

## Descriptions of Patients with COVID-19– Experiences from a Public Hospital in Ecuador, March 23 - October 15, 2020

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### Abstract

### Original Research Article

**Introduction:** The first confirmed case of coronavirus disease 2019 (COVID-19) in Ecuador was on February 29, 2020. Ecuador's response to this novel illness started on February 26, 2020, with initial measures as monitoring of temperature, which were strengthened after the WHO declaration of COVID-19 as a pandemic outbreak on March 11, 2020. As part of the health system of Ecuador, the First Armed Forces Specialty Hospital (AH-1), located in Quito, provides care to COVID-19 patients since March 2020. **Material and Methods:** Using medical records of that health facility (HF), this report describes 407 hospitalized and 200 non-hospitalized COVID-19 patients evaluated in this hospital during March 23 - October 15, 2020. **Results and Discussion:** As of April, 2020, the hospital requires all individuals needing to be evaluated in this facility to present results of polymerase chain reaction (PCR) or rapid antigen (RA) tests. This testing is performed by the hospital depending on availability of testing materials. All patients who are admitted to the hospital emergency room presenting with respiratory symptoms are diagnosed of COVID-19 by chest computed tomography (CT-scan) and clinical evaluation. During August 1, 2020-January 13, 2021, trained personnel abstracted information from medical records of COVID-19 patients treated in the AH-1 during March 23 - October 15, 2020. Most (67.1%) of the patients were hospitalized. Male non-hospitalized patients (74.5%) and male hospitalized patients (71.0%) were more frequent. Hospitalized patients were older (median age = 57.0 years) than non-hospitalized patients (median age = 39.5 years). The longest length of stay of the recovered patients (56 hospitalization days) was larger than the longest length of stay of the patients that died for COVID-19 (31 hospitalization days). **Conclusion:** This report provides information on how the AH-1 proceeded to manage COVID-19 cases using scarce resources and information. These results can inform public health efforts focused on procedures that other HFs might find them useful to treat this disease under similar conditions of human and material resources availability.

**Keywords:** COVID-19, experiences, Public Hospital, Ecuador, manage.

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## INTRODUCTION

Ecuador is a coastal, upper-middle income country in northwestern South America (1). The first confirmed case of coronavirus disease 2019 (COVID-19) in Ecuador was on February 29, 2020. The patient was an elderly Ecuadorian woman residing in Spain. She arrived in Guayaquil on February 14, 2020, on a direct flight from Madrid (2). Ecuador's response to this novel illness started on February 26, 2020, with initial measures as monitoring of temperature, which were

strengthened after the WHO declaration of COVID-19 as a pandemic outbreak on March 11, 2020. As part of the health system of Ecuador, the First Armed Forces Specialty Hospital (AH-1), located in Quito, provides care to COVID-19 patients since March 2020. This 226-bed military medical facility located in Quito admits military as well as civilian individuals.

## MATERIAL AND METHODS:

Using medical records of that health facility (HF), this report describes 407 hospitalized and 200

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non-hospitalized COVID-19 patients evaluated in this hospital during March 23 - October 15, 2020. All these patients were the entire population infected with COVID-19 that was treated in the hospital during such a period. This analysis was authorized by the AH-1 Ethical Committee to describe risk profiles of vulnerability to COVID-19.

## RESULTS AND DISCUSSION

As of April, 2020, the hospital requires all individuals needing to be evaluated in this facility to present results of polymerase chain reaction (PCR) or rapid antigen (RA) tests. This testing is performed by the hospital depending on availability of testing materials. All patients who are admitted to the hospital emergency room presenting with respiratory symptoms are diagnosed of COVID-19 by chest computed tomography (CT-scan) and clinical evaluation. Besides, all individuals are screened for any signal and symptom at initial evaluation. Some additional information is collected as underlying conditions, gender and age. Medical records of patients contain other information as length of recovery at home, length of hospital stay, length of ICU stay, deployment to other health facility (HF) if any, and if the patient died or recovered. COVID-19 patients requiring hospitalization were not admitted to this HF when the hospital bed occupancy exceeded its capacity maximum. Depending on the availability of ICU beds on other HF, hospitalized COVID-19 patients requiring intensive care were deployed to them when the hospital intensive care unit (ICU) occupancy exceeded its capacity maximum. Also, some hospitalized COVID-19 patients or their relatives themselves decided deployments to other HF.

