Racial and Ethnic Differences in Management and Outcomes of Ventricular Arrhythmias Complicating Acute Myocardial Infarction

Analysis for RCOP NIS IM17

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## Preamble:

* **Reference Papers:**
  + [Markson et al. 2024](https://doi.org/10.1016/j.jacadv.2024.101042)
  + [Salman et al. 2025](https://doi.org/10.1097/MCA.0000000000001479)
* **Study Objective**: To investigate racial and ethnic differences in the management and in-hospital outcomes of ventricular arrhythmias (VA) complicating acute myocardial infarction (AMI) in the United States, adjusting for patient demographics, socioeconomic factors, clinical comorbidities, and hospital characteristics.
* **Data Source**: Cross-sectional analysis using the National Inpatient Sample (NIS) database from 2018 to 2020, a representative sample of all-payer inpatient hospitalizations in the U.S.
* **Patient Selection**: The study cohort included adult patients (18 years or older) hospitalized with a primary diagnosis of Acute Myocardial Infarction (AMI) who also had a secondary diagnosis of Ventricular Arrhythmias (VA), specifically Ventricular Tachycardia (VT) or Ventricular Fibrillation/Flutter (VF). Diagnoses were identified using International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) codes. We excluded patients who had infiltrative cardiac diseases (amyloidosis, sarcoidosis), Lyme disease, or long QT syndrome, as these conditions could be alternative causes for VA. Patients with missing race/ethnicity information were also excluded. The primary exposure variable was patient-reported Race/Ethnicity, with White patients serving as the reference category.
* **Outcomes of Interest:**
  + In-hospital Mortality
  + Length of Stay (days)
  + Inflation-adjusted Total Charge ($) [adjusted to 2020 dollars, using CPI data by the U.S. Bureau of Labor Statistics]
  + Acute Kidney Injury
  + Cardiogenic Shock
  + Cardiac Arrest
  + Receipt of Implantable Cardiac Defibrillator Insertion procedure
  + Receipt of Ablation Procedure
  + Favorable discharge (Defined as favorable if disposition was to “Routine discharge to home/self-care” or “Home health care”. All other dispositions were classified as unfavorable.)
* **Statistical Analysis**: Univariable and multivariable analyses were conducted to evaluate the association between race/ethnicity and management and in-hospital outcomes among patients with ventricular arrhythmias complicating acute myocardial infarction:
  + **Univariable Analysis:**
    - Continuous variables: Design-based Kruskal-Wallis test.
    - Categorical variables: Pearson’s X² test with Rao & Scott adjustment to account for survey design.
  + **Multivariable Analysis:**
    - Logistic regression for binary outcomes (e.g., in-hospital mortality, AKI).
    - Linear regression for continuous outcomes (e.g., length of stay, total charges).
  + **Adjustments:** Models controlled for the following covariates:
    - **Demographics and Socioeconomic Factors**: Age, Sex, Residential income, Expected primary payer.
    - **Clinical Factors:** A summary measure of comorbidity (Elixhauser comorbidity index).
    - **Hospital-Level Factors:** Hospital region, Hospital bedsize, Hospital location and teaching status.
* **Software:** All statistical analyses were performed using R Statistical Language (Version 4.5.0; R Foundation for Statistical Computing, Vienna, Austria), incorporating survey-weighted procedures via the *survey* package to account for the complex sampling design of NIS.

