Republic of the Philippines
Department of Health
OFFICE OF THE SECRETARY

February 10, 2020

DEPARTMENT CIRCULAR
No. 2020 - 0049

TO: **ALL UNDERSECRETARIES AND ASSISTANT SECRETARIES; DIRECTORS OF BUREAUS AND CENTERS FOR HEALTH DEVELOPMENT; MINISTER OF HEALTH – BANGSAMORO AUTONOMOUS REGION IN MUSLIM MINDANAO); EXECUTIVE DIRECTORS OF SPECIALTY HOSPITALS, NATIONAL NUTRITION COUNCIL; CHIEFS OF MEDICAL CENTERS, HOSPITALS, SANITARIA AND INSTITUTES; PRESIDENT OF THE PHILIPPINE HEALTH INSURANCE CORPORATION; DIRECTORS OF PHILIPPINE NATIONAL AIDS COUNCIL AND TREATMENT AND REHABILITATION CENTERS AND OTHERS CONCERNED**

SUBJECT: **Reiteration of the Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCoV ARD) Response in Hospitals and Other Health Facilities**

The Department of Health reiterates Department Memorandum No. 2020-0072 entitled "Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCoV ARD) Response in Hospitals and Other Health Facilities."

This is to provide guidance to all health facilities and institutions whether public or private on the necessary precautions, preparations of the health facilities, and management of persons under investigation (PUI) and confirmed cases of the 2019-nCoV ARD.

Dissemination of the information to all concerned is requested.

FRANCISCO T. DUQUE III, MD, MSc
Secretary of Health

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FEB 10 2020
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Republic of the Philippines
Department of Health
OFFICE OF THE SECRETARY

February 3, 2020

DEPARTMENT MEMORANDUM
No. 2020 - 0072

TO: **ALL UNDERSECRETARIES AND ASSISTANT SECRETARIES; DIRECTORS OF BUREAUS AND CENTERS FOR HEALTH DEVELOPMENT; MINISTER OF HEALTH – BANGSAMORO AUTONOMOUS REGION IN MUSLIM MINDANAO); EXECUTIVE DIRECTORS OF SPECIALTY HOSPITALS AND NATIONAL NUTRITION COUNCIL; CHIEFS OF MEDICAL CENTERS, HOSPITALS, SANITARIA AND INSTITUTES; PRESIDENT OF THE PHILIPPINE HEALTH INSURANCE CORPORATION; DIRECTORS OF PHILIPPINE NATIONAL AIDS COUNCIL AND TREATMENT AND REHABILITATION CENTERS AND OTHERS CONCERNED**

SUBJECT: **Interim Guidelines for 2019 Novel Coronavirus Acute Respiratory Disease (2019-nCoV ARD) Response in Hospitals and Other Health Facilities**

I. BACKGROUND

After a cluster of pneumonia cases of unknown etiology was reported in Wuhan City, Hubei Province of China last December 31, 2019, Chinese health authorities preliminarily identified the cause of this viral pneumonia as a new or novel type of coronavirus (2019-nCoV).

With an increasing number of cases spreading to various territories and confirmed human-to-human transmission, the World Health Organization declared the outbreak as a Public Health Emergency of International Concern (PHEIC) last January 30, 2020.

The Department of Health (DOH) hereby issues these interim guidelines for all health facilities and institutions whether public or private on the necessary precautions, preparations of the health facilities, and management of persons under investigation (PUI) and confirmed cases of the 2019-nCoV ARD.

II. GENERAL GUIDELINES

1. All Level 2 and Level 3 hospitals shall attend to all PUIs.
2. All hospitals and health facilities shall establish and maintain an Infection Prevention and Control Committee (IPCP) in the health facility, headed by an infection control physician and infection control nurse. The IPCP shall be responsible for the formulation, implementation, and monitoring of policies, guidelines, and procedures related to infection control. *(Refer to the National Standards in Infection Control for Healthcare Facilities, 2009 Edition)*

3. All hospitals and health facilities shall ensure that all hospital personnel are familiar with and adhere to infection prevention policies, guidelines, and procedures of the hospital, and shall be protected at all times since they are the first in line for exposure.
4. All hospitals and health facilities shall ensure that all resources and contingencies needed for the implementation of infection prevention and control measures are adequately available.
5. All hospitals and health facilities shall ensure that appropriate personal protective equipment (PPE) are appropriately used by patients and hospital personnel, according to existing protocols.

III. SPECIFIC GUIDELINES

A. Infection Prevention and Control

Universal precautionary measures are implemented in all health facilities. However, for an emerging infectious disease event such as the 2019-nCoV ARD, standard prevention and control strategies must be employed.

IPC strategies to prevent or limit infection transmission in health-care settings are summarized in ***Annex A.***

B. Case Definition

1. **Patient under Investigation (PUI)**
   Clinical features and epidemiological risk should be considered in identifying persons as PUI for 2019-nCoV ARD. A person meeting the following criteria should be evaluated as a PUI in association with the outbreak of 2019-nCoV ARD:

   a) A person with Severe Acute Respiratory Infection (SARI), with history of fever and cough requiring admission to hospital, with no other etiology that fully explains the clinical presentation (clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised), and ANY of the following:
      (1) A history of travel to China and other 2019-nCoV ARD affected areas in the 14 days prior to symptom onset.
      (2) The disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, without regard to place of residence or history of travel;
      (3) The person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified that fully explains the clinical presentation.