The Ministry of Public Health of Ecuador has given recommendations for the diagnosis and management of COVID-19, which have been followed by the AH-1. However, little empirical data available to support the understanding of this virus has conducted this hospital to complement such recommendations with good practices developed around the world and with international guides on viral pneumonia because this novel disease would be related to this kind of diseases.

The AH-1 may send COVID-19 patients home to focus on patients requiring hospitalization. This decision is taken when mainly fever is under 100.4°F (38°C) during an interval of at least 48 hours, oxygen saturation ranges between 90% and 100%, and manufacturer's stated reference range for white blood cell count (4.00-10.00 k/ $\mu$ L), C-reactive protein (0.00-0.50 mg/dL), procalcitonin (<0.5 mL), ferritin (30.00-400.00 ng/ml), and D-dimer (0.00-500.00 ng/ml). Home

oxygen therapy can also be prescribed if oxygen saturation ranges between 85% and 90% and no more than 2 L are required. Further, indications to try to safeguard home patients from COVID-19 are provided (isolation for 14 full days, keep shared space usage to a minimum, restrict visitors, frequent hand-washing and use hand sanitizer, clean surfaces using disinfectant, handle patient secretions using disposable gloves, ensure good indoor ventilation, and wear a surgical or N95 mask). Non-hospitalized COVID-19 patients are expected to return to the hospital if they have shortness of breath, fever over 100.4°F (38°C), persistent vomiting, drowsiness, intense chest pain or blood-tinged sputum.

During August 1, 2020-January 13, 2021, trained personnel abstracted information from medical records of COVID-19 patients treated in the AH-1 during March 23 - October 15, 2020. Most (67.1%) of the patients were hospitalized. Male non-hospitalized patients (74.5%) and male hospitalized patients (71.0%) were more frequent (TABLE). Hospitalized patients were older (median age = 57.0 years) than non-hospitalized patients (median age = 39.5 years). Although most of patients did not have underlying conditions, hospitalized patients presenting preexisting conditions showed higher numbers of them with respect to non-hospitalized patients. Cardiovascular disease, diabetes mellitus, and endocrine disease were more prevalent among non-hospitalized patients, whereas all these diseases plus immunosuppression were more prevalent among hospitalized patients. Only a few patients were asymptomatic. Most of the patients presented two or three signs and symptoms at initial evaluation. Cough, fever and shortness of breath were more frequent among hospitalized patients, whereas all these signs and symptoms plus body ache were more frequent among non-hospitalized patients. Most of the patients were tested using the PCR test. This test allowed the detection of COVID-19 infection for almost all tested patients. During March 23 - October 15, 2020, some hospitalized COVID-19 patients (7.1%) were deployed to other HFs. A few non-hospitalized COVID-19 patients (4.5%) required home oxygen therapy, whereas most of the hospitalized COVID-19 patients (66.6%) were treated with only oxygen, without using intensive care. A few hospitalized COVID-19 patients (17.4%) required UCI. During March 23 - October 15, 2020, zero COVID-19-associated deaths were reported among non-hospitalized patients, 1 death (0.3%) among hospitalized patients without requirement of oxygen, 29 deaths (7.8%) among hospitalized patients with requirement of oxygen but not of intensive care, and 28 deaths (7.5%) among hospitalized patients in UCIs.

