



USAID | **AFGHANISTAN**
FROM THE AMERICAN PEOPLE



HEALTH SECTOR RESILIENCY (HSR) PROJECT

AFGHANISTAN COVID-19 CASE MANAGEMENT AND TREATMENT COSTING REPORT

Date: July 2020

This publication was produced for review by the U.S. Agency for International Development (USAID) in Afghanistan. It was prepared by staff of the Health Sector Resiliency Project.

Suggested citation

Afghanistan COVID-19 Cases Management and Treatment Costing Study Report, USAID/ Health Sector Resiliency Project, Kabul, 2020.

Disclaimer:

This document is made possible by the support of the American people through the U.S. Agency for International Development (USAID). The contents of this document are the sole responsibility of Palladium and do not necessarily reflect the views of USAID or the U.S. Government.

Acknowledgments

The Ministry of Public Health (MoPH) is pleased to complete this cost analysis of COVID-19 cases management and treatment. This study was developed and conducted by the USAID Health Sector Resiliency (HSR) Project and the Health Economics and Financing Directorate (HEFD), Ministry of Public Health (MoPH). This report provides crucial cost information to the MoPH for potential discussions around purchasing COVID-19 services from NGOs and the private sector.

MoPH would like to thank HSR's technical team: Dr. Ajmal Behzad, Health Financing Advisor and Dr. Wu Zeng, Health Economist, who led the process with HEFD. We also thank Dr. Carol Shepherd, Chief of Party, Dr. Omarzaman Sayedi, Senior Technical Advisor/HSS, Elizabeth Eastman, Senior Associate Health, and Dr. Yousuf Jabarkhil, Private Sector and Governance Advisor for their leadership and contributions in completion of this report.

We also thank Dr. Farhad Farewar, Acting Director of HEFD, and Dr. Khwaja Mir Ahad Saeed, Head of Health Economics Unit, HEFD, for their technical support in analysis and coordination during the entire process.

It is important to mention that the completion of this study would not have been possible without the full support of Dr. Helay Mustafa, Coordinator ICU project, MoPH, and Dr. Muheb Barekzai, Director of Jenah National Tertiary Hospital.

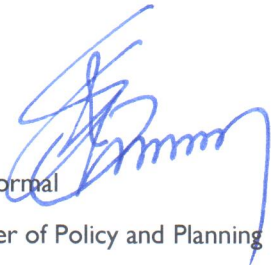
Finally, we would like to extend our gratitude to USAID, who made it financially possible to complete this study.

Regards,

Dr. Bashir Noormal

Deputy Minister of Policy and Planning

Ministry of Public Health



Introduction

In December 2019, the first case infected with severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) was reported in Wuhan City, China. The virus was identified as the Novel Corona Virus type 2. SARS-Cov-2 soon spread across countries and was labeled a global pandemic by the World Health Organization (WHO).

Following the rapid spread of COVID-19 and the announcement of WHO, the Afghanistan Ministry of Public Health (MoPH) initiated the preparedness response for the disease. The first case of COVID-19 in Afghanistan was officially recorded on February 24, 2020 in Herat province. Since then, the disease has spread across all 34 provinces. As of July 13, 2020, the total number of confirmed cases is 34,455 with 12,189 active cases, 21,254 recovered and 1,012 deaths (Johns Hopkins University 2020).

To ensure better coordination of the COVID – 19 response, the Government of the Islamic Republic of Afghanistan (GIROA) established an oversight committee, chaired by the second Vice President with major involvement of the MoPH.

To cope with COVID-19, the MoPH has identified laboratory testing facilities and inpatient care facilities for case management and treatment of COVID-19 patients in Kabul, Herat, Balkh and Nangarhar in public hospitals and national laboratories. Currently, all 34 provinces have allocated a specified number of beds for COVID-19 patients. Two national hospitals, the Afghan-Japan Communicable Disease Hospital and Jenah Specialty Hospital, have been identified for management and treatment of COVID-19 patients in Kabul. The MoPH has assigned surveillance teams for case detection. The international community and development partners including WHO, WB, USAID and the EU, have committed technical and financial support to the MoPH for COVID-19 response.

Despite these efforts, the number of COVID-19 cases continues to rise. The increasing number of patients with COVID-19 is straining the MoPH's capacity to provide adequate public resources for testing, case management and treatment of COVID-19 patients. Therefore, engagement of the private health sector is warranted to augment Afghanistan's capacity to effectively respond to the pandemic and meet the population's needs.

Initially, the private health sector was not authorized to provide COVID-19 testing and care but recently the MoPH issued a policy statement allowing the private sector to test and treat COVID-19 patients in addition to the public health facilities. The MoPH policy statement also mandated that NGOs delivering BPHS and EPHS services around the country should also provide COVID-19 management services to patients.

