

Appendix I. Characteristics of inpatients with COVID-19 admitted between March 2020 and February 2021

Characteristic	Overall N = 38,104	Mar-Apr N = 4,589	May-Jun N = 2,742	Jul-Aug N = 5,403	Sep-Oct N = 4,733	Nov-Dec N = 12,373	Jan-Feb N = 8,264	p-value
Race								<0.001
White	26,692 (70%)	2,110 (46%)	1,703 (62%)	3,639 (67%)	3,763 (80%)	9,357 (76%)	6,120 (74%)	
Black or African American	8,941 (23%)	2,197 (48%)	786 (29%)	1,405 (26%)	700 (15%)	2,233 (18%)	1,620 (20%)	
Other	2,471 (6.5%)	282 (6.1%)	253 (9.2%)	359 (6.6%)	270 (5.7%)	783 (6.3%)	524 (6.3%)	
Age								<0.001
18-49	7,167 (19%)	749 (16%)	768 (28%)	1,267 (23%)	863 (18%)	2,042 (17%)	1,478 (18%)	
50-64	9,758 (26%)	1,216 (26%)	725 (26%)	1,417 (26%)	1,172 (25%)	3,146 (25%)	2,082 (25%)	
65-84	16,668 (44%)	2,033 (44%)	936 (34%)	2,183 (40%)	2,168 (46%)	5,706 (46%)	3,642 (44%)	
85+	4,511 (12%)	591 (13%)	313 (11%)	536 (9.9%)	530 (11%)	1,479 (12%)	1,062 (13%)	
Age (Median, IQR)	67 (54, 78)	68 (56, 78)	62 (47, 76)	65 (51, 76)	68 (55, 78)	68 (56, 78)	67 (55, 78)	<0.001
Sex								0.004
Female	18,834 (49%)	2,329 (51%)	1,403 (51%)	2,737 (51%)	2,353 (50%)	5,979 (48%)	4,033 (49%)	
Male	19,270 (51%)	2,260 (49%)	1,339 (49%)	2,666 (49%)	2,380 (50%)	6,394 (52%)	4,231 (51%)	
Insurance								<0.001
Commercial	11,588 (30%)	1,202 (26%)	834 (30%)	1,749 (32%)	1,482 (31%)	3,744 (30%)	2,577 (31%)	
Medicaid	3,396 (8.9%)	540 (12%)	364 (13%)	542 (10%)	365 (7.7%)	912 (7.4%)	673 (8.1%)	
Medicare	21,692 (57%)	2,751 (60%)	1,304 (48%)	2,846 (53%)	2,741 (58%)	7,329 (59%)	4,721 (57%)	
Other	1,428 (3.7%)	96 (2.1%)	240 (8.8%)	266 (4.9%)	145 (3.1%)	388 (3.1%)	293 (3.5%)	
Comorbidity								
Obesity	13,200 (35%)	1,913 (42%)	841 (31%)	1,730 (32%)	1,603 (34%)	4,449 (36%)	2,664 (32%)	<0.001
Asthma	3,121 (8.2%)	424 (9.2%)	200 (7.3%)	444 (8.2%)	379 (8.0%)	1,042 (8.4%)	632 (7.6%)	0.016

