

Supplemental Table 1: Data Missingness	
Characteristic	Missing, n (%)
Demographics N=16,225	
Age, median (Q1, Q3)	0 (0%)
Gender, n (%)	12 (0.1%)
Female	
Male	
BMI, median (Q1, Q3)	3986 (24.6%)
Race, n (%)	23 (0.1%)
Past Medical History , N=16,225	0 (0%)
Pre-Hospital Medication Use N=16,225	0 (0%)
ICU Support Interventions , N=16,225	
ICU Admission	662 (4.1%)
ECMO, RRT, Proning (on ventilator or self-proning)	0 (0%)
Outcomes , N=16,225	
WHO Disease severity, n (%)	402 (2.5%)
Hospital mortality, n (%)	61 (0.4%)
ICU mortality, n (%)	159 (1.0%)
28-day mortality, n (%)	2583 (15.9%)
Hospital-free days, median (Q1, Q3)	104 (0.6%)
ICU-free days, median (Q1, Q3)	858 (5.3%)
Ventilator-free days, median (Q1, Q3)	333 (2.1%)

Supplemental Table 2:

Odds ratios for Neurologic Manifestations			
Single multivariate logistic regression model			
Risk Factor	OR	95% C.I.	p-value
Race			0.003
American Indian or Alaska Native	0.94	(0.49, 1.84)	0.864
Black or African American	1.26	(1.09, 1.46)	0.002
Mixed Race	0.61	(0.37, 1.01)	0.053
Other	0.85	(0.68, 1.07)	0.162
South Asian	0.33	(0.18, 0.61)	<0.001
Unknown	0.89	(0.65, 1.22)	0.473
West Asian	0.56	(0.35, 0.91)	0.018
Age	1.20	(1.17, 1.23)	<0.001
Hypertension	1.05	(0.92, 1.20)	0.477
Cardiac Arrhythmia	0.85	(0.74, 0.97)	0.016
Diabetes	0.86	(0.77, 0.95)	0.003
Coronary Artery Disease	0.93	(0.83, 1.05)	0.244

Odds ratios for Stroke			
Single multivariate logistic regression model			
Risk Factor	OR	95% C.I.	p-value
Race			0.046
American Indian or Alaska Native	0.91	(0.36, 2.34)	0.846
Black or African American	0.90	(0.64, 1.28)	0.573
Mixed Race	0.69	(0.26, 1.85)	0.458
Other	0.98	(0.61, 1.56)	0.926
South Asian	0.10	(0.02, 0.46)	0.003
Unknown	0.51	(0.09, 3.01)	0.459
West Asian	0.66	(0.20, 2.23)	0.507
Age	1.09	(1.03, 1.18)	0.002
Hypertension	0.91	(0.67, 1.22)	0.516
Cardiac Arrhythmia	1.10	(0.77, 1.57)	0.609
Diabetes	0.78	(0.59, 1.02)	0.072
Coronary Artery Disease	0.90	(0.72, 1.11)	0.318

Odds ratios for Seizure			
Single multivariate logistic regression model			
	OR	95% C.I.	p-value
Race			0.034
American Indian or Alaska Native	2.82	(0.96, 8.27)	0.060
Black or African American	1.28	(0.87, 1.87)	0.213
Mixed Race	1.49	(0.73, 3.06)	0.277

Other	0.90	(0.49, 1.65)	0.730
South Asian	0.19	(0.06, 0.69)	0.011
Unknown	0.18	(0.06, 0.55)	0.003
West Asian	0.52	(0.17, 1.57)	0.246
Age	0.94	(0.89, 1.00)	0.039
Hypertension	1.11	(0.75, 1.65)	0.595
Cardiac Arrhythmia	0.87	(0.49, 1.56)	0.644
Diabetes	0.97	(0.72, 1.30)	0.849
Coronary Artery Disease	1.01	(0.68, 1.51)	0.950

