

Supplementary Material

**Association of Geographical Disparities and Segregation in Regional Treatment Facilities
for Black Patients with Aneurysmal Subarachnoid Hemorrhage in the United States**

Supplementary Table 1. ICD - 10 codes for variables not translated in the NIS

Variable	ICD - 10 Code
Aneurysmal SAH	160.00 - 160.09
Hypertension	I10-I15
Diabetes Mellitus	E10.618, E10.620 - E10.628, E10.65, E10.630, E10.69, E10.9, E11.618, E11.620-E11.628, E11.638, E11.00, E11.01, E11.630, E11.649, E11.65, E11.69, E11.9
Obesity	E66.01, E66.09, E66.1 - E66.9
Congestive Heart Failure	I11.0, I50.1, I50.9, I51.7
Alcohol Abuse	F10.10
Hyperlipemia	E78.0, E78.2, E78.4, E78.5
Smoking	Z87.891, F17.200
Coronary artery disease	I25.10
Arterial Fibrillation	I48.0 - I48.2, I48.91
Chronic Kidney Disease	N18.1 - N18.9
Palliatives Care	Z515
Do Not Resuscitate	Z66
Mechanical Ventilation	5A1955Z, 5A1935Z, 5A1945Z
Tracheostomy	0BH17EZ, 0BH17EZ,0BJ08ZZ
Gastrostomy	0D163J4
Blood Transfusions	30233N1

Supplementary Table 2. U.S. Census Division and State

U.S Census Division	U.S. State
New England	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
Middle Atlantic	New York, Pennsylvania, New Jersey
East North Central	Wisconsin, Michigan, Illinois, Indiana, Ohio
West North Central	Missouri, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa
South Atlantic	Delaware, Maryland, District of Columbia*, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida
East South Central	Kentucky, Tennessee, Mississippi, Alabama
West South Central	Oklahoma, Texas, Arkansas, Louisiana
Mountain	Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico
Pacific	Alaska, Washington, Oregon, California, Hawaii

*The District of Columbia is included in the NIS but is not a U.S. state

Supplementary Table 3. Pairwise Comparison of Dissimilarity Index by U.S. Census Division

