. There were similar significant associations between race and low AAI in the flu shot or not groups [$p < 0.001$, $OR = 1.80$, 95% CI (1.28, 2.52); $p < 0.05$, $OR = 1.81$, 95% CI (1.10, 2.99)]. There was almost a three times greater odds of Black adults having LVH when they had the flu shot [$p < 0.001$, $OR = 2.73$, 95% CI (1.66, 4.50)], whereas there was almost a five times greater odds for those without the flu shot [$p < 0.01$, $OR = 4.91$, 95% CI (1.85, 12.99)]. As a quality of health care measure, having a flu shot reduced the likelihood of racial disparities in hypertension and LVH.

Based on literature examining ethnic disparities in CVD among older Mexican Americans (Satish et al. 1997; Satish et al. 1998), a follow-up study to understand why Black versus White racial disparities persist in CVD indicators among older adults should address the lack of awareness (i.e. undiagnosed disease), inadequate anti-hypertension medication (i.e. under-treatment), and lack of hypertension control among older Black adults. Furthermore, since CVD is a weight-related disease, a consideration of health-related behaviors is warranted. Both positive and negative health-related behaviors, such as exercise, low fat, low salt, and high fiber diets, working, volunteering, smoking, alcohol drinking, and watching television, may provide insight about remaining racial disparities in our three CVD indicators.

Showing weaker effects than expected, health care did little to modify the significant association between older Black adults and hypertension (significant in men only), low AAI (except for men), and LVH, after adjusting for anti-hypertensive medications, age, study site, household family size, marital status, education, family income, assets, BMI, and comorbidity. Access to care, associated with low AAI for men, was the only significant health care association with CVD. Except for adjustments for health care eliminating the racial disparity in low AAI among men, race continued to be a strong predictor of poorer cardiovascular functioning, regardless of considerations of SES, health care, and weight-related biomedical measures.

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Table 1Distribution of Health Care and Cardiovascular Disease Indicators by Race and Sex ^{ab}.

Variables	Women		Men	
	Black	White	Black	White
N	729	855	552	939
Age, mean $\pm$ sd, years	73.4 $\pm$ 3.0	73.6 $\pm$ 2.8	73.5 $\pm$ 2.8	73.9 $\pm$ 2.9
Site, %				
Pittsburgh, PA	25.7	25.9	18.1	30.3
Memphis, TN	21.8	29.7	17.8	30.8
<u>Health Care Access</u>				
No supplemental health insurance, % ^c	31.1	4.6	33.4	6.0
with Hypertension	30.4	4.3	33.2	5.1
with Low ankle-arm blood pressure index (AAI)	31.2	9.5	34.9	12.2
with Left ventricular hypertrophy (LVH)	36.4	4.8	30.6	0.0
No HMO or private doctor access to care, %	23.7	9.6	35.7	9.4
with Hypertension	25.6	9.7	34.4	8.3
with Low AAI	25.7	5.4	42.3	18.9
with LVH	35.4	0.0	34.7	10.3
<u>Cardiovascular Disease Indicators</u>				
Hypertension, i.e. elevated SBP $\geq$ 140 or DBP $\geq$ 90 mmHg., %	44.3	35.3	46.0	33.3
Systolic blood pressure (SBP), mean $\pm$ sd, mmHg.	139 $\pm$ 23	134 $\pm$ 20	139 $\pm$ 22	133 $\pm$ 20
Diastolic blood pressure (DBP), mean $\pm$ sd, mmHg.	72 $\pm$ 12	69 $\pm$ 11	75 $\pm$ 12	71 $\pm$ 11
Taking anti-hypertensive medications, %	68.3	49.8	55.1	49.0
AAI				
AAI, mean $\pm$ sd	1.0 $\pm$ 0.2	1.1 $\pm$ 0.2	1.0 $\pm$ 0.2	1.1 $\pm$ 0.2
Low AAI, $\leq$ 0.9, %	21.0	9.0	21.4	10.1
LVH, %	9.2	2.5	9.0	3.2

^a Chi-square statistics for Health Care Access were significant at $p < 0.001$ for differences by race within each sex group.

^b Chi-square statistics for the Cardiovascular Disease Indicators were significant at $p < 0.001$, except for racial differences in anti-hypertensive medications for men ($p = 0.023$).

