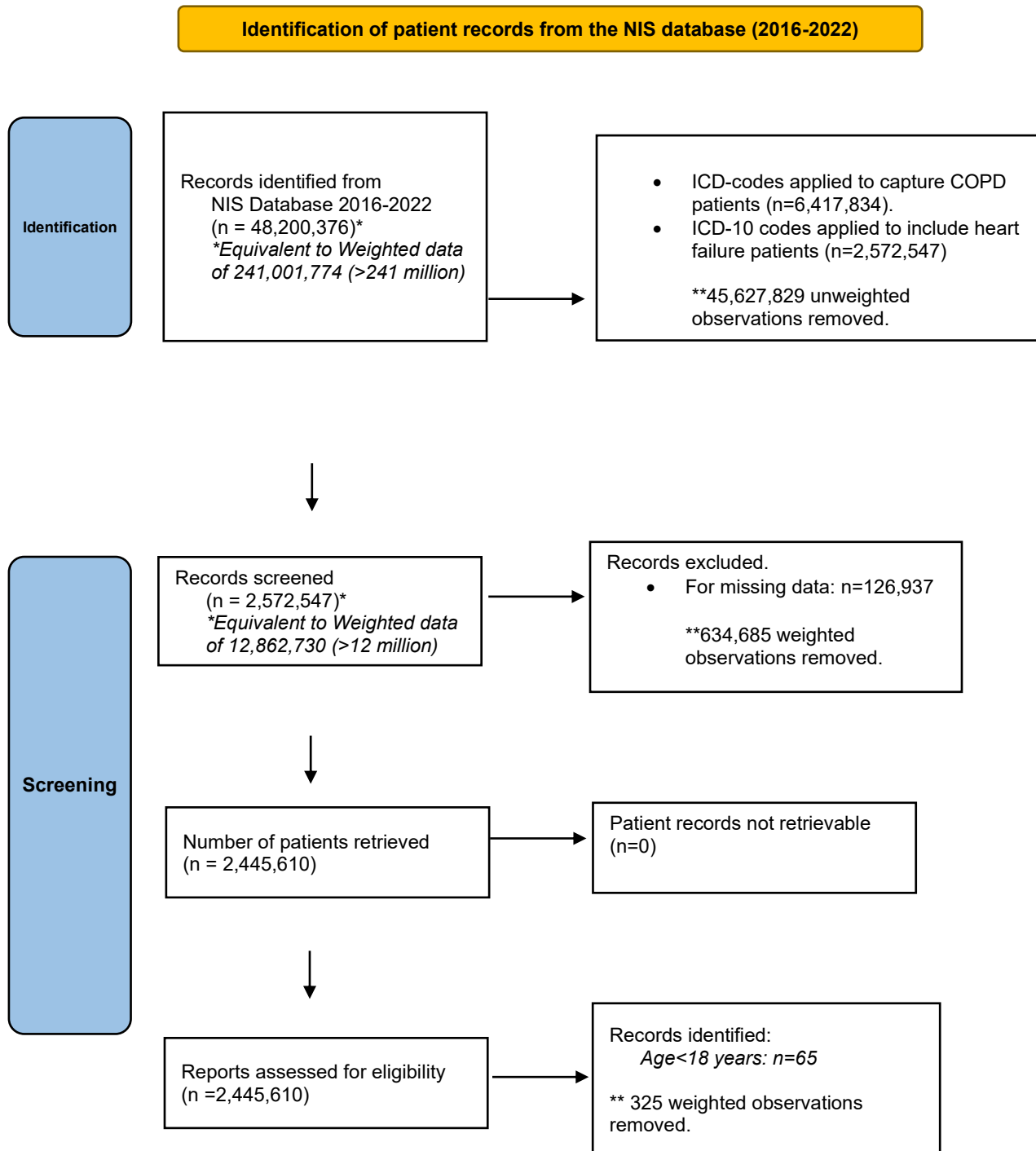
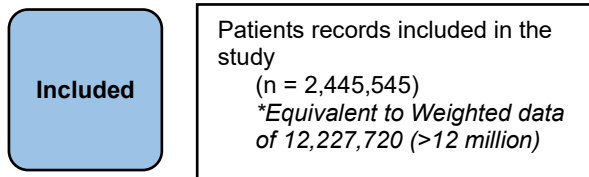


Racial/Ethnic Based Disparities in the Clinical Outcomes of Heart Failure in patients with Chronic Obstructive Pulmonary Disease: A National Inpatient Database Analysis.

Supplementary Figure 1 NIS database screening and exclusion.





*Hospital discharge weights obtained from NIS – HCUP defined stratum and primary sampling units (PSU) of hospital universe to provide national level estimates.

**Records removed due to exclusion criteria.

Supplementary Table 1 ICD-10 diagnosis codes used to identify study population

Procedure	ICD-10 codes
Heart failure (HF)	J410 J411 J418 J42 J430 J431 J432 J438 J439 J440 J441 J449 J4520 J4521 J4522 J4530 J4531 J4532 J4540 J4541 J4542 J4550 J4551 J4552 J45901 J45902 J45909 J45990 J45991 J45998 J470 J471 J479 J60 J61 J620 J628 J630 J631 J632 J633 J634 J635 J636 J64 J65 J660 J661 J662 J668 J670 J671 J672 J673 J674 J675 J676 J677 J678 J679 J684 J701 J703
Chronic pulmonary diseases	I0981 I110 I130 I132 I501 I5020 I5021 I5022 I5023 I5030 I5031 I5032 I5033 I5040 I5041 I5042 I5043 I50810 I50811 I50812 I50813 I50814 I5082 I5083 I5084 I508 I509 I5181 I97130 I97131 O29121 O29122 O29123 O29129 R570 Z95811 Z95812

Supplementary Table 2 Baseline characteristics of the study population among racial groups

Variables	White (n=1,851,518)	Black (n=381,574)	Hispanic (n=128,386)	Others (n=84,067)	p- value
Age mean (SD)	72.91 (11.07)	66.75 (11.72)	71.77 (12.13)	72.55 (11.99)	<0.001
Female n(%)	922693 (49.8%)	211129 (55.3%)	63752 (49.7%)	39457 (46.9%)	<0.001
Male n(%)	928825 (50.2%)	170445 (44.7%)	64634 (50.3%)	44610 (53.1%)	
Mortality n(%)	100627 (5.4%)	15430 (4%)	6840 (5.3%)	5377 (6.4%)	<0.001
Elective admission n(%)	150377 (8.1%)	19093 (5%)	7427 (5.8%)	5650 (6.7%)	<0.001
Weekend admission n(%)	431643 (23.3%)	92202 (24.2%)	31180 (24.3%)	20150 (24%)	<0.001