The private sector is charging fees for the services they provide to COVID-19 patients, meaning that patients are paying for these services out of pocket. Thus, the services may not be affordable for many patients due to the high rate of poverty. The Government of Afghanistan initially expressed its intention to cover the cost of some COVID-19 patients treated at private health facilities and initiated discussions on the price of such services with the private sector. In addition, since NGOs provide BPHS and EPHS services based on pre-set prices and contracts, provision of services to respond to COVID-19 cases may be beyond their available resources. To inform discussions on potentially purchasing COVID-19 services from private and NGO health facilities, the MoPH urgently needed to understand the cost of cases management of COVID-19 in the local setting.

Currently, there is a dearth of cost data for treatment of COVID-19. In countries where advanced payment information systems exist the cost for diseases with similar symptoms as COVID-19 was used as a proxy (e.g. influenza and pneumonia)(Bartsch et al. 2020; Cohen et al. 2020), disaggregated by type of patient. Rae et al. used a claims database, which contained the cost of admissions for patients with pneumonia caused not only by coronavirus but also viruses and bacteria from three diagnosis-related groups (DRGs) (Rae et al. 2020). The average cost of admission for pneumonia at various disease stages such as with major complications or comorbidities, with mild complications or comorbidity, and without complications were estimated at US\$20,292, US\$13,769 and US\$9,763, respectively. The average cost of admission was much higher when ventilator support was required. Levitt et al. used a similar approach as Rae and found similar results (Levitt et al. 2020). There is one study from China that estimated the treatment cost of patients with COVID-19 through primary data collection. The median cost per admission was US\$1,040¹ (\$716-\$1,569), with the median cost for patients with shorter length of stay (LOS) (<=14 days) of US\$824 and US\$1,443 with longer LOS (>14 days) (Hong et al. 2020). This was translated into US\$117.8/day for admissions with short LOS and US\$90.2 for those with long LOS.

To inform discussions on setting prices for COVID-19 services, the HSR Project, in collaboration with the MoPH/Health Economics and Financing Department (HEFD), conducted this costing study, aiming to estimate the unit cost of case management of various types of COVID-19 patients and understand the drivers of the costs. Understanding the cost of COVID-19 management/treatment will help the Government of Afghanistan to discuss and negotiate a fee schedule for purchasing the services provided at either NGOs or private hospitals.

Methodology

A combination of top-down and bottom-up approach was employed to implement this study from the health system's perspective. Therefore, the cost from households was excluded from the analysis.

The COVID-19 management/treatment varies by the severity of illness, therefore we categorized COVID-19 patients into four groups based on symptoms according to the existing literature (Leng et al. 2020), including (1) mild case: cases requiring outpatient care only; (2) moderate case: cases requiring inpatient care but without the use of ICU; (3) severe case: cases requiring the use of ICU; and (4) critically ill case: cases that require the use of a ventilator.

Cost components

For each category of patient, the following costs were estimated: (1) personnel cost, (2) recurrent cost of supplies and consumables, (3) cost of medicines, (4) cost of routine lab tests, (5) COVID-19 related depreciated capital cost (e.g. ventilators, oxygen machines), and (6) Indirect cost (e.g. administrative labor cost, utilities, stationary, and building depreciation). These constitute the core cost components of COVID-19 case management/treatment. Additionally, we also estimated the cost of RT-PCR diagnostic testing for COVID-19. The cost for mild cases was estimated as the cost per visit, while the cost was estimated as cost per day for the three remaining types of patients.

¹ Exchange rate was estimated to be 7.1 RMB = 1 USD

To implement this approach, we first reviewed clinical management guideline of novel coronavirus infection to inform development of a costing tool template, listing potential key inputs needed for the four types of the patients.

To estimate labor costs, we listed all the potential types of staff (e.g. specialist, general medical doctors, nurses, pharmacists) involved with management of COVID-19 patients. We obtained the average monthly salary for each type of staff from the hospital administration and finance department and then estimated the encounter duration for management of the COVID-19 patients for each type of medical staff through a consultative process. Due to the COVID-19 pandemic, we were unable to conduct in-person data collection in the hospital resulting in the need for virtual data collection meetings with the hospital medical director. The hospital medical director served as the information source within the hospital as he met with each type of staff to estimate the duration of time spent caring for each type of patient per day. We understand that some cases may not require services from each type of staff, so we adjusted the staff costs to reflect the proportion of patients who are estimated to need services from each type of staff. For mild cases, the duration of the encounter was for each outpatient visit, while for the rest of the cases, the duration of the encounter was for the average duration of the encounters per day. The duration of encounters was estimated in minutes.

To estimate the recurrent cost related to supplies and consumables, we developed a list of the key consumables and supplies needed for each type of patient. The unit cost for each supply and consumable was obtained from the hospital administration and finance department, and the average quantity needed for each visit (for mild cases) or per day (for the rest of the patients) was estimated using the process described above. For items that could be used for multiple patients, such as face shields, we divided the costs by the number of patients that the items could be used for to identify the cost per patient per day (or visit in the case of OPD mild cases)².

