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Sex, Race, and Socioeconomic Disparities in Patients With Aortic Stenosis (from a Nationwide Inpatient Sample)

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Abstract

Aortic stenosis (AS) is the third most prevalent cardiovascular disease following hypertension and coronary artery disease. The primary objective of this cross-sectional study is to examine gender, racial, and socioeconomic disparities in AS-related health care utilization in patients aged ≥50 years using data from the Healthcare Cost and Utilization Project Nationwide Inpatient Sample. AS was identified among inpatient discharges with *International Classification of Diseases, Ninth Revision, Clinical Modification*, code 424.1. Using stratum-specific weighted totals, means, proportions, and regression models, we examined time trends and disparities for in-hospital AS prevalence according to gender, race, and income over the 2002 to 2012 period, predictors of AS (gender, race, income, age, health insurance, co-morbidities, and hospital-level characteristics), and AS's role as a predictor of in-hospital death, length of stay, and total charges. In-hospital AS prevalence increased from 2.10% in 2002 to 2.37% in 2012, with similar trends observed within gender, race, and income strata. Women were less likely to have AS compared with men (adjusted odds ratio [OR_{adj}] 0.84; 95% confidence interval [CI] 0.83 to 0.86). Blacks (OR_{adj} 0.68; 95% CI 0.66 to 0.71), Hispanics (OR_{adj} 0.79; 95% CI 0.76 to 0.84), and Asians/Pacific Islanders (OR_{adj} 0.68; 95% CI 0.64 to 0.74) were less likely than whites to have AS diagnosis that was directly associated with income. AS was inversely related to in-hospital death but positively linked to total charges overall and longer hospital stays among men, whites, and middle-income patients. However, shorter stays with AS were observed among blacks. In conclusion, among older inpatients, AS prevalence was ~2% and was higher among males, whites, and higher income groups. Although in-hospital death was lower and total charges were higher in AS, length of stay's association with AS varied by gender, race, and income.

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See page 864 for disclosure information.

Disclosures

The authors have no conflicts of interest to disclose.

Aortic stenosis (AS) is currently the third most prevalent cardiovascular disease following hypertension and coronary artery disease.^{1,2} Although considered a degenerative disorder typically affecting the elderly people, AS has gained importance in recent years because of population aging.¹⁻³ AS prevalence in subjects ≥ 65 years was estimated at 2% to 7%, with 5.5% of subjects >85 years diagnosed with AS¹⁻³; each year, $\sim 22,000$ deaths were attributed to valvular disease in the United States, with AS being particularly problematic because it carries a high mortality risk once symptoms have appeared. Furthermore, the multifactorial etiology of AS points to prominent roles played by traditional cardiovascular risk factors such as male gender, advanced age, smoking, hypertension, hypercholesterolemia, diabetes, metabolic syndrome, and atherosclerosis.³⁻⁶ The equitable distribution of health care resources requires a better understanding of the epidemiology of AS, whereas identifying subgroups within the general population at high risk for AS. Previous research suggested that most AS-affected subjects ($\sim 70\%$) are >60 years, with a balanced gender ratio.⁷ AS is also less prevalent among African-Americans compared with Caucasians.⁶ Little is known about the prevalence of AS in other racial groups and whether socioeconomic disparities exist in the prevalence of AS. In this population-based cross-sectional study, we examined gender, racial, and socioeconomic disparities in AS-related health care utilization using data collected for the Nationwide Inpatient Sample (NIS).⁸

