

Medical Debt and Related Financial Consequences Among Older African American and White Adults

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Objectives. To evaluate African American–White differences in medical debt among older adults and the extent to which economic and health factors explained these.

Methods. We used nationally representative data from the 2007 and 2010 US Health Tracking Household Survey (n=5838) and computed population-based estimates of medical debt attributable to economic and health factors with adjustment for age, gender, marital status, and education.

Results. African Americans had 2.6 times higher odds of medical debt (odds ratio=2.62; 95% confidence interval=1.85, 3.72) than did Whites. Health status explained 22.8% of the observed disparity, and income and insurance explained 19.4%. These factors combined explained 42.4% of the observed disparity. In addition, African Americans were more likely to be contacted by a collection agency and to borrow money because of medical debt, whereas Whites were more likely to use savings.

Conclusions. African Americans incur substantial medical debt compared with Whites, and more than 40% of this is mediated by health status, income, and insurance disparities.

Public health implications. In Medicare, low-income beneficiaries, especially low-income African Americans with poor health status, should be protected from the unintended financial consequences of cost-reduction strategies. (*Am J Public Health.* 2016; 106:1086–1091. doi:10.2105/AJPH.2016.303137)

Medical debt—personal debt incurred from health care costs—is a substantial and increasing problem among older Americans, especially African Americans.^{1,2} Older adults incur medical debt because of high health care needs from multiple chronic conditions and limited financial resources to pay out-of-pocket costs.^{1,2} According to 2007 data from the Commonwealth Fund Biennial Health Insurance Survey, approximately 1 in 5 low-income older adults had problems paying medical bills or medical debt in the past 12 months.³ Even older adults in the highest income households have been found to experience significant medical debt problems.^{1,2}

Few studies have examined why medical debt may disproportionately occur among older African Americans. Yet, this is an important problem for several reasons. First, older African Americans are particularly vulnerable to medical debt problems because they tend to be in poorer health, to have

higher out-of-pocket expenses, and to have fewer financial resources than their White counterparts.² Low-income African American adults typically qualify for both Medicare and Medicaid coverage, which should alleviate out-of-pocket spending for health care.^{1,2} However, many low-income African American Medicare beneficiaries are not covered by Medicaid because of the burden of the eligibility and enrollment process, and lack of awareness about eligibility.¹ Finally, older African American adults also experience financial barriers to care from a combination of economic and social factors such as working in racially segregated,

low-wage jobs that offer no retiree health benefits.⁴ As a result, avoidance of medical services and nonadherence to prescribed medications because of costs are more prevalent among older African Americans than they are among older Whites, resulting in a reliance on high-cost services when care is finally sought.^{4,5}

Medical debt captures unpredictable and unavoidable trade-offs or choices that individuals make between medical care spending and other household spending (e.g., paying utilities, buying food, paying mortgage or rent) to address serious health needs.⁶ But the magnitude and distribution of medical debt and related financial consequences between African Americans and Whites is unclear. Moreover, we lack an understanding of how economic and health status factors may explain medical debt disparities. Therefore, we addressed the following questions: (1) What is the prevalence of medical debt among older African Americans and Whites? (2) What proportion of the observed racial/ethnic disparity in medical debt is accounted for by economic measures after control for self-rated health status and other covariates? (3) What proportion of the observed racial/ethnic disparity in medical debt is accounted for by differing self-rated health status after control for economic factors and other covariates? (4) How do the financial consequences of medical debt differ among older African Americans and Whites? Lessons learned from asking these questions may inform policy on health care affordability for a large and growing proportion of our aging population.⁴