Odds ratios for Encephalopathy			
Single multivariate logistic regression model			
Risk Factor	OR	95% C.I.	p-value
Race			0.002
American Indian or Alaska Native	0.66	(0.40, 1.11)	0.119
Black or African American	1.33	(1.09, 1.61)	0.005
Mixed Race	0.43	(0.26, 0.71)	0.001
Other	0.83	(0.66, 1.04)	0.097
South Asian	0.38	(0.19, 0.77)	0.007
Unknown	1.02	(0.73, 1.41)	0.924
West Asian	0.66	(0.43, 1.00)	0.052
Age	1.24	(1.21, 1.28)	<0.001
Hypertension	1.03	(0.89, 1.19)	0.693
Cardiac Arrhythmia	0.85	(0.73, 0.97)	0.020
Diabetes	0.87	(0.78, 0.97)	0.017
Coronary Artery Disease	0.96	(0.84, 1.10)	0.539
Disease severity			<0.001
3	0.74	(0.63, 0.87)	<0.001
4	0.60	(0.51, 0.70)	<0.001
5	0.57	(0.47, 0.68)	<0.001
6	0.92	(0.76, 1.11)	0.377
7	1.04	(0.84, 1.29)	0.733

Odds ratios for Meningitis/Encephalitis			
Single multivariate logistic regression model			
Risk Factor	OR	95% C.I.	p-value
Race			0.752
American Indian or Alaska Native	1.55	(0.29, 8.34)	0.607
Black or African American	1.31	(0.76, 2.24)	0.331
Mixed Race	0.49	(0.11, 2.29)	0.366
Other	1.40	(0.86, 2.29)	0.176
South Asian	0.85	(0.23, 3.15)	0.811

Unknown	1.22	(0.29, 5.05)	0.785
West Asian	0.54	(0.06, 4.50)	0.570
Age	1.00	(0.93, 1.07)	0.969
Hypertension	0.87	(0.53, 1.42)	0.575
Cardiac Arrhythmia	0.71	(0.37, 1.38)	0.312
Diabetes	0.92	(0.61, 1.40)	0.698
Coronary Artery Disease	0.75	(0.47, 1.18)	0.213

Adjust for race, as well as age, and comorbidities

Supplemental Table 3: Demographics and Past Medical History by Neurologic Manifestation (n=16,225)			
Characteristic	Stroke (N=331)	No stroke (N=15894)	p-value
Age, median (Q1, Q3)	67.0 (58.0, 78.0)	62.0 (49.0, 73.0)	<0.001
Gender, n (%), N=16,213			0.760
Female	140 (42%)	6853 (43%)	
Male	191 (58%)	9029 (57%)	
BMI, median (Q1, Q3), N=12,239	28.4 (25.2, 33.5)	29.2 (25.2, 34.6)	0.20
Race, n (%), N=16,202			<0.001
Black or African American	76 (23%)	3810 (24%)	
Mixed Race	9 (3%)	521 (3%)	
Other	35 (11%)	1716 (11%)	
South Asian	2 (1%)	1401 (9%)	
Unknown	3 (1%)	241 (2%)	
West Asian	7 (2%)	265 (2%)	
White	199 (60%)	7917 (50%)	
Past Medical History			
Hypertension, n (%)	219 (66%)	8780 (55%)	<0.001
Diabetes, n (%)	146 (44%)	5701 (36%)	0.002
Coronary Artery Disease, n (%)	95 (29%)	3316 (21%)	<0.001
Cardiac Arrhythmia, n (%)	41 (12%)	1509 (9%)	0.080
Stroke or Other Neurological Disorders, n (%)	137 (41%)	1747 (11%)	<0.001
Chronic Kidney Disease, n (%)	63 (19%)	2253 (14%)	0.012
Chronic Dialysis, n (%)	7 (2%)	428 (3%)	0.520
Liver Disease, n (%)	14 (4%)	514 (3%)	0.310
Obesity, n (%)	75 (23%)	3193 (20%)	0.250
Chronic Pulmonary Disease (Not Asthma), n (%)	53 (16%)	1999 (13%)	0.060
Asthma, n (%)	26 (8%)	1529 (10%)	0.280
Hypothyroidism, n (%)	27 (8%)	1380 (9%)	0.740
Dementia, n (%)	16 (5%)	1087 (7%)	0.150
Valvular Heart Disease, n (%)	19 (6%)	372 (2%)	<0.001
Congestive Heart Failure, n (%)	57 (17%)	1611 (10%)	<0.001
Solid Tumor without Metastasis, n (%)	27 (8%)	1011 (6%)	0.190
Hematologic Malignancy, n (%)	33 (10%)	586 (4%)	<0.001
Metastatic Cancer, n (%)	6 (2%)	287 (2%)	0.990
HIV/AIDS or Other Immunosuppression, n (%)	3 (1%)	180 (1%)	0.700
History of Solid Organ or Bone Marrow Transplant, n (%)	3 (1%)	239 (2%)	0.370
Substance Use Disorder, n (%)	26 (8%)	492 (3%)	<0.001
Dyslipidemia/Hyperlipidemia, n (%)	79 (24%)	3221 (20%)	0.110
Pre-Hospital Medication Use			
Pre-hospital Aspirin use, n (%)	80 (24%)	3187 (20%)	0.065