A similar approach was employed to estimate the medicine and lab tests costs, except that we adjusted the associated costs based on the proportion of patients who needed each type of test and/or medicine per day. These adjustments were developed based on consultations with local experts. The routine lab tests mentioned here are not directly related to COVID-19 as all COVID-19 related lab tests, such as RT-PCR tests for COVID-19, were conducted by the central MoPH laboratory, for which detailed costs were not available. To estimate the unit cost of the test, we first obtained its market price in Kabul and then discounted the market price by 20% to account for the assumed profit margin.

To estimate the capital cost in this exercise, we focused on the capital costs specific to COVID-19, such as oxygen machines, suction machines, patient monitors, ventilators, and so on. The non-COVID-19 related capital costs were reflected as part of the indirect cost. For each type of case, we listed required equipment. The unit cost of the equipment's useful life (10 years for major equipment), and a discount rate of 3% were used to estimate the depreciation cost of equipment per day.

To estimate indirect costs such as utilities, rental, and cost of supporting staff we used a top-down approach of multiplying the total direct cost by the estimated indirect cost as a percentage of the direct

² Cost of item for a patient per day was estimated based on the average number of patients in a day times the average number of days that the item was used. The item cost was then divided by this number to obtain the cost per patient per day

cost. Based on an available literature (Zeng et al. 2017), we estimated that the indirect cost accounted for 10% of total direct cost.

Data collection

At the time of this exercise, patients in Afghanistan with COVID-19 were only being treated at public hospitals, making it impossible to collect detailed cost inputs from providers in private hospitals through primary data collection. Therefore, we relied primarily on data from public hospitals, except the PCR diagnostic test, to estimate the costs. Given the circumstance surrounding COVID-19, all data was collected through interviews with clinical experts who had experience in treating COVID-19 patients. Remote virtual meetings were conducted with experts from Ali Jenah tertiary hospital, one of the two public hospitals in Kabul managing COVID-19 patients. Data collection was coordinated by the MoPH Health Economics and Financing Directorate along with the MoPH ICU Project Management team, which is responsible for service delivery at the mentioned hospital.

Data analysis

All the cost components were aggregated to estimate the cost per visit for mild cases and cost per day for the other three types of COVID-19 cases. The cost per component was also estimated to understand the drivers of the costs.

Results

Table 1 presents a summary of the unit costs per visit or per day for 4 different clinical categories of COVID-19 cases with and without the COVID-19 diagnostic test cost. Without the diagnostic cost, the average unit cost of a mild OPD COVID-19 patient was Afs 783.69 (US\$10.31) per visit. However, if we included the cost of the COVID-19 diagnostic test, the average unit cost increased to Afs 4,533.69 (US\$59.65). The average unit cost of a moderate case was Afs 5,446.20 (US\$71.66) per day without the diagnostic test and Afs 9,196.20 (US\$121.00) per day with the COVID-19 diagnostic test. The average unit cost of a severe patient was estimated at Afs 9,758.90 (US\$128.41) per day without the diagnostic tests and Afs 13,508.90 (US\$177.75) per day with the diagnostic test. Finally, the average unit cost of a critical patient who needs mechanical ventilation in an ICU was estimated at Afs 12,470.08 (US\$164.08) per day without the diagnostic test and Afs 16,220.08 (US\$213.42) with the test. The detailed data supporting these costs is available in Annex A.

Table 1: Average unit cost of COVID-19 patient treatment

Cost Driver	Mild Case (per visit)	Moderate Case (per day)	Severe Case (per day)	Critical Case (per day)
Total Labor Cost (Afs)	29.17	168.29	402.55	396.96
Total Recurrent Cost (Afs)	624.28	3451.66	4642.13	6008.55
Total Medicine Cost (Afs)	59.00	844.00	1876.00	1847.00
Total Routine Lab Cost (Afs)	0.00	445.00	1885.00	2270.00
Total Capital Cost (Afs)	0.00	42.14	66.06	813.92
Indirect Cost (Afs)	71.24	495.11	887.17	1133.64
Total Cost per patient per visit or per day without diagnostic tests cost (Afs)	783.69	5,446.20	9,758.90	12,470.08
Total Cost per patient per visit or per day without diagnostic tests cost (US\$) ³	10.31	71.66	128.41	164.08
RT-PCR Diagnostic Test Cost (Afs)	3,750.0	3,750.0	3,750.0	3,750.0
Total Cost per patient per day with diagnostic test cost (Afs)	4,533.69	9,196.20	13,508.90	16,220.08
Total Cost per patient per day with diagnostic test cost (US\$)	59.65	121.00	177.75	213.42

Breakdown of unit cost

A further breakdown of the unit cost components, excluding the COVID19 diagnostic test cost, demonstrates that the labor costs accounts for only a small share of the total cost across different types of patients (Figure 1). The largest share of the costs is from the recurrent cost of supplies and consumables, such as personal protection equipment (PPE). Among the mild cases, recurrent costs represented 79.7% of the total treatment cost. Lab costs and medicine costs are the next largest cost categories in general. In critically ill patients, the lab costs and medicine costs accounted for 18.2% and 14.8% of total treatment

³ Exchange rate of 1 USD = 76 Afghanis

cost respectively while the cost share was quite similar in severe cases. For moderate cases, the medicine costs were higher than the labor costs.

