

Table S1. STROBE Statement: Checklist of items that should be included in reports of observational studies.

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1,2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	2,3
Objectives	3	State specific objectives, including any prespecified hypotheses	2,3
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants	5
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5,6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	7,8
		(b) Describe any methods used to examine subgroups and interactions	7,8
		(c) Explain how missing data were addressed	7,8
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed	7

		<i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	
		(e) Describe any sensitivity analyses	8
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—e.g., numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analyzed	9
		(b) Give reasons for non-participation at each stage	9
		(c) Consider use of a flow diagram	9
Descriptive data	14*	(a) Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders	11,12
		(b) Indicate number of participants with missing data for each variable of interest	13
		(c) <i>Cohort study</i> —Summarize follow-up time (e.g., average and total amount)	N/A
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time	N/A
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure	N/A
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures	11,12
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g., 95% confidence interval). Make clear which confounders were adjusted for and why they were included	13,14
		(b) Report category boundaries when continuous variables were categorized	14,15
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	16
Discussion			
Key results	18	Summarize key results with reference to study objectives	16,17
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	17,18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16-18
Generalizability	21	Discuss the generalizability (external validity) of the study results	18
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	N/A

Table S2. Multiple Imputation for Race

	Odds ratio	Std. Error	p-value	95% Conf. Interval	
Hospital region					
Midwest reference					
Northeast	1.09	0.032	0.002	1.031	1.156
South	1.21	0.028	<0.001	1.153	1.264
West	1.29	0.034	<0.001	1.223	1.357
Race					
White reference					
Black	0.91	0.016	<0.001	0.880	0.944
Hispanic	1.18	0.023	<0.001	1.132	1.221
Asian or Pacific Islander	1.10	0.037	0.004	1.031	1.176
Native American	1.34	0.080	<0.001	1.193	1.508
Other	1.08	0.036	0.018	1.014	1.155
Female	0.81	0.008	<0.001	0.792	0.824
Payer					
Medicare reference					
Medicaid	1.12	0.024	<0.001	1.075	1.170
Private Insurance	0.92	0.017	<0.001	0.889	0.956
Self-Pay	1.07	0.039	0.066	0.996	1.149
No Charge	1.01	0.122	0.922	0.799	1.282
Other	1.36	0.049	<0.001	1.265	1.456
Median household income for patient's ZIP code					
0–25 th percentile reference					
26 th –50 th percentile	0.88	0.014	<0.001	0.858	0.911
51 st –75 th percentile	0.82	0.014	<0.001	0.793	0.849
76 th –100 th percentile	0.72	0.015	<0.001	0.693	0.754
Charlson Comorbidity Index	1.14	0.003	<0.001	1.133	1.144
Age category					
18– 44 years (reference)					
45–64 years	2.09	0.043	<0.001	2.011	2.179
65 years and older	3.78	0.093	<0.001	3.606	3.972
Hospital Control					
Government, nonfederal (reference)					
Private, non-profit	0.90	0.025	<0.001	0.855	0.952
Private, investor-own	0.91	0.031	0.007	0.852	0.974
Location/teaching status of hospital					
Rural reference					
Urban nonteaching	1.09	0.033	0.004	1.028	1.159
Urban teaching	1.22	0.033	<0.001	1.156	1.284
Severity-of-illness subclass					
None to minor (reference)					

Moderate	0.11	0.089	0.007	0.022	0.542
Major	0.58	0.435	0.466	0.131	2.534
Extreme	2.63	1.981	0.201	0.598	11.522

Table S3. Multinomial Logistic Regression Analysis by Region

Region	Variable	Relative risk ratio	Standard error	p-value	95% conf. interval	
Northeast						
	Race	White (reference)				
	Black	1.27	0.116	0.008	1.066	1.522
	Hispanic	2.87	0.291	<0.001	2.355	3.502
	Asian or Pacific Islander	2.38	0.374	<0.001	1.752	3.243
	Native American	0.52	0.099	0.001	0.361	0.759
	Other	5.03	0.790	<0.001	3.698	6.846
	Female	0.94	0.012	<0.001	0.922	0.968
	Payer	Medicare (reference)				
	Medicaid	1.43	0.057	<0.001	1.322	1.547
	Private Insurance	0.94	0.039	0.132	0.866	1.019
	Self-Pay	0.53	0.059	<0.001	0.429	0.664
	No Charge	3.61	1.413	0.001	1.674	7.774
	Other	0.84	0.075	0.046	0.702	0.997
	Median household income for patient's ZIP code	0–25 th percentile (reference)				
	26 th –50 th percentile	1.10	0.083	0.187	0.953	1.280
	51 st –75 th percentile	1.43	0.136	<0.001	1.184	1.721
	76 th –100 th percentile	2.93	0.384	<0.001	2.266	3.787
	Charlson Comorbidity Index	0.97	0.005	<0.001	0.958	0.978
	Age category	18–44 years (reference)				
	45–64 years	1.30	0.030	<0.001	1.247	1.364
	65 years and older	1.74	0.070	<0.001	1.606	1.880
	Hospital Control	Government, nonfederal (reference)				
	Private, non-profit	1.51	0.208	0.003	1.155	1.981
	Private, investor-own	1.03	0.222	0.909	0.670	1.567
	Location/teaching status of hospital	Rural (reference)				
	Urban nonteaching	0.94	0.114	0.596	0.738	1.191
	Urban teaching	2.00	0.210	<0.001	1.627	2.456
	Severity-of-illness subclass	None to Minor (reference)				
	Moderate	1.13	0.800	0.866	0.280	4.532
	Major	0.69	0.480	0.593	0.176	2.701
	Extreme	0.55	0.384	0.392	0.141	2.158
Midwest	(base outcome)					
South						
	Race	White (reference)				
	Black	1.95	0.147	<0.001	1.685	2.261

