

# Demographic, epidemiological, and clinical factors of presumptive positive COVID-19 patients admitted from an urban emergency department



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## Introduction

The first detected case of the novel coronavirus disease 2019 (COVID-19) in the State of Louisiana was reported on March 9, 2020. Since then, the number of individuals who tested positive for infection increased to more than 39,920 by the end of May 2020, showing a higher rate of spread in Louisiana than in many other states.<sup>1</sup> According to the Louisiana Department of Health, Black patients have been disproportionately impacted by COVID-19 as compared to White patients with 74.6% of the 586 deaths in Orleans Parish being Black individuals and 23.7% White (reported 10/7/20).<sup>2</sup> Of the 5,402 deaths in Louisiana as of 10/7/20, 86.1% of fatalities occurred in patients at or above 60 years of age with a mean age of 75,<sup>2</sup> despite the fact that citizens > 60 years of age comprise only 21.9% of Louisiana's population.<sup>3</sup> To date, little information has been published about the association between patient demographics, treatment modalities and outcomes in COVID-19 in the Louisiana population. The paucity of analyzed data on patient characteristics and outcomes presents a barrier to the understanding of both the spread and control of COVID-19.

## Objectives

This preliminary study sets out to identify the demographic, epidemiological, and clinical factors associated with the outcomes of patients infected with the novel coronavirus in the Greater New Orleans area. Objectives and outcomes of this project include: to identify the demographics, chief complaints, and underlying comorbidities among patients who tested positive for COVID-19 in the ED at University Medical Center-New Orleans, to identify the modalities used in the treatment of these patients, and if these variables are associated with patient outcomes.

## Methods

This presentation represents a preliminary chart review of the first 160 patients who tested positive for COVID-19 at University Medical Center New Orleans Emergency Department, beginning with the first case in March 2020. Electronic Medical Records (EMR) were queried for patients meeting inclusion criteria. Specific data points for patient characteristics included: age, gender, race, body mass index (BMI), insurance type, homeless status, chief complaint, and pre-existing conditions. Variables for clinical care practices and hospital course included: service dates and duration of hospital stay; usage of nasal cannula and mechanical ventilation; and employment of antibiotic treatment, antiviral treatment, proning, and convalescent plasma treatment. Collected data were stored in the HIPAA-approved online data storage tool, RedCap. Data analysis was performed using Microsoft Excel and SAS software.

