

Assessment of pandemic (COVID-19) preparedness in a teaching hospital in Northern India using available (CDC-Atlanta) checklist

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ABSTRACT

Background: Hospitals are at the forefront of dealing infectious public health emergencies. Recently, COVID-19 has been declared as pandemic by the World Health Organization. Dealing with COVID-19 pandemic requires high intensity of administrative activity. **Objective:** We conducted this study to assess and compare, objectively, hospital preparedness with available Centre of Disease Control and Prevention (CDC) standards. **Methods:** CDC has issued checklist for the assessment of hospital preparedness for COVID-19 pandemic, globally. This list contains 10 elements with sub-sections. We objectified the same and scored the hospital preparations accordingly. Various financial efforts made by the hospital to procure COVID19-specified items was also recorded. **Results:** As per the CDC checklist, the hospital scored 197 points (72.06%) out of 270 points with highest points in element two and eight. Element two is for the development for written COVID-19 plan. Element eight consists of addressing the occupational health of healthcare workers. Lowest scoring was in the element seven represented visitor access and movement within facility. During the study period, the hospital procured items of approximately 55 lakhs. In the study period, doctors, nursing staff, housekeeping staff, and security staff were channelized for doing COVID-19 duties. **Conclusions:** We obtained a score above 70% (good) which is quite encouraging, and we concluded that pandemic preparations in hospitals are necessary and it can be assessed objectively against prevailing standards. It is important in poor countries like India where spending on healthcare is minimal compared to other countries. Additionally, this assessment can be used to guide us further changes in policies and identifying the gaps in pandemic preparedness in hospitals which require special attention.

Keywords: COVID-19, healthcare workers, hospital preparedness, novel coronavirus, pandemic, public health emergency

Introduction

The infectious diseases have been the most critical public health emergencies globally,^[1] and the hospitals are at the forefront in case of their outbreaks.^[2] The COVID-19 was first reported in

Wuhan, China in December 2019 and there was an exponential rise in the number of cases in following days.^[3] Till the writing of this manuscript, it was reported that the COVID-19 has spread into more than 200 countries/territories and number of cases is more than 6.1 million.^[4] In India, COVID-19 cases were first reported from Kerala and since then, the number of COVID-19 confirmed cases has increased to more than 200,000 (May 5, 2020).^[5] Although multiple sectors play an important role in pandemic management, healthcare facilities play a vital role in pandemic preparedness and response. Timely and efficient intervention to the healthcare needs

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Received: 16-12-2020

Revised: 21-02-2021

Accepted: 17-03-2021

Published: 30-07-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_2455_20

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How to cite this article: Singh S, Govindagoudar MB, Chaudhry D, Singh PK, Vashist A, Vashist MG. Assessment of pandemic (COVID-19) preparedness in a teaching hospital in Northern India using available (CDC-Atlanta) checklist. J Family Med Prim Care 2021;10:2619-24.

of the pandemic-affected populations is one of the highest priorities in its overall management.^[6] Whenever any pandemic accelerates, it is commonly observed that healthcare systems face tremendous workload. Most of the countries have been battered by the first wave and now are going through the *second* wave. Association of schools of public health in the European region recently released the statement as a recommendation for preparedness for the second wave.^[7] During such public health emergencies, besides logistics, there is shortage of trained personnel and management usually come under tremendous pressure for smooth functioning of the hospitals. Multiple stringent measures are already taken by the Government of India like nationwide lockdown, social distancing, in-hospitals closing of out-patient services, postponement of elective surgeries, creating dedicated COVID-19 treatment hospital, etc. Although as there is no definite treatment is available for COVID-19 globally, till date, and the sick patients are dependent on supportive therapy only, for example, ventilators and oxygen, as our capacity of providing these therapies is limited. Even in developed countries, which have so-called finest healthcare system across the world (Italy, USA) have made harsh policy decisions to give priority of life saving treatments/ventilators to the younger population who have more chance for survival.^[8] So, it is outmost important that hospital should be prepared to tackle this pandemic in an efficient manner with minimal loss of lives. The hospital managerial hierarchy and emergency policies are the crucial components of such preparedness.^[9] In times of these emergencies mobilizing the resources, arranging finances, recruitment of healthcare personnel takes an unprecedented toll on the finances of the state.