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METHODS

We drew the cross-sectional data for our analyses from the 2007 and 2010 Health Tracking Household Survey (HTHS), previously known as the Community Tracking Study Household Survey.⁷ The HTHS is a nationally representative, telephone-administered survey of civilian, non-institutionalized individuals grouped into family insurance units (FIUs). The FIU includes an adult household member, spouse, and dependent children aged up to 18 years. The HTHS collects information on access to care, health care experiences, health expenses and bills, insurance coverage, health status, and sociodemographic characteristics. The 2007 HTHS consisted of 17 797 individuals from 9407 FIUs, and the 2010 HTHS consisted of 16 671 individuals from 9165 FIUs. Detailed descriptions of the HTHS and documentation are available from the Health and Medical Care Archives (<http://www.icpsr.umich.edu/HMCA>) and have been published elsewhere.⁷ Data from multiple rounds may be combined to increase sample size and to calculate a single “pooled” estimate.⁸ The pooled sample of adults who were aged at least 65 years included 3261 individuals from 2007 and 3076 from 2010. We restricted our sample to non-Hispanic Whites and African Americans aged 65 years or older ($n = 5838$).

Dependent and Independent Variables

The dependent variables of interest were a dichotomous variable assessing medical debt and 5 dichotomous variables indicating self-reported financial consequences of medical debt. The HTHS used the following question to assess medical debt: “During the past 12 months, have you or has your family had any problems paying medical bills?” If an individual reported “yes” to having problems paying medical bills, they were asked the following questions (categorized as financial consequences of medical debt):

Because of problems paying medical bills during the past 12 months, have you and your family [question 1] been contacted by a collection agency; [question 2] had problems paying for other necessities; [question 3] put off major purchases, such as a new car; [question 4] had to take money out of savings; or [question 5] had to borrow money?

All responses were coded as yes or no. All respondents reporting medical debt experienced at least 1 financial consequence.

The main independent variable of interest was race/ethnicity (non-Hispanic White, African American, both mutually exclusive). The proposed mediators were economic (income and insurance) and health status. We categorized income level as a percentage of the federal poverty level (based on the 2002 and 2007 US Census Bureau poverty guidelines for the size of the Census family given)^{7,8} as low (0%–199%), medium (200%–399%), or high ($\geq 400\%$). “Low” indicates less income and more poverty, whereas “high” indicates more income and less poverty. We assessed insurance type as Medicare only, Medicare and public insurance, and Medicare and private coverage. Therefore, we coded this variable so that greater values indicated better insurance status. These economic measures enable purchase of health services and are highly amenable to social or policy changes.⁹ We categorized perceived health status, assessed on a 5-point scale, as (1) poor or fair, (2) good, and (3) very good or excellent, with greater coded values indicating better health. Other covariates included age (continuous), gender (male or female), marital status (single or married), and education level (less than high school, high school, some college, or college and above). We included these covariates because of their association with health care utilization and outcomes.^{2,5,9}

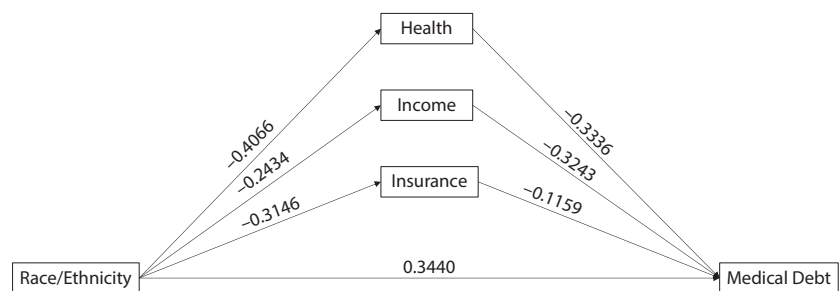
Statistical Analysis

We first examined data distributions and descriptive summaries. Bivariate analyses

compared older African Americans and Whites on all study variables. To account for complex survey characteristics, we based statistical significance on the Pearson χ^2 test with the Rao and Scott second-order correction for categorical variables and the t test with the robust variance estimator (continuous variables).^{10,11} Next, we used logistic regression—adjusted for age, gender, marital status, and education—to assess the relationship between race/ethnicity and medical debt. We used odds ratios (ORs), confidence intervals (CIs), and P values to characterize associations. We used the c -statistic to assess how well the model can discriminate between people who reported having medical debt from those who did not have medical debt.¹²

We performed mediation analysis according to approaches outlined by MacKinnon.¹³ For this analysis, we postulated that race/ethnicity leads to problems with medical debt through 3 indirect (mediated) pathways and a direct pathway. The mediators for the 3 indirect pathways were health status, income level, and insurance status, with each cast as a 3-level ordinal variable. These paths are depicted in the mediation diagram in Figure 1.

