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ORIGINAL RESEARCH

Coronavirus Outbreak: How to Protect Yourself from this Novel Virus: A Review

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ABSTRACT:

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that everyone also practice respiratory etiquette. We have summarised some of the strategies and precautions one can take to block virus transmission. Coronavirus disease 2019 (COVID-19), is caused by the COVID-19 virus, which was first detected in Wuhan, China, in December 2019. On 30 January 2020, the WHO Director-General declared that the current outbreak constituted a public health emergency of international concern. While most people with COVID-19 develop only mild or uncomplicated illness, approximately 14% develop severe disease that requires hospitalization and oxygen support, and 5% require admission to an intensive care unit. In severe cases, COVID-19 can be complicated by the acute respiratory distress syndrome (ARDS), sepsis and septic shock, multiorgan failure, including acute kidney injury and cardiac injury. Older age and co-morbid disease have been reported as risk factors for death. The longest observed duration of viral shedding in survivors was 37 days.

Key words: COVID-19, infectious disease, droplet infection.

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CASE DEFINITIONS FOR SURVEILLANCE⁽¹⁻⁵⁾

The case definitions are based on the current available information and might be revised as new information accumulates. Countries may need to adapt case definitions depending on their own epidemiologic situation.

Suspect case

A. Patient with severe acute respiratory infection (fever, cough, and requiring admission to hospital), AND with no other etiology that fully explains the clinical presentation AND a history of travel to or residence in China during the 14 days prior to symptom onset

B. Patient with any acute respiratory illness AND at least one of the following during the 14 days prior to symptom onset:

a) contact with a confirmed or probable case of 2019-nCoV infection, or

b) worked in or attended a health care facility where patients with confirmed or probable 2019-nCoV acute respiratory disease patients were being treated.⁶

Probable case

A suspect case for whom testing for 2019-nCoV is inconclusive or is tested positive using a pan-coronavirus assay and without laboratory evidence of other respiratory pathogens.

Confirmed case

A person with laboratory confirmation of 2019-nCoV infection, irrespective of clinical signs and symptoms.⁷⁻¹²

Definition of contact^(5,12)

A contact is a person involved in any of the following:
- Providing direct care for 2019-nCoV patients, working with health care workers infected with novel

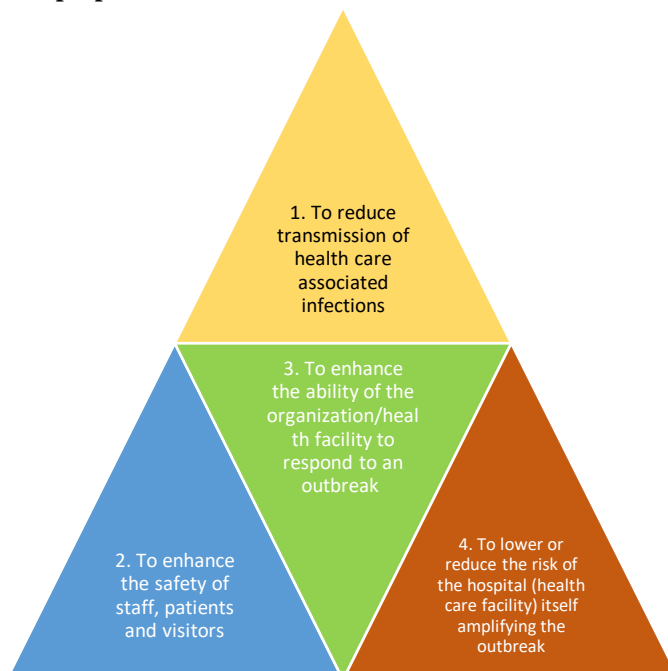
coronavirus, visiting patients or staying in the same close environment of a 2019-nCoV patient.