Chronic obstructive pulmonary disease	5,565 (15%)	795 (17%)	363 (13%)	748 (14%)	716 (15%)	1,846 (15%)	1,097 (13%)	<0.001
Diabetes	15,947 (42%)	1,969 (43%)	1,137 (41%)	2,273 (42%)	1,874 (40%)	5,214 (42%)	3,480 (42%)	0.024
Hypertension	16,142 (42%)	1,948 (42%)	1,077 (39%)	2,279 (42%)	2,022 (43%)	5,274 (43%)	3,542 (43%)	0.032
Heart failure	6,956 (18%)	914 (20%)	486 (18%)	870 (16%)	865 (18%)	2,318 (19%)	1,503 (18%)	<0.001
Chronic Ischemic Heart disease	8,462 (22%)	997 (22%)	505 (18%)	1,093 (20%)	1,105 (23%)	2,903 (23%)	1,859 (22%)	<0.001
Chronic kidney disease	8,540 (22%)	1,270 (28%)	617 (23%)	1,139 (21%)	971 (21%)	2,779 (22%)	1,764 (21%)	<0.001
Liver disease	2,263 (5.9%)	286 (6.2%)	200 (7.3%)	304 (5.6%)	274 (5.8%)	698 (5.6%)	501 (6.1%)	0.023
Neoplasms	2,467 (6.5%)	284 (6.2%)	160 (5.8%)	303 (5.6%)	289 (6.1%)	889 (7.2%)	542 (6.6%)	<0.001
Transplant	244 (0.6%)	25 (0.5%)	10 (0.4%)	31 (0.6%)	38 (0.8%)	78 (0.6%)	62 (0.8%)	0.2
ECI	9 (0, 17)	11 (4, 20)	9 (0, 17)	8 (0, 16)	8 (0, 16)	8 (0, 17)	8 (0,16)	<0.001
Social Vulnerability Index								<0.001
Low	5,417 (14%)	953 (21%)	332 (12%)	441 (8.2%)	683 (14%)	1,903 (15%)	1,105 (13%)	
Mid-Low	11,905 (31%)	1,275 (28%)	992 (36%)	1,924 (36%)	1,419 (30%)	3,635 (29%)	2,660 (32%)	
Mid-High	12,602 (33%)	749 (16%)	805 (29%)	1,920 (36%)	1,742 (37%)	4,504 (36%)	2,882 (35%)	
High	8,180 (21%)	1,612 (35%)	613 (22%)	1,118 (21%)	889 (19%)	2,331 (19%)	1,617 (20%)	
Vital Signs								
Respiratory rate ≥24 breaths / min	8,055 (21%)	1,173 (26%)	539 (20%)	1,103 (20%)	871 (18%)	2,604 (21%)	1,765 (21%)	<0.001
Oxygen saturation < 94%	12,734 (33%)	1,460 (32%)	722 (26%)	1,666 (31%)	1,505 (32%)	4,396 (36%)	2,985 (36%)	<0.001
Temperature ≥ 38°C	5,086 (13%)	953 (21%)	436 (16%)	807 (15%)	570 (12%)	1,474 (12%)	846 (10%)	<0.001
ICU admission	16,756 (44%)	1,933 (42%)	1,204 (44%)	2,357 (44%)	2,194 (46%)	5,533 (45%)	3,535 (43%)	<0.001
COVID-19 hospital prevalence (average)	0.16 (0.10, 0.24)	0.27 (0.09, 0.43)	0.07 (0.04, 0.13)	0.13 (0.07, 0.20)	0.09 (0.06, 0.13)	0.19 (0.15, 0.26)	0.19 (0.12, 0.24)	<0.001
COVID-19 hospital prevalence								<0.001

Low (<10%)	9,027 (24%)	1,214 (26%)	1,767 (64%)	1,867 (35%)	2,394 (51%)	487 (3.9%)	1,298 (16%)	
Mid (10%-25%)	20,265 (53%)	1,020 (22%)	744 (27%)	2,603 (48%)	2,242 (47%)	8,559 (69%)	5,097 (62%)	
High (>25%)	8,812 (23%)	2,355 (51%)	231 (8.4%)	933 (17%)	97 (2.0%)	3,327 (27%)	1,869 (23%)	

Appendix II. Adjusted odds ratios (AOR) of in-hospital mortality among patients with COVID-19 admitted between May 2020 and February 2021