   OR

   b) Individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had ANY of the following exposures:
      (1) Close physical contact with a confirmed case of 2019-nCoV ARD infection, while that patient was symptomatic;

(2) A healthcare facility in a country where hospital associated 2019-nCoV ARD infections have been reported;
(3) Direct contact with animals (if animal source is identified) in countries where the 2019-nCoV ARD is known to be circulating in animal populations or where human infections have occurred as a result of presumed zoonotic transmission

PUIs may present a range of signs and symptoms from mild, moderate, or severe illness; the latter includes severe pneumonia, ARDS, sepsis and septic shock. (See page *3* of ***Annex B*** for clinical manifestation of 2019-nCoV ARD*)* The criteria and the DOH decision tool ***(Annex C)*** shall be used to guide evaluation.

2. **Close Contact**

Persons visiting patients or staying in the same close environment of a 2019-nCoV ARD confirmed case who are either:

a) Within approximately 6 feet (2 meters), or within the room or care area, of a confirmed case for a prolonged period of time while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, NIOSH-certified disposable N95 respirator, eye protection); **OR**
b) Having direct contact with infectious secretions of a novel coronavirus case (e.g., being coughed on) while not wearing recommended personal protective equipment.

Close contact can include caring for, living with, visiting, or sharing a health care waiting area or room with a confirmed case.

The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

C. Patient Screening

The objective of screening is to quickly identify people with a travel history to countries with ongoing transmission of 2019-nCoV ARD. All personnel in health facilities should be trained on the following 2019-nCoV ARD screening procedures:

1. Screen at all points of entry to the health facility (to catch every patient and visitor).
2. Use broad criteria to quickly identify all patients at risk (i.e. travel to China in the last 14 days).
3. Train screening staff on what to probe. e.g., Have you traveled overseas in the last 14 days? Did you travel to China? Have you visited any animal or seafood market? Did you visit any healthcare facility or sick person during your travel?
4. Train screening staff on what to do once a PUI is identified.
5. Identify holding and isolation areas and healthcare workers who will perform further assessment of patients.
6. Ensure that effective triage checklist and patient flow are in place.
7. Ensure that necessary precautions are observed:
   a) Designate a well-ventilated area.
   b) Maintain a minimum 1-meter distance from patients.
   c) Provide symptomatic patients with facemask for source control when possible.

d) Perform hand hygiene frequently.
e) Follow standard precautions and droplet precautions when evaluating patients with acute respiratory tract infections.

8. Once identified, immediately isolate PUIs in designated holding or isolation areas with full infection control precautions.
9. There should be prompt reporting of cases to surveillance units for immediate contact tracing and quarantine measures. Ensure that the relevant contact numbers are readily available.

D. Patient Triage

The objective of triage is to determine if patients have symptoms of 2019-nCoV ARD infection and if so, to promptly isolate them. Only health care personnel should perform triage.

1. Triage should ideally be conducted in an isolation room with negative pressure and/or adequate ventilation.
2. Other respiratory hygiene supplies (such as facial tissues), trash cans, and hand hygiene facilities should be available inside the room.
3. Triage officers should wear the appropriate PPE.
4. Triage officers shall conduct a complete history and physical examination, and decide whether a patient fulfills the case definition or criteria for the specific Respiratory Infection of Pandemic or Outbreak Potential (RIPOP) in consultation with surveillance officers and consultant(s) in charge of EREIDs.
5. If patients are in queue (surge of patients), separate the "sick" from the "well" patients by 6 feet (2 meters) , and ensure patients are at least 3 feet (1 meter) apart from each other.

E. Referral for Admission

1. Symptomatic contacts or PUIs should be considered for admission for close observation in a health facility.
2. Based on WHO guidelines, coordination with a health facility and/or health care provider should be done during the observation period. Medical personnel should be involved in reviewing the current health status of the contacts by phone and, ideally, by scheduled visits on a regular (e.g. daily) basis, performing specific diagnostic tests as necessary.
3. Doctors and other health care professionals should give advance instructions on where to seek care when a contact becomes ill, what should be the most appropriate mode of transportation, when and where to enter the designated health care facility, and what infection control precautions should be followed.
4. Once the receiving medical facility has been notified that a symptomatic contact will be referred to their facility, the facility should facilitate transport of patient to the facility.
5. The ill contact should be advised to perform respiratory hygiene and stand or sit as far away from others as possible or at least 3 feet (1 meter), when in transit and when in the health care facility.
6. Appropriate hand hygiene should be employed by the ill contact and caregivers. Any surfaces that become soiled with respiratory secretions or body fluids during transport should be cleaned with regular household cleaners or a diluted bleach solution, whichever is most appropriate.

F. Isolation Precautions

1. The duration of infectivity for 2019-nCoV ARD is unknown. While Standard Precautions should continue to be applied always, additional isolation precautions should be used during the duration of symptomatic illness and continued for 24 hours after the resolution of symptoms. ***(Annex A2)***
2. Given that little information is currently available on viral shedding and the potential for transmission of 2019-nCoV ARD, testing for viral shedding should assist the decision making when readily available.
3. Patient information (e.g. age, immune status and medication) should also be considered in situations where there is concern that a patient may be shedding the virus for a prolonged period.