Methods

The work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. A federal state-industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ), the Healthcare Cost and Utilization Project (HCUP), developed several databases and software tools, of which the NIS is the largest publicly available all-payer database in the United States that can provide national estimates of health care utilization, access, charges, quality, and outcomes. NIS consists of a 20% stratified probability sample of community hospitals from the State Inpatient Databases including all inpatient data currently contributed to HCUP. The sampling frame of hospitals (or hospital discharges) was divided into strata using five hospital characteristics, namely ownership/control, bed size, teaching status, urban/rural location, and US region. NIS samples were selected with probabilities proportionate to the number of hospitals (or hospital discharges) in each stratum. NIS data were collected from $\sim 1,000$ hospitals from 1988 to 2012, and the number of states covered by NIS has grown from 8 to 44. Starting in 2012, NIS became a sample of discharge records from all HCUP-participating hospitals, rather than a sample of hospitals, of which all discharges were kept. To facilitate trend analyses, AHRQ created new discharge trend weights for the NIS time period of 1993 until 2011, calculated in the same way as the redesigned 2012 NIS weights. The NIS contains clinical, nonclinical, and resource use data elements typical of a discharge abstract. Inpatient hospital discharges corresponding to patients who satisfy the criteria of being either male or female and ≥ 50 years were selected from the 2012 NIS for most analyses and 2002 to 2012 NIS for trend analyses. Accordingly, the study sample consists of 45,380,630 discharges ≥ 50 years (weighted mean age $\pm$ SEM: 70.6 ± 0.1 years, weighted proportion female $\pm$ SEM: $54.6 \pm 0.1\%$, weighted number of discharges: 217,060,201), out of a total number of 87,039,711 discharges (2002 to 2012)

(weighted mean age $\pm$ SEM: 47.9 ± 0.2 years, weighted proportion female $\pm$ SEM: $58.5 \pm 0.1\%$, weighted number of discharges: 411,487,801). For the 2012 NIS, the study sample aged ± 50 years consisted of 3,991,678 discharges (weighted mean age $\pm$ SEM: 70.1 ± 0.0 years, weighted proportion female $\pm$ SEM: $53.5 \pm 0.1\%$, weighted number of discharges: 19,958,391).

Our plan was to examine time trends in the prevalence of AS diagnosis over a 10-year study period (2002 to 2012), predictors of AS including demographic (gender, race, and socioeconomic status), clinical (age, health insurance, and co-morbidities), and hospital (geographical area, hospital location and teaching status, and hospital control) characteristics, AS diagnosis as a predictor of inhospital death, hospital length of stay, and total charges overall, and according to gender, race, and socioeconomic categories. Accordingly, a dichotomous outcome variable was defined as the presence or absence of AS among inpatient discharges using an *International Classification of Diseases, Ninth Revision, Clinical Modification*, code of 424.1 as a criterion based on any of the multiple diagnostic variables. Trends in AS prevalence were evaluated over a 10-year period (2002 to 2012) using calendar year. The key predictors of AS diagnosis were patient gender (male or female), patient race (white, black, Hispanic, Asian or Pacific Islander, Native American, or other), and household socioeconomic status defined in quartiles. Potential confounders of the hypothesized relations were clinical and hospital characteristics identified as simultaneously related to the outcome and predictor variables but not on the causal pathway between them. "Clinical characteristics" included patient admission type (elective and nonelective), age, health insurance (Medicare, Medicaid, Private (including HMO), self-pay, no charge or other), and a 12-item Charlson's co-morbidity index defined using diagnostic variables. Of note, from 2002 to 2008, only 15 diagnoses were available, whereas after 2009, 25 diagnoses became available. "Hospital characteristics" included geographical area (North, South, Mid-west, East, or West), location, and teaching status (rural, urban/nonteaching, or urban/teaching) and also control ("government, nonfederal," "private, nonprofit," and "private, investor-own"). Finally, adverse health care utilization outcomes were evaluated based on "inhospital death," "hospital length of stay (in days)," and "total charges" (in US dollars).

All statistical analyses were conducted using STATA, version 14 (STATA Corp., College Station, Texas). Summary statistics included mean ($\pm$ SE) for continuous variables and frequencies with percentages for categorical variables. Bivariate relations were evaluated using the chi-square test, Fisher's exact test, independent-sample *t* test, or Wilcoxon's rank-sum test, as appropriate. Linear or logistic regression models were constructed to assess disparities in AS prevalence and AS diagnosis as a predictor of adverse health care utilization outcomes, before and after adjustment for confounders. All analyses were performed accounting for complex survey design, through STATA's *svy* commands. Two-sided statistical tests were conducted at an alpha level of 0.05.