We adjusted the main mediation models for age, gender, marital status, and education. We also ran the mediation models without marital status and education. Because the outcomes for the mediation equations were dichotomous or ordinal, we standardized path coefficients to account for the variance of the assumed underlying latent outcome.¹⁴ We accomplished maximum likelihood estimation with mean-variance adaptive



Note. All standardized path coefficients are adjusted for age, gender, marital status, and education.

FIGURE 1—Proposed Mediation Pathways Linking African American Race/Ethnicity With Medical Debt: 2007 and 2010 US Health Tracking Household Survey, Respondents Aged 65 Years or Older

TABLE 1—Characteristics of Study Sample and Population by Race/Ethnicity: 2007 and 2010 US Health Tracking Household Survey, Respondents Aged 65 Years and Older

Characteristic	Weighted % ^a (SE) or Mean \pm SE		
	Total (n = 66 019 000)	White (n = 59 832 575)	African American (n = 6 186 426)
Gender			
Male	43.1 (0.65)	43.9 (0.68)	34.9 (2.43)
Female	56.9 (0.65)	56.1 (0.68)	65.1 (2.43)
Married			
Yes	60.4 (1.04)	63.1 (1.07)	34.6 (3.28)
No	39.6 (1.04)	36.9 (1.07)	65.4 (3.28)
Education level			
< high school	18.1 (0.83)	16.1 (0.84)	37.1 (3.00)
High school	35.3 (0.91)	35.5 (0.96)	32.6 (2.52)
Some college	22.4 (0.82)	23.0 (0.87)	17.2 (2.22)
\geq college	24.2 (0.85)	25.3 (0.90)	13.0 (1.68)
Income level			
Low (0%–199% FPL ^b)	30.7 (0.99)	28.1 (1.00)	55.8 (3.11)
Medium (200%–399% FPL)	33.0 (1.05)	34.6 (1.12)	18.3 (2.01)
High (\geq 400% FPL)	36.3 (1.09)	37.4 (1.16)	26.0 (2.63)
Insurance			
Medicare only	15.2 (0.80)	14.2 (0.84)	24.4 (2.57)
Medicare and public insurance	10.0 (0.62)	9.1 (0.63)	19.7 (2.55)
Medicare and private insurance	74.8 (0.95)	76.7 (0.99)	55.9 (2.97)
Perceived health status			
Poor or fair	25.9 (0.84)	23.9 (0.85)	45.6 (2.88)
Good	30.3 (0.86)	30.4 (0.94)	29.0 (2.47)
Very good or excellent	43.8 (0.95)	45.7 (1.01)	25.4 (2.22)
Medical debt			
No	91.5 (0.61)	92.9 (0.62)	78.6 (2.43)
Yes	8.5 (0.61)	7.1 (0.62)	21.4 (2.43)
Age, y	74.0 \pm 0.13	74.1 \pm 0.14	73.8 \pm 0.38

^aPercentages may not add to 100 because of rounding.

^bFPL = federal poverty level based on the 2002 US Census Bureau poverty level for the size of the census family given.^{7,8}

quadrature,¹⁵ by using the generalized structural equation modeling module of Stata version 14.1 (StataCorp LP, College Station, TX). We calculated the total contribution of each path as the product of the path coefficients. We calculated mediated proportions as the ratio of a specific path contribution (or combination of paths) to the total contribution of all paths. Therefore, the mediated proportion approximately represented the proportion of the total effect of the independent variable that was transmitted through the mediator¹⁶ after we considered covariates in the model. We generated CIs based on linear approximation from a Taylor expansion.¹⁷ In addition, we developed

separate mediation models within each of the 3 strata of income.