## Results

| Demographic Variables  | COVID-19(+) Patients |       | Admitted Patients |       | Intubated Patients |       |
|------------------------|----------------------|-------|-------------------|-------|--------------------|-------|
|                        | n=                   | %     | n=                | %     | n=                 | %     |
| Gender                 |                      |       |                   |       |                    |       |
| Female                 | 86                   | 53.75 | 28                | 50.91 | 9                  | 64.29 |
| Male                   | 74                   | 46.25 | 27                | 49.09 | 5                  | 35.71 |
| Race                   |                      |       |                   |       |                    |       |
| American Indian        | 2                    | 1.25  | 0                 | 0     | 0                  | 0     |
| Asian                  | 0                    | 0     | 0                 | 0     | 0                  | 0     |
| Pacific Islander       | 0                    | 0     | 0                 | 0     | 0                  | 0     |
| Black/African American | 143                  | 89.38 | 51                | 92.73 | 14                 | 100   |
| White                  | 11                   | 6.88  | 4                 | 7.27  | 2                  | 14.29 |
| More Than One Race     | 2                    | 1.25  | 2                 | 3.64  | 2                  | 14.29 |
| Other                  | 8                    | 5     | 2                 | 3.64  | 0                  | 0     |
| Ethnicity              |                      |       |                   |       |                    |       |
| Hispanic/Latino        | 9                    | 5.63  | 1                 | 1.82  | 1                  | 7.14  |
| Not Hispanic or Latino | 151                  | 94.38 | 54                | 98.18 | 13                 | 92.86 |
| Insurance Coverage     |                      |       |                   |       |                    |       |
| Government             | 65                   | 40.63 | 27                | 49.09 | 6                  | 42.86 |
| Private                | 71                   | 44.38 | 25                | 45.45 | 7                  | 50    |
| Uninsured              | 24                   | 15    | 3                 | 5.45  | 1                  | 7.14  |
| Homeless status        |                      |       |                   |       |                    |       |
| No                     | 159                  | 99.38 | 55                | 10    | 14                 | 0     |
| Yes                    | 1                    | 0.63  | 0                 | 0     | 0                  | 0     |
| BMI                    |                      |       |                   |       |                    |       |
| <18.5                  | 0                    | 0     | 0                 | 0     | 0                  | 0     |
| 18.5-25                | 27                   | 16.88 | 10                | 18.18 | 1                  | 7.14  |
| 25-30                  | 35                   | 21.88 | 8                 | 14.55 | 2                  | 14.29 |
| 30-35                  | 39                   | 24.38 | 15                | 27.27 | 4                  | 28.57 |
| >35                    | 54                   | 33.75 | 22                | 40    | 7                  | 50    |
| Age (years)            |                      |       |                   |       |                    |       |
| 18-30                  | 13                   | 8.13  | 0                 | 0     | 0                  | 0     |
| 30-40                  | 24                   | 14.91 | 9                 | 16.98 | 2                  | 14.29 |
| 40-50                  | 43                   | 26.71 | 12                | 22.64 | 4                  | 28.57 |
| 50-60                  | 39                   | 24.22 | 14                | 26.42 | 1                  | 7.14  |
| 60-70                  | 32                   | 19.88 | 16                | 30.19 | 6                  | 42.86 |
| 70-80                  | 5                    | 3.11  | 2                 | 3.77  | 1                  | 7.14  |
| >80                    | 2                    | 1.24  | 0                 | 0.00  | 0                  | 0     |

Table 1. Demographic factors of COVID-19(+) patients, those who were admitted to UMC, and those who were intubated.

| Chief Complaint        | COVID-19(+) patients | Discharged patients | Admitted patients | Intubated patients | Expired patients |
|------------------------|----------------------|---------------------|-------------------|--------------------|------------------|
| Flu-like symptoms      | 42                   | 28                  | 15                | 1                  | 1                |
| Fever                  | 33                   | 21                  | 12                | 4                  | 4                |
| Cough                  | 23                   | 16                  | 6                 | 3                  | 3                |
| Shortness of breath    | 19                   | 10                  | 8                 | 2                  | 2                |
| Generalized body aches | 9                    | 7                   | 1                 | 0                  | 0                |
| Chest pain             | 5                    | 1                   | 4                 | 0                  | 0                |
| Altered mental status  | 3                    | 2                   | 1                 | 1                  | 1                |
| Hemoptysis             | 1                    | 0                   | 1                 | 1                  | 1                |

Table 5. Most common chief complaints of COVID-19(+) patients by frequency and clinical outcomes.

| Age (years) | COVID-19(+) Patients | Admitted Patients | Intubated Patients | Expired Patients |
|-------------|----------------------|-------------------|--------------------|------------------|
| Mean        | 49.51                | 51.29             | 54.71              | 58.67            |
| Median      | 49                   | 52                | 58.5               | 59               |
| Minimum     | 18                   | 18                | 33                 | 36               |
| Maximum     | 98                   | 80                | 78                 | 91               |

Table 2. Age distribution of COVID-19(+) patients based on disposition and clinical outcome.

| Patient Disposition | n=  | %     |
|---------------------|-----|-------|
| Admit from ED       | 55  | 34.38 |
| Discharge from ED   | 103 | 64.38 |
| Death               | 12  | 7.5   |

Table 3. Patient disposition to include those who died either in the ED (n=2) or after admission (n=10).