Pre-hospital Statin use, n (%)	109 (33%)	4730 (30%)	0.212
Pre-hospital Anticoagulant use, n (%)	33 (10%)	1550 (10%)	0.895
Characteristic	Seizure (N=243)	No seizure (N=15982)	p-value
Age, median (Q1, Q3)	61.0 (49.0, 69.0)	62.0 (49.0, 73.0)	0.060
Gender, n (%), N=16,213			0.980
Female	105 (43%)	6888 (43%)	
Male	138 (57%)	9082 (57%)	
BMI, median (Q1, Q3) , N=12,239	28.6 (24.2, 35.7)	29.2 (25.2, 34.6)	0.540
Race, n (%), N=16,202			<0.001
Black or African American	82 (34%)	3804 (24%)	
Mixed Race	9 (4%)	521 (3%)	
Other	31 (13%)	1720 (11%)	
South Asian	3 (1%)	1400 (9%)	
Unknown	1 (0%)	243 (2%)	
West Asian	3 (1%)	269 (2%)	
White	114 (47%)	8002 (50%)	
Past Medical History			
Hypertension, n (%)	131 (54%)	8868 (55%)	0.620
Diabetes, n (%)	90 (37%)	5757 (36%)	0.740
Coronary Artery Disease, n (%)	51 (21%)	3360 (21%)	0.990
Cardiac Arrhythmia, n (%)	26 (11%)	1524 (10%)	0.540
Stroke or Other Neurological Disorders, n (%)	87 (36%)	1797 (11%)	<0.001
Chronic Kidney Disease, n (%)	39 (16%)	2277 (14%)	0.430
Chronic Dialysis, n (%)	13 (5%)	422 (3%)	0.009
Liver Disease, n (%)	11 (5%)	517 (3%)	0.260
Obesity, n (%)	56 (23%)	3212 (20%)	0.260
Chronic Pulmonary Disease (Not Asthma), n (%)	47 (19%)	2005 (13%)	0.002
Asthma, n (%)	42 (17%)	1513 (9%)	<0.001
Hypothyroidism, n (%)	24 (10%)	1383 (9%)	0.500
Dementia, n (%)	27 (11%)	1076 (7%)	0.007
Valvular Heart Disease, n (%)	6 (2%)	385 (2%)	0.950
Congestive Heart Failure, n (%)	28 (12%)	1640 (10%)	0.520
Solid Tumor without Metastasis, n (%)	21 (9%)	1017 (6%)	0.150
Hematologic Malignancy, n (%)	20 (8%)	599 (4%)	<0.001
Metastatic Cancer, n (%)	5 (2%)	288 (2%)	0.770
HIV/AIDS or Other Immunosuppression, n (%)	7 (3%)	176 (1%)	0.009
History of Solid Organ or Bone Marrow Transplant, n (%)	3 (1%)	239 (1%)	0.740
Substance Use Disorder, n (%)	25 (10%)	493 (3%)	<0.001
Dyslipidemia/Hyperlipidemia, n (%)	49 (20%)	3251 (20%)	0.950
Pre-Hospital Medication Use			
Pre-hospital Aspirin use, n (%)	51 (21%)	3216 (20%)	0.739
Pre-hospital Statin use, n (%)	77 (32%)	4762 (30%)	0.523

Pre-hospital Anticoagulant use, n (%)	29 (12%)	1554 (10%)	0.249
---------------------------------------	----------	------------	-------

