

Health-care preparedness and health-care worker protection in COVID-19 pandemic

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ABSTRACT

The COVID-19 pandemic has ravaged the nations and has created the institution of unprecedented measures globally toward its containment. Extraordinary measures may be needed for health-care preparedness, to reduce morbidity and mortality. Health-care workers who are at the frontlines in such pandemics are the most vulnerable. These issues are addressed in this article.

KEY WORDS: COVID-19, epidemic severe acute respiratory syndrome-coronavirus-2, health-care worker, pandemic, personal protective equipment, preparedness, protection

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INTRODUCTION

The COVID-19 pandemic is now a major global health of threat, the full impact of which is yet unknown. As of March 28, 2020, there have been 597,335 cases and 27,365 deaths confirmed worldwide. Global spread has been rapid, with 177 countries now having reported at least one case. Health-care workers (HCWs) who are at the frontlines in the fight against infectious disease are the most vulnerable. In this article, we look at the epidemiology of this epidemic, the likely impact on the nation and the preparation of the health-care settings to cope with the endemic. Most importantly, HCWs in this setting are the most valuable resources and so we cover the measures needed to protect HCWs and optimize their output.

STATUS OF THE COVID-19 EPIDEMIC

The last time a health catastrophe struck of a similar scale was the 1918–1919 H1N1 influenza pandemic. Valuable

lessons have been learned from the measures adopted then, which include social distancing measures such as closing schools, churches, bars, and other social venues. Cities in which these interventions were implemented early in the epidemic were successful at reducing case numbers while the interventions remained in place and experienced lower mortality overall.^[1]

While our understanding of infectious diseases and their prevention is now very different compared to 1918, most of the countries across the world face the same challenge today with COVID-19, a virus with comparable lethality to H1N1 influenza in 1918. Two fundamental strategies have been deemed to be effective.^[2]

Suppression

Here, the aim is to reduce the reproduction number (the average number of secondary cases each case generates),

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R, to below 1 and hence to reduce case numbers to low levels or (as for severe acute respiratory syndrome [SARS] or Ebola) eliminate human-to-human transmission.^[3] This would involve measures to reduce transmission through severe social distancing measures which are not very practical in a large and diverse country like India. Furthermore, this will require to be maintained till the virus stops circulating in the population or until effective drugs and or vaccines become available. It is believed that in the case of COVID-19, it will be at least 12–18 months before a vaccine is available.^[3] Suppression, while successful to date in China and South Korea, carries with it enormous social and economic costs which may themselves have a significant impact on health and well-being in the short and long terms.^[3]

Mitigation

Here, the aim is to reduce human-to-human transmission substantially, but not completely, thus reduce the impact of the epidemic. Such strategies had been adopted to tackle previous influenza pandemics in 1957, 1968, and 2009. The goal is to reduce the reproduction number, R, which may not lower it to below 1. The herd immunity builds up through the epidemic, leading to slower but eventual rapid decline in cases as well as transmission.

A nation like India with its huge population, compounded by linguistic and social diversity, may better be able to adopt “mitigation” strategy, and also, an attempted “suppression” strategy could degenerate to “mitigation.” How would social distancing efforts pan out in places with high population density, such as in crowded slums? Although the impact on the short term may not match the “suppression” strategy, the slowdown may buy time for the introduction of vaccine and new drugs.

At present, the entire nation of India is in a stage of lockdown, as are several parts of the globe. This strategy aims to slow down the epidemic so that there is a drop in caseload and consequently, a reduction in those requiring hospitalization and intensive care unit (ICU) care. The hope is that the reduction would ensure that the available health-care capacity would not be overwhelmed. This is a bold step and will substantially slow down transmission and save lives, but it comes at a cost. In India, there are millions of daily wage workers who live from hand to mouth, and it may pose an enormous burden on them to tide over this period, without work. When the policy mandates that people should stay at home, what are the implications for the millions who are homeless in India? When social normalcy is restored, there is bound to be a surge of transmission and an increase in cases.