Finally, we performed logistic regression analyses to assess how the 5 financial consequences of medical debt (i.e., been contacted by a collection agency, had problems paying for other necessities, put off major purchases, had to take money out of savings, and had to borrow money) differed among older Whites and African Americans. We adjusted all regression models for age, gender, marital status, and education. To facilitate more intuitive comparison based on these logistic regression models, adjusted percentages (i.e., model-adjusted risks) and standard errors directly contrasted the financial

consequences of medical debt between Whites and African Americans.¹⁸ We considered all results statistically significant at $P \leq .05$.

We conducted all statistical analysis with Stata version 14, which is designed to analyze complex sample survey data like those of the HTHS.⁷ Sampling weights provided with the HTHS represent the total US civilian noninstitutionalized population with adjustments for oversampling and nonresponse.

RESULTS

Table 1 summarizes the characteristics of our study sample and population. Approximately 9% of the sample was African American. More African Americans than Whites had low income, Medicare-only insurance, and poor or fair health status. Approximately 7.1% of Whites had medical debt versus 21.4% of African Americans. Table 2 shows results from the logistic regression model assessing self-reported medical debt. After adjustment for age, gender, marital status, and education, older African Americans had 2.6 times higher odds of having medical debt than did Whites (OR = 2.62; 95% CI = 1.85, 3.72). Increasing age and increasing education were associated with lower odds of medical debt.

Table 3 shows the results from the analysis exploring the contribution of economic and health status factors to the observed disparity in medical debt. Together, economic factors explained 19.4% of the medical debt disparity between African Americans and Whites, with income being more important than insurance status. Health factors explained 22.8% of the disparity. Combined, economic and health factors explained 42.2% of the racial/ethnic disparity in medical debt. Omitting education and marital status as confounders slightly increased the mediated effect, but did not substantively alter the findings. In stratified analyses, the proportion of medical debt disparity explained by health status was 31.1% (95% CI = 8.8%, 53.5%) for those in the lowest income category, 24.8% (95% CI = 9.9%, 39.6%) for those in the middle income category, and 12.0% (95% CI = 0.0%, 25.5%) for those in the highest income category.

TABLE 2—Adjusted Odd Ratios and 95% Confidence Intervals for Having Medical Debt: 2007 and 2010 US Health Tracking Household Survey, Respondents Aged 65 Years or Older

Characteristic	Medical Debt, % ^a (95% CI)	OR (95% CI)
Race/ethnicity		
African American	21.4 (17.0, 26.5)	2.62 (1.85, 3.72)
White	7.1 (6.0, 8.4)	1 (Ref)
Gender		
Female	8.6 (7.2, 10.2)	0.81 (0.64, 1.03)
Male	8.4 (7.1, 9.9)	1 (Ref)
Age		
	...	0.96 (0.93, 0.98)
Marital status		
Not married	9.9 (8.2, 11.9)	1.38 (0.96, 1.98)
Married	7.5 (6.1, 9.2)	1 (Ref)
Education level		
< high school	13.8 (10.8, 17.4)	2.95 (1.74, 5.00)
High school	8.9 (7.1, 11.0)	1.85 (1.17, 2.94)
Some college	8.1 (5.9, 11.0)	1.57 (0.93, 2.66)
≥ college	4.2 (3.0, 5.9)	1 (Ref)

Note. CI = confidence interval; OR = odds ratio. Unweighted n = 5838; weighted n = 66 019 000. The relationship between race/ethnicity and problems paying medical bills was only adjusted for gender, age, marital status, and education. C-statistic (area under the receiver-operating-characteristic curve) = 0.683.

^aPercentages for medical debt are unadjusted.