On the literature review, it was found that very few studies have discussed or evaluated the planning and responsiveness to infectious public health emergency in the hospital setting. Most of the data has come from countries where pandemic has been at its worst. Recently, similar experience was shared by Gupta *et al.* from veteran affairs Connecticut Healthcare system.^[10] Similarly, a questionnaire-based study was done on the citizens of Serbia to assess the impact of preparedness and the perception among the citizens.^[11] Assessment of hospital preparedness is a complex process which is mainly subjective. Thus, we took this opportunity to evaluate and compare the standards of preparation done by our hospital with respect to international standards. We chose to follow the CDC recommendation given their global acceptance though a similar scheme has also been proposed by other authors as well.^[12]

Materials and Methods

Aim and objectives

1. To study the planning and preparedness including finances of hospital for COVID-19.
2. To compare the preparedness with the CDC recommendations.

Study setting

This was a cross-sectional study done at a tertiary-care teaching and research hospital of northern India (Post Graduate Institute of

Medical Sciences, Rohtak) done from February 2020 to May 2020. This institute has total 2,050 number of hospital beds, and it caters around 7,000 daily OPD including A&E patients. Most of the patients come from Haryana and neighboring states. Assessment of COVID-19 preparations included both human resources mobilizations, creation of space and procurement of goods using CDC checklist. Finances utilized for the same were also included in the analysis. Subsequently, hospitals preparedness was compared with the current prevailing standard of care which has been issued by the Centre of Disease Control and Prevention (CDC), U. S. Department of Health and Human Services.^[13]

Data analysis

The hospital preparedness was assessed against the standards given in the checklist issued by the CDC. The checklist has 10 elements, and each element has different checkpoints/standards. For the objective assessment, an indigenously developed point system was made. This point system was developed on the single presumption that each element is as vital as the other. If the hospital was found to be fully complying the individual element, then two (02) marks were awarded and in case of partial compliance (or in the process of completion of the task) one (01) mark was awarded and in case of non-compliance, zero (0) mark was awarded. There was a total of 135 checkpoints/standards within an overall of 10 elements, and therefore, the total overall achievable score was 270. We have categorized our preparedness score which ranges from extremely poor to excellent. (<50 is extremely poor, >50–<100 is poor, >100–<150 is average, >150–<200 is good, >200–<250 is very good, and >250 is excellent.). The study protocol was approved by the Institutional Scientific Board and cleared by the Institute Ethical Committee.

Results

As per the CDC checklist, overall score of the hospital was 197, which was 72.96% of the total achievable score. The hospital achieved the highest score (92–94%) against elements no. two and eight and the lowest score (12.5%) was achieved against the element no. seven [Table 1, detailed in supplementary Table 1]. Element two consisted of the development of a written COVID-19 plan. COVID-19 emergency was well anticipated in our territory, and various administrative measures were taken like *lockdown* and *sealing of borders*. These measures were further enhanced in effect making an exhaustive plan of action. This was reflected in high scoring of the hospital in element two. Regarding element eight, hospital administration made it compulsory for all the hospital staff, which was employed in COVID-19 care, to have frequent breaks and to work in shifts. All concerns of healthcare workers (HCW) were addressed, and residential facilities for them were arranged. This is reflected in high score in element eight. Element seven consisted of visitor policies of the hospital. Hospital had a strict policy of allowing no visitors for COVID-19 suspects/cases. The phone was allowed to the patients, and they could make calls to relatives, but no extra steps were taken by the hospital to address this issue. This was observed as a poor score in element seven.

Table 1: Element wise evaluation of hospital preparedness for COVID-2019

Element No.	Element as per CDC Checklist	Total no of checkpoints	Total achievable score	Score achieved by the hospital
1	Structure for planning and decision making	37	74	54
2	Development of a written COVID-19 plan	6	12	11
3	Elements of a COVID-19 plan	8	16	11
4	Facility Communications	11	22	18
5	Consumables and Durable Medical Equipment and Supplies	13	26	22
6	Identification and Management of Ill Patients	13	26	23
7	Visitor Access & Movement within the Facility	8	16	2
8	Occupational Health	8	16	15
9	Education and Training	11	22	18
10	Healthcare Services/Surge Capacity	20	40	23
Total		135	270	197

(Finances allocation) In view of acute rise in number of cases, the hospital made immediate procurement of required items needed for ensuring the safety of HCW as well as patient management. It was observed that during this period, the hospital made several purchases for maintaining uninterrupted supply of items required for management of novel coronavirus outbreak [Table 2]. These items were purchased over and above the available stock items.