Characteristic	Encephalopathy (N=1656)	No encephalopathy (N=14569)	p-value
Age, median (Q1, Q3)	74.0 (64.0, 82.0)	61.0 (48.0, 72.0)	<0.001
Gender, n (%), N=16213			0.003
Female	771 (47%)	6222 (43%)	
Male	884 (53%)	8336 (57%)	
BMI, median (Q1, Q3), N=12,239	27.1 (23.1, 32.5)	29.4 (25.4, 34.9)	<0.001
Race, n (%), N=16,202			<0.001
Black or African American	582 (35%)	3304 (23%)	
Mixed Race	15 (1%)	515 (4%)	
Other	125 (8%)	1626 (11%)	
South Asian	20 (1%)	1383 (10%)	
Unknown	26 (2%)	218 (1%)	
West Asian	23 (1%)	249 (2%)	
White	865 (52%)	7251 (50%)	
Past Medical History			
Hypertension, n (%)	1149 (69%)	7850 (54%)	<0.001
Diabetes, n (%)	707 (43%)	5140 (35%)	<0.001
Coronary Artery Disease, n (%)	503 (30%)	2908 (20%)	<0.001
Cardiac Arrhythmia, n (%), N=16,225	298 (18%)	1252 (9%)	<0.001
Stroke or Other Neurological Disorders, n (%)	454 (27%)	1430 (10%)	<0.001
Chronic Kidney Disease, n (%)	392 (24%)	1924 (13%)	<0.001
Chronic Dialysis, n (%)	74 (4%)	361 (2%)	<0.001
Liver Disease, n (%)	62 (4%)	466 (3%)	0.240
Obesity, n (%)	252 (15%)	3016 (21%)	<0.001
Chronic Pulmonary Disease (Not Asthma), n (%)	224 (14%)	1828 (13%)	0.260
Asthma, n (%)	97 (6%)	1458 (10%)	<0.001
Hypothyroidism, n (%)	206 (12%)	1201 (8%)	<0.001
Dementia, n (%)	421 (25%)	682 (5%)	<0.001
Valvular Heart Disease, n (%)	62 (4%)	329 (2%)	<0.001
Congestive Heart Failure, n (%)	292 (18%)	1376 (9%)	<0.001
Solid Tumor without Metastasis, n (%)	161 (10%)	877 (6%)	<0.001
Hematologic Malignancy, n (%)	34 (2%)	585 (4%)	<0.001
Metastatic Cancer, n (%)	45 (3%)	248 (2%)	0.003
HIV/AIDS or Other Immunosuppression, n (%)	22 (1%)	161 (1%)	0.410
History of Solid Organ or Bone Marrow Transplant, n (%)	19 (1%)	223 (2%)	0.220
Substance Use Disorder, n (%)	82 (5%)	436 (3%)	<0.001
Dyslipidemia/Hyperlipidemia, n (%)	413 (25%)	2887 (20%)	<0.001
Pre-Hospital Medication Use			
Pre-hospital Aspirin use, n (%)	515 (31%)	2752 (19%)	<0.001
Pre-hospital Statin use, n (%)	708 (43%)	4131 (28%)	<0.001

Pre-hospital Anticoagulant use, n (%)	250 (15%)	1333 (9%)	<0.001
---------------------------------------	-----------	-----------	--------

Characteristic	Meningitis / Encephalitis (N=73)	No meningitis/ encephalitis (N=16152)	p-value
Age, median (Q1, Q3)	65.0 (52.0, 73.0)	62.0 (49.0, 73.0)	0.290
Gender, n (%), N=16,213			0.720
Female	30 (41%)	6963 (43%)	
Male	43 (59%)	9177 (57%)	
BMI, median (Q1, Q3), N=12,239	29.3 (24.2, 35.1)	29.2 (25.2, 34.6)	0.870
Race, n (%), N=16,202			0.240
Black or African American	22 (30%)	3864 (24%)	
Mixed Race	1 (1%)	529 (3%)	
Other	12 (16%)	1739 (11%)	
South Asian	3 (4%)	1400 (9%)	
Unknown	1 (1%)	243 (2%)	
West Asian	1 (1%)	271 (2%)	
White	33 (45%)	8083 (50%)	
Past Medical History			
Hypertension, n (%)	45 (62%)	8954 (55%)	0.290
Diabetes, n (%)	29 (40%)	5818 (36%)	0.510
Coronary Artery Disease, n (%)	22 (30%)	3389 (21%)	0.060
Cardiac Arrhythmia, n (%), N=16,225	10 (14%)	1540 (10%)	0.230
Stroke or Other Neurological Disorders, n (%)	15 (21%)	1869 (12%)	0.017
Chronic Kidney Disease, n (%)	13 (18%)	2303 (14%)	0.390
Chronic Dialysis, n (%)	2 (3%)	433 (3%)	0.980
Liver Disease, n (%)	2 (3%)	526 (3%)	0.800
Obesity, n (%)	13 (18%)	3255 (20%)	0.620
Chronic Pulmonary Disease (Not Asthma), n (%)	5 (7%)	2047 (13%)	0.140
Asthma, n (%)	4 (5%)	1551 (10%)	0.230
Hypothyroidism, n (%)	5 (7%)	1402 (9%)	0.580
Dementia, n (%)	7 (10%)	1096 (7%)	0.340
Valvular Heart Disease, n (%)	4 (5%)	387 (2%)	0.090
Congestive Heart Failure, n (%)	13 (18%)	1655 (10%)	0.034
Solid Tumor without Metastasis, n (%)	6 (8%)	1032 (6%)	0.520
Hematologic Malignancy, n (%)	2 (3%)	617 (4%)	0.630
Metastatic Cancer, n (%)	3 (4%)	290 (2%)	0.140
HIV/AIDS or Other Immunosuppression, n (%)	2 (3%)	181 (1%)	0.190
History of Solid Organ or Bone Marrow Transplant, n (%)	1 (1%)	241 (1%)	0.930
Substance Use Disorder, n (%)	3 (4%)	515 (3%)	0.660
Dyslipidemia/Hyperlipidemia, n (%)	15 (21%)	3285 (20%)	0.960
Pre-Hospital Medication Use			
Pre-hospital Aspirin use, n (%)	16 (22%)	3251 (20%)	0.704