ED admission n(%)	1477800 (79.8%)	331117 (86.8%)	111615 (86.9%)	69765 (83%)	<0.001
LOS mean (SD)	6.20 (6.46)	6.52 (7.72)	6.60 (7.78)	6.81 (8.67)	<0.001
Total hospital charges in \$ mean (SD)	71542.9 (104372.3)	73656.7 (117050.9)	99738.5 (142641.8)	99460.8 (161389.5)	<0.001
Total cost (adjusted for inflation) in \$ mean (SD)	18587.7 (23549.9)	18606.1 (27122.0)	21250.9 (28782.0)	24142.2 (35722.1)	<0.001
Disposition n(%)					<0.001
Routine (alive)	714564 (38.6%)	176557 (46.3%)	54804 (42.7%)	35064 (41.7%)	
Short-term facility	51751 (2.8%)	8003 (2.1%)	2840 (2.2%)	2303 (2.7%)	
Intermediate or SNF	501105 (27.1%)	78443 (20.6%)	27363 (21.3%)	19099 (22.7%)	
Home health	458649 (24.8%)	93407 (24.5%)	33658 (26.2%)	20624 (24.5%)	
AMA	24822 (1.3%)	9734 (2.6%)	2881 (2.2%)	1600 (1.9%)	
Died	100627 (5.4%)	15430 (4%)	6840 (5.3%)	5377 (6.4%)	
Discharge quarter n(%)					<0.001
January-March	492785 (26.6%)	99857 (26.2%)	34929 (27.2%)	22707 (27%)	
April-June	457070 (24.7%)	93508 (24.5%)	31336 (24.4%)	20902 (24.9%)	
July-September	434048 (23.4%)	91245 (23.9%)	29471 (23%)	19367 (23%)	
October-	467615 (25.3%)	96964 (25.4%)	32650	21091	

December			(25.4%)	(25.1%)	
Health Insurance n(%)					<0.001
Medicare	1487449 (80.3%)	257853 (67.6%)	94700 (73.8%)	61894 (73.6%)	
Medicaid	132568 (7.2%)	73653 (19.3%)	19398 (15.1%)	11837 (14.1%)	
Private including HMO	161344 (8.7%)	34441 (9%)	9260 (7.2%)	7033 (8.4%)	
Self pay	22576 (1.2%)	7320 (1.9%)	2676 (2.1%)	1391 (1.7%)	
No charge or others	47581 (2.6%)	8307 (2.2%)	2352 (1.8%)	1912 (2.3%)	
NCHS urbanization scheme n(%)					<0.001
Large metropolitan (≥ 1 million population)	800421 (43.2%)	251243 (65.8%)	85425 (66.5%)	52552 (62.5%)	
Medium-small metropolitan (< 1 million population)	624494 (33.7%)	94016 (24.6%)	33242 (25.9%)	19685 (23.4%)	
Non- metropolitan	426603 (23%)	36315 (9.5%)	9719 (7.6%)	11830 (14.1%)	
Median household income quartiles per area zip code n(%)					<0.001
\$1 - 55999 \$ (0- 25 th percentile)	577735 (31.2%)	223750 (58.6%)	55032 (42.9%)	24299 (28.9%)	
\$ 56000 - \$ 70999 (26-50 th	550578 (29.7%)	78951 (20.7%)	32875 (25.6%)	19701 (23.4%)	

percentile)					
\$ 71000 - \$ 93999 (51–75 th percentile)	432788 (23.4%)	50711 (13.3%)	25813 (20.1%)	20040 (23.8%)	
\$ 94000 – or more (76–100 th percentile)	290417 (15.7%)	28162 (7.4%)	14666 (11.4%)	20027 (23.8%)	
Hospital bed size n(%)					<0.001
Small	430166 (23.2%)	78076 (20.5%)	26428 (20.6%)	17322 (20.6%)	
Medium	554217 (29.9%)	109014 (28.6%)	44781 (34.9%)	25213 (30%)	
Large	867135 (46.8%)	194484 (51%)	57177 (44.5%)	41532 (49.4%)	
Hospital location and teaching services n(%)					<0.001
Rural	256641 (13.9%)	22691 (5.9%)	4815 (3.8%)	6694 (8%)	
Urban, non- teaching	423715 (22.9%)	61058 (16%)	30374 (23.7%)	19381 (23.1%)	
Urban, teaching	1171162 (63.3%)	297825 (78.1%)	93197 (72.6%)	57992 (69%)	
Hospital region n(%)					<0.001
Northeast	328291 (17.7%)	56154 (14.7%)	23708 (18.5%)	17411 (20.7%)	
Midwest	516568 (27.9%)	95153 (24.9%)	9820 (7.6%)	11154 (13.3%)	
South	749335 (40.5%)	194514 (51%)	56002 (43.6%)	24538 (29.2%)	
West	257324 (13.9%)	35753 (9.4%)	38856	30964	

			(30.3%)	(36.8%)	
Transfer into the hospital n(%)					<0.001
Not transferred	1597100 (86.7%)	345083 (90.8%)	116374 (91%)	73011 (87.1%)	
Transfer in from another hospital	140937 (7.7%)	17444 (4.6%)	6060 (4.7%)	6202 (7.4%)	
Transfer from SNF/other facility	104231 (5.7%)	17485 (4.6%)	5400 (4.2%)	4565 (5.4%)	
Transfer out of the hospital n(%)					<0.001
Not transferred	1298662 (70.1%)	295128 (77.3%)	98183 (76.5%)	62665 (74.5%)	
Transfer to another acute care hospital	51751 (2.8%)	8003 (2.1%)	2840 (2.2%)	2303 (2.7%)	
Transfer to SNF/other facility	501105 (27.1%)	78443 (20.6%)	27363 (21.3%)	19099 (22.7%)	
DRG: Disease Severity Subclass n(%)					<0.001
Minor-moderate	489827 (26.5%)	103593 (27.1%)	32069 (25%)	20204 (24%)	
Severe	846118 (45.7%)	185344 (48.6%)	59433 (46.3%)	38411 (45.7%)	
Extreme	515544 (27.8%)	92637 (24.3%)	36881 (28.7%)	25451 (30.3%)	
DRG: Risk of Mortality Subclass n(%)					<0.001
Minor-moderate	511398 (27.6%)	112391 (29.5%)	33207 (25.9%)	20883 (24.8%)	

Severe	862653 (46.6%)	181475 (47.6%)	59492 (46.3%)	38414 (45.7%)	
Extreme	477438 (25.8%)	87708 (23%)	35684 (27.8%)	24769 (29.5%)	
Hospital ownership n(%)					<0.001
Government, non-federal	173113 (9.3%)	45011 (11.8%)	14140 (11%)	8514 (10.1%)	
Private, non-profit	1425403 (77%)	284331 (74.5%)	80113 (62.4%)	59580 (70.9%)	
Private, investor-owned	253002 (13.7%)	52232 (13.7%)	34133 (26.6%)	15973 (19%)	
Year of index admission n(%)					<0.001
2016	245851 (13.3%)	48808 (12.8%)	16310 (12.7%)	10662 (12.7%)	
2017	268515 (14.5%)	53980 (14.1%)	19557 (15.2%)	12578 (15%)	
2018	278615 (15%)	57237 (15%)	21986 (17.1%)	12792 (15.2%)	
2019	290665 (15.7%)	60340 (15.8%)	19513 (15.2%)	13629 (16.2%)	
2020	252498 (13.6%)	53857 (14.1%)	16689 (13%)	11703 (13.9%)	
2021	252445 (13.6%)	52909 (13.9%)	16750 (13%)	10891 (13%)	
2022	262929 (14.2%)	54443 (14.3%)	17581 (13.7%)	11812 (14.1%)	
ED: emergency; HMO: health maintenance organization; DRG: diagnosis related groups; LOS: length of stay; SNF: skilled nursing facility; AMA: against medical device; NCHS: National Center for Health Statistics.					