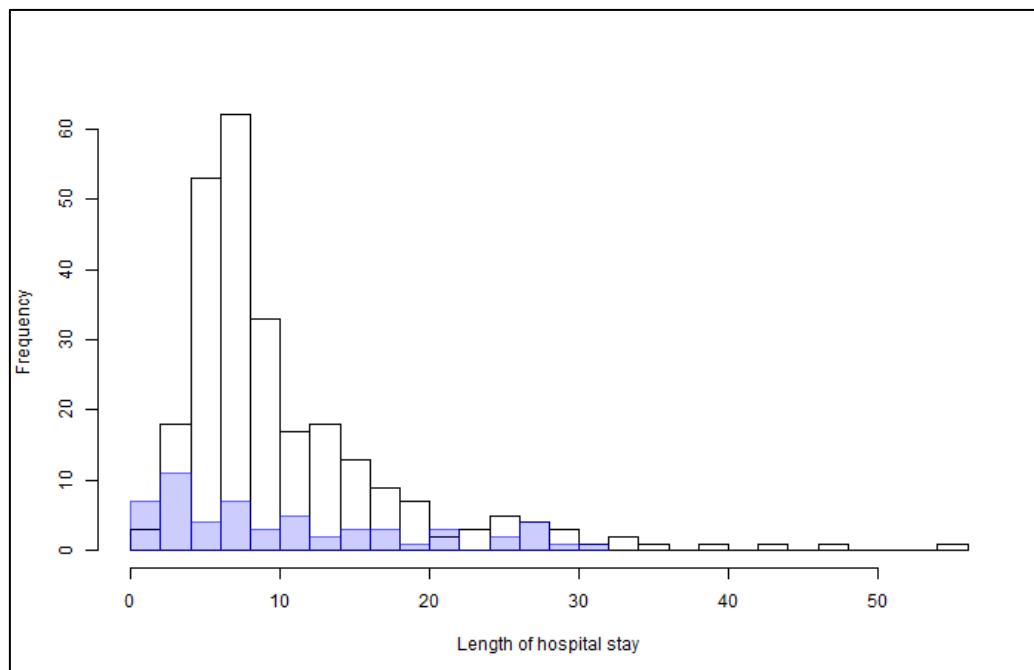
**Table: Characteristics of hospitalized and non-hospitalized patients with COVID-19 treated at the AH-1, Quito, Ecuador, March 23 - October 15, 2020**

Characteristic	No. (%) of patients	
	Non-hospitalized	Hospitalized
<b>Sex</b>		
Male	149 (74.5)	289 (71.0)
Female	51 (25.5)	118 (29.0)
<b>Age group (yrs)</b>		
<b>Median age, yrs (IQR)</b>	39.5 (33.0-50.0)	57.0 (46.0-70.0)
≤17 years	2 (1.0)	2 (0.5)
18-44	127 (63.5)	88 (21.6)
45-64	64 (32.0)	186 (45.7)
≥65 years	7 (3.5)	131 (32.2)
<b>Underlying condition</b>		
Cardiovascular disease	23 (34.3)	119 (31.6)
Diabetes mellitus	7 (10.4)	61 (16.2)
Endocrine disease	11 (16.4)	39 (10.3)
Immunosuppression	4 (6.0)	30 (8.0)
Gastrointestinal disease	5 (7.5)	21 (5.6)
Neurologic conditions	4 (6.0)	19 (5.0)
Urologic disease	1 (1.5)	14 (3.7)
Cancer	2 (3.0)	11 (2.9)
Chronic lung disease	0 (0.0)	10 (2.7)
Obesity	0 (0.0)	9 (2.4)
Chronic kidney disease	2 (3.0)	8 (2.1)
Chronic respiratory disease	1 (1.5)	7 (1.9)
Otorhinolaryngologic disease	1 (1.5)	6 (1.6)
Chronic liver conditions	0 (0.0)	4 (1.1)
Hematologic disease	2 (3.0)	3 (0.8)
Rheumatic disease	0 (0.0)	3 (0.8)
End-stage renal disease	0 (0.0)	2 (0.5)
Other disease	4 (6.0)	11 (2.9)
<b>No. of underlying conditions*</b>		
0	150 (75.0)	181 (44.5)
1	38 (19.0)	123 (30.2)
2	8 (4.0)	66 (16.2)
≥3	4 (2.0)	37 (9.1)
<b>Signs and symptoms at initial evaluation</b>		
Cough	138 (69.0)	293 (72.0)
Fever†	103 (51.5)	225 (55.3)
Shortness of breath (dyspnea)	40 (20.0)	173 (42.5)
Body ache	24 (12.0)	97 (23.8)
Myalgia	28 (14.0)	79 (19.4)
Sore throat	44 (22.0)	78 (19.2)
Headache	47 (23.5)	76 (18.7)
Diarrhea	37 (18.5)	58 (14.3)
Loss of smell§	49 (24.5)	32 (7.9)
Runny nose	4 (2.0)	12 (2.9)
Loss of taste§	16 (8.0)	9 (2.2)
Arthralgia	5 (2.5)	8 (2.0)
Loss of appetite	3 (1.5)	8 (2.0)
Other gastrointestinal symptoms§§	5 (2.5)	19 (4.6)
<b>No. of signs and symptoms¶</b>		
0**	5 (2.5)	4 (1.0)
1	21 (10.5)	41 (10.1)
2	60 (30.0)	109 (26.8)
3	67 (33.5)	136 (33.4)