Pre-hospital Statin use, n (%)	25 (34%)	4814 (30%)	0.408
Pre-hospital Anticoagulant use, n (%)	10 (14%)	1573 (10%)	0.255

Supplemental Table 4: Odds ratios for Stroke manifestations			
Risk Factor	OR	95% C.I.	p-value
Age*	1.11	(1.05, 1.18)	<0.001
Sex	1.04	(0.94, 1.15)	0.855
Time since pandemic			0.915
4-6 months	0.98	(0.69, 1.41)	0.931
7-9 months	0.87	(0.51, 1.47)	0.595
10-12 months	0.89	(0.20, 3.93)	0.881
Hypertension	1.50	(1.13, 1.99)	0.005
Cardiac Arrhythmia	1.21	(0.78, 1.87)	0.395
Diabetes	1.42	(1.10, 1.83)	0.007
Coronary Artery Disease	1.41	(1.09, 1.83)	0.010
Stroke or Other Neurologic Disorder	5.30	(3.23, 8.68)	<0.001
Valvular Heart Disease	1.94	(1.09, 3.47)	0.025
Chronic Heart Failure	1.36	(1.00, 1.86)	0.051
Substance Use	1.92	(0.96, 3.85)	0.067
Dyslipidemia/Hyperlipidemia	1.10	(0.79, 1.54)	0.580
Smoking History			0.750
Current smoker	1.35	(0.82, 2.23)	0.234
Former smoker	0.94	(0.66, 1.34)	0.747
Unknown	0.98	(0.51, 1.85)	0.941
Pre-hospital Aspirin	1.52	(1.12, 2.08)	0.008
Pre-hospital Statins	1.44	(1.16, 1.78)	<0.001
Pre-hospital Anti-coagulants	1.17	(0.76, 1.80)	0.464

The reference group for sex is Male. The reference group for time since pandemic is 1-3 months.

The reference group for smoking history is None.