| Patient Disposition | Average Duration of Hospital Stay (days) |
|---------------------|--|
| Admitted patients   | 6.91                                     |
| Recovered patients  | 5.17                                     |
| Expired patients    | 13.58*                                   |

Table 4. Average duration of hospital stay for COVID+ patients who were admitted. T-test yields statistically significant difference between average durations of stay for recovered vs expired patients (p=0.042)\*

| Pre-existing health condition | COVID-19(+) patients | Admitted patients | Intubated patients | Expired patients |
|-------------------------------|----------------------|-------------------|--------------------|------------------|
| Obesity                       | 95                   | 38                | 11                 | 8                |
| Hypertension                  | 84                   | 42                | 12                 | 9                |
| Diabetes                      | 49                   | 21                | 8                  | 6                |
| Cardiac Disease               | 22                   | 15                | 4                  | 6                |
| Chronic Kidney Disease        | 16                   | 12                | 6                  | 3                |
| Asthma                        | 16                   | 7                 | 2                  | 1                |
| Cancer                        | 6                    | 2                 | 0                  | 1                |
| Neurological Disease          | 12                   | 9                 | 3                  | 3                |
| Pulmonary Disease             | 9                    | 7                 | 2                  | 4                |
| Congestive Heart Failure      | 1                    | 0                 | 0                  | 0                |

Table 6. Common pre-existing health conditions in COVID-19(+) patients by frequency and clinical outcomes.

| Clinical Variables                   | COVID-19(+) Patients |       | Admitted Patients |       | Intubated Patients, n=14 |       |
|--------------------------------------|----------------------|-------|-------------------|-------|--------------------------|-------|
|                                      | n=                   | %     | n=                | %     | n=                       | %     |
| Admitted to                          |                      |       |                   |       |                          |       |
| ICU                                  |                      |       | 8                 | 14.54 | 6                        | 42.86 |
| Floor                                |                      |       | 47                | 85.45 | 8                        | 57.14 |
| Antimicrobials                       |                      |       |                   |       |                          |       |
| Azithromycin                         | 46                   | 28.75 | 17                | 30.91 | 3                        | 21.43 |
| Hydroxy-chloroquine                  | 4                    | 2.5   | 2                 | 3.64  | 0                        | 0     |
| Both                                 | 20                   | 12.5  | 20                | 36.36 | 8                        | 57.14 |
| Other                                | 20                   | 12.5  | 12                | 21.82 | 2                        | 14.29 |
| None                                 | 70                   | 43.75 | 4                 | 7.27  | 1                        | 7.14  |
| Antivirals                           |                      |       |                   |       |                          |       |
| Remdesivir                           | 1                    | 0.63  | 1                 | 1.82  | 1                        | 7.14  |
| Other                                | 4                    | 2.5   | 3                 | 5.45  | 0                        | 0     |
| None                                 | 155                  | 96.88 | 51                | 92.73 | 13                       | 92.86 |
| Oxygen Therapy                       |                      |       |                   |       |                          |       |
| Nasal Cannula                        | 45                   | 28.13 | 38                | 69.09 | 12                       | 85.71 |
| High Flow Nasal Cannula              | 9                    | 5.63  | 8                 | 14.55 | 6                        | 42.86 |
| Oxygen Mask                          | 13                   | 8.13  | 13                | 23.64 | 9                        | 64.29 |
| BiPAP or CPAP                        | 8                    | 5.06  | 8                 | 14.81 | 6                        | 42.86 |
| Invasive with Mechanical Ventilation | 14                   | 8.75  | 13                | 23.64 | 14                       | 100   |
| Other                                |                      |       |                   |       |                          |       |
| Proning                              | 7                    | 4.38  | 6                 | 10.91 | 7                        | 50    |
| Convalescent Plasma                  | 0                    | 0     | 0                 | 0     | 0                        | 0     |
| Renal Replacement                    | 9                    | 5.63  | 9                 | 16.36 | 6                        | 42.86 |

Table 7. Clinical factors of COVID-19(+) patients, those who were admitted to UMC, and those who were intubated.