According to the experience during the 2002 SARS outbreak, more emphasis should be placed on HCWs’ protection, since approximately 1725 of front-line HCWs were infected by SARS.^[4] Ever since the early days of the current COVID-19 epidemic, infection of medical and nursing personnel has been a common occurrence.

PROJECTED MAGNITUDE OF THE EPIDEMIC

Wu *et al.*^[5] observed that a common characteristic of both SARS-coronavirus (SARS-CoV) and Middle East respiratory syndrome (MERS)-CoV is that they have a low potential for sustained community transmission (i.e., low basic reproductive number).^[6-8] However, the most worrisome aspect is the ability of the SARS-CoV-2 virus to cause unusually large case clusters through superspreading, which can exceed 100 individuals that are apparently seeded by a single index case.^[7-11]

Gabriel Leung, a leading epidemiologist from Hongkong stated in mid-February 2020 that at the current rates of coronavirus infection, 60%–80% of the World’s population could get infected.^[12] This has been reiterated by several world leaders. If the epidemic progresses unmitigated in India, 60% of the 139 crore Indians could get infected over the next few months, that works out to 83.4 crore (834 million) people. We used the infection fatality rate (IFR) which was 0.66 as calculated by Verity *et al.* for the Chinese cohort, to predict the mortality which worked out to 55 lakhs (5.5 million) and make some projections for the healthcare needs for India. We chose to use IFR rather than Case fatality rate (CFR), since it includes the asymptomatic and undiagnosed cases in addition to the diagnosed cases. Assuming that the ICU mortality was 50%, approx 110 lakhs (11 million) may require ICU care. Since the total hospitalizations (including critical care) is roughly 4 folds higher, we estimated that approximately 440 lakhs (44 million) could require to be hospitalized.^[13] Dr. Dhruva Chaudhry, the president of the Indian Society of Critical Care Medicine, estimates that there could at best be 100,000 ICU beds and between 35,000 and 45,000 ventilators in the country. Apart from the shortage of equipment, skilled workforce is required to manage these patients, and we would fall woefully short.

There are some who hold the view that the worst might be already over for the world as it deals with the coronavirus pandemic.^[14] Dr. Michael Levitt, a Nobel laureate and Stanford biophysicist, is one of them. His prediction regarding the China outbreak of the drop in death rate in early February 2020 was correct, contrary to the prediction of many that it would continue for much longer. He predicted a ballpark figure of around 80,000 cases, with about 3250 deaths, when others were calculating deaths in the range of millions. As of March 24, 2020, China has reported 3277 deaths with 81,171 positive cases. Therefore, his insight^[14] about the tapering trend in the rest of the world may also be true. However, global predictions are confounded by several factors and by huge heterogeneity.

The impact of temperature on the epidemic has been a point of contention. We feel the impending summer may work in India’s favor for the following reasons. Viral respiratory infections are seasonal and drop significantly during the summer months. Wang *et al.*^[15] recently

reported their work on the impact of air temperature and humidity on the transmission of COVID-19 in 100 Chinese cities. High temperature and high relative humidity significantly reduced the transmission of COVID-19, even after controlling for population density and GDP per capita of cities. One degree Celsius increase in temperature and one percent increase in relative humidity lowered R by 0.0383 and 0.0224, respectively. This supports the observation that in the early dates of the outbreak, countries with relatively lower air temperature and lower humidity (e.g., Korea, Japan, and Iran) saw more severe outbreaks than warmer and more humid countries (e.g., Singapore, Malaysia, and Thailand).^[15] At the present time, Europe and the USA bear the brunt of this epidemic, and this seems to fit with the hypothesis.