(Finances related to human resources allocation) Hospital also deployed special manpower at the emergency department, triage area, and isolation ward for prevention and management of novel coronavirus patients or suspects. This was done by recruiting staff from various departments as well as training of the already posted HCW. Their salary data was retrieved from the accounts branch, and entries were made based on the same [Table 3].

This data was over a period of 66 days. Considering only direct costing of human resources, a total cost born by the hospital was 87,96,216 INR ($1,33,276 \times 66$). Adding to this, the cost of safety items for HCW like personal protective equipment (PPE) kits, hand wash, gloves and masks consumed over this period (35,47,140 INR from Table 2 item no. 1, 3, 4, 9) and the cost of testing (5,79,000 INR- once for every case and thrice for positive cases- two additional testing needed to be negative to fulfill discharge criteria), the final value comes out to be 1,29,22,356 INR. This was the cost of COVID-19 management born by hospital till date of writing of this manuscript. On an average to manage, one subject of COVID-19 (asymptomatic or mildly symptomatic), the money spent by the Government was 57,178 INR. This does not include various other items like stay arrangements for HCW, room rent for patients, and salaries of staff involved indirectly like in policy making, etc.

Discussion

In this study, the hospital preparedness and responsiveness to deal with novel coronavirus were compared with the current prevailing standard of care issued by the CDC. The first component of the standard of care was related to Structure for planning and decision making. The hospital formed a planning committee of 13 members and included representatives from all specialties

Table 2: Detail of Hospital purchases made for the management of Novel Coronavirus

Name of Item	Qty	Total Amount (In Indian Rs)
N-95 Masks	5000	1,83,000
Ventury mask	600	40,350
Gloves	70,000	11,47,800
Personal Protective Equipment (PPE) Kit	1580	15,81,840
Nebulizer Chamber with Oxygen Mask and tubing	700	23,450
Nasal Prongs (Adults)	2700	51,595
Safety IV Cannula	3000	70,500
Surgical Mask	89000	10,63,750
Disinfectant-Hand Wash	4700	6,34,500
Hydroxychloroquine 200 mg	300000	8,37,000
RT PCR (reverse transcription polymerase chain reaction) testing kits and consumables	10000	1,50,00,000

Table 3: Detail of Manpower deployment made and expenditure incurred for management of Novel Coronavirus

Head	Total No.	Total Tentative Expenditure per day (In Rs)
Doctors	18	51,776
Nursing Staff	31	61,200
Bearers	18	9600
Sanitation Staff	11	5900
Security Staff	9	4800
Total	96	1,33,276

except Legal Counsel/risk management, Union representative, etc. The planning committee convened training programs in the form of lectures and workshops for providing education and job-specific training to HCW regarding COVID-19. Previous studies^[14,15] have suggested that hospitals ought to possess fundamental public health emergency programs, which includes staff training and public awareness sessions.

The second component mentioned in the CDC list was related to the development of a written COVID-19 plan. This component has six different checkpoints, and it was observed that the hospital

has an overall 92% compliance against the second component. Policy making was influenced by the knowledge acquired from the experiences of China and Italy. Document for formulating COVID-19 action plan was inspired by advisories issued by International bodies.^[16,17]

The third component of the CDC checklist was related to elements of a COVID-19 plan. This component has seven checkpoints. During the study, it was revealed that the study hospital was fully complying with majority of the checkpoints except that the plan to monitor and track COVID-19 related staff absences were not developed, and the system was not in place for monitoring healthcare-associated transmission of COVID-19. Healthcare workers who were symptomatic with flu-like illness were still tested for COVID-19 and were provided self-quarantine leaves, but strict follow-up of these cases was not done.

The fourth component of the standard of care was related to facility communications. It was observed that the study hospital had an overall 82% compliance with this standard. Hospital was having signages and posters regarding symptoms of coronavirus, use of facemask, hand hygiene, and others displayed at various places. The hospital had well formulated standard operating procedure (SOPs) in synchronization with the district/state health authorities for immediate notification of suspected/confirmed COVID-19. The hospital also started control room, helpline number, and email facility round the clock for external and internal communications regarding COVID-19, as was recommended in WHO hospital preparedness guidance document.^[18]

The fifth component of the standard of care was associated with consumables and durable medical equipment and supplies. The hospital was having overall compliance of 85%. The hospital did not have a contingency plan to meet out the shortage of supply. The hospital was making procurement at its own level, and the support was also received from the state government agencies. In the beginning, PPE were out of stock, and special arrangements were made by the hospital management for their immediate procurement. The hospital had an adequate protocol for ensuring proper cleanliness and disinfection of environmental surfaces. The house keeping staff was adequately trained and they were aware of the contact time for the selected products. In addition, special areas were also created for PPE donning, doffing, taking bath, and changing rooms for HCWs who were involved in direct patient contact.