Results

Table 1 presents the distribution of the study sample according to gender, race, and socioeconomic status in the 2012 NIS. Further analyses suggested disparities in AS

prevalence according to these demographic characteristics were statistically significant ($p < 0.0001$). Therefore, time trend analyses for AS prevalence between 2002 and 2012 were stratified according to gender, race, and socioeconomic status. Statistically significant variations over time were noted for AS prevalence in the total sample and in most subgroups except for the nonwhite racial groups. Although no clearly defined linear trend was observed, AS prevalence increased from 2.10% in 2002 to 2.37% in 2012, with similar trends observed within gender, race, and socioeconomic subgroups (Table 2).

In the multivariable analysis, AS diagnosis was less common among women compared with men (adjusted odds ratio [OR_{adj}] 0.84; 95% confidence interval [CI] 0.83 to 0.86); black (OR_{adj} 0.68; 95% CI 0.66 to 0.71), Hispanic (OR_{adj} 0.79; 95% CI 0.76 to 0.84), and Asian or Pacific Islander (OR_{adj} 0.68; 95% CI 0.64 to 0.74) patients were less likely than white patients to be diagnosed with AS. Whereas AS diagnoses were more likely with increasing socioeconomic status and elective admission, patients having Charlson co-morbidity score of 1, urban location, and private ownership of hospitals were significantly related to AS diagnosis. Taking “Medicare” as a referent, recipients of “Medicaid” (OR_{adj} 0.86; 95% CI 0.82 to 0.90) or “other” (OR_{adj} 0.83; 95% CI 0.77 to 0.89) types of insurance were less likely to be diagnosed with AS. Compared with patients seeking health care services in the Northeast, those at Midwestern and Southern hospitals were less likely to be diagnosed with AS (Table 3).

In the overall sample and within demographic subgroups, AS diagnosis was inversely related to inhospital death, after controlling for confounders. Furthermore, AS diagnosis was associated with increased length of stay in the overall sample, among male and white patients and also those in the middle quartiles of socioeconomic status and with reduced length of stay among black patients. Total charges were significantly increased for patients diagnosed with AS whether in the overall sample or according to gender, race, or socioeconomic status (Table 4).

Discussion

This is the first study to examine disparities in AS prevalence according to gender, race, and socioeconomic status in a nationally representative sample of hospital discharges from the United States. Consistent with published literature, our results indicate that the prevalence of AS among hospitalized patients, 50 years, is approximately 2% and varied little over a 10-year period, although an increasing trend was observed from 2002 to 2012. Furthermore, AS diagnosis was predicted by male gender, white race, and higher socioeconomic status (i.e., income quartiles). Whereas inhospital death was lower and total charges were more elevated with AS diagnosis, the association between AS and length of hospital stay varied according to gender, race, and socioeconomic status. The observed relations between AS and health care utilization outcomes need further exploration in light of various diagnostic and treatment procedures that are typical of hospitalized patients with AS.

Previous studies have examined gender differences in AS diagnosis and prognosis, treatment safety, and effectiveness. Although the prevalence of AS in men and women was nearly equal,⁷ there are gender differences in mortality rates and disease symptomology. Compared