However, looking at the global trend, there has been a large difference in the transmission as well as the severity of the disease between the countries. Anecdotal observations from the preliminary trends that have been made available for the country are that high mortality or sustained transmission from those who have acquired the infection overseas and have returned to India is not yet apparent. However, it is too early to make firm conclusions. Therefore, how exactly the epidemic will behave in our country cannot be accurately predicted. Preparation for the worst is the best strategy.

EPIDEMIC PREPAREDNESS

Preparation for an emergency on war footing is of paramount importance. However, it is a huge task for a country with its large population and without a strong health-care system. While in the long term, improving the national health-care system with increased budget allocation for health is the way forward, immediate fund allocation and action to effectively revamp and use available infrastructure is the need of the hour. The private health-care system contributes to the care of more people than the public system. Therefore, their engagement and active participation is crucial. The health-care system must have the preparations in place before late April or early May, when the epidemic is expected to peak. The city of Wuhan in China completed a makeshift hospital to treat patients with coronavirus in just 10 days using prefabricated material. It consisted of 2 floors and had several isolation wards and 30 ICU units and could hold up to 1000 patients. If the scale of the problem so demands, India should be even prepared to consider such a project.

The introduction of social distancing measures nationally is a welcome step and would definitely stagger the impact of the pandemic. However, this should be complemented with substantial escalation of testing. The model we propose would be:

- Test – As many of the suspects as possible on the basis carefully thought through strategy

- Treat – According to the severity, hospitalize only those requiring in-house care
- Isolate – The COVID-19 cases
- Contact tracing and screening
- Quarantine – The contacts.

At the level of health-care centers, allotting appropriate and adequate space would be of paramount importance in the care of these patients and to reduce transmission. Ensuring allocation of beds in hospitals for COVID-19 patients in as many hospitals as possible is one of the models. A more effective model, especially in the public sector, could be designating certain hospitals or blocks within hospitals exclusively for the care of COVID-19 patients. This would ensure appropriate infrastructure modification, deploying appropriately skilled workforce, and also ensure the segregation of these patients from the patients coming to the hospital for the care of other ailments. Personal protective equipment (PPE) could be preferentially channeled to these hospitals and ensure their more optimal use and availability. Another major challenge is sourcing PPEs in the face of severe shortage. PPE prices have escalated and are likely to be a drain on the finances of the health-care systems. The government should cap these prices and ensure they are followed.

MODE OF TRANSMISSION

It is important to understand the route of transmission for setting up PPE. At the present time, the mode of transmission is not fully understood. At the beginning of the outbreak in Wuhan, it was thought to be animal-to-human transmission, attributed to a seafood market that sold live animals, where most of the initial patients had either worked or visited. Now, the mode of transmission is person-to-person. The spread of SARS-CoV-2 is thought to occur mainly through respiratory droplets, similar to the spread of influenza. The droplet with the infectious agent is released when a person with infection coughs, sneezes, or speaks. These droplets normally do not travel more than six feet (about two meters) and do not linger in the air. This could infect another person if the droplets are inhaled. Infection may also occur if it comes in contact with the mucous membranes, which may happen if a person touches an infected surface and then touches his or her eyes, nose, or mouth. There have been fears expressed about airborne transmission.^[16]

Given the current uncertainty regarding transmission mechanisms, airborne precautions are recommended routinely in some countries and in the setting of certain high-risk procedures that involve aerosol generation.

CLINICAL FEATURES AND RISK FACTORS

Ran *et al.*^[17] conducted a retrospective cohort study on HCWs at the forefront of the fight against COVID-19, who presented with acute respiratory symptoms from the disease. Although it was a single-center study, there is a

lot of useful information about the disease and pattern of involvement.