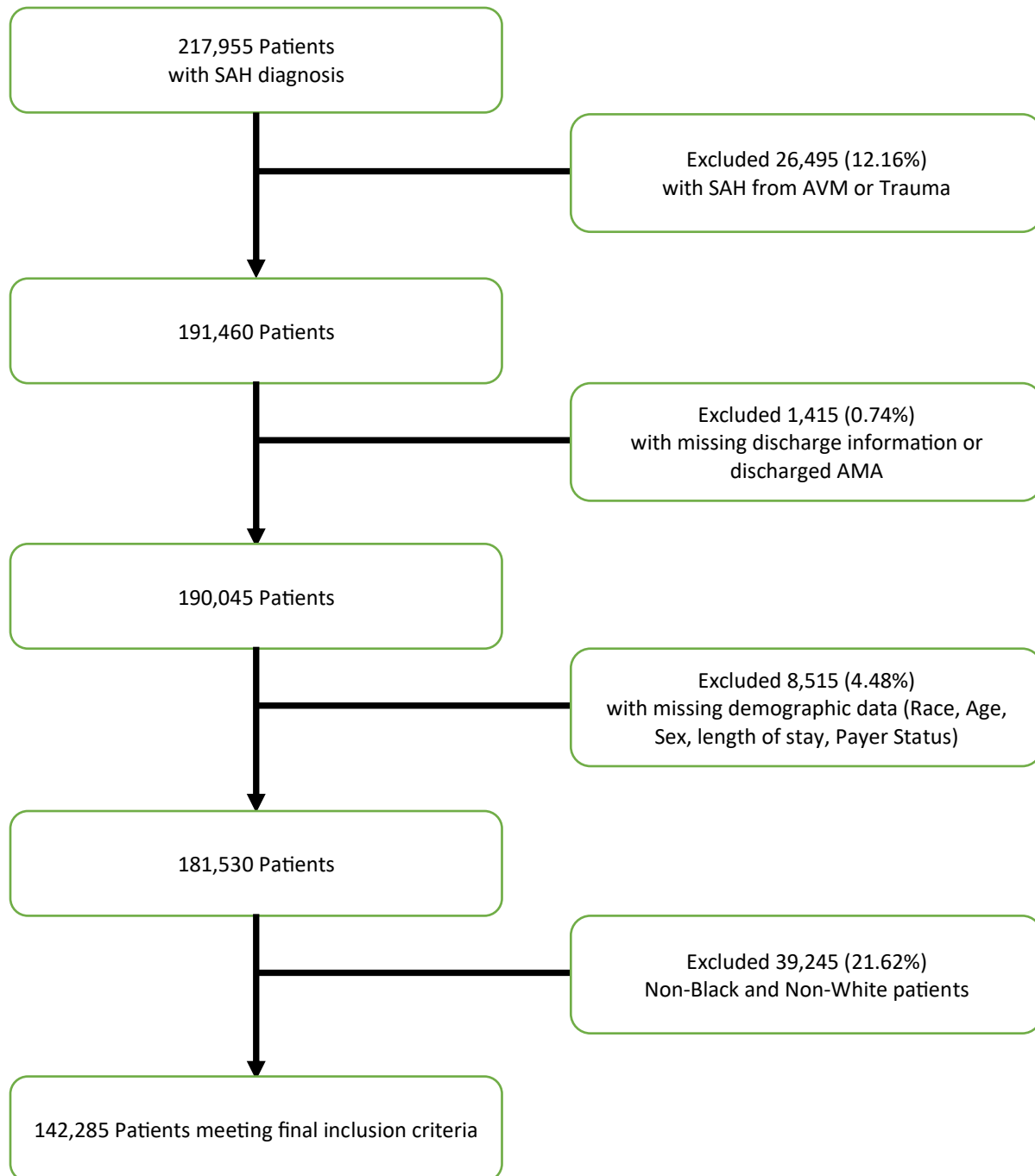
Census Division		Mean Difference	<i>F</i> test <i>P</i> Value	<i>P</i> Value
New England	Middle Atlantic	0	< 0.001	1.000
	East North Central	0.02	< 0.001	< 0.001
	West North Central	0.01	< 0.001	< 0.001
	South Atlantic	0.13	< 0.001	< 0.001
	East South Central	0.03	< 0.001	< 0.001
	West South Central	0.06	< 0.001	< 0.001
	Mountain	-0.02	< 0.001	< 0.001
	Pacific	-0.03	< 0.001	< 0.001
Middle Atlantic	New England	0	< 0.001	1.000
	East North Central	0.02	< 0.001	< 0.001
	West North Central	0.01	< 0.001	< 0.001
	South Atlantic	0.13	< 0.001	< 0.001
	East South Central	0.03	< 0.001	< 0.001
	West South Central	0.06	< 0.001	< 0.001
	Mountain	-0.02	< 0.001	< 0.001
	Pacific	-0.03	< 0.001	< 0.001
East North Central	New England	-0.02	< 0.001	< 0.001
	Middle Atlantic	-0.02	< 0.001	< 0.001
	West North Central	-0.01	< 0.001	< 0.001
	South Atlantic	0.11	< 0.001	< 0.001
	East South Central	0.01	< 0.001	< 0.001
	West South Central	0.04	< 0.001	< 0.001
	Mountain	-0.04	< 0.001	< 0.001
	Pacific	-0.05	< 0.001	< 0.001
East South Central	New England	-0.01	< 0.001	< 0.001
	Middle Atlantic	-0.01	< 0.001	< 0.001
	East North Central	0.01	< 0.001	< 0.001
	South Atlantic	0.12	< 0.001	< 0.001
	East South Central	0.02	< 0.001	< 0.001
	West South Central	0.05	< 0.001	< 0.001
	Mountain	-0.03	< 0.001	< 0.001
	Pacific	-0.04	< 0.001	< 0.001
South Atlantic	New England	-0.13	< 0.001	< 0.001
	Middle Atlantic	-0.13	< 0.001	< 0.001
	East North Central	-0.11	< 0.001	< 0.001
	West North Central	-0.12	< 0.001	< 0.001
	East South Central	-0.10	< 0.001	< 0.001