G. Notification

1. Designated disease surveillance officers in hospitals and other facilities shall be responsible for doing the preliminary assessment of suspected cases in their respective health facility and report accordingly using the form in ***Annex D***.
2. Healthcare providers should immediately notify the infection control personnel at their healthcare facility and report any event of a possible case of 2019-nCoV ARD to the Municipal Health Officer (MHO) or City Health Officer (CHO) for verification and initial investigation. The MHO/CHO shall then report to the Regional Epidemiology Surveillance Unit (RESU) using the Event-Based Surveillance System (ESR) system of the Epidemiology Bureau (EB) of DOH.

H. Clinical Management

1. There is no current evidence from RCTs to recommend any specific anti-2019-nCoV ARD treatment for PUIs or confirmed cases.
2. All healthcare providers are advised to use the latest available clinical practice guidelines issued by local specialty societies and duly-endorsed by the DOH. In the interim, a separate issuance will be published by the DOH.

I. Discharge and Follow-up

Due to the evolving nature of the etiology of 2019-nCOV, guidance for discharge criteria and management during follow-up shall be regularly updated and published in a separate issuance. In the interim, the following shall apply.

1. Confirmed positive cases on admission SHOULD ONLY be discharged if ALL of the following conditions are fulfilled:
    a. Two negative RT-PCR tests for 2019-nCoV ARD done 48 hours apart.
    b. Afebrile and asymptomatic (including cough and respiratory symptoms) for 48 hours.
    c. Laboratory and radiologic tests done according to clinical case management (e.g. chest x-ray WBC, platelet count, CPK, liver functions tests, plasma sodium) previously abnormal returning to normal
2. PUIs admitted as per DOH Decision Tool (***Annex C***), shall be discharged upon NEGATIVE 2019-nCoV ARD test from RITM. Until then PUIs shall be admitted in isolation even if asymptomatic. Repeat testing for patients with an initial negative nCoV test result may be performed if a high index for suspicion

for 20191-nCoV ARD remains despite an initial negative test result. Such conditions include, but are not limited, to the following:

a. Clinical deterioration in the presence of an established disease etiology and with adequate treatment. A single negative test result, particularly if this is from an upper respiratory tract specimen, does not exclude infection. Repeat sampling and testing, preferably of lower respiratory specimen, is strongly recommended in severe or progressive disease. Consider a possible co-infection with 2019-nCoV.
b. No other etiology for the patient's signs and symptoms has been identified despite work-up.
c. Clinical specimen(s) initially sent was/were deemed to be unsatisfactory or insufficient (delay in transport and processing, only NPS or OPS was sent).

3. For mortalities of 2019-nCoV ARD, refer to guidelines for Disposal and Shipment of the Remains of confirmed cases of 2019-nCoV ARD.

4. Hospital Disease Surveillance Officer shall report to the RESU within 24 hours the patients that have been discharged. The RESU shall then report to the DOH Regional Director and the 2019-nCoV ARD Task Force
   a. One week after discharge, confirmed cases should submit to mandatory follow-up and retesting for chest x-ray, complete blood count, and other laboratory tests which previously yielded abnormal results.

H. Sources of 2019-nCoV ARD Information and Advisories

1. Everyone is advised to refrain from sharing unverified reports and/or false news to avoid undue stress and worry due to misinformation.
2. For announcements and public advisories, you may visit the following official DOH channels:
   - Website: https://www.doh.gov.ph/2019-nCoV
   - Facebook: https://www.facebook.com/OfficialDOHgov/
   - Twitter: https://twitter.com/DOHgov
3. DOH health promotion materials (e.g. infographics, social media cards among others) may be reproduced by hospitals and other health facilities for instructional use or to keep health workers and patients informed free of charge.

For strict compliance of all concerned.

FRANCISCO T. DUQUE III, MD, MSc
Secretary of Health

Annex A. Infection Prevention and Control Practices

1. **HAND HYGIENE**
   a. Proper handwashing is the single most effective way to prevent infections in the hospital.
   b. Hand hygiene practices in the health facility must be emphasized using the WHO Multimodal Hand Hygiene Strategy: 5 Moments of Hand Hygiene *(Annex A1)* and proper handwashing technique.
   c. The availability of alcohol-based hand rubs at point-of-care and other areas of the facility must be ensured.

2. **ISOLATION PRECAUTION**
   To achieve effective interruption in the transmission of an infectious agent, it is essential to use two tiers of precautions (***Annex A2***)
   a. Standard Precautions for the care of all patients; AND
   b. Transmission-based precautions for patients with known or suspected disease spread by any of these routes: Airborne Precautions, Droplet Precautions or Contact Precautions

3. **PERSONAL PROTECTIVE EQUIPMENT**
   a. Appropriately wearing personal protective equipment (PPE), such as gloves, masks, and gowns, is also essential to protect healthcare workers from contact with infectious agents. The selection of PPE is based on the nature of the patient interaction and/or mode of transmission (***Annex A3***).
   b. Hand hygiene is always the first and the final step before wearing or after removing and disposing of PPE.