Common symptoms were fever (85.71%), cough (60.71%), brachypnea (7.14%), chest distress (7.14%), headache (7.14%), diarrhea (7.14%), and hemoptysis (7.14%) among the 28 HCWs diagnosed with COVID-19.^[17]

The risk factors identified were unqualified handwashing, suboptimal hand hygiene before and after contact with patients, and improper PPE. The relative risks were 2.64 (95% confidence interval [CI] = 1.04–6.71, $P < 0.05$), 3.10 (95% CI = 1.43–6.73, $P < 0.01$), 2.43 (95% CI = 1.34–4.39, $P < 0.01$), and 2.82 (95% CI = 1.11–7.18, $P < 0.05$), respectively.^[17]

It appeared that the cumulative proportion of infection free HCWs would be decreased proportionate to daily work hours, in those working in high-risk departments compared to other areas ($P < 0.05$). It appeared that all of the staff in high-risk areas could be infected if they worked 15 h per day.^[17] HCWs in China were generally working long hours, with an average workweek exceeding 54 h.^[18] Moderate work hour benefits the health and safety of HCWs, while prolonged work (>10 h/day) in high risk areas with aerosol generating procedures would possibly increase the risk of respiratory infections.^[17,19] It would be judicious to restrict the number of hours of shift in this group.

IMPACT ON HEALTH-CARE WORKER

Figures from China's National Health Commission show that more than 3300 health-care workers have been infected as of early March, and according to local media, by the end of February, at least 22 had died. In Italy, 20% of responding health-care workers were infected, and some have died.^[20]

These are challenging times for HCWs, particularly those directly caring for COVID-19 patients. They are likely to be overworked, which makes them vulnerable to errors and possibly increases their risk of getting infected.^[17] Compounding this is the fear and mental exhaustion from overwork, death of patients, colleagues falling ill or dying from the infection, and their own safety. When health-care systems are overwhelmed, difficult choices may be required on prioritization of hospital bed allocation, ICU care and institution of invasive ventilation. All these may take a heavy toll on the HCWs.

In addition, they could be separated from their family on quarantine or may opt not to go home fearing infection risk to their families. Impact of social distancing and lockdown does not spare HCWs, whose children may need to be looked after at home on account of school closures, and they may require to fulfill their duty toward the care of elderly family members. Domestic help may cease to be available with travel restrictions, and they may also be sources of infection.

HCWs are the most valuable agents in this battle against the pandemic. While the manufacture of ventilators and other equipment could be escalated, HCWs cannot be created at short notice and so protecting them against infection and safeguarding their health and morale is crucial.

SCREENING AND TRIAGE BEFORE ENTRY TO HOSPITAL PREMISES

The aim is to screen large number of people who enter the hospital premises. The screening should be done by a brief questionnaire and temperature checking with an infrared thermometer. There are four groups of people who may enter the hospital.

1. COVID-19 suspects
2. Patients attending hospital with non-COVID symptoms
3. Relatives of patients
4. Hospital staff.

A proposed patient flow and triage model has been attached [Figure 1].

COVID-19 suspects should be referred to acute respiratory infection (ARI)/fever clinic which is described below. It should be borne in mind that patient relatives and hospital staff could be COVID-19 suspects. Therefore, we feel both these categories should be subject to screening before entry. Since a large number of people may need to pass through this facility, it could be a single screening unit located close to the main gate or it could be multiple units at the entrance to each building, in which case there should preferably be a single-entry point. Ideally, there should be a way of tagging those who have passed screening for the day, so that they could access all the hospital buildings without need for rescreening. The screening should be done by staff with appropriate protective gear.

ACUTE RESPIRATORY INFECTION TRIAGE/ FEVER CLINIC

The ARI/fever clinic should have sufficient space on account of the likely large number of patients who may need to be screened. It should be well ventilated or it should be a negative pressure facility. This would also help mitigate HCW risks. It should ideally be a stand-alone unit with clear pathways of entry and exit with minimal scope for mixing with other patients/relatives/hospital staff. The staff in these areas should use appropriate PPE.