with men, female patients with AS tend to have lower all-cause⁹ and postoperative transcatheter aortic valve replacement mortality rates.^{10–12} However, when adjusting for confounding factors, such as body surface area, at least 1 study found no perioperative mortality differences between the genders.¹³ Nonetheless, it seems as though the progression of AS is similar among men and women⁹ and that both genders incur a similar severity for lower aortic valve calcification loads, even after controlling for women's smaller body size.¹⁴ Furthermore, when controlling for body surface area, there is no difference in left ventricular mass¹⁵ and left ventricular remodeling¹⁶ between men and women. However, in terms of the left ventricles, women seem to have a smaller cavity size and higher ejection fraction than men.^{10,15} Although female gender is associated with improved survival and better baseline characteristics (e.g., higher ejection fraction, less coronary and peripheral disease, less previous cardiac surgery, lower European System for Cardiac Operative Risk Evaluation or Euroscore¹⁰), women with AS are at greater risk for increased severity of pre-existing cerebral ischemic lesions.¹⁷ Unfortunately, this increased risk may mean that women who underwent aortic valve replacement may be more susceptible to developing postoperative neurologic dysfunction.¹⁷

In the present study, we found that black patients have a lower prevalence of AS compared with whites. This finding is consistent with previous studies which used medical records to define AS.¹⁸ However, studies in which echocardiography is used to assess AS found that the prevalence of AS is the same in black and white participants.¹⁹ This discrepancy may be because of under-diagnosis of AS in the black population, possibly because black subjects misattribute chest discomfort as gastrointestinal, rather than cardiac.²⁰ Furthermore, among patients who underwent aortic valve replacement, black patients have increased odds of valvular ossification,¹ suggesting that black patients may have a higher degree of disease progression before valve replacement is performed, compared with white patients. This study is the first to compare the prevalence of AS in Asian/Pacific Islanders and whites; therefore, further verification of the current results is needed. Although we found that Asian and Pacific Islanders have a lower prevalence of AS, previous research has demonstrated that Chinese patients who underwent transcatheter aortic valve replacement have increased leaflet calcium burden, compared with Western patients.² Therefore, AS may be more prevalent in Asian and Pacific Islanders and may be more severe.

Socioeconomic disparities in AS prevalence and treatment safety and effectiveness outcomes is a clear gap of the literature. Our results suggested a positive relation between socioeconomic status and AS prevalence, after controlling for confounders. Furthermore, the middle quartiles of socioeconomic status exhibited a positive relation between AS prevalence and length of hospital stay. These results should be confirmed in different populations and using alternative measures of socioeconomic status.

The present study has numerous strengths including national representativeness, a large sample size, and access to extensive data on health care utilization and patient-level and hospital-level characteristics that are harmonized across study years, allowing for trend analyses. Nevertheless, our study findings should be interpreted cautiously in light of several limitations. First, the use of *International Classification of Diseases, Ninth Revision, Clinical Modification*, codes from an administrative database could lead to diagnosis

misclassification. Nevertheless, AHRQ has installed a system for quality checks using internal and external validations. Second, longitudinal analyses are not possible given that admission-level ID were de-identified. Third, the data structure of NIS limits our ability to identify multiple discharges per patient for the same condition including AS. Thus, clustering by patient could not be corrected for in addition to clustering by hospital ID, given the lack of patient-level ID. Fourth, clinical data that are often collected in large epidemiologic studies, including medication use and laboratory analyses, are lacking in this database. This presents a clear limitation when the research question involves such covariates. Fifth, NIS is limited to inpatient admissions, and thus, this is a special population that may differ in many ways to the noninstitutionalized older adult US population. Sixth, missing data can lead to some selection bias in some cases. However, this is unlikely to be a severe type of bias given that large sample size of NIS. Finally, this study does not allow us to compare AS and non-AS patient frequencies of hospitalization over a pre-set period of time (e.g., a month or a year).

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Table 1

Distribution of study sample according to sex, race and socioeconomic status—2012 Nationwide Inpatient Sample

Variable	
Sex (N=19,957,316):	
Male	46.4 ± 0.075
Female	53.6 ± 0.075
Race (N=18,942,347):	
White	74.80 ± 0.48
Black	12.59 ± 0.31
Hispanic	7.29 ± 0.29
Asian or Pacific Islander	1.93 ± 0.10
Native American	0.58 ± 0.069
Other	2.79 ± 0.22
Socioeconomic Status (N=19,522,160):	
1st quartile	30.25 ± 0.47
2nd quartile	25.15 ± 0.36
3rd quartile	23.6 ± 0.32
4th quartile	21.0 ± 0.50

SEM = standard error of the mean.