- Working together in close proximity or sharing the same classroom environment a with 2019-nCoV patient

- Traveling together with 2019-nCoV patient in any kind of conveyance

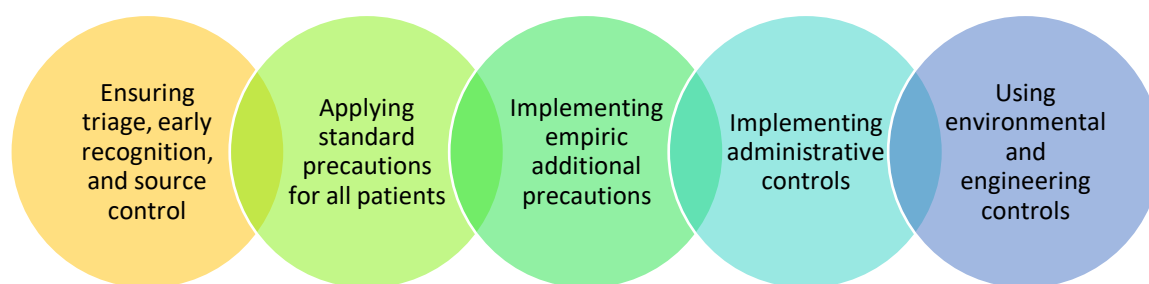
- Living in the same household as a 2019-nCoV patient within a 14-day period after the onset of symptoms in the case under consideration.

IPC goals in outbreak preparedness ⁽⁸⁾



IPC strategies to prevent or limit transmission in healthcare settings ^(1,11)

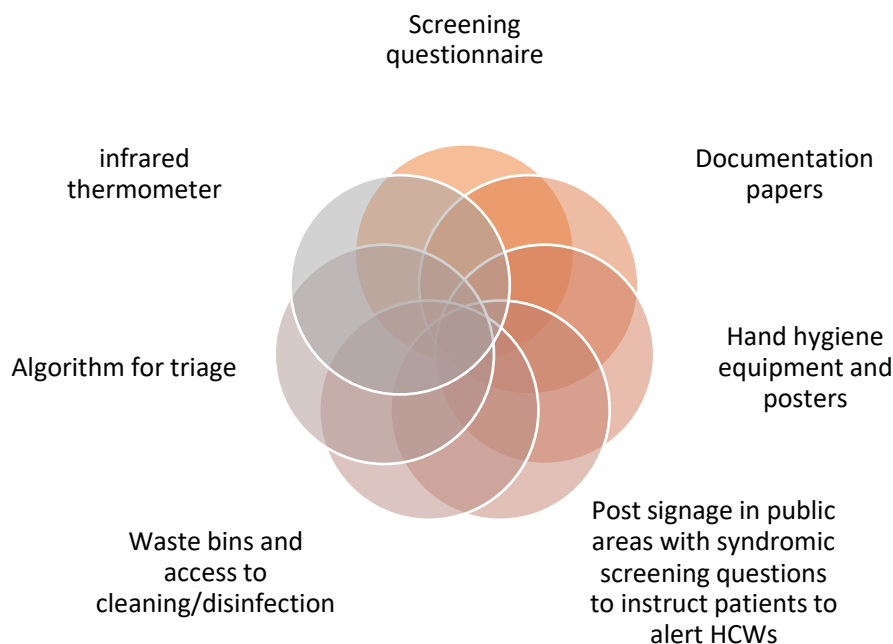
IPC strategies to prevent or limit transmission in healthcare settings include the following:



A. Ensuring triage, early recognition, and source control ^{(1) (8) (11)}

- Suspected patients to be triaged at the screening area of the Emergency
- Encouraging HCWs to have a high level of clinical suspicion
- Establishing a well-equipped triage station at the entrance of health care facility, supported by trained staff
- Prevent overcrowding.
- Keep at least 1-2 meters distance between suspected patients.
- Adequate supplies including alcohol-based hand rub (ABHR), tissues, no touch receptacles for disposal, and facemasks at designated areas

The triage or screening area requires the following equipment:



B. Applying standard precautions for all patient

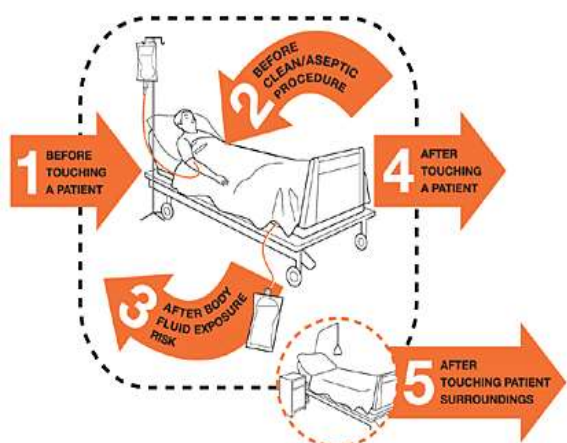
-Elements of Standard Precautions-



- Ensuring that all patients cover their nose and mouth with a tissue or elbow when coughing or sneezing
- Offering a medical mask to patients with suspected 2019-nCoV infection while they are in waiting/public areas or in cohorting rooms

1. **Hand hygiene**-Performing hand hygiene after contact with respiratory secretions.