*Odds ratios are displayed per 5 years of age

Supplemental Table 5: ICU Support Utilization and Clinical Outcomes						
ICU Support Interventions for Patients with Neurologic Manifestations (Co-variate adjusted Model)						
	Unadjusted			Adjusted		
ICU Intervention	OR	95% CI	p-value	OR	95% CI	p-value
Stroke manifestations						
ECMO	2.44	(1.47, 4.06)	<0.001	3.20	(1.94, 5.28)	<0.001
RRT	3.14	(1.87, 5.29)	<0.001	3.23	(1.83, 5.71)	<0.001
Proning on ventilation	0.95	(0.57, 1.59)	0.849	0.98	(0.61, 1.58)	0.934
Self-proning (not on vent)	0.47	(0.25, 0.88)	0.019	0.49	(0.27, 0.89)	0.018
Seizure manifestations						
ECMO	2.85	(1.30, 6.24)	0.009	2.78	(1.28, 6.04)	0.010
RRT	0.75	(0.22, 2.62)	0.655	0.75	(0.18, 3.11)	0.696
Proning on ventilation	0.98	(0.58, 1.65)	0.942	1.01	(0.62, 1.63)	0.976
Self-proning (not on vent)	0.52	(0.31, 0.89)	0.017	0.52	(0.32, 0.86)	0.011
Encephalopathy manifestations						
ECMO	0.67	(0.40, 1.14)	0.142	0.97	(0.59, 1.60)	0.914
RRT	1.90	(1.36, 2.67)	<0.001	1.78	(1.20, 2.65)	0.004
Proning on ventilation	0.66	(0.53, 0.83)	<0.001	0.66	(0.52, 0.83)	<0.001
Self-proning (not on vent)	0.44	(0.31, 0.63)	<0.001	0.47	(0.32, 0.68)	<0.001
Meningitis manifestations						
ECMO	-	-	-	-	-	-
RRT	1.43	(0.43, 4.78)	0.564	1.30	(0.40, 4.26)	0.668
Proning on ventilation	1.13	(0.57, 2.24)	0.737	1.13	(0.57, 2.24)	0.722
Self-proning (not on vent)	0.60	(0.17, 2.07)	0.415	0.61	(0.17, 2.23)	0.457
Adjustment variables were age, sex, and time since the pandemic began.						
Clinical Outcomes of Patients with Neurologic Manifestations (Proportional Odds Model)						
	Unadjusted			Adjusted		
Outcome	Estimate*	95% CI	p-value	Estimate*	95% CI	p-value
Encephalopathy						
Admitted to ICU	1.39	(1.22, 1.60)	<0.001	1.32	(1.16, 1.50)	<0.001
Hospital mortality	2.03	(1.84, 2.25)	<0.001	1.39	(1.26, 1.54)	<0.001
ICU mortality	1.65	(1.49, 1.83)	<0.001	1.23	(1.11, 1.35)	<0.001
28-day mortality	2.16	(1.95, 2.39)	<0.001	1.45	(1.31, 1.61)	<0.001

Hospital-free days	-1.13	(-1.89, -0.37)	0.004	-0.64	(-1.32, 0.04)	0.066
ICU-free days	-0.01	(-0.53, 0.51)	0.966	0.09	(-0.42, 0.59)	0.742
Ventilation-free days	-0.06	(-0.51, 0.39)	0.791	0.07	(-0.37, 0.52)	0.746
Meningitis/Encephalitis						
Admitted to ICU	2.60	(1.49, 4.51)	<0.001	2.55	(1.46, 4.44)	0.001
Hospital mortality	1.28	(0.80, 2.05)	0.311	1.25	(0.80, 1.95)	0.334
ICU mortality	1.45	(0.90, 2.32)	0.128	1.43	(0.92, 2.21)	0.110
28-day mortality	1.29	(0.80, 2.08)	0.300	1.26	(0.79, 2.01)	0.340
Hospital-free days	-6.63	(-9.30, -3.95)	<0.001	-6.41	(-9.09, -3.73)	<0.001
ICU-free days	-5.46	(-8.47, -2.45)	<0.001	-5.34	(-8.36, -2.31)	<0.001
Ventilation-free days	-3.74	(-5.97, -1.52)	0.001	-3.59	(-5.83, -1.34)	0.002
Seizure						
Admitted to ICU	1.79	(1.28, 2.51)	<0.001	1.83	(1.32, 2.53)	<0.001
Hospital mortality	1.33	(1.07, 1.66)	0.011	1.56	(1.21, 2.01)	<0.001
ICU mortality	1.30	(1.03, 1.66)	0.029	1.45	(1.14, 1.83)	0.002
28-day mortality	1.38	(1.11, 1.72)	0.004	1.65	(1.26, 2.16)	<0.001
Hospital-free days	-3.19	(-4.65, -1.73)	<0.001	-3.34	(-4.77, -1.90)	<0.001
ICU-free days	-3.03	(-4.54, -1.52)	<0.001	-3.07	(-4.52, -1.61)	<0.001
Ventilation-free days	-2.86	(-4.44, -1.28)	<0.001	-2.91	(-4.47, -1.34)	<0.001
Stroke						
Admitted to ICU	2.32	(1.62, 3.33)	<0.001	2.25	(1.56, 3.25)	<0.001
Hospital mortality	2.43	(1.75, 3.37)	<0.001	2.14	(1.52, 3.03)	<0.001
ICU mortality	2.27	(1.49, 3.47)	<0.001	2.02	(1.31, 3.12)	0.001
28-day mortality	2.49	(1.82, 3.42)	<0.001	2.20	(1.57, 3.10)	<0.001
Hospital-free days	-3.10	(-4.92, -1.28)	<0.001	-2.86	(-4.65, -1.08)	0.002
ICU-free days	-3.47	(-5.18, -1.77)	<0.001	-3.44	(-5.07, -1.82)	<0.001
Ventilation-free days	-3.53	(-5.06, -2.00)	<0.001	-3.49	(-4.96, -2.02)	<0.001

Adjustment variables were age, sex, and time since pandemic.