The sixth component of the standard of care related to the identification and management of ill patients. The hospital had an overall 89% compliance with this component. Isolation facility was fully ventilated, and the provision of a minimum six feet distance between each patient bed was maintained. All requisite supplies like face masks, PPE, etc., were provided at the entry, in the triage area. Similarly, to meet the anticipated needs of critically ill patients separate intensive care/high dependency unit was made near the emergency department. The hospital also had a facility for receiving

suspects from other hospitals, through a special entrance to triage areas. It was observed that the hospital did not have an order or plan in place for auditing adherence to recommended PPE use by HCW. The hospital did not have any Airborne Infection Isolation Rooms. Therefore, the hospital leadership got vacated the private ward (with single rooms) for admitting the suspected/confirmed cases of COVID-19. Each room had separate ventilation and toilets. The ward had four different entrances and exits. Two of them were temporarily closed, and out of remaining two, one was made an entrance, and the other was made an exit and both these points were manned by the hospital security personals. Strict isolation was maintained, and no person other than authorized HCW were allowed. The isolation ward did not have any facility of electronic tracking of HCW entering and exit the patient room; however, the record of the same was maintained manually at the nursing station.

The seventh component of CDC checklist was related to the visitor access and movement within the facility. The hospital compliance with this standard was poor. The isolation ward created for admission of suspected/confirmed cases of COVID-19 had strict access control, and visitors were not allowed in this area. No special arrangement was made for communication of patients.

The eighth component of CDC checklist was related to the occupational health. Hospital had a scoring of 94% in this component. Hospital did not make arrangement for ensuring compliance for respiratory protection. The hospital did not plan for symptom and temperature checks prior to the start of any shift of asymptomatic, exposed HCWs. The precautions advisory issued by the authorities was compiled to but active monitoring for symptoms was not planned or enforces. These factors have been emphasized to be contributors toward occupational exposure and infections.^[19]

The ninth component of CDC checklist was related to education and training. The hospital scored an overall 82% score against this component. The hospital was not complying with awareness programs for patients and family members. Eitzen E M *et al.*^[20] in their study concluded that HCW were the primary source of information for admitted patients as well as their relatives. Admitted patients and their caregivers are often ignored in the process of creating awareness.

The tenth component of CDC Checklist was related to the Surge Capacity building. The hospital had a low scoring (58%) in this regard, and it was mainly attributed toward the primary area of focus being capacity building for initial cases only. Capacity building has been stressed as one of the most important pillars of hospital preparedness for anticipated emergencies.^[21]

CDC has provided with a comprehensive checklist to act as guidance during the initial preparedness for a pandemic. Primary physicians being at the center for the management of such a pandemic can take significant direction from it. We have demonstrated here that preparedness for the pandemic can be objectively assessed and the points which need attention can be

highlighted and addresses. In India, the primary care physicians and the unorganized private sector facilities may derive significant inspiration from these recommendations.

In the initial day of the pandemic, there was no in-house testing facility for COVID-19. It leads to high turnaround time for the results and prolonged stay of the patients in hospital. Later on, Microbiology Department started the viral testing, and this significantly reduced the overall stay duration. Turnaround time of results of vitals tests is of paramount importance in public health emergencies.^[22]

Exhaustive financial analysis from our study revealed that over 57,000 INR were spent on each subject admitted with suspicion or diagnosed COVID-19. At the time of preparation of this manuscript there were only mild or asymptomatic cases who were admitted in the institute. It was an underestimation as our study evaluated on direct costing. It was astounding to acknowledge that such amounts are spent on cases that usually do not require hospitalization at all.

Strength of this Study

The major strength of our study was that it studied the preparedness of hospital for dealing an infectious pandemic in a large public sector tertiary care hospital. To our knowledge, it is the first study to objectively assess and compare such preparedness with international standards.