Median household income quartiles per area zip code quartiles for each year:

Year	1 st quartile (0–25 th percentile)	2 nd quartile (26–50 th percentile)	3 rd quartile (51–75 th percentile)	4 th quartile (75–100 th percentile)
2016	1 - 42,999	43,000 - 53,999	54,000 - 70,999	71,000+
2017	1 - 43,999	44,000 - 55,999	56,000 - 73,999	74,000+
2018	1 - 45,999	46,000 - 58,999	59,000 - 78,999	79,000+
2019	1 - 47,999	48,000 - 60,999	61,000 - 81,999	82,000+
2020	1 - 49,999	50,000 - 64,999	65,000 - 85,999	86,000+
2021	1 - 51,999	52,000 - 65,999	66,000 - 87,999	88,000+
2022	1 - 55,999	56,000 - 70,999	71,000 - 93,999	94,000+

Supplementary Table 3 Racial disparities in baseline comorbidities and in-hospital events of the study population

Variables	White (n=1,851,518)	Black (n=381,574)	Hispanic (n=128,386)	Others (n=84,067)	p- value
Elixhauser Comorbidity Index					
HIV	3510 (0.2%)	7648 (2%)	773 (0.6%)	267 (0.3%)	<0.001
Alcohol abuse	89616 (4.8%)	22226 (5.8%)	5629 (4.4%)	3641 (4.3%)	<0.001
Autoimmune conditions	87092 (4.7%)	17505 (4.6%)	5439 (4.2%)	3416 (4.1%)	<0.001
Coagulopathy	175096 (9.5%)	33710 (8.8%)	13723 (10.7%)	9592 (11.4%)	<0.001
Depression	330705 (17.9%)	47678 (12.5%)	18753 (14.6%)	9931 (11.8%)	<0.001
Diabetes (Uncomplicated)	306102 (16.5%)	73653 (19.3%)	27693 (21.6%)	16251 (19.3%)	<0.001
Complicated Diabetes	537697 (29%)	138853 (36.4%)	51258 (39.9%)	29961 (35.6%)	<0.001
Substance abuse	73517 (4%)	37380 (9.8%)	6963 (5.4%)	4101 (4.9%)	<0.001
Hypertension (Uncomplicated)	169131 (9.1%)	39290 (10.3%)	11972 (9.3%)	7776 (9.2%)	<0.001
Complicated Hypertension	1439670 (77.8%)	327055 (85.7%)	106604 (83%)	67524 (80.3%)	<0.001
Mild liver disease	120494 (6.5%)	33345 (8.7%)	11850 (9.2%)	6730 (8%)	<0.001
Liver disease, moderate to severe	28242 (1.5%)	4564 (1.2%)	3028 (2.4%)	1608 (1.9%)	<0.001
Obesity	510598 (27.6%)	126571 (33.2%)	38521 (30%)	19496 (23.2%)	<0.001
Peripheral artery disease	271993 (14.7%)	40787 (10.7%)	15078 (11.7%)	10518 (12.5%)	<0.001

Psychoses	93651 (5.1%)	26755 (7%)	6500 (5.1%)	3803 (4.5%)	<0.001
Pulmonary circulation disease	321101 (17.3%)	82856 (21.7%)	22000 (17.1%)	15065 (17.9%)	<0.001
Renal disease (moderate)	511554 (27.6%)	105858 (27.7%)	33549 (26.1%)	22681 (27%)	<0.001
Renal disease (severe)	208366 (11.3%)	84709 (22.2%)	24862 (19.4%)	15642 (18.6%)	<0.001
Weight loss	172620 (9.3%)	35745 (9.4%)	11260 (8.8%)	9521 (11.3%)	<0.001
Prior Medical History					
Prior MI	297062 (16%)	52998 (13.9%)	17793 (13.9%)	11552 (13.7%)	<0.001
Prior PCI	258836 (14%)	38780 (10.2%)	15396 (12%)	10255 (12.2%)	<0.001
Prior CABG	227102 (12.3%)	24357 (6.4%)	14530 (11.3%)	9287 (11%)	<0.001
Prior pacemaker	137165 (7.4%)	16479 (4.3%)	9007 (7%)	5474 (6.5%)	<0.001
Prior peripheral angioplasty	11808 (0.6%)	1972 (0.5%)	641 (0.5%)	401 (0.5%)	<0.001
Prior valve replacement	82246 (4.4%)	9979 (2.6%)	4744 (3.7%)	2951 (3.5%)	<0.001
Prior ICD	228495 (12.3%)	46354 (12.1%)	16570 (12.9%)	9524 (11.3%)	<0.001
Prior CVA (including sequelae)	241089 (13%)	64022 (16.8%)	17779 (13.8%)	11495 (13.7%)	<0.001
Neurological					
Cerebrovascular disease	133946 (7.2%)	32905 (8.6%)	9522 (7.4%)	6905 (8.2%)	<0.001
Dementia	170779 (9.2%)	29434 (7.7%)	15414 (12%)	9493 (11.3%)	<0.001
Neurological disorders affecting	91873 (5%)	5466 (1.4%)	3553 (2.8%)	2662 (3.2%)	<0.001

movements					
Other neurological disorders	208900 (11.3%)	39969 (10.5%)	14262 (11.1%)	10392 (12.4%)	<0.001
Seizures and epilepsy	72648 (3.9%)	23374 (6.1%)	5656 (4.4%)	3419 (4.1%)	<0.001
Status epilepticus	2221 (0.1%)	984 (0.3%)	222 (0.2%)	128 (0.2%)	<0.001
Paralysis	71311 (3.9%)	25343 (6.6%)	6698 (5.2%)	4864 (5.8%)	<0.001
Migraine	17914 (1%)	3528 (0.9%)	971 (0.8%)	567 (0.7%)	<0.001
TIA	8181 (0.4%)	1525 (0.4%)	536 (0.4%)	325 (0.4%)	<0.001
Stroke	31097 (1.7%)	7046 (1.8%)	2103 (1.6%)	1569 (1.9%)	<0.001
Cardiovascular					
Coronary artery disease	1001287 (54.1%)	171960 (45.1%)	66996 (52.2%)	43103 (51.3%)	<0.001
Acute exacerbation of heart failure	1006467 (54.4%)	194441 (51%)	72613 (56.6%)	46344 (55.1%)	<0.001
Systolic heart failure	636141 (34.4%)	155776 (40.8%)	46524 (36.2%)	30650 (36.5%)	<0.001
Diastolic heart failure	1032007 (55.7%)	206511 (54.1%)	66991 (52.2%)	45238 (53.8%)	<0.001
Valvular heart disease	381951 (20.6%)	62259 (16.3%)	23874 (18.6%)	16462 (19.6%)	<0.001
Mitral stenosis	9701 (0.5%)	1389 (0.4%)	700 (0.5%)	464 (0.6%)	<0.001
Mitral valve disease	95265 (5.1%)	18424 (4.8%)	6374 (5%)	4387 (5.2%)	<0.001
Carotid stenosis	46822 (2.5%)	4426 (1.2%)	2019 (1.6%)	1516 (1.8%)	<0.001
Pericarditis	25575 (1.4%)	6731 (1.8%)	2193 (1.7%)	1497 (1.8%)	<0.001
Pericardial Tamponade	2222 (0.1%)	363 (0.1%)	181 (0.1%)	118 (0.1%)	<0.001
Rheumatic heart disease	121291 (6.6%)	25116 (6.6%)	8223 (6.4%)	5868 (7%)	<0.001
In-hospital Acute MI	174269 (9.4%)	31422 (8.2%)	12869 (10%)	9599 (11.4%)	<0.001

