

# 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 BiPAP or CPAP	13	8.13	13	23.64	9	64.29
Other	8	1.26	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	7.89	9	17.65	6	50

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

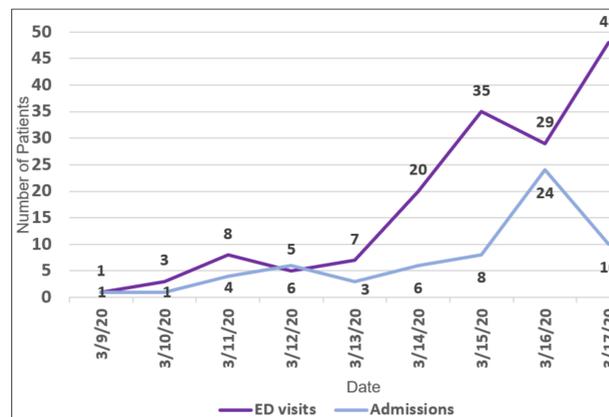


Figure 1. Number of patients tested positive for COVID-19 in the UMC-ED per day and number of COVID-19(+) patients admitted to UMC per day.

## 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/.