Characteristic	No. (%) of patients	
	Non-hospitalized	Hospitalized
4	30 (15.0)	66 (16.2)
≥5	17 (8.5)	51 (12.5)
<b>RA Test</b>		
No. of patients tested	78 (39.0)	202 (49.6)
No. of positive tests	44 (54.4)	83 (41.1)
<b>PCR Test</b>		
No. of patients tested	162 (81.1)	327 (80.3)
No. of positive tests	159 (98.2)	322 (98.5)
<b>Deployment to other HF</b>		
No. of patients deployed	0 (0.0)	36 (7.1)
<b>Main management of COVID-19 patients</b>		
Requirement of oxygen without intensive care	9 (4.5)	271 (66.6)
Intensive care requirement	0 (0.0)	71 (17.4)
<b>Place of death††</b>		
Without requirement of oxygen	0 (0.0)	1 (0.3)
Requirement of oxygen but not of intensive care	0 (0.0)	29 (7.8)
Intensive care requirement	0 (0.0)	28 (7.5)
<b>Abbreviation:</b> IQR = interquartile range; HIV = human immunodeficiency virus.		
* Includes all detected diseases.		
† Includes subjective or objective fever ( $\geq 100.4^{\circ}\text{F}$ [ $38^{\circ}\text{C}$ ]).		
§ In the AH-1, it is undetermined the date since when the losses of taste and smell were considered as symptoms related to COVID-19, because hospital practitioners never were instructed to ask for these symptoms.		
§§ Includes abdominal pain, nausea and vomiting.		
¶ Includes all signs and symptoms detected at initial evaluation.		
** Asymptomatic patient.		
†† Excludes patients deployed to other HF.		

Considering lengths of hospital stay of COVID-19 patients requiring oxygen, the COVID-19 deaths were mostly concentrated in the fourth day of hospitalization (mode = 4 hospitalization days) which was shorter than the day (mode = 7 hospitalization days) where the lengths of stay of the recovered patients

