

Supplementary Table S1. Characteristics of COVID-19 Patients Readmitted to Eight Metropolitan Atlanta Hospitals (March 2020 – December 2020)*

| | Full population (n = 7,155), n (%) | Non-readmitted (n = 6,692), n (%) | Readmitted (n = 463), n (%) | P-value |
|--------------------------------------|--|---|-----------------------------------|---------|
| Age group, yrs | | | | |
| <45 | 1476 (20.6) | 1390 (20.8) | 86 (18.6) | 0.26 |
| 45–64 | 2834 (39.6) | 2660 (39.7) | 174 (37.6) | 0.36 |
| 65–79 | 2000 (28.0) | 1865 (27.9) | 135 (29.2) | 0.55 |
| ≥80 | 845 (11.8) | 777 (11.6) | 68 (14.7) | 0.04 |
| Sex | | | | |
| Women | 3382 (47.3) | 3170 (47.4) | 212 (45.8) | 0.51 |
| Men | 3772 (52.7) | 3521 (52.6) | 251 (54.2) | 0.50 |
| Race/ethnicity | | | | |
| White (Non-Hispanic) | 1337 (18.7) | 1241 (18.5) | 96 (20.7) | 0.24 |
| Black (Non-Hispanic) | 4335 (60.6) | 4046 (60.5) | 289 (62.4) | 0.40 |
| Hispanic | 514 (7.2) | 485 (7.2) | 29 (6.3) | 0.43 |
| Asian | 223 (3.1) | 210 (3.1) | 13 (2.8) | 0.69 |
| Unknown/other | 746 (10.4) | 710 (10.6) | 36 (7.8) | 0.05 |
| Insurance Status | | | | |
| Private Insurance (including Kaiser) | 3554 (49.7) | 3367 (50.3) | 187 (40.4) | <0.001 |
| Medicare | 2280 (31.9) | 2103 (31.4) | 177 (38.2) | 0.002 |
| Medicaid | 684 (9.6) | 627 (9.4) | 57 (12.3) | 0.04 |
| Veterans Administration | 403 (5.6) | 376 (5.6) | 27 (5.8) | 0.85 |
| Uninsured | 234 (3.3) | 219 (3.3) | 15 (3.2) | 0.97 |
| Comorbidities | | | | |
| Obesity | 3445 (49.3) | 3253 (49.7) | 192 (42.8) | 0.004 |
| Hypertension | 4588 (64.1) | 4244 (63.4) | 344 (74.3) | <0.001 |
| Diabetes | 2738 (38.3) | 2533 (37.9) | 205 (44.3) | 0.006 |
| Hyperlipidemia | 2461 (34.4) | 2276 (34.0) | 185 (40.0) | 0.009 |
| Chronic lung disease | 861 (12.0) | 793 (11.8) | 68 (14.7) | 0.07 |
| Chronic kidney disease | | | | |
| Stage 3 and 4 | 992 (13.9) | 884 (13.2) | 108 (23.3) | <0.001 |
| Stage 5 and ESRD | 450 (6.7) | 385 (6.1) | 65 (14.9) | <0.001 |
| Chronic congestive heart failure | 1364 (19.1) | 1220 (18.2) | 144 (31.1) | <0.001 |
| Other cardiovascular disease | 2096 (31.0) | 1910 (30.2) | 186 (42.7) | <0.001 |
| Mental health condition† | 1362 (19.0) | 1258 (18.8) | 104 (22.5) | 0.05 |
| Cancer | 509 (7.1) | 458 (6.8) | 51 (11.0) | 0.001 |
| HIV | 141 (2.0) | 133 (2.0) | 8 (1.7) | 0.70 |
| Charlson Comorbidity Index (CCI)‡ | | | | |
| 0 (low risk) | 1803 (31.4) | 1738 (32.4) | 65 (17.5) | <0.001 |
| 1–3 (medium risk) | 3343 (58.2) | 3104 (57.8) | 239 (64.4) | 0.03 |
| ≥4 (high risk) | 597 (10.4) | 530 (9.9) | 67 (18.1) | <0.001 |
| Index Admission Treatment | | | | |
| Remdesivir | 1832 (32.4) | 1729 (33.3) | 103 (22.2) | <0.001 |