4. **DECONTAMINATION, DISINFECTION AND STERILIZATION**
   Proper cleaning, disinfection and sterilization is one of the most effective ways of disrupting the transmission and spread of microorganisms in the healthcare setting. Existing protocols need to be strictly implemented by healthcare personnel (***Annex A4***).

5. **SPECIMEN COLLECTION**
   a. All specimens collected for laboratory testing shall be regarded as potentially infectious.
   b. All Health Care Workers who will collect, handle or transport, perform testing any clinical specimens shall adhere rigorously to the standard precaution measures such as Personal Protective Equipment (i.e. gloves, laboratory gown, N95 Masks, face shield, etc.), and ensure biosafety practices are observed to minimize the possibility of exposure to pathogens.
   c. For further details of the guidelines kindly refer to the "Interim Laboratory Biosafety Guidelines for Handling and Processing Suspected 2019 Novel Coronavirus (2019 nCoV) Specimens" of Research Institute for Tropical Medicine.

6. **SPECIMEN HANDLING, PROCESSING, PACKAGING AND TRANSPORT**
   To ensure that proper handling, processing, packaging and transport of laboratory specimens from suspected Person Under Investigation (PUI) is observed, please refer to the DOH Manual on Packaging and Transport of Laboratory Specimen for Referral and Interim Laboratory Biosafety Guidelines for Handling and Processing Suspected 2019-nCoV Specimens (http://bit.ly/2tdLr4x)

7. FLOW OF PATIENTS SUSPECTED TO BE INFECTIOUS

Early detection and placement of patients to appropriate areas in the health facility is critical in the prevention of spread of infectious diseases. For guidelines on the management of patients suspected to be infectious, kindly refer to the Interim Guidelines on the Preparedness and Response to Novel Coronavirus (2019-nCoV) issued.

Health facilities should ensure that all resources and contingencies needed to support the management of patients and for the implementation of infection prevention and control measures are adequately available.

8. DISPOSAL OF INFECTIOUS BODY

For proper handling of infectious body, strict adherence to precautionary measures is a must. Kindly refer to the Guidelines on Disposal of Dead Persons from Dangerous Communicable Diseases for guidance.

9. HEALTHCARE WASTE MANAGEMENT

a. "Health Care Waste" (HCW) includes all the solid and liquid waste generated as a result of any of the following: (***Annex A5***)
   i. Diagnosis, treatment, or immunization of human beings;
   ii. Research pertaining to the above activities;
   iii. Research using laboratory animals for the improvement of human health;
   iv. Production or testing of biological products; and
   v. Other activities performed by health care facilities.

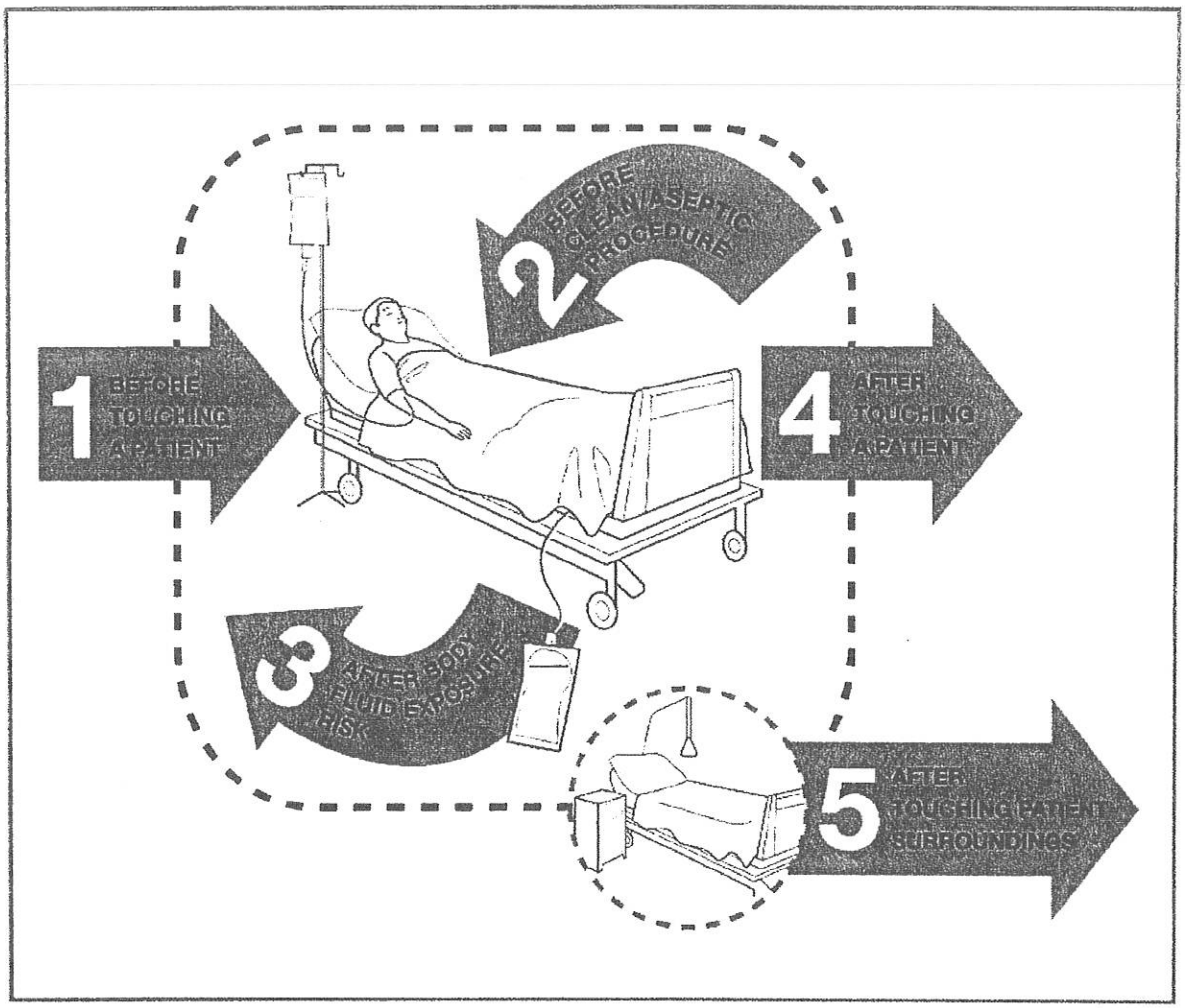
b. Management of health care waste, more specifically of the hazardous waste types (which include infectious waste) must be done through proper waste disposal to mitigate risks and potential health hazards to people exposed. Infectious waste should always be assumed to potentially contain a variety of pathogenic microorganisms that may enter the human body through the following routes:
   i. through a puncture, abrasion, or cut in the skin
   ii. through the mucous membrane
   iii. by inhalation
   iv. by ingestion