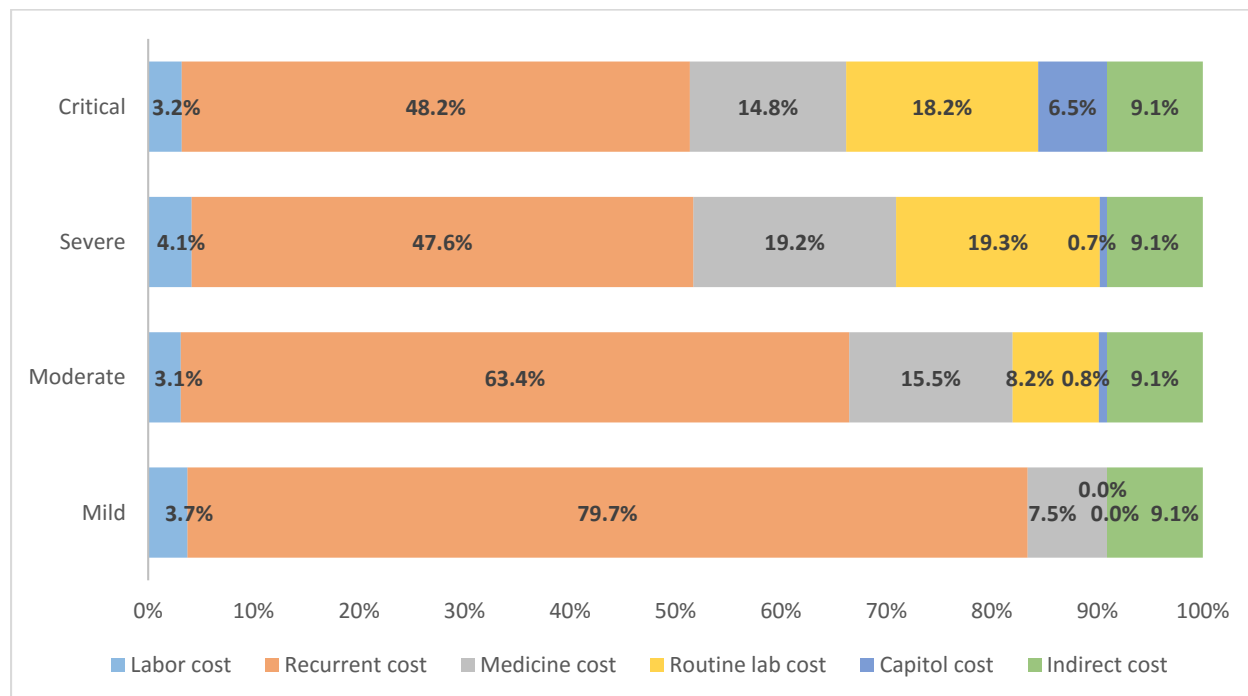


Figure 1. Cost composition of treating COVID-19 cases by case type

Discussion and Conclusion

Given the Government’s urgent efforts to engage the private sector and NGOs in response to COVID-19, a rapid costing exercise was conducted to help inform Government discussions on potential reimbursement rates for NGOs and/or the private health sector for treatment/management of COVID-19 patients. The estimates found that when excluding the COVID-19 diagnostic tests (PCR), it costs approximately Afs 783.69 (US\$10.31) per visit for mild cases, Afs 5,446.20 (US\$71.66) per day for moderate cases, Afs 9,758.90 (US\$128.41) per day for severe cases, and Afs 12,470.08 (US\$164.08) per day for critically ill cases. The results are consistent with the findings in the region(Hong et al. 2020).

It should be noted that the costs presented in this study do not account for potential profit margins in the private sector. When the MoPH considers contracting private hospitals or clinics to provide COVID-19 treatment services, additional consideration should be given in setting fee schedules, including profit margins to cover taxes and return on investment; therefore, the contract reimbursement rates would be higher than the cost estimated from this study. We recommend the MoPH use the results from this study as a basis for setting reimbursement rates, with the understanding that the final rates should be further adjusted.

This costing study has several limitations that we would like to acknowledge: (1) the COVID-19 pandemic prevented us from collecting data in person; (2) due to the time constraints, the estimation of some key parameters (e.g. the duration of encounters) were primarily from expert interviews conducted by the Medical Director, and thus the collected information might be subject to recall biases; (3) the indirect cost was estimated based on the available literature, which may not accurately reflect the indirect cost in

Afghanistan; (4) the cost estimation is deterministic due to the fact that the parameters for costing were obtained from a limited number of providers. Lastly, we could not perform uncertainty analyses.