Table 2

Time trend in the prevalence of aortic stenosis (%) according to sex, race and socioeconomic status–Nationwide Inpatient Sample (2002–2012) *

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	P trend
Overall	2.10 ± 0.04	2.17 ± 0.04	2.21 ± 0.04	2.34 ± 0.05	2.28 ± 0.04	2.32 ± 0.05	2.17 ± 0.04	2.21 ± 0.04	2.18 ± 0.04	2.30 ± 0.04	2.37 ± 0.02	<0.0001
Male	2.10 ± 0.04	2.18 ± 0.05	2.26 ± 0.05	2.36 ± 0.05	2.31 ± 0.05	2.36 ± 0.05	2.21 ± 0.05	2.26 ± 0.05	2.19 ± 0.04	2.34 ± 0.05	2.43 ± 0.02	<0.0001
Female	2.09 ± 0.04	2.16 ± 0.04	2.19 ± 0.04	2.33 ± 0.05	2.26 ± 0.04	2.28 ± 0.04	2.13 ± 0.04	2.17 ± 0.04	2.17 ± 0.04	2.28 ± 0.04	2.32 ± 0.02	<0.0001
White	2.34 ± 0.05	2.39 ± 0.05	2.48 ± 0.05	2.61 ± 0.06	2.58 ± 0.06	2.63 ± 0.06	2.43 ± 0.06	2.48 ± 0.05	2.41 ± 0.04	2.57 ± 0.05	2.62 ± 0.02	<0.0001
Black	1.30 ± 0.06	1.33 ± 0.06	1.32 ± 0.07	1.47 ± 0.07	1.43 ± 0.06	1.44 ± 0.06	1.35 ± 0.05	1.29 ± 0.04	1.25 ± 0.04	1.33 ± 0.04	1.37 ± 0.02	0.058
Hispanic	1.66 ± 0.11	1.57 ± 0.11	1.51 ± 0.07	1.73 ± 0.1	1.60 ± 0.09	1.61 ± 0.09	1.74 ± 0.09	1.64 ± 0.09	1.54 ± 0.08	1.73 ± 0.11	1.73 ± 0.05	0.53
Asian or Pacific Islander	1.71 ± 0.15	1.70 ± 0.12	1.75 ± 1.54	2.14 ± 0.15	2.04 ± 0.13	1.78 ± 0.14	1.75 ± 0.11	1.69 ± 0.09	1.97 ± 0.15	1.82 ± 0.10	1.97 ± 0.08	0.10
Native American	1.12 ± 0.16	1.22 ± 0.22	1.16 ± 0.20	1.07 ± 0.13	1.35 ± 0.17	2.18 ± 0.6	2.28 ± 0.73	1.94 ± 0.33	1.65 ± 0.25	1.45 ± 0.12	2.14 ± 0.03	0.17
Other	1.76 ± 0.17	1.89 ± 0.17	1.73 ± 0.16	1.88 ± 0.13	2.21 ± 0.21	1.91 ± 0.10	1.92 ± 0.11	1.86 ± 0.13	1.89 ± 0.09	2.19 ± 0.21	2.32 ± 0.16	0.06
1st quartile	1.57 ± 0.77	1.79 ± 0.05	1.78 ± 0.05	1.95 ± 0.06	1.81 ± 0.05	1.89 ± 0.06	1.77 ± 0.05	1.80 ± 0.05	1.69 ± 0.04	1.85 ± 0.04	1.94 ± 0.02	0.0002
2nd quartile	1.89 ± 0.052	2.10 ± 0.05	2.17 ± 0.05	2.27 ± 0.06	2.22 ± 0.05	2.27 ± 0.05	2.11 ± 0.05	2.16 ± 0.05	2.16 ± 0.04	2.25 ± 0.05	2.32 ± 0.02	<0.0001
3rd quartile	2.09 ± 0.046	2.38 ± 0.05	2.44 ± 0.05	2.54 ± 0.06	2.47 ± 0.05	2.51 ± 0.05	2.32 ± 0.05	2.39 ± 0.05	2.37 ± 0.05	2.83 ± 0.09	2.53 ± 0.03	<0.0001
4th quartile	2.28 ± 0.053	2.51 ± 0.07	2.64 ± 0.06	2.72 ± 0.07	2.79 ± 0.08	2.82 ± 0.08	2.63 ± 0.07	2.68 ± 0.07	2.70 ± 0.06	2.83 ± 0.09	2.91 ± 0.04	<0.0001