Characteristic	All hospitalized patients (N = 33,515)			Patients with an ICU stay (N = 14,823)		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Month admitted						
May-Jun	Ref	Ref	Ref	Ref	Ref	Ref
Jul-Aug	1.02	0.86, 1.21	0.8	1.13	0.93, 1.37	0.2
Sep-Oct	1.08	0.91, 1.29	0.4	1.16	0.95, 1.42	0.15
Nov-Dec	1.15	0.97, 1.36	0.12	1.32	1.09, 1.61	0.005
Jan-Feb	0.9	0.76, 1.07	0.2	1.06	0.87, 1.29	0.6
Race						
White	Ref	Ref	Ref	Ref	Ref	Ref
Black or African American	0.94	0.85, 1.05	0.3	1.06	0.93, 1.20	0.4
Other	1.37	1.18, 1.58	<0.001	1.41	1.19, 1.67	<0.001
Age (standardized)	1.86	1.75, 1.98	<0.001	1.76	1.65, 1.89	<0.001
Sex						
Female	Ref	Ref	Ref	Ref	Ref	Ref
Male	1.24	1.15, 1.34	<0.001	1.21	1.11, 1.32	<0.001
Insurance						
Commercial	Ref	Ref	Ref	Ref	Ref	Ref
Medicaid	1.13	0.94, 1.36	0.2	1.19	0.97, 1.46	0.087
Medicare	1.14	1.02, 1.27	0.021	1.22	1.07, 1.38	0.002
Other	0.95	0.73, 1.24	0.7	0.98	0.73, 1.32	0.9
Comorbidity						
Obesity	2.03	1.86, 2.21	<0.001	1.88	1.70, 2.08	<0.001
Asthma	0.75	0.64, 0.88	<0.001	0.63	0.53, 0.74	<0.001
Chronic obstructive	0.87	0.79, 0.96	0.005	0.65	0.59, 0.73	<0.001

pulmonary disease						
Diabetes	1.48	1.37, 1.60	<0.001	1.4	1.28, 1.53	<0.001
Hypertension	0.89	0.81, 0.98	0.023	0.93	0.83, 1.04	0.2
Heart failure	0.55	0.50, 0.61	<0.001	0.54	0.48, 0.61	<0.001
Chronic Ischemic Heart Disease	1.12	1.03, 1.23	0.007	1.1	0.99, 1.22	0.065
Chronic kidney disease	0.83	0.75, 0.92	<0.001	0.93	0.82, 1.04	0.2
Liver disease	1.72	1.52, 1.96	<0.001	1.72	1.48, 2.00	<0.001
Neoplasms	0.64	0.56, 0.74	<0.001	0.74	0.62, 0.87	<0.001
Transplant	1.2	0.79, 1.82	0.4	1.38	0.85, 2.23	0.2
Elixhauser Comorbidity Index (standardized)						
	2.52	2.41, 2.64	<0.001	2.18	2.06, 2.31	<0.001
Social Vulnerability Index						
Low	Ref	Ref	Ref	Ref	Ref	Ref
Mid-Low	0.95	0.82, 1.10	0.5	0.91	0.76, 1.08	0.3
Mid-High	0.92	0.80, 1.07	0.3	0.86	0.72, 1.02	0.088
High	1.15	0.99, 1.35	0.074	1.03	0.85, 1.24	0.8
Vital signs						
Respiratory rate \geq 24 breaths / min	2.21	2.04, 2.40	<0.001	1.58	1.44, 1.73	<0.001
Oxygen saturation < 94%	1.82	1.69, 1.96	<0.001	1.58	1.45, 1.73	<0.001
Temperature \geq 38°C	1.03	0.93, 1.15	0.6	1.11	0.98, 1.26	0.1
COVID-19 hospital prevalence						

Low (<10%)	Ref	Ref	Ref	Ref	Ref	Ref
Mid (10%-25%)	1.15	1.03, 1.29	0.012	1.19	1.05, 1.36	0.008
High (>25%)	1.21	1.03, 1.42	0.022	1.20	0.99, 1.45	0.061
Hospital census comparison to 2019						
Equal (>-10%-<10%)	Ref	Ref	Ref	Ref	Ref	Ref
Less (<-10%)	0.88	0.75, 1.05	0.2	0.92	0.75, 1.13	0.4
More (>10%)	1.05	0.94, 1.17	0.4	1.14	1.00, 1.31	0.044