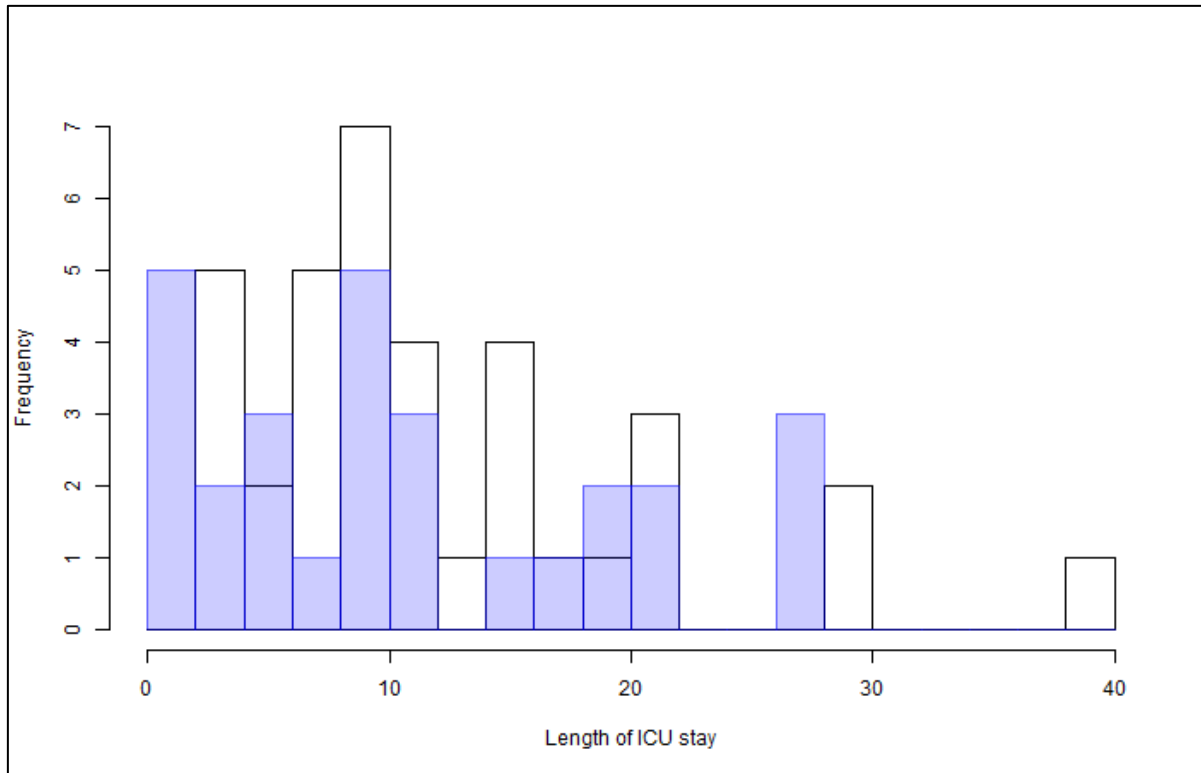
were mostly concentrated (FIGURE 1). The longest length of stay of the recovered patients (56 hospitalization days) was larger than the longest length of stay of the patients that died for COVID-19 (31 hospitalization days).



**Figure 1: Frequencies of length of hospital stay of died and recovered hospitalized patients with COVID-19 treated at the AH-1, Quito, Ecuador, March 23 - October 15, 2020**

Considering lengths of hospital stay of COVID-19 patients requiring UCI, the COVID-19 deaths were mostly concentrated in the eighth day of hospitalization (mode = 8 hospitalization days) which was shorter than the day (mode = 10 hospitalization

days) where the lengths of stay of the recovered patients were concentrated (Figure 2). The longest length of stay of the recovered patients (40 hospitalization days) was larger than the longest length of stay of the patients that died for COVID-19 (27 hospitalization days).



**Figure 2: Frequencies of length of ICU stay of died and recovered patients with COVID-19 who needed intensive care at the AH-1, Quito, Ecuador, March 23 - October 15, 2020**

## CONCLUSION

This report provides information on how the AH-1 proceeded to manage COVID-19 cases using scarce resources and information. These results can inform public health efforts focused on procedures that other HF's might find them useful to treat this disease under similar conditions of human and material resources availability.

## LIMITATIONS

This report is subject to the following limitation. The medical records of COVID-19 patients treated in the AH-1 during March 23 - October 15, 2020, do not inform on the final situation of the patients that were deployed.

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