References:

- Bartsch SM, Ferguson MC, McKinnell JA, et al. 2020. The Potential Health Care Costs And Resource Use Associated With COVID-19 In The United States. *Health Aff (Millwood)*: 101377hlthaff202000426.
- Cohen M, Whittal K, Murray T. 2020. COVID-19 cost scenario modeling: Estimating the cost of COVID-19 treatment for U.S. private Insurers. Atlanta, GA: Wakely Consulting Group, LLC. <https://www.ahip.org/wp-content/uploads/AHIP-COVID-19-Modeling.pdf>.
- Hong Y, Wu X, Qu J, et al. 2020. Clinical characteristics of Coronavirus Disease 2019 and development of a prediction model for prolonged hospital length of stay. *Ann Transl Med*, **8**: 443.
- Johns Hopkins University. 2020. COVID-19 dashboard. Baltimore, MD: Johns Hopkins University. <https://coronavirus.jhu.edu/map.html>.
- Leng Z, Zhu R, Hou W, et al. 2020. Transplantation of ACE2(-) Mesenchymal Stem Cells Improves the Outcome of Patients with COVID-19 Pneumonia. *Aging Dis*, **11**: 216-228.
- Levitt L, Schwartz K, Lopez E. 2020. Estimated cost of treating the uninsured hospitalized with COVID-19. San Francisco, CA: Kaiser Family Foundation. <https://www.kff.org/report-section/estimated-cost-of-treating-the-uninsured-hospitalized-with-covid-19-issue-brief/>.
- Rae M, Claxton G, Kurani N, McDermott D, Cox C. 2020. Potential costs of COVID-19 treatment for people with employer coverage. San Francisco, CA: Kaiser Family Foundation. <https://www.healthsystemtracker.org/brief/potential-costs-of-coronavirus-treatment-for-people-with-employer-coverage/>.
- Zeng W, Halasa YA, Cros M, et al. 2017. Costing essential services package provided by a non-governmental organization network in Bangladesh. *Health Policy Plan*, **32**: 1375-1385.

Annex A: Detailed input information of each cost driver for unit cost estimation

Table 1: Direct COVID-19 Average Labor Cost Estimation per Patient per Visit/ Hospital Day

Staff Type	Salary/ month (Afs)	Salary/ minute (Afs)	Proportion of patients requiring each staff type	OPD-consultation (avg mins/ patient)	Inpatient treatment (avg mins/ patient)	COVID-19 laboratory test (avg mins/ patient)	Total time (mins/ patient)	Adjusted total cost based on staff needs
Mild case								
Specialist	90000.00	2.08	50%	3.00			3.00	3.13
Physician	70000.00	1.62	100%	8.00			8.00	12.96
Nurse	50000.00	1.62	100%	3.00			3.00	4.86
Worker	25000.00	0.58	100%	3.00			3.00	1.74
Lab Tech	40000.00	0.93	0%	0.00		0.00	0.00	0.00
Psychiatrist	70000.00	1.62	0%	0.00			0.00	0.00
Pharmacist	40000.00	0.93	100%	7.00			7.00	6.48
Total								29.17
Moderate case								
Specialist	90000.00	2.08	50%	3.00	3.00		6.00	6.25
Physician	70000.00	1.62	100%	8.00	13.00		21.00	34.03
Nurse	50000.00	1.62	100%	3.00	13.00		16.00	25.93
Worker	25000.00	0.58	100%	3.00	25.00		28.00	16.20
Lab Tech	40000.00	0.93	100%		3.00	60.00	63.00	58.33
Psychiatrist	70000.00	1.62	50%		26.00		26.00	21.06
Pharmacist	40000.00	0.93	100%	7.00			7.00	6.48
Total								168.29
Severe case								
Specialist	90000.00	2.08	100%		35.00		35.00	72.92

Physician	70000.00	1.62	100%		50.00		50.00	81.02
Nurse	50000.00	1.62	100%		90.00		90.00	145.83
Worker	25000.00	0.58	100%		25.00		25.00	14.47
Lab Tech	40000.00	0.93	100%		3.00	60.00	63.00	58.33
Psychiatrist	70000.00	1.62	50%		13.00		13.00	10.53
Pharmacist	40000.00	0.93	100%		21.00		21.00	19.44
Total								402.55
Critical case								
Specialist	90000.00	2.08	100%		35.00		35.00	72.92
Physician	70000.00	1.62	100%		50.00		50.00	81.02
Nurse	50000.00	1.62	100%		90.00		90.00	145.83
Worker	25000.00	0.58	100%		25.00		25.00	14.47
Lab Tech	40000.00	0.93	100%		3.00	60.00	63.00	58.33
Psychiatrist	70000.00	1.62	0%				0.00	0.00
Anesthesia Tech or Specialist	70000.00	1.62	100%		3.00		3.00	4.86
Pharmacist	40000.00	0.93	100%		21.00		21.00	19.53
Total								396.96