HCWs should apply the **WHO’s My 5 Moments for Hand Hygiene** ⁽⁸⁾



Respiratory hygiene/etiquette-⁽¹¹⁾

- Reduces the spread of microorganisms (germ) that cause respiratory infections (colds, flu).
- Turn head away from others when coughing/sneezing
- Cover the nose and mouth with a tissue and do not spit here and there
- If tissues are used, discard immediately into the trash
- Cough/sneeze into your sleeve if no tissue is available
- Clean your hands with soap and water or alcohol based products
- Encourage handwashing for patients with respiratory symptoms
- Provide masks for patients with respiratory symptoms

- Patients with fever + cough or sneezing should be kept at least 1m away from other patients
- Post visual aids reminding patients and visitors with respiratory symptoms to cover their cough

PPE for use in health care for COVID-19 Principles for using PPE –⁽²⁾

- Always clean your hands before and after wearing PPE
- PPE should be available where and when it is indicated –
 - in the correct size
 - select according to risk or per transmission based precautions
- Always put on before contact with the suspected or infected person
- Always remove immediately after completing the task and/or leaving the patient care area
- NEVER reuse disposable PPE
- Clean and disinfect reusable PPE between each use Principles for using PPE
- Change PPE immediately if it becomes contaminated or damaged
- PPE should not be adjusted or touched during patient care; specifically-never touch your face while wearing PPE
- if there is concern and/or breach of these practices, leave the patient care area when safe to do so and properly remove and change the PPE
- Always remove carefully to avoid self-contamination (from dirtiest to cleanest areas)

Recommendations for optimizing the availability of PPE^(10,11)



5. Environment cleaning, disinfection and BMW-^(6,11)

- It is important to ensure that environmental cleaning and disinfection procedures are followed consistently and correctly.
- Thorough cleaning environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite, 0.5%, or ethanol, 70%) are effective and sufficient procedures.
- Medical devices and equipment, laundry, food service utensils and medical waste should be managed in accordance with safe routine procedures.

C. Implementing empiric additional precautions-^(4,11)

- Patients should be placed in adequately ventilated single rooms. For general ward rooms with natural ventilation, adequate ventilation is considered to be 60 L/s per patient
- When single rooms are not available, patients suspected of being infected with nCoV should be grouped together
- All patients’ beds should be placed at least 1 m apart regardless of whether they are suspected to have nCov infection
- Where possible, a team of HCWs should be designated to care exclusively for suspected or confirmed cases to reduce the risk of transmission
- HCWs should use a medical mask ⁽⁴⁾

S. No.	Name of the item	Category of personnel
1.	PPE Kit, N 95, Mask, Gloves, Goggles, cap and shoe cover)	<ul style="list-style-type: none"> • Doctors and nurses attending to patients in isolation, ICU/ critical care facilities of hospitals in the containment zone. • Para-medical staff in the back cabin of ambulance. • Auxillary/ support staff involved in disinfection vehicles/ ambulances and surface cleaning of hospital floors and other surfaces
2.	N-95 Mask and gloves	<ul style="list-style-type: none"> • Supervisory doctors verifying a suspect case • Persons collecting samples. • Doctors/nurses attending patients in primary health care facilities
3.	Triple Layer Surgical mask	<ul style="list-style-type: none"> • To be used by Field workers doing surveillance work • Staff providing essential services. • Suspect cases and care giver / by stander of the suspect case • Security staff. • Ambulance drivers • Residents permitted to go out for essential services .

D. Implementing administrative controls

- Establishing sustainable IPC infrastructures and activities
- Educating patients’ caregivers
- Developing policies on the early recognition of acute respiratory infection potentially caused by 2019-nCoV
- Ensuring access to prompt laboratory testing for identification of the etiologic agent
- Preventing overcrowding, especially in the emergency department
- Providing dedicated waiting areas for symptomatic patients
- Appropriately isolating hospitalized patients
- Ensuring an adequate patient-to-staff ratio;
- Ensuring that health care workers and public, understand the importance of promptly seeking medical care
- Ensuring adequate supplies of PPE
- A dedicated central helpline number 011-23978046 is provided at the Control room and state(district headquarter) and its number is widely circulated for providing general population with information on risks of COVID-19 transmission, the preventive measures required and the need for prompt reporting to health facilities, availability of essential services and administrative orders on perimeter control.
- Regular press briefings/ press releases is updated to keep media on the developments and avoid stigmatization of affected communities.
- Awareness is created among the community through miking, distribution of pamphlets, mass SMS and social media. Also use of radio and television (using local channels) will ensure penetration of health messages in the target community.