10. REFERENCES

Full WHO guidelines are available at Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. Retrieved from the following:

- https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125; and
- https://www.who.int/publications-detail/advice-on-the-use-of-masks-the-community-during-home-care-and-in-health-care-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak

Annex A1. Five Moments of Handwashing



Source:
The patient zone, health-care area, and critical sites with inserted time-space representation of "My five moments for hand hygiene" (Figure I.21.5b). Reprinted by the World Health Organization from Sax, 2007 with permission from Elsevier. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/44102/9789241597906_eng.pdf;jsessionid=F58881D16DB6861F4F387CFD85E3A998?sequence=1

Annex A2. Isolation Precautions

A. Standard Precautions

1. Standard precautions are recommended for all hospitalized patients should consist of hand hygiene and respiratory hygiene with cough etiquettes. This also includes safe disposal of instruments and soiled linens.
2. All healthcare workers should use appropriate barrier precautions to avoid skin and mucous membrane exposure when contact with blood or body fluids from any patient.
3. Gloves should be worn for contact with blood and body fluids, mucous membranes, or non-intact skin; when handling surfaces or items soiled with blood or body fluids; or for venipuncture or other procedures involving vascular access.
4. Gloves should be changed after each patient contact.
5. Masks and protective eyewear or face shields should be worn when procedures are likely to generate aerosols or droplets of blood or other body fluids.
6. Gowns should be worn for procedures that are likely to soil clothing.
7. Hands or skin contaminated with blood or body fluids should be washed immediately using soap and water. Hand hygiene should be done after removing gloves.
8. Precautions should be taken to prevent sharps or needlestick injuries. Needles should not be recapped, removed from disposable syringes, or manipulated by hand. After use, needles, disposable syringes, scalpels, and other disposable sharp instruments should immediately be placed in a designated puncture-resistant container.
9. Mouthpieces and resuscitation devices should be readily available for use in areas where resuscitation procedures may be anticipated.
10. All healthcare workers with exudative skin lesions should not be involved in direct patient care or should not handle patient-care equipment until the condition has resolved.

B. Transmission-based Precautions

1. When standard precautions are not able to completely interrupt the route of transmission of certain infections, transmission-based precautions are implemented.

C. Contact Precautions

1. Contact Precautions are intended to prevent transmission of pathogens which are spread by direct or indirect contact with the patient or the patient's environment. It applies when there is presence of excessive wound drainage, fecal incontinence, or other discharges from the body suggest an increased potential for extensive environmental contamination and risk of transmission.
2. A single-patient room is preferred for patients who require Contact Precautions.
3. When a single-patient room is not available, consultation with the ICC is recommended to assess the various risks associated with other patient placement options (e.g., cohorting, keeping the patient with an existing roommate).
4. In multi-patient rooms, ≥3 feet spatial separation between beds is advised to reduce the opportunities for inadvertent sharing of items between the infected/colonized patient and other patients.
5. Healthcare personnel caring for patients on Contact Precautions MUST wear a gown and gloves for all interactions that may involve contact with the patient or potentially contaminated areas in the patient's environment.

6. Donning PPE upon room entry and discarding before exiting the patient room is done to contain pathogens, especially those that have been implicated in transmission through environmental contamination.