Table 2: Direct COVID-19-specific Average Recurrent Cost Estimation per Patient per Visit/ Hospital Day

No	Item Name	Item Cost/ Unit (Afs)	OPD- Quantity of Item Required (units)	Inpatient (IPD) Quantify of Item Required (units)	Total cost (item)	Adjusted cost per patient (for multi-use items)	Denominator (for multi-use items)	Remarks on calculations
Mild case								
1	Mask	21.00	14.00		294.00	5.88	50.00	On average, 1 mask per staff can be used for 50 patients, considering two shifts per day
2	Gloves	30.00	110.00		3300.00	66.00	50.00	On average, doctors use 1 pair of gloves per patient and other staff use 1 pair per day
3	Face shield	100.00	12.00		1200.00	2.40	500.00	On average, 1 face shield per staff can be used for 500 patients
4	Disposable gown	250.00	110.00		27500.00	550.00	50.00	1 per staff person per 50 patients
Total						624.28		
Moderate case								
1	Mask	21.00		14.00	294.00	5.88	50.00	On average, 1 mask per staff can be used for 50 patients, considering two shifts per day
2	Gloves	30.00		205.00	6150.00	123.00	50.00	On average, doctors use 1 pair of gloves per patient and other staff use 1 pair per day

3	Face shield	100.00		16.00	1600.00	3.20	500.00	On average, 1 face shield can be used to visit 500 patients
4	Disposable gown	250.00		205.00	51250.00	1025.00	50.00	1 per staff person per 50 patients
5	Oxygen	490.00		4.00	1960.00	1960.00	1.00	On average, 4 balloons of 42 kg for 24 hours as of (1-5 liter) per minute per patient
6	Syringe	3.00		2.00	6.00	6.00	1.00	On average, 2 syringes per patient per day
7	Oxygen mask	65.00		1.00	65.00	16.25	4.00	On average, 1 per patient for 4 days as average length of stay for this type of case is 4 days
8	PPE kit	2500.00		12.00	30000.00	300.00	100.00	On average, 2 PPE kits per staff to visit 100 patients , worn with a disposable gown on top
9	Eye glass	100.00		1.00	100.00	0.33	300.00	On average, 1 eye glass can be used for 10 patients in a day for 30 days
10	Hand Rub	600.00		1.00	600.00	12.00	50.00	On average, 1 bottle is enough to care for 50 patients in a day
	Total					3451.66		
	Severe case							
1	Mask	21.00		14.00	294.00	5.88	50.00	On average, 1 mask per staff can be used for 50 patients, considering two shifts per day

2	Gloves	30.00		154.00	4620.00	92.40	50.00	On average, doctors and nurses use 1 pair per patient and other staff use 1 pair per day
3	Face shield	100.00		16.00	1600.00	5.33	300.00	On average, 1 face shield can be used to visit 300 patients
4	Disposable gown	250.00		205.00	51250.00	1025.00	50.00	1 per staff person per 50 patients
5	Oxygen	490.00		5.00	2450.00	2450.00	1.00	On average, 5 balloons of 42 kg for 24 hours as of (1-5 liter) per minute per patient
6	PPE kit	2500.00		12.00	30000.00	600.00	50.00	On average, 2 PPE kits per staff to visit 50 patients, worn with a disposable gown on top
7	Hand rub	600.00		1.00	600.00	12.00	50.00	On average, 1 bottle is enough to care for 50 patients in a day
8	Syringe	3.00		4.00	12.00	12.00	1.00	On average, 4 syringes per patient per day
9	Shoes cover	5.00		28.00	140.00	2.80	50.00	On average, 4 shoe covers per staff per day to visit 50 patients
10	Eye glass	100.00		4.00	400.00	1.33	300.00	On average, 1 eye glass can be used for 10 patients in a day for 30 days
11	Nebulizer mask	90.00		1.00	90.00	12.86	7.00	On average, 1 per patient for 7 days as average length of stay for this type of case is 7 days