NSTEMI	100579 (5.4%)	15083 (4%)	7587 (5.9%)	5267 (6.3%)	<0.001
NSTEMI type 2	54449 (2.9%)	11288 (3%)	3859 (3%)	2868 (3.4%)	<0.001
STEMI	15709 (0.8%)	1761 (0.5%)	1015 (0.8%)	858 (1%)	<0.001
Takotsubo cardiomyopathy	12376 (0.7%)	904 (0.2%)	429 (0.3%)	407 (0.5%)	<0.001
Peripheral atherosclerosis	62553 (3.4%)	10324 (2.7%)	4969 (3.9%)	3587 (4.3%)	<0.001
Infective endocarditis	9328 (0.5%)	1689 (0.4%)	632 (0.5%)	474 (0.6%)	<0.001
Cardiac rhythm abnormalities					
Cardiac arrhythmia (including sinus rhythm)	966898 (52.2%)	154336 (40.4%)	57320 (44.6%)	40077 (47.7%)	<0.001
Atrial arrhythmias (Afib & Aflutter)	775306 (41.9%)	106771 (28%)	43423 (33.8%)	30668 (36.5%)	<0.001
Afib alone	746800 (40.3%)	100285 (26.3%)	41926 (32.7%)	29459 (35%)	<0.001
SVT	43149 (2.3%)	5014 (1.3%)	2483 (1.9%)	1956 (2.3%)	<0.001
VT	45774 (2.5%)	11451 (3%)	2788 (2.2%)	2188 (2.6%)	<0.001
Sick Sinus Syndrome	76955 (4.2%)	19722 (5.2%)	4527 (3.5%)	3356 (4%)	<0.001
AV block	44849 (2.4%)	8397 (2.2%)	2979 (2.3%)	2124 (2.5%)	<0.001
Respiratory					
Respiratory failure (acute and chronic)	913917 (49.4%)	168024 (44%)	59618 (46.4%)	39274 (46.7%)	<0.001
Acute respiratory failure	721915 (39%)	132047 (34.6%)	48864 (38.1%)	32229 (38.3%)	<0.001
Respiratory tract bleeding	31511 (1.7%)	6669 (1.7%)	1850 (1.4%)	1512 (1.8%)	<0.001
Smoking history	1078839 (58.3%)	223568 (58.6%)	63014 (49.1%)	41323 (49.2%)	<0.001
Pneumonia	496462 (26.8%)	78616 (20.6%)	36169 (28.2%)	24858 (29.6%)	<0.001
Aspiration	78399 (4.2%)	11576 (3%)	5269 (4.1%)	4567 (5.4%)	<0.001

pneumonitis/pneumonia					
BiPAP dependence	9291 (0.5%)	3167 (0.8%)	1136 (0.9%)	827 (1%)	<0.001
Oxygen dependence	383391 (20.7%)	72228 (18.9%)	21394 (16.7%)	13157 (15.7%)	<0.001
Pulmonary hypertension	322360 (17.4%)	83121 (21.8%)	22045 (17.2%)	15109 (18%)	<0.001
OSA	356393 (19.2%)	82345 (21.6%)	21560 (16.8%)	12491 (14.9%)	<0.001
Pneumothorax	16256 (0.9%)	2409 (0.6%)	1002 (0.8%)	867 (1%)	<0.001
Acute exacerbation of COPD	744172 (40.2%)	144065 (37.8%)	54088 (42.1%)	34807 (41.4%)	<0.001
Acute asthma	19112 (1%)	10444 (2.7%)	4044 (3.1%)	2516 (3%)	<0.001
Acute bronchitis	60039 (3.2%)	11140 (2.9%)	5090 (4%)	2873 (3.4%)	<0.001
COVID-19	49250 (2.7%)	11041 (2.9%)	3906 (3%)	2517 (3%)	<0.001
Gastrointestinal					
UGI Bleeding	80403 (4.3%)	16395 (4.3%)	5457 (4.3%)	3861 (4.6%)	0.001
LGI Bleeding	46654 (2.5%)	9841 (2.6%)	3301 (2.6%)	2189 (2.6%)	0.071
Peptic ulcer with bleeding	28521 (1.5%)	5442 (1.4%)	2123 (1.7%)	1595 (1.9%)	<0.001
IBD	14984 (0.8%)	1525 (0.4%)	436 (0.3%)	400 (0.5%)	<0.001
Acute bowel ischemia	2956 (0.2%)	430 (0.1%)	190 (0.1%)	129 (0.2%)	<0.001
Endocrine					
Diabetes	829332 (44.8%)	208478 (54.6%)	77417 (60.3%)	45417 (54%)	<0.001
Hypertension	1567392 (84.7%)	347927 (91.2%)	114214 (89%)	72776 (86.6%)	<0.001
Diabetic ketoacidosis	6406 (0.3%)	1744 (0.5%)	588 (0.5%)	327 (0.4%)	<0.001
Hypothyroidism	382328 (20.6%)	37758 (9.9%)	22902 (17.8%)	13724 (16.3%)	<0.001

Other thyroid disorders (including hyperthyroidism)	23852 (1.3%)	7774 (2%)	1649 (1.3%)	1432 (1.7%)	<0.001
Dyslipidemia	955275 (51.6%)	180749 (47.4%)	65672 (51.2%)	42241 (50.2%)	<0.001
Major In-hospital events and procedures					
Septic shock	71555 (3.9%)	12062 (3.2%)	5815 (4.5%)	4329 (5.1%)	<0.001
Cardiogenic shock	39922 (2.2%)	7900 (2.1%)	2906 (2.3%)	2454 (2.9%)	<0.001
Major bleeding	17614 (1%)	3120 (0.8%)	1198 (0.9%)	1074 (1.3%)	<0.001
In-hospital cardiac arrest	28830 (1.6%)	7855 (2.1%)	2709 (2.1%)	1876 (2.2%)	<0.001
Mechanical circulatory support	41539 (2.2%)	8142 (2.1%)	3235 (2.5%)	2505 (3%)	<0.001
In-hospital PRBC transfusion	106076 (5.7%)	24029 (6.3%)	8514 (6.6%)	6222 (7.4%)	<0.001
In-hospital PCI	40005 (2.2%)	4630 (1.2%)	2511 (2%)	2015 (2.4%)	<0.001
In-hospital CABG	15015 (0.8%)	1437 (0.4%)	1031 (0.8%)	830 (1%)	<0.001
In-hospital pacemaker insertion	16646 (0.9%)	1706 (0.4%)	1003 (0.8%)	722 (0.9%)	<0.001
Invasive mechanical ventilation	138459 (7.5%)	32982 (8.6%)	11705 (9.1%)	8304 (9.9%)	<0.001
Tracheostomy	106393 (5.7%)	26170 (6.9%)	9396 (7.3%)	6363 (7.6%)	<0.001
PEG tube placement	28719 (1.6%)	8658 (2.3%)	3033 (2.4%)	2257 (2.7%)	<0.001
Acute pulmonary embolism	28774 (1.6%)	7080 (1.9%)	1753 (1.4%)	1194 (1.4%)	<0.001
Acute VTE	31767 (1.7%)	8912 (2.3%)	2430 (1.9%)	1515 (1.8%)	<0.001
In-hospital catheter ablation	7709 (0.4%)	1217 (0.3%)	408 (0.3%)	281 (0.3%)	<0.001
Hematology/Oncology					
Any malignancy	159457 (8.6%)	26890 (7%)	8007 (6.2%)	6606 (7.9%)	<0.001
Leukemia	16767 (0.9%)	1832 (0.5%)	670 (0.5%)	556 (0.7%)	<0.001
Lymphoma	18088 (1%)	3716 (1%)	1054 (0.8%)	796 (0.9%)	<0.001
Metastatic cancer	44359 (2.4%)	8035 (2.1%)	2189 (1.7%)	2051 (2.4%)	<0.001
Solid organ malignancies	117877 (6.4%)	19975 (5.2%)	5870 (4.6%)	4940 (5.9%)	<0.001
Deficiency anemias	555756 (30%)	147458	47915	29367	<0.001