Among those with medical debt (n = 453), 38.3% were contacted by a collection agency, 42.9% put off major purchases, 57.9% used savings, 33.9% borrowed money, and 59.6% had difficulty paying for necessities (results not shown). More African Americans than Whites were contacted by a collection agency (61.4% vs 31.1%; $P < .001$) and borrowed money (52.4% vs 28.2%; $P = < .001$), whereas more Whites than African Americans used savings (63.5% vs 39.8%; $P = .002$) because of

medical debt (results not shown). Because of medical debt, older African Americans had significantly higher rates than older Whites had of being contacted by a collection agency (56.7% vs 32.3%; $P \leq .001$) and borrowing money (50.4% vs 28.6%; $P = .001$). Older Whites had a significantly higher rate than older African Americans had of using savings because of medical debt (62.1% vs 44.7%; $P = .018$). Figure A, available as a supplement to the online version of this article at

<http://www.ajph.org>, shows the adjusted percentages (i.e., model-adjusted risks) for the financial consequences of medical debt.

DISCUSSION

We found that older African Americans had a higher (2.6 times) prevalence of problems paying medical bills than did older Whites. Perceived health status explained about 35% of the racial/ethnic disparity in problems paying medical bills, and economic factors explained an additional 39%. We also found that older African Americans were more likely than were Whites to be contacted by a collection agency and to borrow money, whereas older Whites were more likely to use savings because of medical bill problems.

These results suggest that older African Americans incur substantial medical debt because they lack the income or insurance coverage to pay for needed medical care. The income gap between African Americans and Whites is a well-documented and persistent issue across the lifespan.¹⁹ Many older adults live on low or modest incomes, but older African Americans are almost 3 times more likely to live in poverty than are their White counterparts.² Income inequality has been linked to a variety of adverse health and health care outcomes.¹⁹ Although low-income African Americans may be dually covered by Medicare and Medicaid, states' variation in Medicaid benefit packages leaves many dual beneficiaries with burdensome out-of-pocket costs, which can greatly press budgets of older adults on fixed incomes and with other financial obligations.^{1,2} As out-of-pocket expenses continue to rise and older adults face the prospect of shrinking income,²⁰ medical debt represents a major threat to the economic security of older African Americans. Although the 2010 Affordable Care Act will reduce the financial burden of medical care on older adults by closing the "doughnut hole" in Medicare Part D, African Americans—who need and have to use more health services because of poor health—will continue to incur considerable medical debt because of out-of-pocket costs for deductibles and copayments.

We also found that increasing age was associated with less medical debt. On first consideration, this finding may appear to be

TABLE 3—Percentage of Disparity in Medical Debt Problems for African Americans and Whites Explained by Health and Economic Factors: 2007 and 2010 US Health Tracking Household Survey, Respondents Aged 65 Years and Older

Variable	Percentage Explained (95% CI) ^a	Percentage Explained (95% CI) ^b
Health	22.8 (14.1, 31.5)	23.5 (15.9, 31.1)
Economic factors		
Income	13.3 (4.5, 22.1)	23.0 (14.0, 31.9)
Insurance	6.1 (0.9, 11.4)	8.0 (1.5, 14.4)
Subtotal explained by economic factors	19.4 (8.6, 30.2)	30.9 (19.8, 42.0)
Total proportion explained	42.2 (27.2, 57.1)	54.4 (40.3, 68.5)

Note. CI = confidence interval. Unweighted n = 5838; weighted n = 66 019 000. Income, insurance, and health were coded as 3-level variables.

^aModels were adjusted for age, gender, marital status, and education.

^bModels were adjusted for age and gender.

paradoxical because it is well recognized that medical expenditures increase with age and, on average, peak near time of death.²¹ However, in this context, it is important to note that all respondents in our sample were at aged 65 years or older and, therefore, potentially eligible for Medicare. We suspect that enrollment in Medicare resulted in a substantial decrease in the acquisition of new debt and also provided an opportunity to pay down existing debt. It is reasonable to assume that this effect could begin after enrollment and continue to accumulate with passing years. Although African Americans have, on average, shorter life expectancies than Whites,²² we do not suspect that the age-related decline in medical debt results from a depletion of African Americans from our sample. In support of this assertion, we note that the racial/ethnic composition of our sample remained remarkably constant with age. Furthermore, the finding of an age-related decline in medical debt persisted in subanalyses for both African Americans and Whites. Nonetheless, the age-related decline in medical debt is an interesting finding and warrants further study.