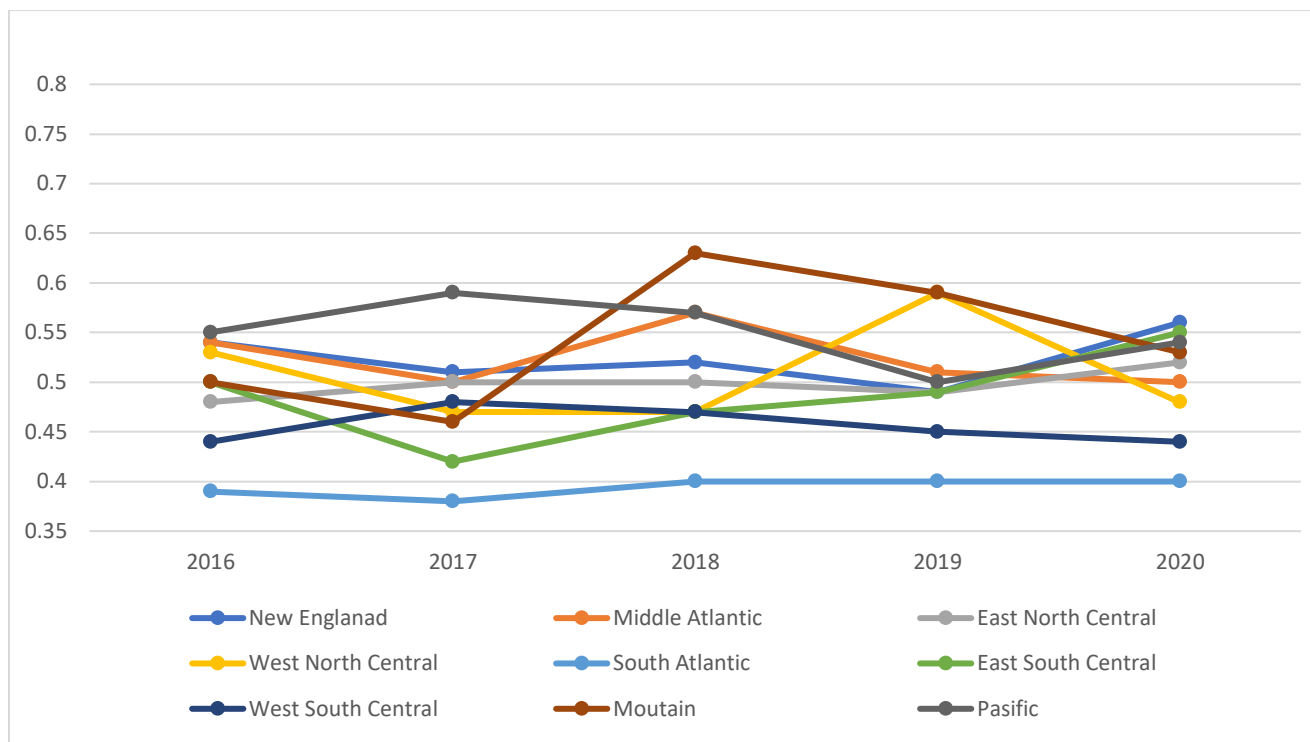
East South Central	West South Central	-0.07	< 0.001	< 0.001
	Mountain	-0.15	< 0.001	< 0.001
	Pacific	-0.16	< 0.001	< 0.001
	New England	-0.03	< 0.001	< 0.001
	Middle Atlantic	-0.03	< 0.001	< 0.001
	East North Central	-0.01	< 0.001	< 0.001
	West North Central	-0.02	< 0.001	< 0.001
	South Atlantic	0.10	< 0.001	< 0.001
	West South Central	0.03	< 0.001	< 0.001
West South Central	Mountain	-0.05	< 0.001	< 0.001
	Pacific	-0.06	< 0.001	< 0.001
	New England	-0.06	< 0.001	< 0.001
	Middle Atlantic	-0.06	< 0.001	< 0.001
	East North Central	-0.04	< 0.001	< 0.001
	West North Central	-0.05	< 0.001	< 0.001
	South Atlantic	0.07	< 0.001	< 0.001
	East South Central	-0.03	< 0.001	< 0.001
	Mountain	-0.08	< 0.001	< 0.001
Mountain	Pacific	-0.09	< 0.001	< 0.001
	New England	0.02	< 0.001	< 0.001
	Middle Atlantic	0.02	< 0.001	< 0.001
	East North Central	0.04	< 0.001	< 0.001
	West North Central	0.03	< 0.001	< 0.001
	South Atlantic	0.15	< 0.001	< 0.001
	East South Central	0.05	< 0.001	< 0.001
	West South Central	0.08	< 0.001	< 0.001
	Pacific	-0.01	< 0.001	< 0.001
Pacific	New England	0.03	< 0.001	< 0.001
	Middle Atlantic	0.03	< 0.001	< 0.001
	East North Central	0.05	< 0.001	< 0.001
	West North Central	0.04	< 0.001	< 0.001
	South Atlantic	0.16	< 0.001	< 0.001
	East South Central	0.06	< 0.001	< 0.001
	West South Central	0.09	< 0.001	< 0.001
	Mountain	0.01	< 0.001	< 0.001