Every hospital needs to have a protocol on whom to test and when to test, and this information needs to be disseminated to all staff involved in the process. A suggested algorithm is given in Figure 2. If the patient has suggestive symptoms but mild in severity and they do not have poor prognostic factors, they can be sent home without testing with advice to self-isolation and education regarding seeking medical

care, in case their condition deteriorates. However, HCWs should be tested even if they had mild symptoms, and this is because of the risk they pose to colleagues and the patients. Patients with moderate-to-severe symptoms need to be hospitalized, and testing for COVID-19 needs to be done. These recommendations are subject to change based on policies of the Ministry of Health and Family Welfare, Government of India.

INFECTION CONTROL IN THE HOSPITAL

Every effort should be made to ensure that outpatients spend as little time as possible in the hospital premises and patients are hospitalized only if they cannot be cared

for at home. Efforts should be made to reduce the number of patient visitors. Respiratory services would have special challenges in deciding which of the chronic lung disease patients are COVID-suspects. Droplet infection precautions are important in all areas where suspects could be present. It should be universal if screening is not in place before patients enter the hospital. Posters teaching cough etiquette should be placed in waiting rooms and at other parts of the hospital. Needless to say, all patients with cough should be provided surgical masks. At these times when PPEs are in short supply, cloth masks/shawl/handkerchief/towel, etc., may be used. Although extreme, it may become necessary to ask all patients and relatives to use one of these within the hospital premises. Universal use could