* Numbers presented in the table are percentages with their standard error.

Table 3

Demographic, clinical and hospital characteristics as predictors of aortic stenosis—2012 Nationwide Inpatient Sample

Variable	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Sex:		
Male	Ref.	Ref.
Female	0.95 (0.94–0.97)	0.84 (0.83–0.86)
Race:		
White	Ref.	Ref.
Black	0.51 (0.49–0.54)	0.68 (0.66–0.71)
Hispanic	0.65 (0.62–0.69)	0.79 (0.76–0.84)
Asian or Pacific Islander	0.75 (0.69–0.81)	0.68 (0.64–0.74)
Native American	0.81 (0.62–1.07)	1.07 (0.87–1.31)
Other	0.88 (0.77–1.02)	0.98 (0.87–1.10)
Socioeconomic Status:		
1st quartile	Ref.	Ref.
2nd quartile	1.20 (1.17–1.23)	1.06 (1.03–1.08)
3rd quartile	1.31 (1.27–1.35)	1.09 (1.06–1.12)
4th quartile	1.51 (1.46–1.57)	1.16 (1.12–1.19)
Admission type:		
Elective	0.94 (0.91–0.98)	1.29 (1.26–1.34)
Non-Elective	Ref.	Ref.
Age (years):	1.07 (1.07–1.07)	1.07 (1.07–1.07)
Health insurance:		
Medicare	Ref.	Ref.
Medicaid	0.26 (0.24–0.27)	0.86 (0.82–0.90)
Private (including HMO)	0.39 (0.38–0.41)	0.99 (0.97–1.02)
Self-pay	0.25 (0.23–0.27)	0.92 (0.84–1.00)
No charge	0.24 (0.19–0.30)	1.01 (0.81–1.28)
Other	0.35 (0.33–0.38)	0.83 (0.77–0.89)
Charlson Comorbidity Index:		
0	Ref.	Ref.
1	1.68 (1.64–1.72)	1.60 (1.57–1.64)
2+	2.24 (2.19–2.29)	1.98 (1.94–2.02)
Geographical area:		
Northeast	Ref.	Ref.
Midwest	0.83 (0.79–0.88)	0.89 (0.84–0.94)
South	0.70 (0.66–0.74)	0.86 (0.82–0.89)
West	0.83 (0.79–0.88)	0.95 (0.90–1.01)
Hospital location & teaching status:		
Rural	Ref.	Ref.
Urban/non-Teaching	1.19 (1.13–1.25)	1.21 (1.15–1.28)

Variable	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Urban/Teaching	1.24 (1.17–1.30)	1.38 (1.30–1.46)
Hospital control:		
Government, nonfederal	Ref.	Ref.
Private, non-profit	1.45 (1.35–1.56)	1.18 (1.11–1.25)
Private, investor-own	1.11 (1.02–1.21)	1.03 (0.96–1.10)

CI = confidence interval; OR = odds ratio.