		(38.6%)	(37.3%)	(34.9%)	
Blood loss anemia	146663 (7.9%)	25051 (6.6%)	8437 (6.6%)	6189 (7.4%)	<0.001
Systemic					
Sepsis	257730 (13.9%)	40745 (10.7%)	19092 (14.9%)	13922 (16.6%)	<0.001
Immunocompromised state (except HIV)	11987 (0.6%)	1485 (0.4%)	748 (0.6%)	497 (0.6%)	<0.001
Sarcoidosis	5501 (0.3%)	6654 (1.7%)	382 (0.3%)	288 (0.3%)	<0.001
Liver cirrhosis	117563 (6.3%)	31733 (8.3%)	11663 (9.1%)	6586 (7.8%)	<0.001
Amyloidosis	2513 (0.1%)	1292 (0.3%)	203 (0.2%)	128 (0.2%)	<0.001
Orthostatic hypotension	24672 (1.3%)	3037 (0.8%)	1028 (0.8%)	860 (1%)	<0.001
Chronic kidney disease	670053 (36.2%)	147149 (38.6%)	45538 (35.5%)	30933 (36.8%)	<0.001
ESRD	103919 (5.6%)	59721 (15.7%)	16792 (13.1%)	10036 (11.9%)	<0.001
Dialysis dependence	65795 (3.6%)	42116 (11%)	11485 (8.9%)	6776 (8.1%)	<0.001
Acute Kidney Injury	574002 (31%)	128881 (33.8%)	43267 (33.7%)	28710 (34.2%)	<0.001
In-hospital hemodialysis	66014 (3.6%)	37006 (9.7%)	10281 (8%)	6188 (7.4%)	<0.001
HIV: human immunodeficiency; ICD: Implantable cardioverter-defibrillator; CVA: cerebrovascular accident; NSTEMI: non-ST elevation; STEMI: ST elevation Myocardial Infarction; PCI: percutaneous coronary intervention; PRBC: packed red blood cell; CABG: coronary artery bypass grafting; Afib: Atrial fibrillation; TIA: transient ischemic attack; COPD: chronic obstructive pulmonary disease; UGI: Upper gastrointestinal; LGI: Lower gastrointestinal; IBD: inflammatory bowel disease; AV: atrioventricular; LBBB: left bundle branch block; OSA: obstructive sleep apnea; VTE: venous					

thromboembolism; SVT: supraventricular tachycardia; VT: ventricular tachycardia; PEG: Percutaneous endoscopic gastrostomy; ESRD: end stage renal disease; COVID-19: coronavirus disease 2019.

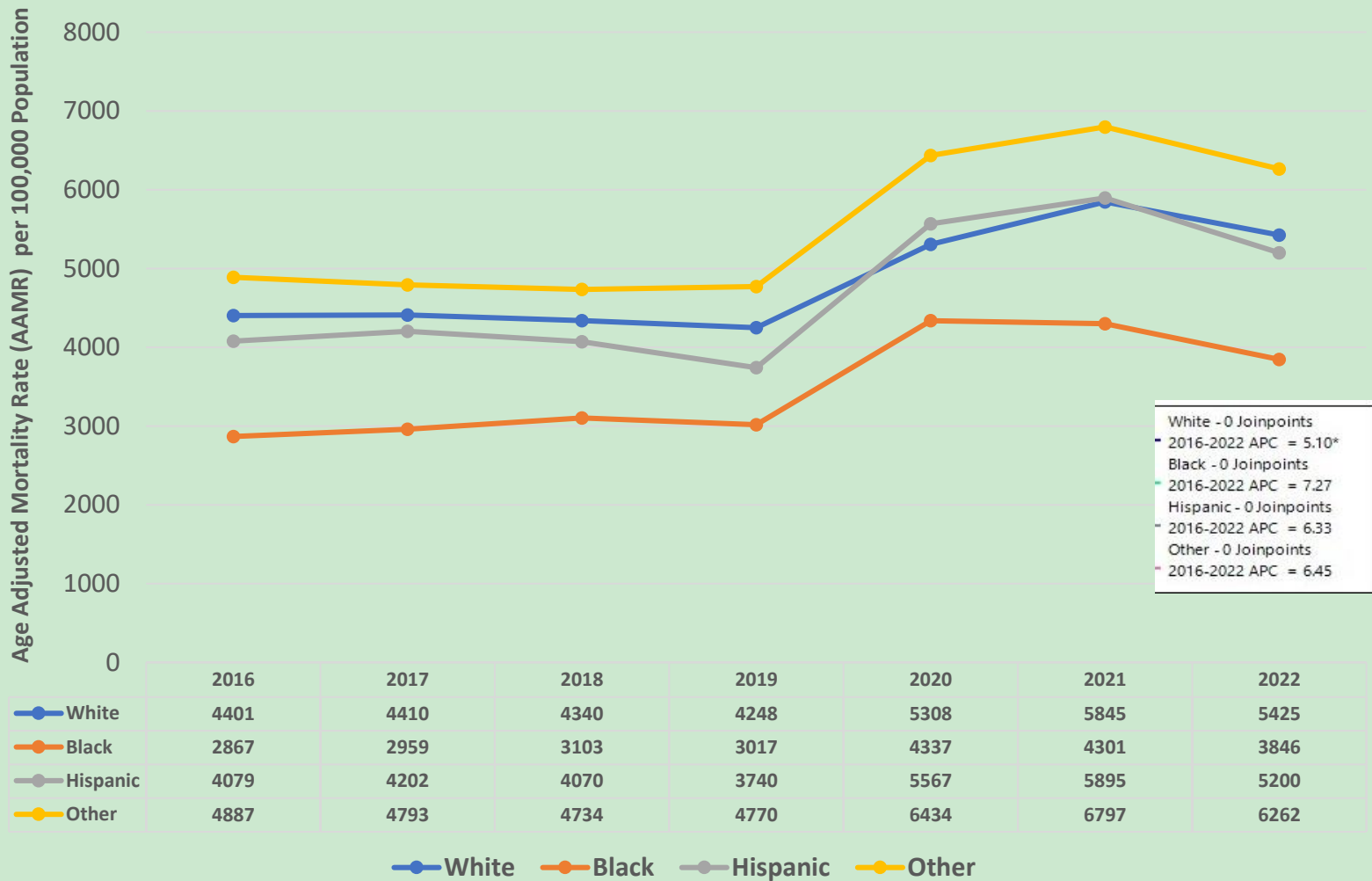
Supplementary Table 4: Disparities among race for resource utilization and mortality on multivariate regression in patients with COPD and Heart Failure