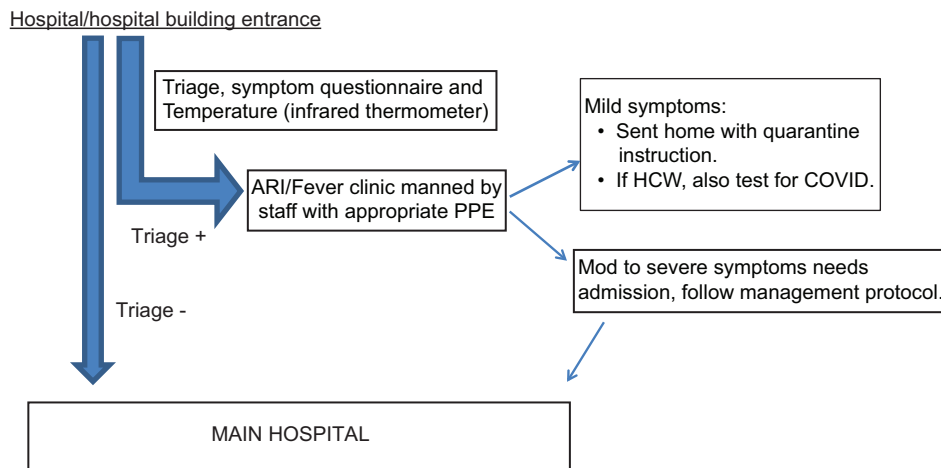


Figure 1: Proposed patient flow and triage model

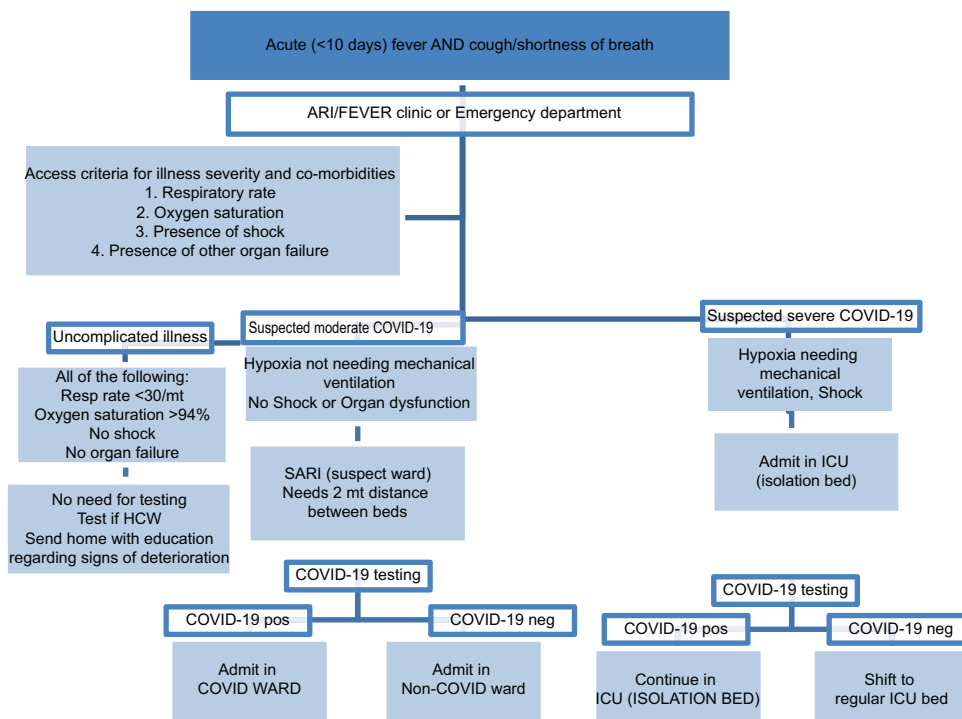


Figure 2: Suggested algorithm – COVID-19

reduce the stigmatization of those who are identified suspects. Furthermore, SARS-CoV-2 is known to spread even during the asymptomatic phase, and the relatives by adopting this practice may also reduce the risk of droplet infection for themselves.

Handwashing: Sanitizers or soap and water should be provided at the entrance of each area – OPD, wards, etc., and its use mandated before entry. Within work areas, the use of hand sanitizers/washing with soap and water may be practiced before and after touching patient/patient bed.

PROTECTIVE GEAR AND CLEANING PROTOCOLS

The HCWs who are involved in the direct care of these patients are at high risk of contracting the infection from these patients. If a HCW acquires the infection, it leads to a double burden on the health-care system, as not only does the HCW become unavailable to work but also becomes one who now needs to be cared for. In addition, the morale of other HCWs could take a toll. Hence, it is imperative to do all that it takes to prevent infection to the HCWs.

It has been known and has now been shown that optimal hand hygiene is of paramount importance in the prevention of COVID-19 to HCW. The following aspects of hand hygiene are to be followed as recommended by the CDC: ^[21]“(a) HCW should perform hand hygiene before and after all patient contact, contact with potentially infectious material, and before putting on and after removing PPE, including gloves. (b) HCW should perform hand hygiene using alcohol-based hand rubs with 60%–95% alcohol or wash hands with soap and water for at least 20 s. If hands are visibly soiled, soap and water should be used before returning to alcohol-based hand rubs.”

The second aspect of protection is the quality and quantum of protective gear that is required in the various scenarios of the care of patients. Due to the worldwide enormity of this disease, and also due to panic buying, there has been an acute shortage of the protective gear. Absence or inadequate PPE has been the legitimate cause of fear for HCWs across the globe. On the other hand, there could be inappropriately excessive usage of various aspects of the PPE, which further intensifies the shortage. Hence, the WHO has come up with a recommendation^[22] for the rational use of the PPE, while caring for COVID-19 patients. We have created a simplified version from this document, have incorporated information from other sources,^[23] and have adapted it to local needs [Table 1]. We have tabulated the requirements based on the patient category and designated areas for their care. The areas we propose to be designated are as follows: (a) ARI clinic, commonly known as the fever clinic, (b) COVID-19 suspect ward, for those requiring hospitalization and awaiting the test results, (c) COVID-19 ward, for confirmed cases, and (d) COVID-19 ICU.

The putting on (donning) and removing (doffing) of PPE is an important exercise that needs to be taught for HCWs who care for these patients. For those who may want to learn this, we are providing a link to an online video available on YouTube:

<https://www.youtube.com/watch?v=cCzwH7d4Ags>.