	Hispanic	3.08	0.277	<0.001	2.585	3.675
	Asian or Pacific Islander	1.24	0.111	0.014	1.046	1.482
	Native American	1.35	0.235	0.084	0.961	1.900
	Other	2.68	0.337	<0.001	2.091	3.424
	Female	1.04	0.011	0.001	1.014	1.058
	Payer	Medicare (reference)				
	Medicaid	0.66	0.028	<0.001	0.606	0.714
	Private Insurance	1.24	0.049	<0.001	1.152	1.345
	Self-Pay	1.73	0.145	<0.001	1.470	2.043
	No Charge	6.66	3.563	<0.001	2.331	19.010
	Other	2.07	0.144	<0.001	1.803	2.370
	Median household income for patient's ZIP code	0–25 th percentile (reference)				
	26 th –50 th percentile	0.66	0.037	<0.001	0.592	0.737
	51 st –75 th percentile	0.57	0.042	<0.001	0.491	0.657
	76 th –100 th percentile	0.75	0.085	0.011	0.600	0.937
	Charlson Comorbidity Index	0.96	0.005	<0.001	0.952	0.970
	Age category	18–44 years (reference)				
	45–64 years	0.98	0.017	0.162	0.942	1.010
	65 years and older	1.11	0.038	0.002	1.040	1.188
	Hospital Control	Government, nonfederal (reference)				
	Private, non-profit	0.38	0.034	<0.001	0.321	0.455
	Private, investor-own	2.51	0.364	<0.001	1.890	3.335
	Location/teaching status of hospital	Rural (reference)				
	Urban nonteaching	2.03	0.178	<0.001	1.707	2.408
	Urban teaching	1.28	0.100	0.001	1.103	1.496
	Severity-of-illness subclass	None to Minor (reference)				
	Moderate	0.62	0.308	0.332	0.231	1.640
	Major	0.40	0.198	0.064	0.155	1.054
	Extreme	0.45	0.222	0.105	0.173	1.182
West						
	Race	White (reference)				
	Black	0.67	0.061	<0.001	0.562	0.803
	Hispanic	8.25	0.730	<0.001	6.934	9.810
	Asian or Pacific Islander	5.80	0.535	<0.001	4.837	6.945
	Native American	7.05	1.098	<0.001	5.195	9.568
	Other	3.39	0.480	<0.001	2.570	4.476
	Female	0.89	0.012	<0.001	0.872	0.918
	Payer	Medicare (reference)				
	Medicaid	1.83	0.078	<0.001	1.685	1.990
	Private Insurance	0.93	0.036	0.059	0.862	1.003
	Self-Pay	0.50	0.053	<0.001	0.408	0.616
	No Charge	0.55	0.273	0.228	0.209	1.453
	Other	1.19	0.096	0.032	1.015	1.395

	Median household income for patient's ZIP Code	0–25 th percentile (reference)				
	26 th –50 th percentile	1.13	0.087	0.098	0.977	1.318
	51 st –75 th percentile	1.61	0.154	<0.001	1.333	1.941
	76 th –100 th percentile	2.75	0.346	<0.001	2.150	3.519
	Charlson Comorbidity Index	0.97	0.005	<0.001	0.964	0.984
	Age category	18–44 years (reference)				
	45–64 years	1.10	0.025	<0.001	1.055	1.153
	65 years and older	1.34	0.053	<0.001	1.243	1.451
	Hospital control	Government nonfederal reference				
	Private, non-profit	0.53	0.060	<0.001	0.427	0.666
	Private, investor-own	2.11	0.361	<0.001	1.507	2.950
	Location/teaching status of hospital	Rural (reference)				
	Urban nonteaching	2.25	0.280	<0.001	1.765	2.872
	Urban teaching	1.58	0.166	<0.001	1.283	1.937
	Severity-of-illness subclass	None to Minor (reference)				
	Moderate	1.49	1.211	0.621	0.305	7.325
	Major	1.15	0.920	0.858	0.242	5.510
	Extreme	1.74	1.386	0.488	0.364	8.298