12	Non-rebreathing oxygen mask	60.00		1.00	60.00	8.57	7.00	On average, 1 per patient for 7 days as average length of stay for this type of case is 7 days
13	Nasal cannula mask	70.00		1.00	70.00	10.00	7.00	On average, 1 per patient for 7 days as average length of stay for this type of case is 7 days
14	IV set plus 4 bags of serum	92.00		4.00	368.00	368.00	1.00	On average, 4 sets per patient per day
15	ECG paper	300.00		1.00	300.00	6.00	50.00	On average, 1 role of ECG paper per 50 patients
16	Foley catheter	40.00		1.00	40.00	13.33	3.00	On average, 1 per patient every 3 days
17	Oxygen mask	65.00		1.00	65.00	9.29	7.00	On average, 1 per patient for 7 days as average length of stay for this type of case is 7 days
18	Urine bag	22.00		1.00	22.00	7.33	3.00	On average, 1 per patient every 3 days
	Total					4642.13		
	Critical case							
1	Mask	21.00		16.00	336.00	6.72	50.00	On average, 1 mask per staff can be used for 50 patients, considering two shifts per day
2	Gloves	30.00		155.00	4650.00	93.00	50.00	On average, doctors and nurses use 1 pair

								per patient and other staff use 1 pair per day
3	Face shield	100.00		16.00	1600.00	5.33	300.00	On average, 1 face shield can be used to visit 300 patients
4	Disposable gown	250.00		205.00	51250.00	1025.00	50.00	1 per staff person per 50 patients
5	Oxygen	490.00		6.00	2940.00	2940.00	1.00	On average, 6 balloons of 42 kg for 24 hours as of (1-5 liter) per minute per patient
6	PPE kit	2500.00		12.00	30000.00	600.00	50.00	On average, 2 PPE kits per staff to visit 50 patients, worn with a disposable gown on top
7	Hand rub	600.00		1.00	600.00	60.00	10.00	On average, 1 bottle is enough to care for 10 patients in a day
8	Syringe	3.00		6.00	18.00	18.00	1.00	On average, 6 per patient per day
9	Shoes cover	5.00		28.00	140.00	14.00	10.00	On average, 4 shoe covers per staff per day
10	Eye glass	100.00		4.00	400.00	1.33	300.00	On average, 1 eye glass can be used for 10 patients in a day for 30 days
11	Ett tube	4.00		1.00	4.00	4.00	1.00	On average, 1 per patient per day
12	Crep bandage	28.00		1.00	28.00	14.00	2.00	On average, 1 bandage can be used for 2 patients in a day
13	Oxygen mask	65.00		1.00	65.00	32.50	2.00	On average, 1 per patient for 2 days as average length of stay

								for this type of case is 2 days
14	Nebulizer mask	90.00		1.00	90.00	45.00	2.00	On average, 1 per patient for 2 days as average length of stay for this type of case is 2 days
15	Non-rebreathing oxygen mask	60.00		1.00	60.00	30.00	2.00	On average, 1 per patient for 2 days as average length of stay for this type of case is 2 days
16	Nasal cannula mask	70.00		1.00	70.00	35.00	2.00	On average, 1 per patient for 2 days as average length of stay for this type of case is 2 days
17	IV set plus 4 bags of serum	92.00		6.00	552.00	552.00	1.00	On average, 6 per patient per day
18	ECG paper	300.00		1.00	300.00	6.00	50.00	On average, 1 role of ECG paper per 50 patients
19	Foley catheter	40.00		1.00	40.00	13.33	3.00	On average, 1 per 1 patient every 3 days
20	Urine bag	22.00		1.00	22.00	7.33	3.00	On average, 1 per 1 patient every 3 days
21	Cvp line catheter	1500.00		1.00	1500.00	500.00	3.00	On average, 1 per 1 patient every 3 days
22	IV Canulla	6.00		1.00	6.00	6.00	1.00	On average, 1 per patient per day
	Total					6008.55		

Table 3: Direct COVID-19-specific Average Medicine Cost Estimation per Patient per Visit/ Hospital Day

No.	Medicine Name	Item cost/ unit (Afs)	Avg. likelihood of use	OPD-consultation (units)	Inpatient treatment (units)	Total cost	Adjusted cost
Mild case							
1	Tab. Paracetamol 500 mg	1.00	100%	6.00		6.00	6.00
2	Tab. Zinc	1.00	100%	3.00		3.00	3.00
3	Tab. Vit C 500	10.00	100%	1.00		10.00	10.00
4	Amp Vit D	40.00	100%	1.00		40.00	40.00
	Total						59.00
Moderate case							
1	Sol paracetamol	100.00	100%		3.00	300.00	300.00
2	Tab. Zinc	1.00	100%		3.00	3.00	3.00
3	Amp. Vit C 500	10.00	100%		1.00	10.00	10.00
4	Amp Vit D	40.00	100%		1.00	40.00	40.00
5	Sol Moxifloxacin	200.00	50%		1.00	200.00	100.00
6	Vial Enoxaparin	350.00	30%		2.00	700.00	210.00
7	Sol Ipratropium Bromide	70.00	30%		4.00	280.00	84.00
8	Sol Ventolin	150.00	30%		1.00	150.00	45.00
9	Vial Hydrocortisone	35.00	20%		3.00	105.00	21.00
10	Serum Normal Saline	80.00	20%		1.00	80.00	16.00
11	Vial Pantoprazole	50.00	30%		1.00	50.00	15.00
	Total						844.00
Severe case							
1	Sol Paracetamol	100.00	100%		3.00	300.00	300.00
2	Tab. Zinc	1.00	100%		3.00	3.00	3.00
3	Amp. Vit C 500	10.00	100%		1.00	10.00	10.00
4	Amp Vit D	40.00	100%		1.00	40.00	40.00
5	Sol Moxifloxacin	200.00	100%		1.00	200.00	200.00