HEALTH-CARE WORKER ROLE AND DEPLOYMENT

In preparation for a pandemic, hospitals have to strategize the management of the HCWs, space, and supplies, so that optimum care is provided to the patients. Among these, health-care personnel are the most valuable and need to be deployed in each of the areas designated for the care of these patients. This needs to be carefully planned, since there may be a need for trained personnel in large numbers, for deployments as well as replacements for those who may fall sick or need quarantine. This may involve the identification of staff from other areas and training them in basic skills. If the need arises, they may need to step in.

We have listed down the plan for staffing these areas with appropriately skilled workforce:

Acute respiratory infection clinic/fever clinic

This will be a dedicated clinic for patients presenting to the hospital as outpatients with febrile illness of short duration with respiratory symptoms. They would normally receive patients from the OPD screening/triage area. One of the objectives of this clinic is also to manage other underlying medical illnesses and tide over the period of infectiousness, after which patients could go to the appropriate medical specialists for the continuation of care.

The most appropriate staff may be general medicine and general practice physicians. The other groups who could fulfill this role are respiratory medicine, infectious diseases, geriatric medicine, community medicine, and the other medical super-specialty physicians. If required, doctors from surgical and other clinical specialties may need to step in.

COVID-19 suspect ward

This is the ward designated for the care of COVID-19 suspects. This will not include patients who are critically unwell, requiring invasive or noninvasive ventilation. The former would have to be cared for in the ICUs, and the latter may require dedicated rooms with negative pressure to prevent aerosol transmission of infection. Nasopharyngeal or oropharyngeal samples required to test for the novel coronavirus will also be obtained here. Once the results arrive, they will either be transferred to COVID-19 ward or to other appropriate wards.

The departments that are most appropriate to care for these patients are general medicine, respiratory medicine, and infectious diseases. The next level of departments who could care for these patients are geriatrics, community

Table 1: Protocol for protection of health-care workers during the COVID-19 pandemic

Type of patient/area	Target personnel	Type of activity	Protective measures required
ARI/fever clinic	Patient	History and physical examination	Surgical mask
	HCW		Hand hygiene between patients Surgical mask Gowns (long-sleeved) Gloves (to be changed between patients) Eye protection (goggles or face shield)
COVID-19 suspect ward (awaiting test results)	Patient	Aerosol generating procedure or prolonged or very close contact	Surgical mask Hand hygiene between patients N95/FFP2 respirator or equivalent (fit tested) Gowns (long-sleeved) Aprons [#] (to be changed between patients) Gloves* (to be changed between patients) Eye protection (goggles or face shield) Overshoes and head cover (desirable)
	HCW		Brief contact and no aerosol-generating procedures Hand hygiene between patients Surgical mask Gowns (long-sleeved) Aprons [#] (to be changed between patients) Gloves* (to be changed between patients) Eye protection (goggles or face shield) Overshoes and head cover (desirable)
COVID-19 positive ward	Patient	Irrespective of activity	Surgical mask Hand hygiene before donning and doffing** N95/FFP2 respirator or equivalent (fit tested) Gowns (long-sleeved) Aprons [§] Gloves* (to be changed between patients) Eye protection (goggles or face shield) Overshoes and head cover (desirable)
	HCW		Surgical mask Hand hygiene before donning and doffing** N95/FFP2 respirator or equivalent (fit tested) Gowns (long-sleeved) Aprons [§] Gloves* (to be changed between patients) Eye protection (goggles or face shield) Overshoes and head cover (desirable)
COVID-19 ICU	Patient HCW	Irrespective of activity	Intubated preferably*** Hand hygiene before donning and doffing** N95/FFP2 respirator or equivalent (fit tested) Gowns (long-sleeved) Aprons [§] Gloves* (to be changed between patients) Eye protection (goggles or face shield) Overshoes and head cover (desirable)

Aerosol generating procedures:

Tracheal intubation, noninvasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy with bronchoalveolar lavage, high-flow nasal oxygen, obtaining a nasopharyngeal or oropharyngeal swab for testing.