COVID-19(+) ED Visits and Admissions Over Time

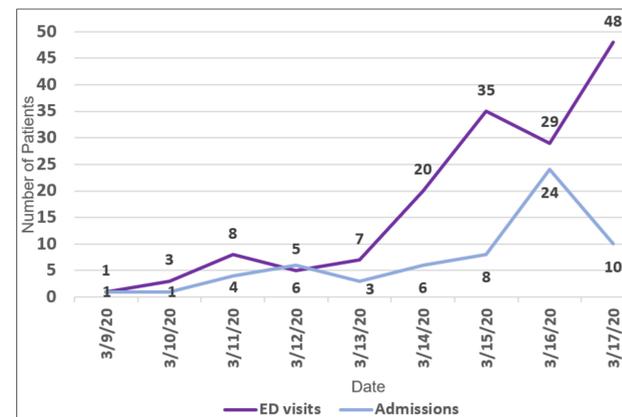


Figure 1. Number of patients tested positive for COVID-19 in the UMC-ED per day and number of COVID-19(+) patients admitted to UMC per day.

## Conclusions

Regarding race demographics, our results appropriately reflect the trends seen in the Louisiana Department of Health's data reports. In our sample of 160 COVID-19(+) patients, Black/African American individuals make up 89.38% and White individuals comprise 6.88% (Table 1). The mean age of patients who expired in our sample was 58.67, significantly lower than that reported by the Louisiana Department of Health ( $\mu=75$ ). Among our sample, 55 patients (34.38%) were admitted, 103 (64.38%) were initially discharged from the ED, and 12 (7.5%) died (Table 3).

Results regarding clinical factors revealed that usage of antibiotic treatment with azithromycin was used in 46 patients, hydroxychloroquine in 4 patients, and a combination of both in 20 patients (Table 7). Antiviral treatment was sparse, with 1 patient receiving remdesivir (Table 7). Most admitted patients received oxygen therapy by nasal cannula (69.09%), and 14 patients were intubated (Table 7). Of the 14 intubated patients, 6 were initially admitted directly to the ICU from the ED, indicating the severity of their clinical presentation (Table 7), and 8 of the intubated patients expired (data not shown).

Daily cases of COVID-19(+) patients presenting in the UMC-ED mostly increased since their first case on 3/9/20, and admissions seemed to peak on 3/16/20 (Figure 1). Patients who expired at UMC had significantly longer hospital stays on average than those who recovered (Table 4,  $p=0.042$ ). Common chief complaints of COVID-19(+) patients include flu-like symptoms, cough, fever, and shortness of breath (Table 5), and common pre-existing health conditions include obesity (>35), hypertension, and diabetes (Table 6).

Further exploration is required to assess the relationships between these factors and their contributions to COVID-19 infectivity and mortality.

## Future Directions

The next steps for this project involve expanding the sample size to include data from the first 500 COVID-19(+) patients diagnosed at UMC-NO. Relative risk and odds ratios will be calculated to identify risk factors for infection with COVID-19 as well as worse health outcomes. Additionally, longitudinal measurements of respiratory variables such as oxygen saturations, partial pressures of arterial oxygen, tidal volumes, and respiratory rates will be collected. Furthermore, we hope to investigate the relationships between invasive mechanical ventilation factors (PEEP settings, sedation types used, and duration of intubation) and patient outcomes. Lastly, to explore the incidence of acute kidney injury in COVID-19(+) patients, we will survey patient records for those who received renal replacement therapy and evaluate creatinine levels.

1. "Louisiana." Worldometer, www.worldometers.info/coronavirus/usa/louisiana/.  
2. "Coronavirus (COVID-19): Department of Health: State of Louisiana." Coronavirus (COVID-19) | Department of Health | State of Louisiana, ldh.la.gov/Coronavirus/.  
3. "Census Profile: Louisiana." Census Reporter, censusreporter.org/profiles/04000US22-louisiana/.