## Baseline Table:

| **Characteristic** | **Overall** N = 163,915*1* | **White** N = 124,180*1* | **Asian or Pacific Islander** N = 4,335*1* | **Black** N = 17,080*1* | **Hispanic** N = 11,735*1* | **Other** N = 6,585*1* | **p-value***2* |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age, y | 65 (13) | 66 (12) | 64 (13) | 62 (13) | 63 (13) | 63 (13) | <0.001 |
| Sex |  |  |  |  |  |  | <0.001 |
| Female | 42,840 (26%) | 31,950 (26%) | 925 (21%) | 5,755 (34%) | 2,770 (24%) | 1,440 (22%) |  |
| Male | 121,055 (74%) | 92,215 (74%) | 3,410 (79%) | 11,325 (66%) | 8,965 (76%) | 5,140 (78%) |  |
| Residential income |  |  |  |  |  |  | <0.001 |
| $1 - $51,999 | 44,485 (28%) | 30,095 (25%) | 355 (8.3%) | 8,265 (49%) | 4,010 (35%) | 1,760 (27%) |  |
| $52,000 - $65,999 | 43,170 (27%) | 34,370 (28%) | 835 (20%) | 3,825 (23%) | 2,890 (25%) | 1,250 (19%) |  |
| $66,000 - $87,999 | 39,545 (25%) | 31,240 (26%) | 1,170 (27%) | 2,765 (17%) | 2,795 (24%) | 1,575 (24%) |  |
| $88,000 or more | 33,795 (21%) | 26,380 (22%) | 1,905 (45%) | 1,890 (11%) | 1,745 (15%) | 1,875 (29%) |  |
| Expected primary payer |  |  |  |  |  |  | <0.001 |
| Medicaid | 16,165 (9.9%) | 9,505 (7.7%) | 635 (15%) | 2,840 (17%) | 2,080 (18%) | 1,105 (17%) |  |
| Medicare | 82,885 (51%) | 65,500 (53%) | 1,745 (40%) | 8,070 (47%) | 5,035 (43%) | 2,535 (39%) |  |
| Other | 15,290 (9.3%) | 10,650 (8.6%) | 415 (9.6%) | 1,925 (11%) | 1,475 (13%) | 825 (13%) |  |
| Private | 49,365 (30%) | 38,385 (31%) | 1,540 (36%) | 4,195 (25%) | 3,130 (27%) | 2,115 (32%) |  |
| Hospital region |  |  |  |  |  |  | <0.001 |
| Midwest | 38,175 (23%) | 32,650 (26%) | 505 (12%) | 3,430 (20%) | 845 (7.2%) | 745 (11%) |  |
| Northeast | 28,815 (18%) | 22,700 (18%) | 720 (17%) | 2,230 (13%) | 1,590 (14%) | 1,575 (24%) |  |
| South | 64,690 (39%) | 46,725 (38%) | 890 (21%) | 9,715 (57%) | 4,845 (41%) | 2,515 (38%) |  |
| West | 32,235 (20%) | 22,105 (18%) | 2,220 (51%) | 1,705 (10.0%) | 4,455 (38%) | 1,750 (27%) |  |
| Hospital bedsize |  |  |  |  |  |  | 0.2 |
| Large | 87,750 (54%) | 66,620 (54%) | 2,505 (58%) | 9,145 (54%) | 5,935 (51%) | 3,545 (54%) |  |
| Medium | 48,755 (30%) | 36,560 (29%) | 1,110 (26%) | 5,305 (31%) | 3,795 (32%) | 1,985 (30%) |  |
| Small | 27,410 (17%) | 21,000 (17%) | 720 (17%) | 2,630 (15%) | 2,005 (17%) | 1,055 (16%) |  |
| Hospital location and teaching status |  |  |  |  |  |  | <0.001 |
| Rural | 8,725 (5.3%) | 7,810 (6.3%) | 45 (1.0%) | 560 (3.3%) | 180 (1.5%) | 130 (2.0%) |  |
| Urban, non-teaching | 29,180 (18%) | 22,275 (18%) | 900 (21%) | 2,620 (15%) | 2,200 (19%) | 1,185 (18%) |  |
| Urban, teaching | 126,010 (77%) | 94,095 (76%) | 3,390 (78%) | 13,900 (81%) | 9,355 (80%) | 5,270 (80%) |  |
| Charlson comorbidity index | 3.12 (1.99) | 3.02 (1.94) | 3.30 (2.07) | 3.62 (2.14) | 3.41 (2.09) | 2.98 (1.94) | <0.001 |
| Hyperlipidemia | 103,635 (63%) | 79,735 (64%) | 2,735 (63%) | 10,065 (59%) | 7,200 (61%) | 3,900 (59%) | <0.001 |
| History of Myocardial Infarction | 25,425 (16%) | 19,375 (16%) | 530 (12%) | 2,825 (17%) | 1,790 (15%) | 905 (14%) | 0.012 |
| Hypertension | 123,885 (76%) | 92,185 (74%) | 3,335 (77%) | 14,575 (85%) | 9,110 (78%) | 4,680 (71%) | <0.001 |
| Diabetes Mellitus | 54,240 (33%) | 37,360 (30%) | 1,975 (46%) | 6,875 (40%) | 5,520 (47%) | 2,510 (38%) | <0.001 |
| Obesity | 32,175 (20%) | 24,890 (20%) | 475 (11%) | 3,485 (20%) | 2,315 (20%) | 1,010 (15%) | <0.001 |
| Chronic Pulmonary Disease | 32,445 (20%) | 26,040 (21%) | 480 (11%) | 3,250 (19%) | 1,725 (15%) | 950 (14%) | <0.001 |
| Peripheral Vascular Disease | 21,700 (13%) | 16,800 (14%) | 420 (9.7%) | 2,505 (15%) | 1,375 (12%) | 600 (9.1%) | <0.001 |
| Congestive Heart Failure | 93,390 (57%) | 69,110 (56%) | 2,495 (58%) | 10,905 (64%) | 7,125 (61%) | 3,755 (57%) | <0.001 |
| Previous Coronary Artery Bypass Graft | 12,360 (7.5%) | 9,800 (7.9%) | 315 (7.3%) | 970 (5.7%) | 855 (7.3%) | 420 (6.4%) | <0.001 |
| Previous Percutaneous Coronary Intervention | 23,770 (15%) | 18,385 (15%) | 555 (13%) | 2,435 (14%) | 1,620 (14%) | 775 (12%) | 0.014 |
| Previous Implantable Cardioverter-Defibrillator Insertion | 6,545 (4.0%) | 4,785 (3.9%) | 85 (2.0%) | 1,025 (6.0%) | 460 (3.9%) | 190 (2.9%) | <0.001 |
| Previous Permanent Pacemaker or Cardiac Resynchronization Therapy Insertion | 3,395 (2.1%) | 2,730 (2.2%) | 80 (1.8%) | 285 (1.7%) | 210 (1.8%) | 90 (1.4%) | 0.067 |
| *1*Mean (SD); n (%) | | | | | | | |
| *2*Design-based KruskalWallis test; Pearson's X^2: Rao & Scott adjustment | | | | | | | |

