

Background

Clinical management of COVID-19, a novel coronavirus disease, is constantly changing. The wide spectrum of illness severity, as well as emergence of new therapies, contribute to variable hospitalization cost. In the Philippines, there is a paucity of studies on the actual hospitalization costs of patients with COVID-19 and how these costs approximate the national health insurance coverage. Given the continuing pandemic in a resource-low country and the possibility of surge in cases due to new variants, knowing the cost of illness will be essential in ensuring that patients are adequately protected from the financial risk of hospitalization from COVID-19.

Objectives

The study determined the cost of treating COVID-19 at the Philippine General Hospital (PGH), a tertiary referral center in the Philippines and one of the designated COVID-19 centers. Specifically, the study objectives were to:

1. Determine the cost of treating patients with COVID-19 at the PGH.
2. Stratify the estimated cost of hospitalization according to illness severity.
3. Identify factors driving the cost of treatment for COVID-19.
4. Estimate the extent of insurance coverage provided by PhilHealth, the national health insurance corporation of the Philippines.

Methods

The study involved retrospective chart review of adult COVID-19 patients admitted from April to September 2020 at the PGH. The hospital perspective approach was used in estimating medical costs. The costs were stratified across different illness severities and clinicodemographic factors. Top cost drivers were identified and the extent of national health insurance coverage for hospitalization was determined.

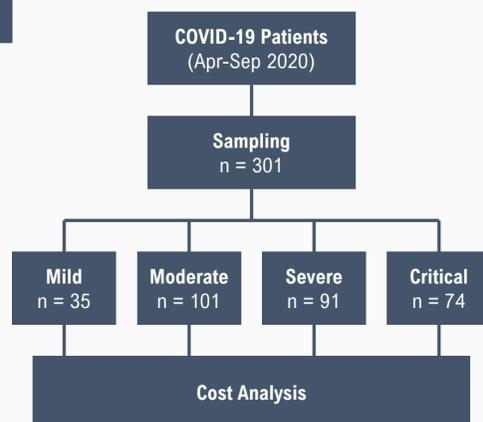


Figure 1. Study Framework

Results

Table 1. Direct total average costs stratified by various demographic and clinical characteristics.

Characteristics	Patients (n)	Average Cost ± SD (USD)	P value
Sex			0.82
Male	165	2800 ± 2804	
Female	136	2916 ± 2947	
Age			<0.001
19-39	57	1857 ± 1679	
40-59	106	2854 ± 3264	
60-79	118	3229 ± 2551	
>80	20	3460 ± 4257	
Residence			0.05
Rural	21	1882 ± 1634	
Urban	280	2925 ± 2926	
Social Service Class			0.01
C	6	4054 ± 1827	
D	280	2891 ± 2922	
None	15	1643 ± 1539	
Co-morbidities			<0.001
Yes	275	2969 ± 2924	
No	25	1568 ± 1674	
Severity			<0.001
Mild	35	910 ± 552	
Moderate	101	1817 ± 947	
Severe	91	3380 ± 2872	
Critical	74	4508 ± 3987	
Length of Stay			<0.001
<8 days	70	1117 ± 832	
8-14 days	91	2201 ± 1743	
15-21 days	60	2751 ± 1648	
22-28 days	34	5270 ± 4114	
>28 days	46	5126 ± 4046	
Clinical Outcome			<0.001
Discharged	197	2819 ± 2804	
Expired	87	3265 ± 3140	
HAMA	3	2121 ± 1109	
Transferred	14	909 ± 447	