Study Outcomes	Univariate, OR/regression coefficient	95% confidence interval	P-value	Multivariate, aOR/regression coefficient	95% confidence interval	P-value
In-hospital mortality						
White	Reference	-	-	Reference	-	-
Black	0.733	0.721–0.746	<0.001	0.797	0.783–0.812	<0.001
Hispanic	0.979	0.955–1.004	0.101	0.956	0.932–0.981	0.001
Others	1.189	1.156–1.223	<0.001	1.131	1.099–1.164	<0.001
LOS						
White	Reference	-	-	Reference	-	-
Black	+0.317	+0.293–0.341	<0.001	+0.058	+0.033–0.083	<0.001
Hispanic	+0.397	+0.358–0.435	0.101	+0.285	+0.246–0.324	0.001
Others	+0.614	+0.567–0.662	<0.001	+0.500	+0.453–0.547	<0.001
Hospital cost						
White	Reference	-	-	Reference	-	-
Black	+18.38	-68.5–+105.3	0.678	-383.17	-472.6–-293.6	<0.001
Hispanic	+2663.20	+2522.1–2804.3	<0.001	+2627.80	+2488.1–2767.6	<0.001
Others	+5554.49	+5382.1–5726.9	<0.001	+4712.32	+4542.7–4882.0	<0.001

Discharge to SNF						
White	Reference	-	-	Reference	-	-
Black	0.680	0.674–0.686	<0.001	0.816	0.808–0.823	<0.001
Hispanic	0.726	0.715–0.735	<0.001	0.733	0.722–0.743	<0.001
Others	0.799	0.786–0.813	<0.001	0.802	0.788–0.816	<0.001

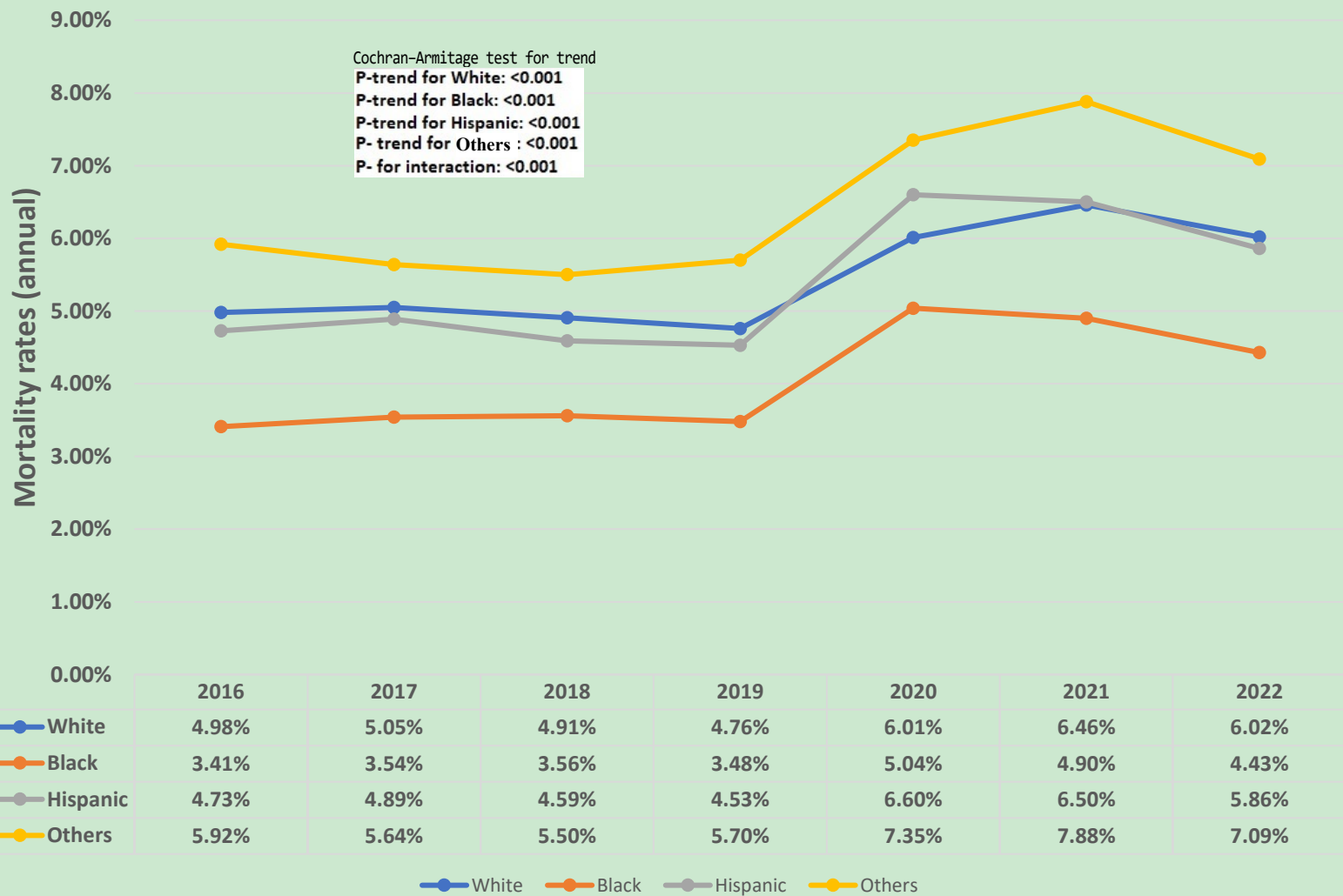
*Adjusted for age, sex, Charlson index, ED admission, weekend admission, elective admission, median income per ZIP quartile, insurance status, hospital region, teaching location, ownership and bedsize.

Trends in age adjusted mortality rate by race



Supplementary Figure 2A: AAMR by race.

Trends of in-hospital mortality over the study duration by ethnic groups



Supplementary Figure 2B: Mortality trends by race.

Trends in mean length of hospital stay stratified by race

Jonckheere-Terpstra test for trend

P-trend for White: <0.001

P-trend for Black: <0.001

P-trend for Hispanic: 0.117

P-trend for Others: 0.021

Mean length of stay (in days)



Supplementary Figure 2C: Trends in length of stay by race.