D. Using environmental and engineering controls (7,8,11)

- These controls address the basic infrastructure of the health care facility.
- These controls aim to ensure there is adequate ventilation in all areas in the healthcare facility, as well as adequate environmental cleaning.
- Additionally, spatial separation of at least 1 meter should be maintained between all patients. Both spatial separation and adequate ventilation can help reduce the spread of many pathogens in the healthcare setting.
- Ensure that cleaning and disinfection procedures are followed consistently and correctly.
- Cleaning environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure.
- Managing laundry, food service utensils and medical waste in accordance with safe routine procedures.

2. All official travels are cancelled unless absolutely essential
3. Business gatherings are cancelled.
4. People with respiratory symptoms are advised to stay at home till recovery
5. Schools have been closed till 31st March, 2020.
6. All the sports events are cancelled or are suggested to be conducted without audiences.
7. Many companies with work from home option have given that facility to the employees.
8. Reduce hospital visits for the patients with Non-communicable diseases including HT and DM by giving drugs for 2 months
 - a. To reduce the hospital visits
 - b. To reduce the risk of getting the disease
9. Universities have started online teachings and have also postponed the examinations including the Board exams for classes 10th and 12th.
10. Academies and coaching centers have been closed and encouraged to conduct online trainings.
11. Closure of Cinema theatres, malls, gyms, theme parks, tourism spots, cultural and social centers.
12. Notified fairs and festivals have been cancelled.
13. Family gatherings, weddings have been postponed.⁸⁻¹²

Steps taken by Indian Government towards Social distancing COVID -19

1. All the public and private establishment are advised to cancel all the Official meeting including Trainings, conferences, seminars and workshops.

Major Recommendations-⁽¹³⁾

For countries with imported cases and/or outbreaks of COVID-19	For uninfected countries
1. Immediately activating the highest level of national Response Management protocols to ensure the all-of-government and all-of-society approach needed to contain COVID-19 with non-pharmaceutical public health measures 2. To prioritize active, exhaustive case finding and immediate testing and isolation, painstaking contact tracing and rigorous quarantine of close contacts. 3. Fully educate the general public on the seriousness of COVID-19 and their role in preventing its spread. 4. Immediately expand surveillance to detect COVID-19 transmission chains, by testing all patients with atypical pneumonias, conducting screening in some patients with upper respiratory illnesses and/or recent COVID-19 exposure, and adding testing for the COVID-19 virus to existing surveillance systems (e.g. systems for influenza-like-illness and SARI)	1. To be prepared to immediately activate the highest level of emergency response mechanisms to trigger the all-of-government and all-of society approach that is essential for early containment of a COVID-19 outbreak. 2. Rapidly test national preparedness plans in light of new knowledge on the effectiveness of non-pharmaceutical measures against COVID-9 3. Immediately enhance surveillance for COVID-19 as rapid detection is crucial to containing spread. 4. Begin now to enforce rigorous application of infection prevention and control measures in all healthcare facilities, especially in emergency departments and outpatient clinics, as this is where COVID-19 will enter the health system. 5. Rapidly assess the general population’s understanding of COVID-19, adjust national health promotion materials and activities accordingly, and engage clinical champions to communicate with the media.

CONCLUSION

Since December 2019, the newly discovered coronavirus (2019-nCoV) has caused the outbreak of pneumonia in Wuhan and throughout China with a death toll of around 3,226. The rapidly increasing number of cases and evidence of human-to-human transmission suggested that the virus is more contagious than SARS-CoV and MERS-CoV. The disease has spread to 176 countries including India where the total number of confirmed COVID-19 suspects is 166 currently with its chances to increase indefinitely. We have reviewed several strategies and precautions one can take to block virus transmission including patient evaluation, hand hygiene, personal protective measures for the health care workers and community to curb the increasing number of cases in India and worldwide.

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