*Estimates are Odds Ratios for ICU admission, hospital mortality, ICU mortality, and 28-day mortality. Estimate for hospital-free days is the estimated difference in days alive and out of hospital in the 28 days from admission; patients who die have zero hospital-free days. Estimate for ICU-free days is the estimated difference in days alive and out of the ICU in the 28 days from admission; patients who die in the ICU have zero ICU-free days. Estimate for ventilation-free days is the estimated difference in days off of ventilation in the 28 days from admission.

Supplemental Table 6: Disease severity						
	Unadjusted			Adjusted		
	OR	95% CI	p-value	OR	95% CI	p-value
Neurologic manifestations	1.81	(1.66, 1.98)	<0.001	1.49	(1.36, 1.63)	<0.001
Encephalopathy	1.74	(1.58, 1.91)	<0.001	1.36	(1.24, 1.50)	<0.001
Stroke	2.17	(1.77, 2.67)	<0.001	1.91	(1.55, 2.35)	<0.001
Seizure	1.65	(1.31, 2.09)	<0.001	1.81	(1.43, 2.30)	<0.001
Meningitis or Encephalitis	2.13	(1.38, 3.29)	<0.001	2.07	(1.34, 3.20)	<0.001

Adjustment variables were age, sex, and time since pandemic.

Outcome	Neurologic manifestations (N=2092)	No Neurologic manifestations (N=14133)
Disease severity, n (%) N=15,823		
3	373 (18%)	3140 (23%)
4	405 (20%)	4349 (32%)
5	161 (8%)	1824 (13%)
6	137 (7%)	822 (6%)
7	222 (11%)	997 (7%)
8	758 (37%)	2651 (19%)
Hospital mortality, n (%) N=16,164	758 (36%)	2651 (19%)
ICU mortality, n (%) N=8,366*	569 (43%)	2133 (30%)
28-day mortality, n (%) N=13,642	816 (44%)	2788 (24%)
Hospital-free days, median (Q1, Q3) N=16,121	4.0 (0, 20.0)	19.0 (0, 23.0)
ICU-free days, median (Q1, Q3) N=15,367	24.0 (0, 28.0)	27.0 (16.0, 28.0)
Ventilation-free days, median (Q1, Q3) N=15,892	28.0 (21.0, 28.0)	28.0 (24.4, 28.0)

Supplemental Table 7: Sensitivity analysis (patients with SOFA data). N= 9,544						
Disease Severity results						
	Unadjusted			Adjusted		
	OR	95% CI	p-value	OR	95% CI	p-value
Neurologic manifestations	1.84	(1.65, 2.06)	<0.001	1.04	(0.93, 1.17)	0.495
Encephalopathy	1.79	(1.59, 2.03)	<0.001	0.92	(0.81, 1.04)	0.188
Meningitis/Encephalitis	1.55	(0.83, 2.88)	0.168	0.91	(0.48, 1.75)	0.787
Seizure	1.52	(1.14, 2.02)	0.005	1.29	(0.95, 1.74)	0.102
Stroke	2.25	(1.75, 2.90)	<0.001	1.65	(1.26, 2.15)	<0.001

Adjustment variables were age, SOFA, sex, and time since pandemic.