TREND ANALYSIS FOR INFLATION ADJUSTED HOSPITAL COST (\$) WITH RACE

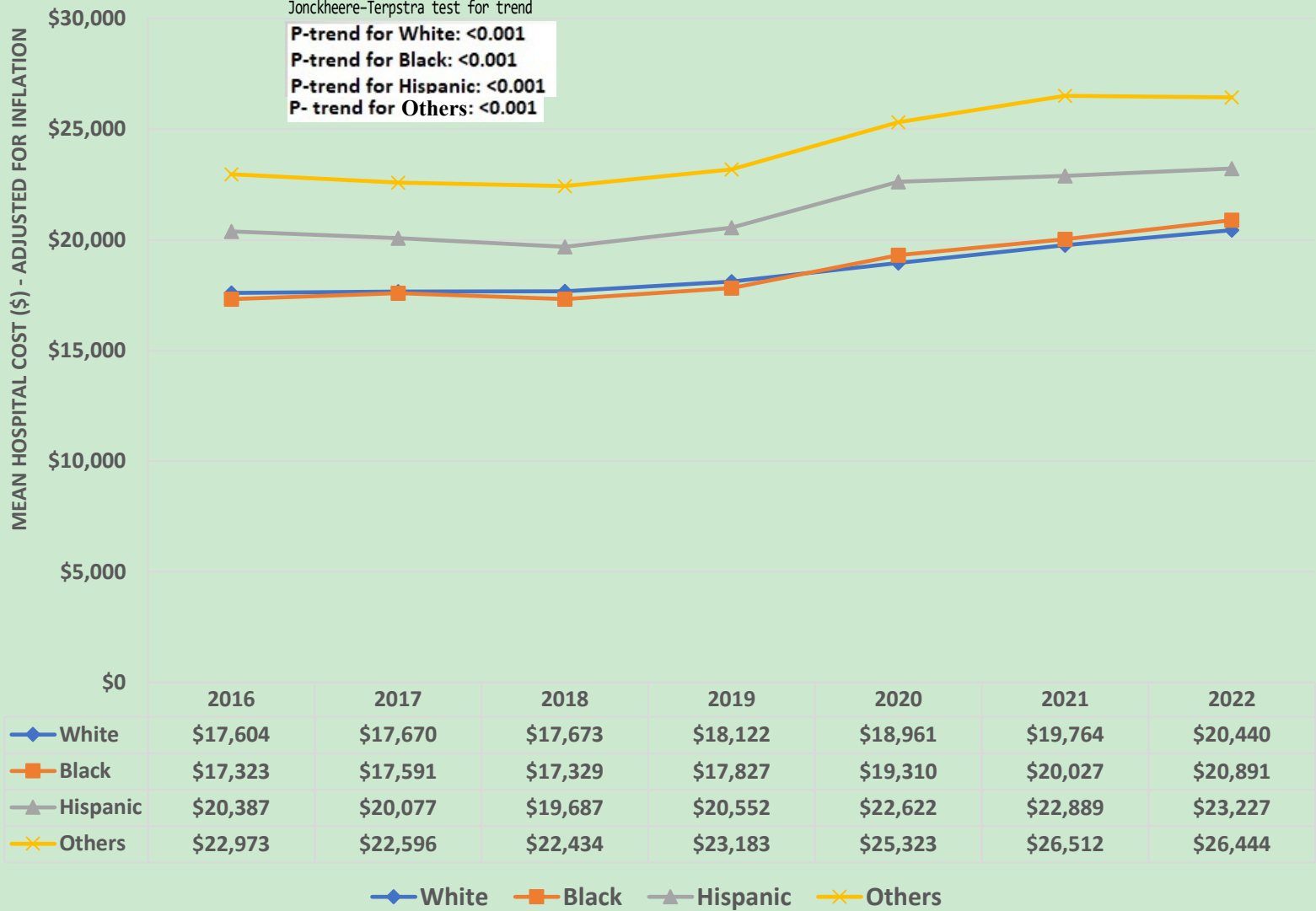
Jonckheere-Terpstra test for trend

P-trend for White: <0.001

P-trend for Black: <0.001

P-trend for Hispanic: <0.001

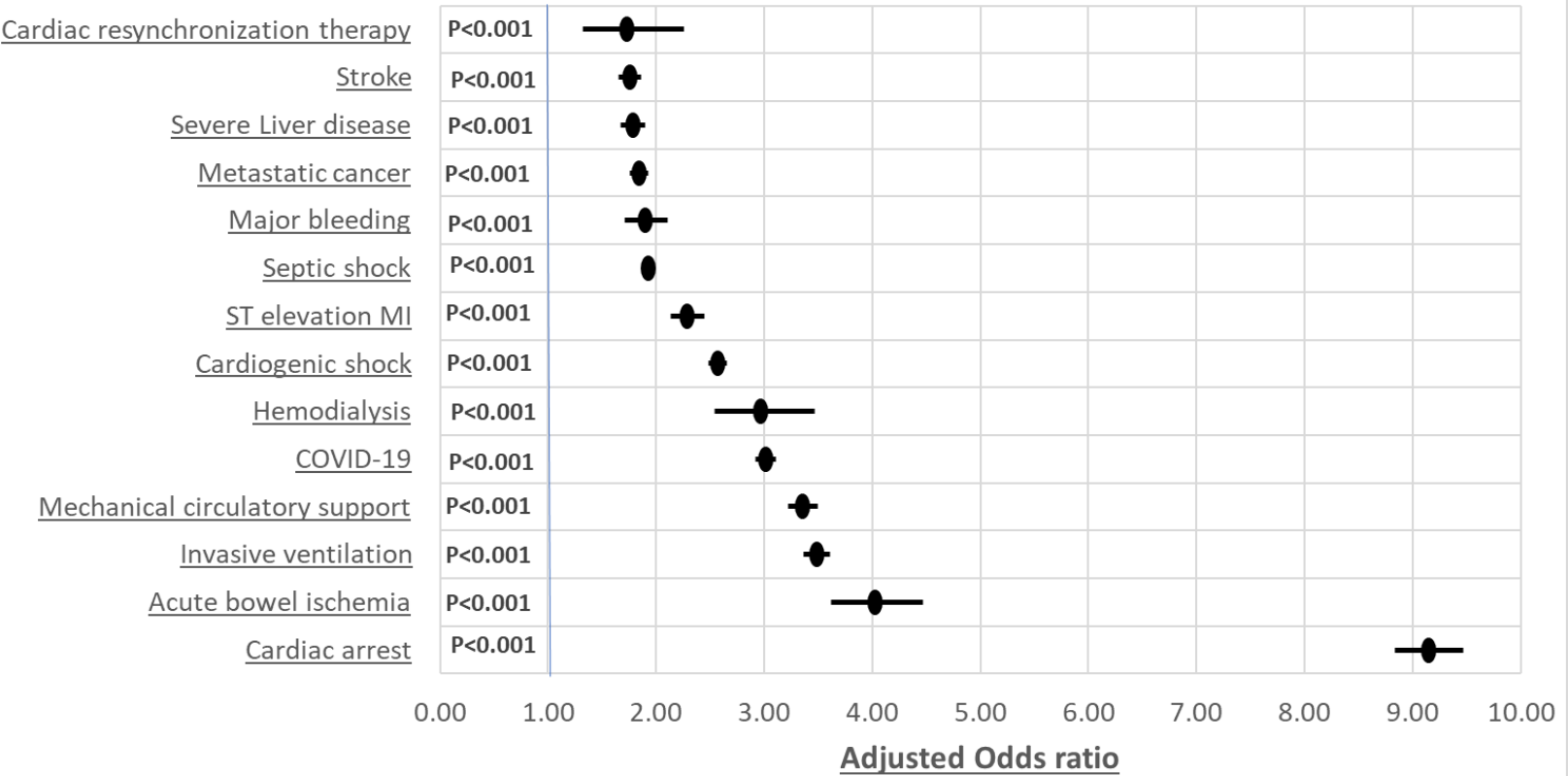
P-trend for Others: <0.001



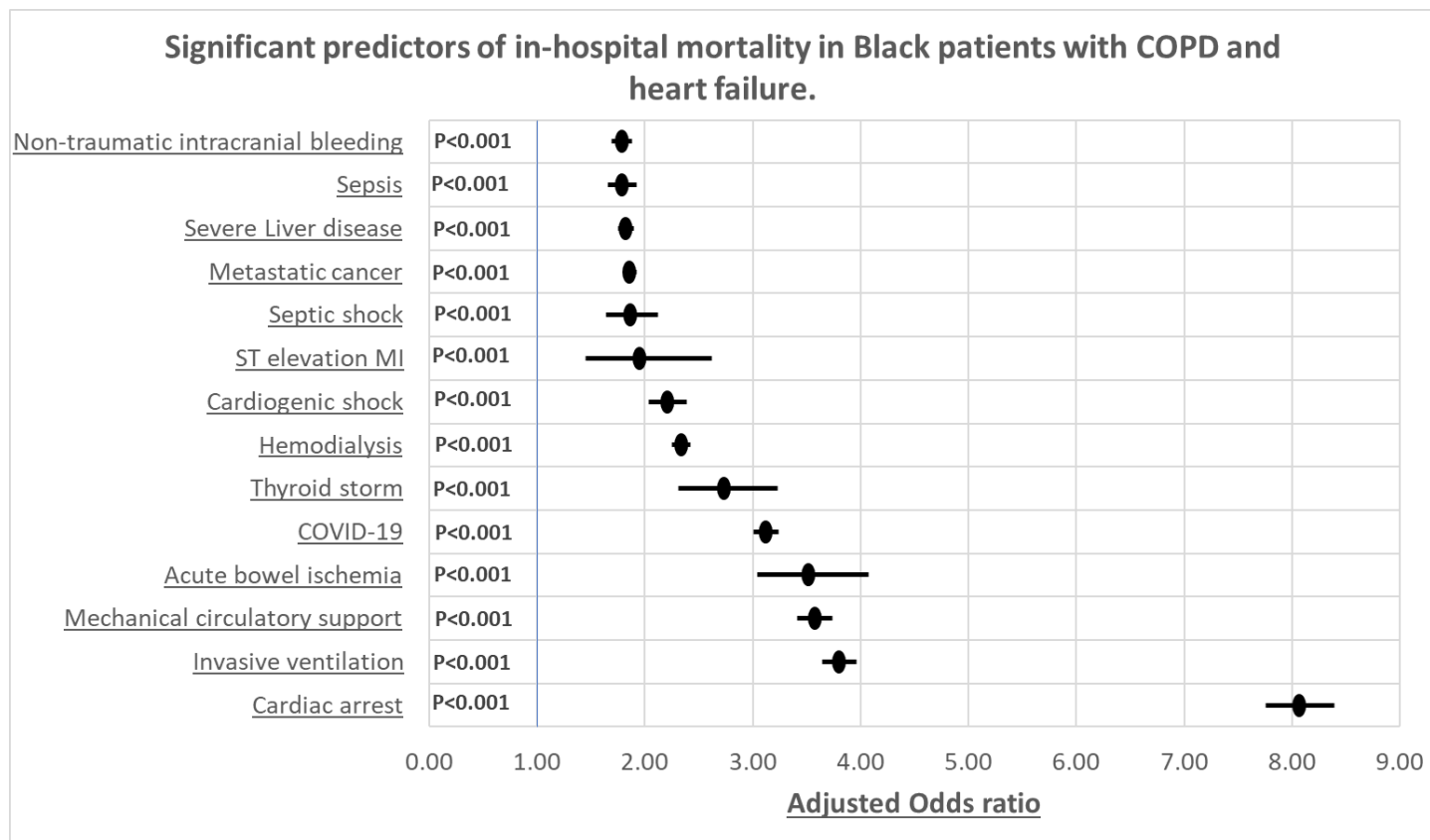
Supplementary Figure 2D: Trends in inflation adjusted hospital cost by race.