Other guidance statements:

The use of nebulizers should be avoided and should be replaced by pMDI with spacer wherever possible (it has been proven to be of equal efficacy)

N95 should be fit tested for each individual

Donning and doffing methods should be taught to each member of the team

It may be desirable to use overshoes and head covers

[#]To be used over the gown, ^{*}Disposable nonsterile gloves are sufficient, ^{**}Donning refers to putting on work clothes, gear, and equipment, while doffing means removing them, ^{***}Avoid high-flow nasal cannula and noninvasive ventilation, [§]Apron needs to be changed if soiled. HCW: Health-care worker, ARI: Acute respiratory infection, ICU: Intensive care unit, ARI: Acute respiratory infection

health, and family medicine. The nurses should also have worked in the wards of the departments caring for these patients. Other nurses if inducted to care for these patients should undergo appropriate practical training.

COVID-19 ward

This ward will care for patients who are confirmed positive for COVID-19. However, those requiring invasive ventilation should be managed in COVID-19 ICU. As alluded to earlier, noninvasive ventilation should be instituted only in a dedicated room with negative pressure, posing no risk for the HCWs. The staffing for this ward is similar to the COVID-19 suspect ward. However, it would be best if these staff do not simultaneously take care of the patients in both wards to reduce risk of cross infection.

COVID-19 intensive care unit

The COVID-19 ICU will take care of the COVID-19-positive patients requiring ventilation. In the ICU, It would be preferable to intubate patients and ventilate them with a closed circuit rather than noninvasive ventilation or use of high flow nasal cannula. Both of these increase the risk of producing infectious aerosols, posing risk to HCWs and visitors.

The first-level departments for COVID-19 ICU will be medical ICU physicians or pulmonology physicians, experienced in providing critical care. The next level should be the other critical care specialists – surgical, cardiothoracic, neurology, etc., If a critical need arises, anesthesiologists could be called on to manage the ventilation, along with a physician.

The nurses working in this area should also have worked in the critical care units, preferably medical ICU. Other nurses if required should be inducted from medical wards and provided appropriate practical training.

Respiratory therapists/critical care therapists are an important workforce in the management of ventilated patients. They already have the core skills in ventilatory management and can be easily trained to manage ventilated COVID-19 patients. They may be a crucial support for the physicians who manage these patients.

Postexposure prophylaxis for HCW:

Currently, there is no established postexposure prophylaxis for those at high risk of developing COVID-19. Prophylaxis with hydroxychloroquine has been proposed, albeit with limited evidence. ICMR has made the following recommendation:

Eligible individuals:

- Asymptomatic HCWs involved in the care of suspected or confirmed cases of COVID-19
- Asymptomatic household contacts of laboratory-confirmed cases

Dose:

- Asymptomatic HCWs involved in the care of suspected or confirmed cases of COVID-19: 400 mg twice a day on day 1, followed by 400 mg once weekly for the next 7 weeks, to be taken with meals
- Asymptomatic household contacts of laboratory-confirmed cases: 400 mg twice a day on day 1, followed by 400 mg once weekly for the next 3 weeks, to be taken with meals.

CONCLUSION

The COVID-19 pandemic is now a major global health threat. As it continues to spread in several countries, the epidemic has just begun in India. The trajectory that the epidemic may take is not entirely clear. Preparation for the worst should be put in place at war footing. We have provided insights for the preparedness of the health-care settings in the country. HCWs who are at the frontlines in the fight against infectious disease are the most vulnerable. This article deals with various ways of protecting them and ensuring that their lives and welfare are not compromised in the battle against this dreadful microbial disease.

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Conflicts of interest

There are no conflicts of interest.

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