## Univariable Analysis:

| **Characteristic** | **Overall** N = 163,915*1* | **White** N = 124,180*1* | **Asian or Pacific Islander** N = 4,335*1* | **Black** N = 17,080*1* | **Hispanic** N = 11,735*1* | **Other** N = 6,585*1* | **p-value***2* |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Died during hospitalization | 26,845 (16%) | 19,360 (16%) | 1,005 (23%) | 2,870 (17%) | 2,310 (20%) | 1,300 (20%) | <0.001 |
| Length of stay (days) | 4.0 (2.0, 8.0) | 3.0 (2.0, 7.0) | 4.0 (2.0, 8.0) | 4.0 (2.0, 9.0) | 4.0 (2.0, 9.0) | 3.0 (2.0, 8.0) | <0.001 |
| Inflation-adjusted total charge ($) | 107,267 (63,271, 200,117) | 104,272 (62,379, 191,158) | 127,704 (74,277, 269,196) | 98,508 (55,743, 202,034) | 141,225 (78,937, 283,428) | 120,428 (73,690, 238,881) | <0.001 |
| Cardiogenic Shock | 38,820 (24%) | 28,290 (23%) | 1,555 (36%) | 3,585 (21%) | 3,385 (29%) | 2,005 (30%) | <0.001 |
| Cardiac Arrest | 31,535 (19%) | 23,645 (19%) | 955 (22%) | 3,410 (20%) | 2,200 (19%) | 1,325 (20%) | 0.15 |
| Acute Kidney Injury | 51,455 (31%) | 37,015 (30%) | 1,695 (39%) | 6,435 (38%) | 4,105 (35%) | 2,205 (33%) | <0.001 |
| Implantable Cardiac Defibrillator Insertion Procedure | 6,480 (4.0%) | 4,845 (3.9%) | 165 (3.8%) | 765 (4.5%) | 465 (4.0%) | 240 (3.6%) | 0.5 |
| Ablation Procedure | 605 (0.4%) | 460 (0.4%) | 5 (0.1%) | 75 (0.4%) | 55 (0.5%) | 10 (0.2%) | 0.4 |
| Favorable Discharge | 106,975 (65%) | 82,215 (66%) | 2,620 (60%) | 10,685 (63%) | 7,340 (63%) | 4,115 (62%) | <0.001 |
| *1*n (%); Median (Q1, Q3) | | | | | | | |
| *2*Pearson's X^2: Rao & Scott adjustment; Design-based KruskalWallis test | | | | | | | |