Table 4

Aortic stenosis as a predictor of in-hospital death, length of hospital stay and total charges, overall and according to sex, race and socioeconomic status—2012 Nationwide Inpatient Sample

	In-Hospital Death	
	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Overall:	1.22 (1.18–1.27)	0.85 (0.82–0.89)
Variables:		
Sex:		
Male	1.11 (1.05–1.16)	0.80 (0.76–0.85)
Female	1.34 (1.27–1.41)	0.90 (0.86–0.95)
Race:		
White	1.25 (1.20–1.30)	0.87 (0.84–0.91)
Black	0.95 (0.81–1.10)	0.69 (0.59–0.81)
Hispanic	1.22 (1.03–1.45)	0.87 (0.73–1.02)
Asian or Pacific Islander	1.46 (1.02–2.08)	0.75 (0.58–0.97)
Native American	0.98 (0.73–1.33)	0.87 (0.58–1.29)
Other	0.98 (0.73–1.33)	0.74 (0.55–0.99)
Socioeconomic Status:		
1st quartile	1.18 (1.10–1.27)	0.83 (0.77–0.89)
2nd quartile	1.23 (1.14–1.31)	0.86 (0.80–0.93)
3rd quartile	1.27 (1.19–1.36)	0.88 (0.82–0.95)
4th quartile	1.23 (1.14–1.32)	0.84 (0.78–0.90)

	Length of Hospital Stay		Total Charges	
	Unadjusted β (95% CI)	Adjusted β (95% CI)	Unadjusted β (95% CI)	Adjusted β (95% CI)
Overall:	0.33 (0.27–0.39)	0.10 (0.05;0.16)	14381.74 (12907.61; 15855.87)	14456.45 (13075.52; 15837.39)
Variables:				
Sex:				
Male	0.34 (0.27–0.42)	0.17 (0.09;0.24)	18895.59 (17061.67; 20729.52)	18394.44 (16670.08; 20118.8)
Female	0.30 (0.24–0.37)	0.049 (–0.013;0.11)	10178.12 (8879.408; 11476.84)	10892.25 (9647.474; 12137.02)
Race:				
White	0.39 (0.33–0.45)	0.13 (0.073;0.19)	14679.71 (13097.93;16261.48)	14688.41 (13250.06; 16126.76)
Black	0.037 (–0.11–0.19)	–0.24 (–0.38; –0.096)	9620.302 (7270.468; 11970.14)	8670.208 (6438.72; 10901.7)
Hispanic	0.42 (0.23–0.63)	0.17 (–0.02;0.37)	21553.15 (18098.29; 25008.01)	18946.44 (15627.78; 22265.09)
Asian or Pacific Islander	0.061 (–0.26–0.39)	–0.22 (–0.56;0.12)	9440.37 (3286.86; 15593.87)	9111.085 (3220.146; 15002.02)
Native American	0.18 (–0.18–0.53)	–0.027 (–0.44;0.38)	13520.88 (5395.09; 21646.67)	12373.44 (5450.382; 19296.5)
Other	0.89 (0.45–1.32)	0.53 (0.11;0.95)	26221.01 (18643.43; 33798.58)	23324.88 (16718; 29931.75)
Socioeconomic Status:				
1st quartile	0.23 (0.15–0.31)	0.021 (–0.061;0.10)	13312.19 (11537.56; 15086.82)	13148.11 (11490.91; 14805.30)
2nd quartile	0.34 (0.25–0.43)	0.15 (0.058;0.25)	13060.58 (11312.05; 14809.11)	14256.68 (12551.84; 15961.51)
3rd quartile	0.37 (0.29–0.45)	0.15 (0.063;0.23)	13697.87 (11869.05; 15526.7)	14979.79 (13202.71; 16756.86)

	Length of Hospital Stay		Total Charges	
	Unadjusted β (95% CI)	Adjusted β (95% CI)	Unadjusted β (95% CI)	Adjusted β (95% CI)
4th quartile	0.42 (0.31–0.54)	0.11 (–0.0016;0.22)	15110.36 (12696.23; 17524.48)	15358.84 (13096.79; 17620.89)

β = slope; CI = confidence interval; OR = odds ratio.