D. Droplet Precautions

1. Droplet Precautions are intended to prevent transmission of pathogens spread through close respiratory or mucous membrane contact with respiratory secretions. Because these pathogens do not remain infectious over long distances in a healthcare facility, special air handling and ventilation are not required to prevent droplet transmission.
2. A single patient room is preferred for patients who require Droplet Precautions.
3. When a single-patient room is not available, consultation with the ICC is recommended.
4. Spatial separation of ≥3 feet and drawing the curtain between patient beds is especially important for patients in multi-bed rooms with infections transmitted by the droplet route.
5. Healthcare personnel caring for patients on Droplet Precautions MUST wear a mask (a respirator is not necessary) for close contact with infectious patient; the mask is generally donned upon room entry.
6. Patients on Droplet Precautions who must be transported outside of the room should wear a mask if tolerated and follow Respiratory Hygiene and Cough etiquette.

E. Airborne Precautions

1. Airborne Precautions prevent transmission of infectious agents that remain infectious over long distances when suspended in the air (ie. rubeola virus [measles], varicella virus [chickenpox], M. tuberculosis, and SARS-CoV).
2. The preferred placement for patients who require Airborne Precautions is in an airborne infection isolation room (AIIR).
3. An AIIR is a single-patient room that is equipped with special air handling and ventilation capacity that meet international standards (i.e., monitored negative pressure relative to the surrounding area, 12 air exchanges per hour for new construction and renovation and 6 air exchanges per hour for existing facilities, air exhausted directly to the outside or recirculated through HEPA filtration before return)
4. It is best that isolation rooms are present in hospitals, emergency departments, and nursing homes that care for patients with M. tuberculosis.
5. In settings where Airborne Precautions cannot be implemented due to limited engineering resources (e.g., physician offices), masking the patient, placing the patient in a private room (e.g., office examination room) with the door closed, and providing N95 or higher level respirators or masks if respirators are not available for healthcare personnel will reduce the likelihood of airborne transmission until the patient is either transferred to a facility with an AIIR or returned to the home environment, as deemed medically appropriate.
6. Healthcare personnel caring for patients on Airborne Precautions MUST wear a mask or respirator, depending on the disease-specific recommendations that is donned prior to room entry.

Annex A3. Personal Protective Equipment (PPE)

A. Gloves

1. Gloves are used to prevent contamination of healthcare personnel hands when:
    a) anticipating direct contact with blood or body fluids, mucous membranes, non-intact skin and other potentially infectious material
    b) having direct contact with patients who are colonized or infected with pathogens transmitted by the contact route
    c) handling or touching visibly or potentially contaminated patient care equipment and environmental surfaces.
2. The healthcare personnel should use the following during specimen collection on a PUI: Double Gloves (preferably: Nitrile); Scrub suit; Disposable Laboratory Gown (impermeable/ breathable/ long sleeves/ back enclosure) ; Fit Tested N95 mask; Face shield / visor.
3. During patient care, transmission of infectious organisms can be reduced by adhering to the principles of working from "clean" to "dirty" and confining or limiting contamination to surfaces that are directly needed for patient care.
4. It may be necessary to change gloves during the care of a single patient to prevent cross-contamination of body sites.
5. It also may be necessary to change gloves if the patient interaction also involves touching portable computer keyboards or other mobile equipment that is transported from room to room.
6. Discarding gloves between patients is necessary to prevent transmission of infectious material.
7. Gloves must not be washed for subsequent reuse because microorganisms cannot be removed reliably from glove surfaces and continued glove integrity cannot be ensured.
8. When gloves are worn in combination with other PPE, they are put on last.
9. Hand hygiene following glove removal further ensures that the hands will not carry potentially infectious material that might have penetrated through unrecognized tears or that could contaminate the hands during glove removal.

B. Isolation Gowns

1. Isolation gowns are used as specified by Standard and Transmission-Based Precautions to protect the HCW's arms and exposed body areas; and to prevent contamination of clothing with blood, body fluids, and other potentially infectious material.
2. When applying Standard Precautions, an isolation gown is worn only if contact with blood or body fluid is anticipated.
3. When Contact Precautions are indicated, donning of both gown and gloves upon room entry is indicated to address unintentional contact with contaminated environmental surfaces.
4. Gowns are usually the first piece of PPE to be donned. Full coverage of the arms and body front, from neck to the mid-thigh or below will ensure that clothing and exposed upper body areas are protected.
5. Isolation gowns should be removed before leaving the patient care area to prevent possible contamination of the environment outside the patient's room.
6. Isolation gowns should be removed in a manner that prevents contamination of clothing or skin. The outer, "contaminated" side of the gown is turned inward and rolled into a bundle, and then discarded into a designated container for waste or linen to contain contamination.

C. Face Protection

a. Face Masks

1. Masks are used for three primary purposes:
    a. Placed on HCWs to protect them from contact with infectious material from patients, example, respiratory secretions and sprays of blood or body fluids, consistent with Standard Precautions and Droplet Precautions;
    b. Placed on HCWs when engaged in procedures requiring sterile technique to protect patients from exposure to infectious agents carried in a HCW's mouth or nose;
    c. Placed on coughing patients to limit potential dissemination of infectious respiratory secretions from the patient to others (Respiratory Hygiene/Cough Etiquette).
2. Masks may be used in combination with goggles to protect the mouth, nose and eyes, or a face shield may be used instead of a mask and goggles, to provide a more complete protection for the face

b. Goggles

1. The eye protection chosen for specific work situations depends upon the circumstances of exposure, other PPE used, and personal vision needs.
2. Personal eyeglasses and contact lenses are NOT considered adequate eye protection.
3. Even if Droplet Precautions are not recommended for a specific respiratory tract pathogen, protection for the eyes, nose and mouth by using a mask and goggles, or face shield alone, is necessary when it is likely that there will be a splash or spray of any respiratory secretions or other body fluids .