Supplementary Figure 3A

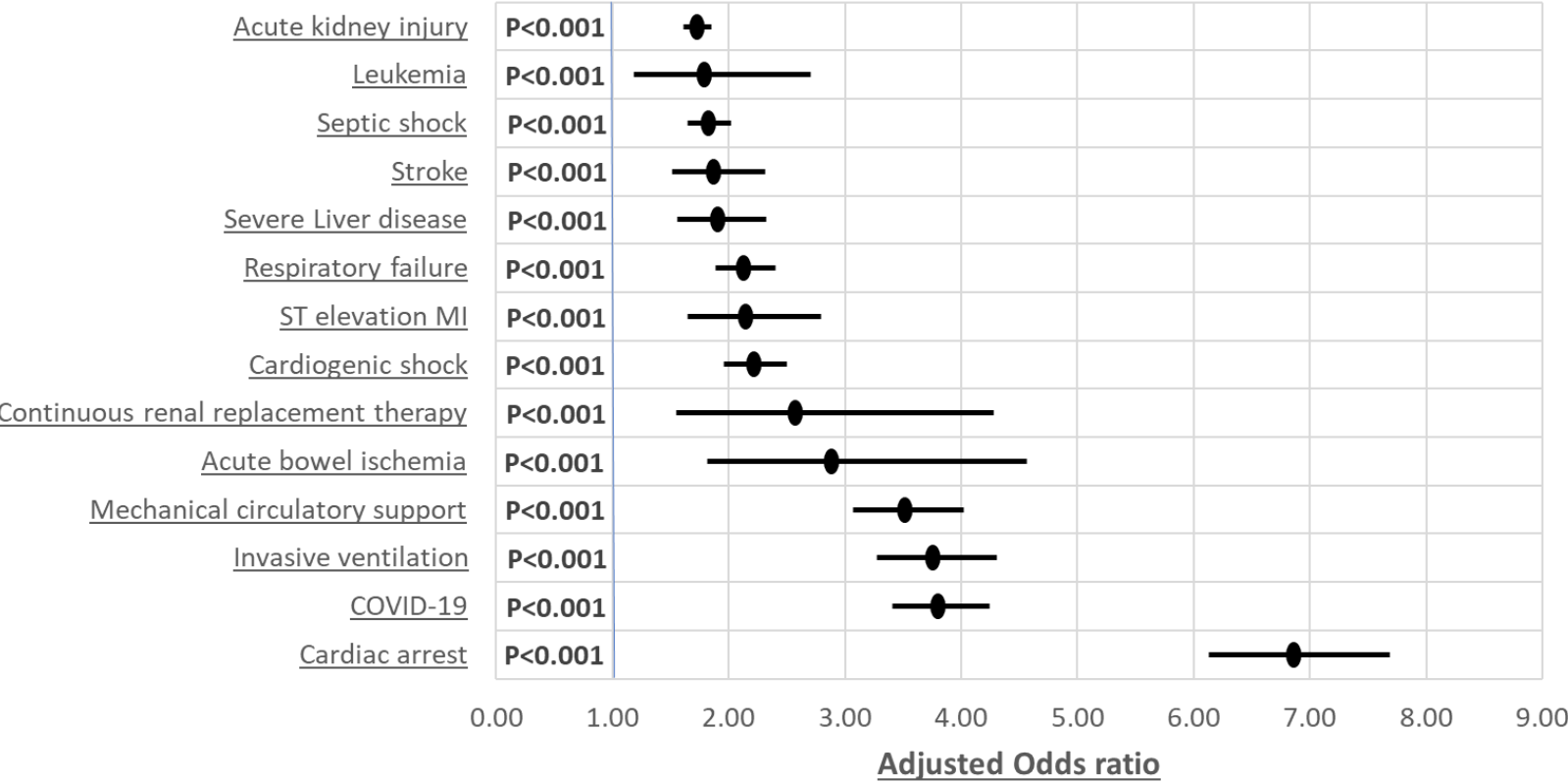
Significant predictors of in-hospital mortality in White patients with COPD and heart failure.



Supplementary Figure 3B



Significant predictors of in-hospital mortality in Hispanic patients with COPD and heart failure.



Supplementary Figure 3C

Supplementary Figure 3D

Significant predictors of in-hospital mortality in other racial groups with COPD and heart failure.