^c No supplemental health insurance outside of Medicare and/or Medicaid.

Source: National Institute on Aging, Laboratory of Epidemiology, Demography, and Biometry. Health, Aging, and Body Composition Study, 1997.

Table 2

Associations between Race and Hypertension, Low Ankle-Arm Index (AAI), and Left Ventricular Hypertrophy (LVH) stratified by Sex.
Odds Ratios (95% Confidence Intervals) ^{ab}

Models	Hypertension		Low AAI		LVH	
	Women	Men	Women	Men	Women	Men
1: Black vs. White adults	1.19 (0.94, 1.51)	1.76*** (1.40, 2.22)	2.80*** (1.99, 3.94)	2.39*** (1.72, 3.32)	4.04*** (2.30, 7.10)	3.21*** (1.96, 5.26)
2: Model 1 and Health care access	1.11 (0.86, 1.42)	1.75*** (1.37, 2.25)	2.55*** (1.78, 3.67)	1.98*** (1.38, 2.83)	3.90*** (2.13, 7.14)	3.32*** (1.97, 5.61)
3: Model 1 and Socioeconomic status (SES)	1.19 (0.91, 1.55)	1.58** (1.20, 2.07)	2.41*** (1.65, 3.53)	1.61* (1.08, 2.40)	4.35*** (2.25, 8.43)	2.49** (1.39, 4.44)
4: Model 1, Health care access, and SES	1.13 (0.86, 1.49)	1.58** (1.20, 2.09)	2.24*** (1.52, 3.31)	1.44 (0.95, 2.18)	4.22*** (2.13, 8.37)	2.60** (1.45, 4.68)

p < 0.001;

**
p < 0.01;

*
p < 0.05

^a Controls for model 1 included age, site, anti-hypertensive medications, household size, marital status, body mass index, and a comorbidity index.

^b SES included education, family income, and assets.

Source: National Institute on Aging, Laboratory of Epidemiology, Demography, and Biometry. Health, Aging, and Body Composition Study, 1997.

Table 3

Associations between Race and Hypertension, Low Ankle-Arm Index (AAI), and Left Ventricular Hypertrophy (LVH) in stratified full models by Education, Family Income, Assets, Health Insurance, and Access to Care. Odds Ratios (95% Confidence Intervals) ^a

Models	Hypertension	Low AAI	LVH
1: Education			
< 12 years	1.49* (1.00, 2.21)	2.39** (1.32, 4.33)	3.34* (1.20, 9.26)
≥ 12 years	1.28* (1.03, 1.60)	1.73*** (1.25, 2.39)	3.23*** (1.96, 5.30)
2: Family Income			
< \$25,000	1.22 (0.93, 1.59)	1.60* (1.09, 2.34)	4.22*** (2.13, 8.36)
≥ 25,000	1.59** (1.15, 2.19)	2.60*** (1.61, 4.20)	2.34* (1.20, 4.57)
3: Assets			
0–2	1.29* (1.02, 1.64)	1.98*** (1.42, 2.76)	3.28*** (1.90, 5.66)
3–7	1.40 (0.93, 2.09)	2.00* (1.08, 3.70)	3.55** (1.53, 8.21)
4: Health insurance			
Medicaid and/or Medicare only	1.55 (0.88, 2.75)	0.64 (0.32, 1.29)	3.57 (0.43, 29.37)
Supplemental	1.30* (1.06, 1.60)	2.20*** (1.63, 2.98)	3.31*** (2.10, 5.22)
5: Access to care			
None or other usual place of care	1.45 (0.90, 2.34)	1.31 (0.67, 2.57)	5.22* (1.34, 20.34)
Private doctor or HMO	1.30* (1.05, 1.61)	2.10*** (1.54, 2.85)	2.77*** (1.73, 4.44)

p < 0.001;

**
p < 0.01;

*
p < 0.05

^aControls included sex, age, site, anti-hypertensive medications, household size, marital status, body mass index, a comorbidity index, and education, family income, assets, health insurance, or access to care, depending on the stratifying variable.

Source: National Institute on Aging, Laboratory of Epidemiology, Demography, and Biometry. Health, Aging, and Body Composition Study, 1997.