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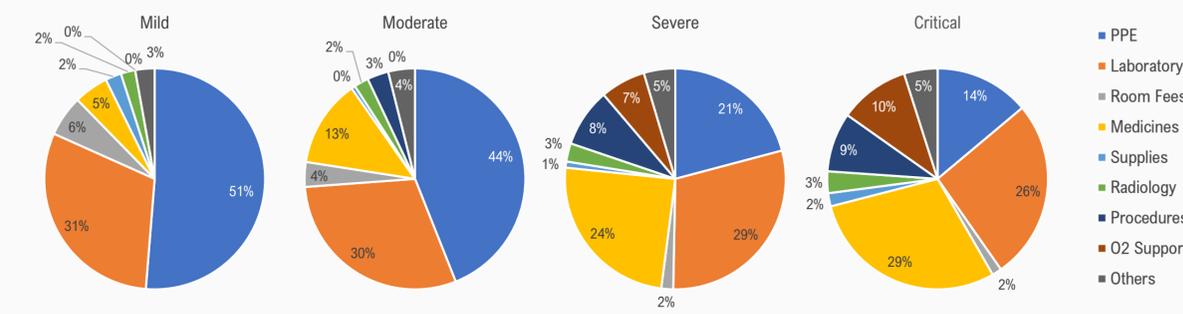


Figure 3. Breakdown of medical costs per severity of COVID-19 case. Personal protective equipment (PPE) use accounted for the highest percentage of costs in mild (51%) and moderate (44%) cases. For severe and critical cases, medications and laboratories are the top cost drivers. Medications included investigational drugs and antibiotics, while laboratories included inflammatory markers, serum chemistry, and microbiologic studies.

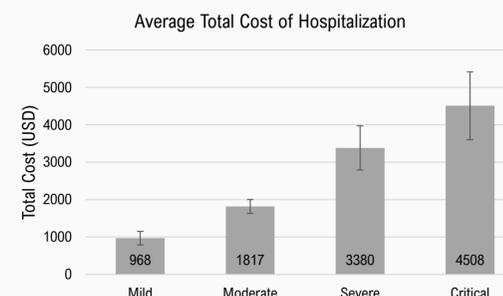


Figure 2. Average cost of hospitalization according to COVID-19 severity. Severe (USD 3,380) and critical (USD 4,508) cases had significantly higher hospitalization costs than mild (USD 968) and moderate (USD 1,817) cases ($p < 0.001$).

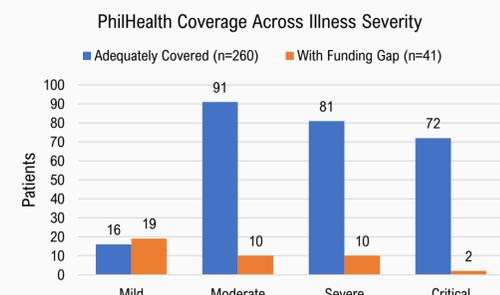


Figure 3. Patients with hospitalization costs exceeding that of the PhilHealth case rates (tagged as with funding gap) and those with hospitalization costs below that of the PhilHealth case rates (tagged as adequately covered), stratified according to severity. Comparing insurance case rates to actual costs showed that 14% of patients were not adequately covered.

Discussion

The average hospitalization cost for COVID-19 at PGH was significantly higher in patients with the following: severe or critical disease, presence of co-morbid conditions, longer hospital stay, elderly, higher socioeconomic status, and residence in rural areas. Patients with co-morbidities predictably incurred significantly higher costs due to higher utilization of resources in addressing more severe medical problems ¹.

For mild and moderate cases, the top cost driver was PPE use. Most of these cases were managed conservatively without need for COVID-19 specific drugs. For severe and critical cases, medications comprised at least a quarter of the total cost. This is consistent with the use of expensive investigational drugs which are part of protocols in managing such cases. Some of the significant cost drivers were similar in other COVID-19 costing studies done ^{1,2,3}.

Comparing individual costs to the PhilHealth case rates showed that around 14% of patients have expenditures exceeding that of their case rates. It should be noted though that this study only involved the charity areas of the hospital where no physicians' fees were charged, and hospital charges were based on subsidized rates. Costs of care in a private hospital setting are expected to be higher and will lead to a lower percentage of support value from insurance.

Conclusion

The hospitalization cost for COVID-19 is highly variable. The following factors significantly resulted in higher costs: severe or critical disease, presence of co-morbidities, longer hospital stay, increasing age, higher socioeconomic status, and residence in rural areas. Medications, laboratory tests, and PPE use accounted for the bulk of expenses. Comparing actual costs to insurance case rates showed that 14% of patients exceeded insurance coverage.

REFERENCES

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