Limitations of this Study

Firstly, it was a single center, short duration study. The healthcare set up of state of Haryana as well as of India is different from various other countries. Secondly, the U. S. A. and India were at different stage of pandemic, during preparation of this manuscript. Lastly, the economic landscape of Indian government hospital is completely different from the rest of the institutes, the pay of HCW and procurement of material at their respective costs, might not be generalizable.

Key Highlights of the Study

We found that being the first study to objectify the pandemic preparedness, it can act as a scoring tool for the hospital administrators as well as primary care physicians. As the scoring was validated on one of the biggest hospitals of northern India, the same can act as a benchmark for future comparisons. It is often found to be difficult to adhere to the checklist in letter and spirit but as has been demonstrate in the manuscript, keeping the objectives same the indicators can be modified as per local needs and requirements.

Conclusions

1. We obtained a pandemic preparedness score above 70% (good) which is quite encouraging to us.
2. Preparing for any anticipated infectious pandemic is a

herculean task and requires a multi-disciplinary approach.

3. The guidelines and checklist provided by the CDC is useful for assessing the preparedness of the hospital.
4. Administration has a significant role in channelizing the resources as well as arranging for the finances for procurement of consumables.

Acknowledgements

The current prevailing standard of care issued by the Centre of Disease Control and Prevention, U. S. Department of Health and Human Service were used for comparing the Hospital Preparedness for dealing with infectious pandemic declared because of outbreak of novel coronavirus.

Ethical clearance

Obtained from IEC

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Xu JG. Status and strategy of emerging infectious diseases. *Chin J Epidemiol* 2003;24:340-1.
2. Schultz CH, Mothershead JL, Field M. Bioterrorism preparedness. I: The emergency department and hospital. *Emerg Med Clin North Am* 2002;20:437-55.
3. Zhai P, Ding Y, Wu X, Long J, Zhong Y, Li Y. The epidemiology, diagnosis and treatment of COVID-19. *Int J Antimicrob Agents* 2020;55:105955. doi: 10.1016/j.ijantimicag.2020.105955.
4. Organization WH. Situation Report-134: WHO; 2020. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200602-covid-19-sitrep-134.pdf?sfvrsn=cc95e5d5_2.
5. WHO India. Novel coronavirus Disease (COVID-19). Situation Update Report-5. 28 Feb 2020. Available from: https://www.who.int/docs/default-source/wrindia/situation-report/india-situation-report-5.pdf?sfvrsn=e8e1c902_2. [Last accessed on 2020 Mar 05].
6. Bhattacharya S, Singh A, Semwal J, Marzo RR, Sharma N, Goyal M, *et al.* Impact of a training program on disaster preparedness among paramedic students of a tertiary care hospital of North India: A single-group, before-after intervention study. *J Educ Health Promot* 2020;9:5.
7. Middleton J, Lopes H, Michelson K, Reid J. Planning for a second wave pandemic of COVID-19 and planning for winter : A statement from the Association of Schools of Public Health in the European Region. *Int J Public Health* 2020;65:1525-7.
8. Mounk Y. The Extraordinary Decisions Facing Italian Doctors [Internet]. *The Atlantic*. 2020. [cited 2020 Apr 24]. Available from: <https://www.theatlantic.com/ideas/archive/2020/03/who-gets-hospital-bed/607807/>.
9. Sahu KK, Mishra AK, Lal A, Sahu SA. India fights back: COVID-19 pandemic. *Heart Lung* 2020;49:446-8.