Income, insurance, and health status are interrelated factors that influence health care disparities²³; these factors combined explained 42% of the African American–White disparity. We suspect that the impact of economic factors was not fully captured because our measures did not consider the broader construct of wealth. A robust body of research supports the link between self-reported health status and health care utilization and cost,²⁴ which may lead to increased medical debt, especially in the setting of low resources. This is consistent with our finding that the explanatory power of health for medical debt disparity was greater for those in lower income categories.

Previous research has documented that medical debt is associated with forgoing and rationing needed medical care,^{2,3,6,25,26} adverse health outcomes,²⁷ and medical bankruptcy.²⁸ It is contended that Americans make financial trade-offs with other goods and services because of medical debt. Consistent with these studies, we found that older adults with medical debt experience serious financial consequences (i.e., debt collection, problems paying for necessities, putting off major purchases, using savings, and

borrowing money). There were statistically significant differences between African Americans and Whites on being contacted by a collection agency, borrowing money, and using savings. Older African Americans experience more debt collection hassle. Racial/ethnic minorities have been found in other studies to disproportionately experience aggressive and unfair debt collection practices.²⁶ In keeping with the well-described income and wealth differences,^{2,29} older African Americans borrow money, whereas older Whites use savings to pay medical bills.

Limitations

Although this study makes an important contribution to the literature on medical debt among older African American and White adults, our findings should be considered in light of the study's limitations. First, data were cross-sectional, which precludes causal inferences. Cross-sectional data may also provide biased estimates of mediation effects.³⁰ Second, data were self-reported and thus subject to recall and other forms of self-report bias.³¹ However, basing the query on recent events as an anchor point, as in our survey, decreases cognition errors of forgetting, fabrication, and telescoping.³²

Third, self-rated health is a broad measure that captures aspects of mental and physical health, and can be biased by social desirability, individuals' expectations, and relative deprivation.³³ However, self-rated health is well-validated as a strong predictor of mortality and has been found to be associated with chronic and specific serious conditions including cancer and diabetes.³⁴ Fourth, it is also possible that there is an inverse relationship between self-rated health status and medical debt; that is, medical debt leads to poor health and vice versa. Establishing this bidirectional link would require contextual factors including timing and duration of medical debt. Some individuals experience problems paying medical bills within the past year, are gradually paying off medical bills, or have longstanding bills that they are unable to pay,²⁵ which we were unable to assess.

Finally, we lacked an adequate measure of wealth, which consists of accumulated assets in addition to income.²⁹ Wealth has been shown to be associated with self-reported health status, chronic conditions,

and mortality.³⁵ Control for factors such as wealth, credit card debt, debt counseling, or debt management services might have enhanced our ability to account for the race effect in medical bill problems.²⁵

Conclusions

Medical debt is a significant source of financial distress among older adults, particularly African Americans. Medicare plays an important role in alleviating financial burden, but it does not cover all medical care costs.² Policymakers have proposed changes to Medicare (including increasing beneficiary premiums and cost sharing, and reducing provider payment levels) to reduce the national debt and maintain Medicare solvency.²⁰ But cost-cutting strategies that may burden White Medicare beneficiaries may cause catastrophic hardships for minority beneficiaries. Although changes are necessary to sustain Medicare for the future,²⁰ policymakers need to explicitly consider the impact that cost-cutting strategies will have on African American beneficiaries. **AJPH**

CONTRIBUTORS

J. C. Wiltshire conceptualized the study, conducted analyses, interpreted results, and led the writing of the article. J. J. Allison assisted with conceptualization of the study, conducted analyses, interpreted results, and contributed to the writing of the article. K. Elder and C. Kiefe contributed to the conceptualization and writing of the article.

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HUMAN PARTICIPANT PROTECTION

This research involved public-use data and was deemed exempt from review by the University of South Florida institutional review board.

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