## Multivariable Logistic Regression:

### In-hospital Mortality:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 1.67 | 1.41, 1.98 | <0.001 |
| Black | 0.97 | 0.87, 1.08 | 0.6 |
| Hispanic | 1.21 | 1.07, 1.36 | 0.003 |
| Other | 1.40 | 1.21, 1.63 | <0.001 |
| Age, y | 1.02 | 1.02, 1.03 | <0.001 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 0.80 | 0.75, 0.86 | <0.001 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 0.97 | 0.89, 1.06 | 0.5 |
| $66,000 - $87,999 | 0.91 | 0.83, 0.99 | 0.036 |
| $88,000 or more | 0.84 | 0.76, 0.93 | <0.001 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 1.10 | 0.97, 1.24 | 0.14 |
| Other | 1.30 | 1.12, 1.51 | <0.001 |
| Private | 0.90 | 0.80, 1.03 | 0.12 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.17 | 1.04, 1.30 | 0.007 |
| South | 1.25 | 1.14, 1.37 | <0.001 |
| West | 1.26 | 1.14, 1.41 | <0.001 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.94 | 0.87, 1.01 | 0.10 |
| Small | 0.85 | 0.78, 0.94 | 0.002 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.17 | 0.98, 1.39 | 0.083 |
| Urban, teaching | 1.37 | 1.16, 1.61 | <0.001 |
| Elixhauser comorbidity index | 1.21 | 1.19, 1.22 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### Acute Kidney Injury:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 1.44 | 1.23, 1.68 | <0.001 |
| Black | 1.23 | 1.13, 1.35 | <0.001 |
| Hispanic | 1.13 | 1.02, 1.26 | 0.025 |
| Other | 1.26 | 1.10, 1.44 | <0.001 |
| Age, y | 1.02 | 1.02, 1.02 | <0.001 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 1.53 | 1.44, 1.62 | <0.001 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 1.02 | 0.95, 1.10 | 0.5 |
| $66,000 - $87,999 | 1.03 | 0.96, 1.12 | 0.4 |
| $88,000 or more | 1.05 | 0.97, 1.15 | 0.2 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 0.79 | 0.72, 0.88 | <0.001 |
| Other | 0.91 | 0.80, 1.02 | 0.10 |
| Private | 0.85 | 0.77, 0.93 | <0.001 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.14 | 1.04, 1.25 | 0.005 |
| South | 1.03 | 0.95, 1.11 | 0.5 |
| West | 0.95 | 0.87, 1.04 | 0.3 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.90 | 0.84, 0.97 | 0.004 |
| Small | 0.80 | 0.73, 0.87 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.32 | 1.14, 1.52 | <0.001 |
| Urban, teaching | 1.60 | 1.40, 1.82 | <0.001 |
| Elixhauser comorbidity index | 1.48 | 1.46, 1.50 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### Cardiogenic Shock:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 1.71 | 1.48, 1.98 | <0.001 |
| Black | 0.74 | 0.67, 0.82 | <0.001 |
| Hispanic | 1.21 | 1.09, 1.34 | <0.001 |
| Other | 1.48 | 1.30, 1.68 | <0.001 |
| Age, y | 1.00 | 1.00, 1.00 | 0.5 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 0.97 | 0.92, 1.03 | 0.4 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 1.00 | 0.93, 1.08 | >0.9 |
| $66,000 - $87,999 | 1.04 | 0.96, 1.12 | 0.4 |
| $88,000 or more | 1.04 | 0.96, 1.14 | 0.3 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 0.93 | 0.84, 1.03 | 0.2 |
| Other | 1.05 | 0.93, 1.19 | 0.4 |
| Private | 0.96 | 0.87, 1.06 | 0.5 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 0.99 | 0.90, 1.09 | 0.8 |
| South | 1.06 | 0.98, 1.15 | 0.13 |
| West | 1.09 | 0.99, 1.19 | 0.073 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.82 | 0.76, 0.88 | <0.001 |
| Small | 0.73 | 0.67, 0.79 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.41 | 1.21, 1.66 | <0.001 |
| Urban, teaching | 1.76 | 1.51, 2.04 | <0.001 |