10. Gupta S, Federman DG. Hospital preparedness for COVID-19 pandemic: Experience from department of medicine at Veterans Affairs Connecticut Healthcare System. *Postgrad Med* 2020;132:489-94.
11. Cvetković VM, Nikolić N, Radovanović Nenadić U, Ōcal A, K Noji E, Zečević M. Preparedness and preventive behaviors for a pandemic disaster caused by covid-19 in Serbia. *Int J Environ Res Public Health* 2020;17:4124. doi: 10.3390/ijerph 17114124.
12. Shearer FM, Moss R, McVernon J, Ross JV, McCaw JM. Infectious disease pandemic planning and response: Incorporating decision analysis. *PLoS Med* 2020;17:e1003018.
13. Prevention CfDCa. Comprehensive hospital preparedness checklist for coronavirus disease 2019 (COVID-19) United States: U. S. Department of Health & Human Services; 2020. Available from: https://www.cdc.gov/coronavirus/2019-ncov/downloads/HCW_Checklist_508.pdf.
14. Loutfy MR, Wallington T, Rutledge T, Mederski B, Rose K, Kwolek S, *et al.* Hospital preparedness and SARS. *Emerg Infect Dis* 2004;10:771-6.
15. Hui Z, Jian-Shi H, Xiong H, Peng L, Da-Long Q. An analysis of the current status of hospital emergency preparedness for infectious disease outbreaks in Beijing, China. *Am J Infect Control* 2007;35:62-7.
16. Wang C, Wei S, Xiang H, Xu Y, Han S, Mkangara OB, *et al.* Evaluating the effectiveness of an emergency preparedness training programme for public health staff in China. *Public Health* 2008;122:471-7.
17. Biddinger PD, Savoia E, Massin-Short SB, Preston J, Stoto MA. Public health emergency preparedness exercises: Lessons learned. *Public Health Rep* 2010;125(Suppl 5):100-6.
18. Organization WH. Critical preparedness, readiness and response actions for COVID-19: WHO; 2020. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/critical-preparedness-readiness-and-response-actions-for-covid-19>.
19. Organization WH. Coronavirus disease (COVID-19) technical guidance: Patient management 2020. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/patient-management>.
20. Eitzen EM Jr. Education is the key to defense against bioterrorism. *Ann Emerg Med* 1999;34:221-3.
21. Careno L, Costantini E, Greco M, Barra FL, Rendiniello V, Mainetti M, *et al.* Hospital surge capacity in a tertiary emergency referral centre during the COVID-19 outbreak in Italy. *Anaesthesia* 2020;75:928-34.
22. Xu JG. The Laboratory network building of infectious diseases surveillance. *J Dis Surveill* 2005;20:1-2.

Supplementary Appendix

Table 1: Detailed element wise evaluation of hospital preparedness for COVID-2019

1. Structure for planning and decision making				
Element No.	Element as per CDC Checklist	Total no of check points	Total achievable score	Score achieved by the Hospital under study
1	COVID-19 pandemic planning has been incorporated in planning and exercises.	01	02	01
2	A multidisciplinary planning committee has been created to address COVID-19 preparedness.	01	02	02
3	Staff are assigned specific responsibility for coordinating preparedness (with back-up).	02	04	03
4	A planning committee has been established and includes representatives from all concerned departments.	28	56	38
5	The hospital's pandemic response coordinator has contacted local/regional working groups.	04	08	08
6	Institutional leadership has reviewed the CDC's COVID-19 guidance.	01	02	02
2. Development of a written COVID-19 plan				
1	COVID-19 preparedness plan is available and accessible by staff.	01	02	02
2	Inclusion of the elements listed in #3 below.	01	02	02
3	The plan identifies the members' organizational structure of the preparations.	01	02	02
4	The plan stratifies implementation of actions as per the CDC.	01	02	02
5	Responsibilities of key personnel has been described.	01	02	01
6	Back-up teams have been identified and trained.	01	02	02
3. Elements of a COVID-19 plan				
1	A plan for protecting patients and healthcare personnel from COVID-19 is in place.	01	02	02
2	Specific person has been assigned responsibility for monitoring public health advisories.	02	04	03
3	A protocol has been developed for monitoring COVID-19 among health care workers.	01	02	02
4	A plan to monitor COVID-19 related staff absences is in place.	01	02	00
5	A management protocol has been developed for hospitalized patients.	01	02	02
6	A protocol has been developed for suspect cases and contacts.	01	02	02
7	A monitoring plan is in place to overlook healthcare-associated transmission of COVID-19.	01	02	00
4. Facility Communications:				
1	A person has been assigned responsibility for communications with staff, patients, and their families.	02	04	01
2	Communication plans include how signs, playboards and notices.	01	02	01
3	Brochures and posters on COVID-19 have been developed and distributed.	01	02	02
4	A person has been designated for communications with health authorities.	02	04	04
5	Public health points of contact for communication have been identified.	02	04	04
6	Remote/Tribal health department communication contact has been identified.	01	02	02
7	A list of ancillary healthcare entities have been made along with their points of contacts.	01	02	02
8	Local plans for inter-facility communication during an outbreak have been established.	01	02	02
5. Consumables and Durable Medical Equipment and Supplies:				
1	Estimates have been made of patient care consumables and equipment and personal protective equipment.	01	02	01
2	Estimates have been shared with authorities.	01	02	01
3	A back plan has been developed to address supply shortages.	01	02	02
4	A triage strategy has been developed to allocate limited resources in case of shortage.	01	02	02
5	A system is in place to track quantities of consumables available.	01	02	02
6	Infection prevention and control practices equipment must be made available to end users.	07	14	14
7	The facility has a contingency plan for supply shortages.	01	02	00
6. Identification and Management of Ill Patients:				
1	The triage process must be headed over by trained personnel.	01	02	02
2	A process for triage and admission is in place.	05	10	09

contd...