| | | | | |
|---------------------------------------|-------------|-------------|------------|--------|
| Dexamethasone | 2943 (52.1) | 2710 (52.2) | 233 (50.3) | 0.43 |
| Remdesivir and dexamethasone | 1559 (24.6) | 1485 (23.5) | 88 (20.2) | 0.11 |
| Required intensive unit care | 1763 (24.6) | 1485 (23.5) | 91 (19.7) | 0.01 |
| Required mechanical ventilation | 803 (14.2) | 768 (14.8) | 35 (7.6) | <0.001 |
| Index Admission Length of Stay | | | | |
| ≤7 days | 4438 (65.7) | 4158 (65.8) | 280 (64.2) | 0.48 |
| 8–14 days | 1174 (17.4) | 1089 (17.2) | 85 (19.5) | 0.24 |
| >14 days | 1140 (16.9) | 1069 (16.9) | 71 (16.3) | 0.72 |
| Index Admission Disposition | | | | |
| Home (self-care) | 4041 (59.8) | 3787 (60.0) | 254 (58.3) | 0.47 |
| Home (with home health services) | 753 (11.2) | 664 (10.5) | 89 (20.4) | <0.001 |
| Long Term Acute Care Hospital | 94 (1.4) | 90 (1.4) | 4 (0.9) | 0.38 |
| Skilled Nursing Facility | 639 (9.5) | 577 (9.1) | 62 (14.2) | 0.001 |
| Hospice (home or inpatient) | 205 (3.0) | 199 (3.2) | 6 (1.4) | 0.04 |
| Transferred to another hospital | 286 (4.2) | 277 (4.4) | 9 (2.1) | 0.02 |
| Other ¶ | 189 (2.8) | 177 (2.8) | 12 (2.8) | 0.95 |

* Data from all 8 hospitals, including 6 members of an academic health system, 1 academic safety-net hospital, and 1 VA Medical Center.

† Mental health condition includes depression, anxiety, bipolar and schizophrenia.

‡ Charlson Comorbidity Index was not available for the academic safety-net hospital

¶ Other was the combination of other rehab, left against medical advice or discontinued care and other discharge dispositions not included above.

§ Length of Stay (of Index admission) was not available for VA Medical Center data.

|| P value for readmitted population only

Supplementary Table S2. Factors Associated with COVID-19 Readmission (in Multivariable Regression) to Eight Metropolitan Atlanta Hospitals, March-December 2020

| | No. of readmitted cases, n = 463 | Odds Ratio (95% CI) § | |
|--------------------------------------|----------------------------------|-----------------------|---------------|
| | | Unadjusted | Adjusted |
| Age group, yrs | | | |
| <45 | 86 | 1.0 (Ref) | 1.0 (Ref) |
| 45–64 | 174 | 1.1 (0.8,1.4) | 0.8 (0.6,1.1) |
| 65–79 | 135 | 1.2 (0.9,1.5) | 0.8 (0.5,1.1) |
| ≥80 | 68 | 1.4 (1.0,2.0) | 0.8 (0.5,1.2) |
| Sex | | | |
| Women | 212 | 1.0 (Ref) | 1.0 (Ref) |
| Men | 251 | 1.1(0.9,1.3) | 1.0 (0.8,1.3) |
| Race/ethnicity | | | |
| White (Non-Hispanic) | 96 | 1.0 (Ref) | 1.0 (Ref) |
| Black (Non-Hispanic) | 289 | 0.9 (0.7,1.2) | 0.9 (0.7,1.1) |
| Hispanic | 29 | 0.8 (0.5,1.2) | 0.8 (0.5,1.3) |
| Asian | 13 | 0.8 (0.4,1.5) | 0.9 (0.5,1.6) |
| Unknown/other | 36 | 0.7 (0.4,1.0) | 0.4 (0.2,0.8) |
| Insurance Status | | | |
| Private Insurance (including Kaiser) | 187 | 1.0 (Ref) | 1.0 (Ref) |
| Medicare | 177 | 1.5 (1.2,1.9) | 1.2(0.9,1.5) |
| Medicaid | 57 | 1.6 (1.2,2.2) | 1.5 (1.1,2.1) |
| Veterans Administration | 27 | 1.3 (0.9,2.0) | 1.3 (0.8,1.9) |
| Uninsured | 15 | 1.2 (0.7,2.1) | 1.4 (0.8,2.5) |
| Comorbidities | | | |
| Obesity | 192 | 0.8 (0.6,0.9) | 0.7 (0.6,0.9) |
| Hypertension | 344 | 1.7 (1.3,2.1) | 1.3 (1.0,1.7) |
| Diabetes | 205 | 1.3 (1.1, 1.6) | 1.1 (0.9,1.3) |
| Hyperlipidemia | 185 | 1.3 (1.1,1.5) | 1.0 (0.8,1.2) |
| Chronic lung disease | 68 | 1.4 (1.0,1.7) | 1.1 (0.8,1.5) |
| Chronic kidney disease Stage 3 and 4 | 108 | 2.0 (1.6,2.5) | 1.6 (1.2,2.1) |