| Elixhauser comorbidity index | 1.23 | 1.22, 1.25 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### Cardiac Arrest:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 1.15 | 0.97, 1.35 | 0.11 |
| Black | 1.00 | 0.90, 1.10 | >0.9 |
| Hispanic | 0.94 | 0.84, 1.05 | 0.3 |
| Other | 1.06 | 0.92, 1.23 | 0.4 |
| Age, y | 0.99 | 0.99, 1.00 | <0.001 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 0.95 | 0.89, 1.01 | 0.10 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 1.00 | 0.93, 1.08 | >0.9 |
| $66,000 - $87,999 | 1.04 | 0.96, 1.13 | 0.4 |
| $88,000 or more | 1.10 | 1.01, 1.21 | 0.026 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 1.06 | 0.94, 1.18 | 0.3 |
| Other | 1.12 | 0.99, 1.27 | 0.077 |
| Private | 1.10 | 0.99, 1.22 | 0.074 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 0.83 | 0.75, 0.92 | <0.001 |
| South | 0.99 | 0.91, 1.07 | 0.8 |
| West | 0.98 | 0.90, 1.08 | 0.7 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 1.08 | 1.00, 1.15 | 0.044 |
| Small | 1.08 | 1.00, 1.17 | 0.062 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.07 | 0.92, 1.24 | 0.4 |
| Urban, teaching | 1.03 | 0.90, 1.17 | 0.7 |
| Elixhauser comorbidity index | 1.06 | 1.05, 1.08 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### ICD Insertion:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 0.92 | 0.65, 1.30 | 0.6 |
| Black | 0.98 | 0.81, 1.18 | 0.8 |
| Hispanic | 0.93 | 0.74, 1.17 | 0.5 |
| Other | 0.91 | 0.68, 1.22 | 0.5 |
| Age, y | 1.00 | 0.99, 1.00 | 0.2 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 1.60 | 1.39, 1.85 | <0.001 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 0.95 | 0.81, 1.11 | 0.5 |
| $66,000 - $87,999 | 0.97 | 0.82, 1.14 | 0.7 |
| $88,000 or more | 1.12 | 0.95, 1.33 | 0.2 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 0.96 | 0.77, 1.19 | 0.7 |
| Other | 0.85 | 0.66, 1.10 | 0.2 |
| Private | 0.92 | 0.75, 1.14 | 0.5 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.18 | 0.99, 1.41 | 0.072 |
| South | 1.07 | 0.92, 1.24 | 0.4 |
| West | 0.86 | 0.72, 1.03 | 0.11 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.82 | 0.72, 0.93 | 0.003 |
| Small | 0.61 | 0.51, 0.72 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.46 | 1.03, 2.09 | 0.036 |
| Urban, teaching | 2.04 | 1.46, 2.84 | <0.001 |
| Elixhauser comorbidity index | 1.22 | 1.19, 1.25 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### Ablation:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 0.30 | 0.04, 2.19 | 0.2 |
| Black | 1.12 | 0.65, 1.94 | 0.7 |
| Hispanic | 1.19 | 0.62, 2.28 | 0.6 |
| Other | 0.40 | 0.10, 1.63 | 0.2 |
| Age, y | 1.00 | 0.98, 1.02 | >0.9 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 1.82 | 1.14, 2.93 | 0.013 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 1.54 | 0.93, 2.54 | 0.10 |
| $66,000 - $87,999 | 1.11 | 0.64, 1.93 | 0.7 |
| $88,000 or more | 1.57 | 0.88, 2.80 | 0.13 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 1.05 | 0.52, 2.10 | 0.9 |
| Other | 1.07 | 0.46, 2.49 | 0.9 |
| Private | 1.01 | 0.51, 2.02 | >0.9 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.58 | 0.91, 2.73 | 0.10 |
| South | 1.06 | 0.66, 1.71 | 0.8 |
| West | 0.68 | 0.36, 1.28 | 0.2 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.81 | 0.53, 1.23 | 0.3 |
| Small | 0.58 | 0.33, 1.02 | 0.059 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.59 | 0.35, 7.26 | 0.5 |
| Urban, teaching | 3.62 | 0.89, 14.8 | 0.073 |
| Elixhauser comorbidity index | 1.25 | 1.16, 1.34 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