Annex A4. Decontamination, Disinfection and Sterilization

A. Decontamination and Disinfection Practices

The following must be observed in the decontamination and disinfection practices:

1. Use appropriate hand hygiene, PPE (e.g., gloves), and isolation precautions during cleaning and disinfecting procedures.
2. Have clear instructions and provide feedback to the personnel on how to properly wear PPE appropriate for a surface decontamination and cleaning task.
3. Discard used PPE by using routine disposal procedures or decontaminate reusable PPE as appropriate.
4. Use standard cleaning and disinfection protocols to control environmental contamination.
5. Pay close attention to cleaning and disinfection of high-touch surfaces in patient-care areas (e.g., bed rails, carts, charts, bedside commodes, bed rails, doorknobs, or faucet handles)
6. Ensure compliance by housekeeping staff with cleaning and disinfection procedures by putting up checklists.
7. When contact precautions are indicated for patient care, use disposable patient-care items wherever possible to minimize cross-contamination with multiple-resistant microorganisms.

B. Spaulding Classification for Disinfection & Sterilization of Healthcare Items

CLASSIFICATION	ITEM USE	GOAL	APPROPRIATE PROCESS
Critical Items	Items entering sterile tissue, the body cavity, the vascular system and non intact mucous membranes, e.g. surgical instruments	Objects will be sterile (free of all microorganisms including bacterial spores)	**Sterilization (or use of single use sterile product)** • Steam sterilization • Low temperature methods (ethylene oxide, peracetic acid, hydrogen peroxide plasma)
Semi-critical Items	Items that make contact, directly or indirectly, with intact mucous membranes or non intact skin, e.g. endoscopes, diagnostic probes (vaginal/rectal), anesthetic equipment	Objects will be free of all microorganisms, with the exception of high numbers of bacterial spores	**High level disinfection** • Thermal disinfection • Chemical disinfection (glutaraldehyde, OPA) *It is always preferable to sterilize semi-critical items

			whenever they are compatible with available sterilization processes
Non-critical Items	Objects that come into contact with intact skin but not mucous membranes, e.g. crutches, BP cuffs	Objects will be clean	**Low level disinfection** • Cleaning (manual or mechanical)

Annex A5. Healthcare Waste

A. Healthcare Waste Types

Healthcare waste (HCW) can be broadly categorized into "hazardous" and "non-hazardous" waste types, as listed below.

HAZARDOUS	NON-HAZARDOUS (General)
- Sharps - Infectious - Pathological - Anatomical - Pharmaceutical - Genotoxic - Chemical - Radioactive - Pressurized Containers	- Recyclable - Biodegradable - Residual

Hazardous HCW, which includes infectious wastes, refers to waste that may pose a variety of environmental and health risks. Infectious waste is most likely to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts.

B. Risks Associated with Health Care Waste

1. All individuals coming into proximity with hazardous HCW are potentially at risk, including those who generate hazardous HCW, as well as those who either handle such waste or are exposed to it as a consequence of improper management.
2. The main groups of people at risk to potential health hazards associated with HCW are the following:
    a. HCF staff, e.g., doctors, nurses, auxiliaries, and maintenance personnel
    b. Patients in the HCF or receiving home care
    c. Visitors to the HCF
    d. Workers providing support and allied services to the HCF, such as laundry
    e. Workers transporting hazardous HCW to treatment, storage, and disposal facilities
    f. Workers and operators of waste management facilities (e.g., sanitary landfill and Treatment, Storage, Disposal (TSD) facilities) including informal recyclers or scavenger.
3. The General Public could also be at risk whenever hazardous HCW is abandoned or disposed of improperly.

C. Health Care Waste Disposal

1. HCW that is properly treated with the applicable technology as stated in the Health Care Waste Management Manual can be disposed of in a sanitary landfill but must not be mixed with the municipal waste. Dedicated cells for the treated HCW must be provided in a sanitary landfill. To allow the disposal of HCW to the sanitary landfill, the following must be met:
    a. The waste treatment facility/system passed the standards for microbial inactivation test;
    b. The properly treated HCW passed the spore strip test;

c. The waste treatment facility/system has a valid CPR from the DOH-Bureau of Health ·Devices and Technology (BHDT), and;
d. The waste treatment facility is an EMB-registered TSD facility.

Annex B. Clinical Management of Severe Acute Respiratory Infection when Novel Coronavirus (2019-nCoV) Infection is Suspected *(Interim guidance as of January 28, 2020)*

Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected

Interim guidance

28 January 2020

WHO/nCoV/Clinical/2020.2

World Health Organization

Introduction

This is the first edition of this document for novel coronavirus, an adaption of WHO Clinical management of severe acute respiratory infection when MERS-CoV infection is suspected publication (2019).