Supplementary Table 4. Univariate Logistic Regression Models of SAH Outcomes for Race and Region

Outcomes	Univariate Model					
	Race			Region		
	OR	95% CI	P Value	OR	95% CI	P Value
Treatment	1.34	1.25 - 1.44	< 0.001	1.03	1.02- 1.04	< 0.001
NIS-SOM	0.94	0.87 - 0.99	0.026	0.99	.98 - 1.00	0.003
Mortality	0.86	0.81 - 0.93	< 0.001	1.05	1.04 - 1.05	< 0.001
Mechanical Ventilation	1.27	1.19 - 1.34	< 0.001	1.05	1.05 - 1.06	< 0.001
Tracheostomy	1.94	1.74 - 2.18	< 0.001	1.05	1.04 - 1.05	< 0.001
Gastrostomy	1.67	1.52 - 1.83	< 0.001	1.40	1.00 - 1.96	0.052
Blood Transfusions	1.77	1.56 - 2.01	< 0.001	0.99	0.98 - 1.00	0.198
Palliative Care	0.61	0.56 - 0.67	< 0.001	1.03	1.02-1.04	< 0.001
DNR	0.57	0.53 - 0.62	< 0.001	1.02	1.01 - 1.03	< 0.001

Supplementary Figure 1. Flow diagram describing selection process for patients included in the study.





Supplementary Figure 2. Dissimilarity Index by Region 2016 - 2020. Graphical representation of dissimilarity index by U.S. Census division from 2016 – 2020. While there were yearly changes to the level of segregation in treatment facilities as measured using the dissimilarity index, the dissimilarity index within a given census division stayed roughly the same year to year. All regions demonstrated some segregation between White and Black patients in treatment facilities, however the South Atlantic region consistently had the lowest measured level of segregation, while the Mountain, Pacific, New England, and Middle Atlantic divisions had amongst the highest.