### Favorable Discharge:

| **Characteristic** | **OR** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 0.75 | 0.64, 0.87 | <0.001 |
| Black | 0.93 | 0.85, 1.01 | 0.083 |
| Hispanic | 0.89 | 0.80, 0.98 | 0.022 |
| Other | 0.75 | 0.66, 0.86 | <0.001 |
| Age, y | 0.97 | 0.97, 0.98 | <0.001 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 1.23 | 1.16, 1.30 | <0.001 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 1.03 | 0.96, 1.10 | 0.4 |
| $66,000 - $87,999 | 1.02 | 0.95, 1.10 | 0.6 |
| $88,000 or more | 1.05 | 0.97, 1.14 | 0.2 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | 0.95 | 0.86, 1.05 | 0.3 |
| Other | 1.02 | 0.90, 1.15 | 0.8 |
| Private | 1.19 | 1.08, 1.31 | <0.001 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 0.75 | 0.68, 0.82 | <0.001 |
| South | 0.90 | 0.84, 0.97 | 0.005 |
| West | 0.92 | 0.85, 1.01 | 0.081 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | 0.89 | 0.83, 0.95 | <0.001 |
| Small | 0.85 | 0.78, 0.92 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.03 | 0.89, 1.18 | 0.7 |
| Urban, teaching | 1.12 | 0.99, 1.28 | 0.076 |
| Elixhauser comorbidity index | 0.78 | 0.77, 0.78 | <0.001 |
| Abbreviations: CI = Confidence Interval, OR = Odds Ratio | | | |

## Multivariable Linear Regression:

### Length of Stay:

| **Characteristic** | **Beta** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 1.2 | 0.43, 2.0 | 0.003 |
| Black | 0.24 | -0.10, 0.57 | 0.2 |
| Hispanic | 0.71 | 0.32, 1.1 | <0.001 |
| Other | 0.57 | 0.05, 1.1 | 0.032 |
| Age, y | 0.00 | -0.01, 0.01 | 0.8 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 0.31 | 0.12, 0.51 | 0.002 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | -0.03 | -0.27, 0.22 | 0.8 |
| $66,000 - $87,999 | -0.12 | -0.37, 0.13 | 0.4 |
| $88,000 or more | 0.08 | -0.21, 0.36 | 0.6 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | -1.4 | -1.9, -1.0 | <0.001 |
| Other | -1.3 | -1.8, -0.87 | <0.001 |
| Private | -1.2 | -1.6, -0.80 | <0.001 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.4 | 1.0, 1.7 | <0.001 |
| South | 0.44 | 0.19, 0.68 | <0.001 |
| West | -0.39 | -0.67, -0.11 | 0.006 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | -1.2 | -1.5, -1.0 | <0.001 |
| Small | -2.0 | -2.2, -1.7 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 1.2 | 0.85, 1.5 | <0.001 |
| Urban, teaching | 2.4 | 2.1, 2.7 | <0.001 |
| Elixhauser comorbidity index | 1.2 | 1.1, 1.2 | <0.001 |
| Abbreviation: CI = Confidence Interval | | | |

### Inflation-adjusted Total Charge:

| **Characteristic** | **Beta** | **95% CI** | **p-value** |
| --- | --- | --- | --- |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 45,205 | 19,703, 70,707 | <0.001 |
| Black | -14,206 | -24,005, -4,406 | 0.005 |
| Hispanic | 42,242 | 28,786, 55,699 | <0.001 |
| Other | 41,724 | 22,456, 60,992 | <0.001 |
| Age, y | -1,138 | -1,429, -847 | <0.001 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 14,695 | 8,990, 20,400 | <0.001 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 2,888 | -4,725, 10,501 | 0.5 |
| $66,000 - $87,999 | 2,224 | -5,746, 10,194 | 0.6 |
| $88,000 or more | 14,471 | 4,673, 24,269 | 0.004 |
| Expected primary payer |  |  |  |
| Medicaid | — | — |  |
| Medicare | -16,724 | -28,269, -5,179 | 0.005 |
| Other | -10,431 | -22,853, 1,990 | 0.10 |
| Private | -2,770 | -14,574, 9,033 | 0.6 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 45,636 | 32,972, 58,301 | <0.001 |
| South | 35,843 | 27,764, 43,922 | <0.001 |
| West | 68,022 | 55,615, 80,429 | <0.001 |
| Hospital bedsize |  |  |  |
| Large | — | — |  |
| Medium | -29,720 | -39,098, -20,342 | <0.001 |
| Small | -47,314 | -56,730, -37,898 | <0.001 |
| Hospital location and teaching status |  |  |  |
| Rural | — | — |  |
| Urban, non-teaching | 49,608 | 38,614, 60,603 | <0.001 |
| Urban, teaching | 69,805 | 59,997, 79,612 | <0.001 |
| Elixhauser comorbidity index | 27,067 | 25,366, 28,769 | <0.001 |
| Abbreviation: CI = Confidence Interval | | | |