| | | | |
|-------------------------------------|-----|---------------|------------------|
| Stage 5 and ESRD | 65 | 2.7 (2.0,3.6) | 2.1 (1.6,2.9) |
| Chronic congestive heart failure | 144 | 2.0 (1.6,2.5) | 1.5 (1.2,1.9) |
| Other cardiovascular disease | 186 | 1.7 (1.4,2.1) | 1.4 (1.1,1.7) |
| Mental health condition† | 104 | 1.3 (1.0,1.6) | 1.3 (1.0,1.7) |
| Cancer | 51 | 1.7 (1.2,2.3) | 2.0 (1.3,2.6) |
| HIV | 8 | 0.9 (0.4,1.8) | 1.1 (0.5,2.2) |
| Charlson Comorbidity Index (CCI)‡ | | | |
| 0 (low risk) | 65 | 1.0 (Ref) | 1.0 (Ref) |
| 1–3 (medium risk) | 239 | 2.1 (1.6,2.7) | 2.1 (1.4,3.0) |
| ≥4 (high risk) | 67 | 3.4 (2.4,4.8) | 3.3 (1.9,5.9) |
| Index Admission Treatment | | | |
| Remdesivir | 103 | 0.6 (0.5,0.7) | 0.7 (0.5,0.9) |
| Dexamethasone | 233 | 0.9 (0.8,1.1) | 0.9 (0.7,1.1) |
| Remdesivir and dexamethasone | 94 | 0.8 (0.6,1.0) | 1.0 (0.8,1.3) |
| Required intensive care unit | 91 | 0.7 (0.6,0.9) | 0.6 (0.5,0.8) |
| Required mechanical ventilation | 35 | 0.5 (0.3,0.7) | 0.4 (0.3,0.5) |
| Length of Stay (of Index admission) | | | |
| ≤7 days | 280 | 1.0 (Ref) | 1.0 (Ref) |
| 8–14 days | 85 | 1.2 (0.9,1.5) | 1.0 (0.8,1.2) |
| >14 days | 71 | 1.0 (0.8,1.3) | 0.8 (0.6,1.0) |
| Index Admission Disposition | | | |
| Home (self-care) | 254 | 1.0 (Ref) | 1.0 (Ref) |
| Home (with home health services) | 89 | 2.0 (1.5,2.6) | 1.5 (1.1,2.0) |
| Long Term Acute Care Hospital | 4 | 0.7 (0.2,1.8) | 0.3 (0.1,1.1) |
| Skilled Nursing Facility | 62 | 1.6 (1.2,2.1) | 1.1 (0.8,1.5) |
| Hospice (home or inpatient) | 6 | 0.4 (0.2,1.0) | 0.3 (0.1,0.7) |
| Transferred to another hospital | 9 | 0.5 (0.2,0.9) | 0.4 (0.2,0.8) |
| Other ¶¶ | 12 | 1.0 (0.6,1.7) | 1.0 (0.4,2.4) |

* Data from all 8 hospitals, including 6 academic health system hospitals, 1 academic safety-net hospital, and 1 VA Medical Center.

† Mental health condition include depression, anxiety, bipolar and schizophrenia.

‡ Charlson Comorbidity Index was not available for the academic safety-net hospital

¶ Other was the combination of other rehab, left against medical advice or discontinued care and other discharge dispositions not included above.

§ Adjusted according to the independent variables in turn for: Age, gender, obese, race/ethnicity, hypertension, diabetes, hyperlipidemia, chronic lung disease, chronic kidney disease, congestive heart failure, mental disease, respectively.

|| Length of Stay (of Index admission) was not available for VA Medical Center data.

Supplementary Table S3

| Social Determinant | OR | Lower CI | Upper CI | P-value |
|--------------------------------|-----------|-----------------|-----------------|----------------|
| % Education Associates Degree | 0.004 | 0.001 | 0.566 | 0.029 |
| % Never Married | 2.013 | 0.742 | 5.459 | 0.169 |
| Average Household Size | 0.665 | 0.481 | 0.92 | 0.014 |
| Housing Affordability Index | 0.997 | 0.994 | 1 | 0.0253 |
| % Married | 0.632 | 0.257 | 1.555 | 0.318 |
| % Renter Occupied Units | 1.001 | 1.001 | 1.001 | 0.198 |
| Wealth Index | 1.001 | 0.998 | 1.002 | 0.923 |
| Health Insurance Average | 1 | 1 | 1 | 0.867 |
| Neighborhood Deprivation | 1.023 | 0.932 | 1.124 | 0.628 |
| Unemployment Rate | 0.99 | 0.949 | 1.033 | 0.636 |
| Smoking Products Spending | 1.001 | 0.999 | 1.002 | 0.358 |
| Visited Doctor Last 12 months | 1.001 | 1.001 | 1.001 | 0.001 |
| Public Transportation Spending | 1.001 | 0.999 | 1.002 | 0.341 |