Table 1: Contd...

Element No.	Element as per CDC Checklist	Total no of check points	Total achievable score	Score achieved by the Hospital under study
3	Triage location and space has been determined.	01	02	02
4	Other alternatives to face-to-face triage are made available.	01	02	00
5	Patient admission criteria have been made according to severity of illness and are circulated.	01	02	02
6	Intra-hospital transportation and coordination systems have been made and designated.	01	02	02
7	A process is in place for suspect identification and isolation.	03	06	06
7. Visitor Access & Movement within the Facility:				
1	Visitor access and movement plans in the hospital have been reviewed.	01	02	01
2	Proper signs and clear instruction for visitors have been displayed at entrances.	01	02	01
3	Protocols for limiting visitors in the hospital have been made.	01	02	00
4	Remote communication facility should be in place, in case of visitor restrictions.	01	02	00
5	COVID19 protection for visitors must be in place including provisions for PPE kits and masks.	04	08	00
8. Occupational Health:				
1	Hospital sick leave policy has been tuned as per need of the hour.	01	02	02
2	“HCP exposure to COVID19” protocols have been made including isolation place and preliminary management.	01	02	02
3	Self-monitoring protocols have been made and distributed.	01	02	02
4	Plans for active monitoring for COVID19 symptoms among HCP have been made.	01	02	02
5	Plans for management for HCP with COVID19 symptoms should be in place.	01	02	02
6	Work restrictions for HCP with or without symptoms must be in place.	01	02	02
7	Respiratory protection program protocols are made and distributed.	01	02	01
8	Process for auditing adherence to PPE use by HCP.	01	02	02
9. Education and Training:				
1	Education and training activities for HCP, and community members.	01	02	02
2	Education and training activities responsibility must be handed over to specific personnel.	01	02	02
3	Reading materials for HCP, patients, and family members is drafted.	01	02	00
4	Job-specific training and learning materials have been made available in the facility.	06	12	12
5	Auditing adherence to hand hygiene practices HCP.	01	02	02
6	A process for training of non-facility HCP in case of emergencies must be made.	01	02	00
10. Healthcare Services/Surge Capacity				
1	Protocols for continuing care for patients with non-COVID19 disease complications must be made.	01	02	01
2	Surge capacity plans to deal with spike in cases.	01	02	02
3	Surge capacity plans for human resources management.	01	02	02
4	Surge capacity plans for triage areas, ICU, and emergencies.	01	02	01
5	Agreements with other potential health care facilities for surge management have been signed.	01	02	00
6	In-hospital space has been identified for increasing bed count and related planning.	01	02	02
7	Plans to increase equipment, trained personnel and drugs are made.	01	02	01
8	Logistical support has been discussed with higher authorities.	01	02	01
9	Elective admission cancellation criteria have been made.	01	02	02
10	Plans for alternate healthcare facilities have been made and discussed with concerned authorities.	01	02	02
11	Protocols for use of call centers and telemedicine for remote care of patients have been made.	01	02	00
12	Ethical issues concerning triage and judicious distribution of resources have been dealt and notified to the respective bodies.	01	02	00
13	A protocol for communication about hospital status to health authorities.	01	02	01
14	A contingency staffing plan is in place for minimum staffing needs and prioritizes critical and non-essential services.	01	02	01
15	Daily assessment of staffing and needs during a COVID-19 outbreak must be done by one assigned person.	01	02	02

contd...

Table 1: Contd...

Element No.	Element as per CDC Checklist	Total no of check points	Total achievable score	Score achieved by the Hospital under study
16	Definitions and legal implications of declaring “staffing crisis” and appropriate emergency staffing alternatives have been developed and considered.	01	02	00
17	Collaboration with regional planning and response groups for healthcare staffing shortages have been done.	01	02	01
18	Protocol for postmortem care and management of bodies have been made.	01	02	02
19	Temporary morgue facility has been identified/developed.	01	02	02
20	Plans for expanding morgue capacity have been developed.	01	02	00
Total		135	270	197