Outcomes						
	Unadjusted			Adjusted		
	Estimate*	95% CI	p-value	Estimate*	95% CI	p-value
Neurologic manifestations						
Admitted to ICU	1.50	(1.31, 1.73)	<0.001	1.04	(0.92, 1.18)	0.498
Hospital mortality	2.07	(1.80, 2.39)	<0.001	1.26	(1.10, 1.43)	<0.001
ICU mortality	1.86	(1.62, 2.13)	<0.001	1.18	(1.06, 1.31)	0.004
28-day mortality	2.18	(1.89, 2.51)	<0.001	1.31	(1.14, 1.51)	<0.001
Hospital-free days	-1.61	(-2.60, -0.62)	0.001	-0.68	(-1.53, 0.18)	0.121
ICU-free days	-0.91	(-1.46, -0.35)	0.001	0.13	(-0.41, 0.67)	0.634
Ventilation-free days	-0.94	(-1.50, -0.38)	0.001	0.08	(-0.49, 0.64)	0.796
Encephalopathy						
Admitted to ICU	1.47	(1.26, 1.71)	<0.001	0.94	(0.82, 1.07)	0.347
Hospital mortality	2.04	(1.76, 2.35)	<0.001	1.11	(0.96, 1.28)	0.158
ICU mortality	1.78	(1.57, 2.03)	<0.001	1.03	(0.91, 1.16)	0.679
28-day mortality	2.15	(1.86, 2.47)	<.0001	1.14	(0.99, 1.33)	0.068
Hospital-free days	-1.14	(-2.21, -0.06)	0.039	-0.02	(-0.96, 0.92)	0.963
ICU-free days	-0.23	(-0.83, 0.38)	0.460	0.99	(0.44, 1.54)	<0.001
Ventilation-free days	-0.17	(-0.71, 0.38)	0.555	1.04	(0.63, 1.55)	<0.001
Meningitis/Encephalitis						
Admitted to ICU	1.91	(1.13, 3.25)	0.016	1.33	(0.67, 2.66)	0.419
Hospital mortality	1.41	(0.65, 3.04)	0.380	1.07	(0.46, 2.47)	0.881
ICU mortality	1.46	(0.70, 3.05)	0.313	1.09	(0.49, 2.41)	0.833
28-day mortality	1.49	(0.67, 3.33)	0.325	1.16	(0.48, 2.81)	0.735
Hospital-free days	-5.30	(-8.04, -2.55)	<0.001	-4.41	(-7.21, -1.61)	0.002
ICU-free days	-4.58	(-7.41, -1.74)	0.002	-3.18	(-6.10, -0.26)	0.033
Ventilation-free days	-3.62	(-6.43, -0.81)	0.012	-2.22	(-5.12, 0.69)	0.134
Seizure						
Admitted to ICU	1.55	(1.04, 2.31)	0.030	1.39	(0.94, 2.05)	0.094
Hospital mortality	1.15	(0.92, 1.42)	0.220	1.12	(0.84, 1.49)	0.448
ICU mortality	1.14	(0.91, 1.42)	0.245	1.05	(0.78, 1.40)	0.754
28-day mortality	1.23	(1.02, 1.49)	0.035	1.25	(0.93, 1.67)	0.134
Hospital-free days	-3.06	(-4.93, -1.20)	0.001	-2.70	(-4.40, -1.00)	0.002
ICU-free days	-2.94	(-4.86, -1.03)	0.003	-2.18	(-3.69, -0.67)	0.005
Ventilation-free days	-2.79	(-5.02, -0.57)	0.014	-2.04	(-3.83, -0.24)	0.026
Stroke						
Admitted to ICU	1.82	(1.36, 2.44)	<0.001	1.70	(1.23, 2.36)	0.001
Hospital mortality	2.51	(1.76, 3.58)	<0.001	1.95	(1.44, 2.64)	<0.001

ICU mortality	2.20	(1.49, 3.25)	<0.001	1.70	(1.25, 2.33)	<0.001
28-day mortality	2.48	(1.75, 3.53)	<0.001	1.93	(1.43, 2.61)	<0.001
Hospital-free days	-3.07	(-5.09, -1.05)	0.003	-2.43	(-4.12, -0.75)	0.005
ICU-free days	-3.17	(-5.14, -1.20)	0.002	-2.49	(-4.08, -0.91)	0.002
Ventilation-free days	-3.32	(-4.96, -1.67)	<0.001	-2.67	(-3.99, -1.36)	<0.001

Adjustment variables were age, SOFA, sex, and time since pandemic.

*Estimates are Odds Ratios for ICU admission, hospital mortality, ICU mortality, and 28-day mortality. Estimate for hospital-free days is the estimated difference in days alive and out of hospital in the 28 days from admission; patients who die have zero hospital-free days. Estimate for ICU-free days is the estimated difference in days alive and out of the ICU in the 28 days from admission; patients who die in the ICU have zero ICU-free days. Estimate for ventilation-free days is the estimated difference in days off of ventilation in the 28 days from admission.