6	Vial Enoxaparin	350.00	100%		2.00	700.00	700.00
7	Sol Ipratropium Bromide	70.00	100%		4.00	280.00	280.00
8	Sol Ventolin	150.00	100%		1.00	150.00	150.00
9	Vial Hydrocortisone	35.00	100%		3.00	105.00	105.00
10	Serum Normal Saline	80.00	60%		1.00	80.00	48.00
11	Vial Pantoprazole	50.00	80%		1.00	50.00	40.00
	Total						1876.00
	Critical case						
1	Sol Paracetamol	100.00	90%		3.00	300.00	270.00
2	Tab. Zinc	1.00	100%		3.00	3.00	3.00
3	Amp. Vit C 500	10.00	100%		1.00	10.00	10.00
4	Amp Vit D	40.00	100%		1.00	40.00	40.00
5	Sol Moxifloxacin	200.00	100%		1.00	200.00	200.00
6	Vial Enoxaparin	350.00	100%		2.00	700.00	700.00
7	Sol Ipratropium Bromide	70.00	100%		4.00	280.00	280.00
8	Sol Ventolin	150.00	100%		1.00	150.00	150.00
9	Vial Hydrocortisone	35.00	100%		3.00	105.00	105.00
10	Serum Normal Saline	80.00	80%		1.00	80.00	64.00
11	Vial Pantoprazole	50.00	50%		1.00	50.00	25.00
	Total						1847.00

Table 4: Direct COVID-19 Average Routine Laboratory Test Cost Estimation per Patient per Hospital Day

No	Lab Test Name	Item Cost/ Unit (Afs)	Avg. likelihood of use	Routine Laboratory test (units)	Cost	Adjusted Total Cost
Moderate case						
1	Total blood count	350.00	10%	1.00	350.00	35.00
2	LFT	500.00	10%	1.00	500.00	50.00
3	CRP	200.00	10%	1.00	200.00	20.00
4	RFT	500.00	10%	1.00	500.00	50.00
5	D Dimar	1500.00	10%	1.00	1500.00	150.00
6	Electrolyte	1400.00	10%	1.00	1400.00	140.00
	Total					445.00
Severe case						
1	Total blood count	350.00	70%	1.00	350.00	245.00
2	LFT	500.00	20%	1.00	500.00	100.00
3	CRP	200.00	10%	1.00	200.00	20.00
4	RFT	500.00	50%	1.00	500.00	250.00
5	D Dimar	1500.00	10%	1.00	1500.00	150.00
6	Electrolyte	1400.00	80%	1.00	1400.00	1120.00
	Total					1885.00
Critical case						
1	Total blood count	350.00	80%	1.00	350.00	280.00
2	LFT	500.00	30%	1.00	500.00	150.00
3	CRP	200.00	10%	1.00	200.00	20.00
4	RFT	500.00	50%	1.00	500.00	250.00
5	D Dimar	1500.00	30%	1.00	1500.00	450.00
6	Electrolyte	1400.00	80%	1.00	1400.00	1120.00
	Total					2270.00

Table 5: Direct COVID-19 Average Capital Cost Estimation per Patient per Day

No.	Item Name	Total Item Cost (Afs)	Item cost/day	Inpatient treatment	Total Cost/day
Moderate case					
1	Oxygen machine	60000.00	14.79	1.00	14.79
2	Suction machine	18500.00	4.56	1.00	4.56
3	ECG machine	92400.00	22.78	1.00	22.78
	Total				42.14
Severe case					
1	Oxygen machine	60000.00	14.79	1.00	14.79
2	Suction machine	18500.00	4.56	1.00	4.56
3	ECG machine	92400.00	22.78	1.00	22.78
4	Patient monitor	97000.00	23.92	1.00	23.92
	Total				66.06
Critical case					
1	Oxygen machine	60000.00	14.79	1.00	14.79
2	Suction machine	18500.00	4.56	1.00	4.56
3	ECG machine	92400.00	22.78	1.00	22.78
4	Patient monitor	97000.00	23.92	1.00	23.92
5	Ventilator	1025000.00	252.74	1.00	252.74
6	Cap mask	8000.00	1.97	1.00	1.97
7	Portable x-ray machine	2000000.00	493.15	1.00	493.15
	Total				813.92

Table 6: Indirect COVID-19 Average Cost Estimation for the Service per Day

	Total Direct Cost	Indirect Cost (10%)
Mild case	712.45	71.24
Moderate case	4951.09	495.11
Severe case	8871.73	887.17
Critical case	11336.43	1133.64