This document is intended for clinicians taking care of hospitalised adult and paediatric patients with severe acute respiratory infection (SARI) when 2019-nCoV infection is suspected. It is not meant to replace clinical judgment or specialist consultation but rather to strengthen clinical management of these patients and provide to up-to-date guidance. Best practices for SARI including IPC and optimized supportive care for severely ill patients are essential.

This document is organized into the following sections:

1. Triage: recognize and sort patients with SARI
2. Immediate implementation of appropriate infection prevention and control (IPC) measures
3. Early supportive therapy and monitoring
4. Collection of specimens for laboratory diagnosis
5. Management of hypoxemic respiratory failure and acute respiratory distress syndrome (ARDS)
6. Management of septic shock
7. Prevention of complications
8. Specific anti-nCoV treatments
9. Special considerations for pregnant patients

These symbols are used to flag interventions:

- Do: the intervention is beneficial (strong recommendation) **OR** the intervention is a best practice statement
- Don't: the intervention is known to be harmful.
- Consider: the intervention may be beneficial in selected patients (conditional recommendation) **OR** be careful when considering this intervention.

This document aims to provide clinicians with updated interim guidance on timely, effective, and safe supportive management of patients with 2019-nCoV and SARI, particularly those with critical illness.

The recommendations in this document are derived from WHO publications.[1-4] Where WHO guidance is not available, we refer to evidence-based guidelines. Members of a WHO global network of clinicians, and clinicians who have treated SARS, MERS or severe influenza patients have reviewed the recommendations (see Acknowledgements). For queries, please email outbreak@who.int with '2019-nCoV clinical question' in the subject line.

1. Triage: early recognition of patients with SARI associated with 2019-nCoV infection

✔ **Triage: recognize and sort all patients with SARI at first point of contact with health care system (such as the emergency department). Consider 2019-nCOV as a possible etiology of SARI under certain conditions (see Table 1). Triage patients and start emergency treatments based based on disease severity.**

Remarks: 2019-nCoV infection may present with mild, moderate, or severe illness; the latter includes severe pneumonia, ARDS, sepsis and septic shock. Early recognition of suspected patients allows for timely initiation of IPC (see Table 2). Early identification of those with severe manifestations (see Table 2) allows for immediate optimized supportive care treatments and safe, rapid admission (or referral) to intensive care unit according to institutional or national protocols. For those with mild illness, hospitalization may not be required unless there is concern for rapid deterioration. All patients discharged home should be instructed to return to hospital if they develop any worsening of illness.

Table 1. Definitions of patients with SARI, suspected of 2019-nCoV infection*

SARI	An ARI with history of fever or measured temperature ≥38 C° and cough; onset within the last ~10 days; and requiring hospitalization.[5] However, the absence of fever does NOT exclude viral infection.[6]
Surveillance case definitions for 2019-nCoV*	A. Patients with severe acute respiratory infection (fever, cough, and requiring admission to hospital), AND with no other etiology that fully explains the clinical presentation[1] AND at least one of the following: • a history of travel to or residence in the city of Wuhan, Hubei Province, China in the 14 days prior to symptom onset, or • patient is a health care worker who has been working in an environment where severe acute respiratory infections of unknown etiology are being cared for. B. Patients with any acute respiratory illness AND at least one of the following: • close contact[2] with a confirmed or probable case of 2019-nCoV in the 14 days prior to illness onset, or • visiting or working in a live animal market in Wuhan, Hubei Province, China in the 14 days prior to symptom onset, or • worked or attended a health care facility in the 14 days prior to onset of symptoms where patients with hospital-associated 2019-nCov infections have been reported.

*see https://www.who.int/health-topics/coronavirus for latest case definitions

[1] clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised;

[2]: Close contact' is defined as:

- Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with novel coronavirus, visiting patients or staying in the same close environment as a nCoV patient.
- Working together in close proximity or sharing the same classroom environment with a nCoV patient
- Traveling together with a nCoV patient in any kind of conveyance
- Living in the same household as a nCoV patient

The epidemiological link may have occurred within a 14-day period from onset of illness in the case under consideration.

Table 2. Clinical syndromes associated with 2019-nCoV infection

Uncomplicated illness	Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain or malaise. The elderly and immunosuppressed may present with atypical symptoms. These patients do not have any signs of dehydration, sepsis or shortness of breath.
Mild pneumonia	Patient with pneumonia and no signs of severe pneumonia. Child with non-severe pneumonia has cough or difficulty breathing + fast breathing: fast breathing (in breaths/min): <2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40 and no signs of severe pneumonia.
Severe pneumonia	Adolescent or adult: fever or suspected respiratory infection, plus one of respiratory rate >30 breaths/min, severe respiratory distress, or SpO_2 <90% on room air (adapted from [1]). Child with cough or difficulty in breathing, plus at least one of the following: central cyanosis or SpO_2 <90%; severe respiratory distress (e.g. grunting, very severe chest indrawing); signs of pneumonia with a general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions. Other signs of pneumonia may be present: chest indrawing, fast breathing (in breaths/min): <2 months, ≥60; 2–11 months, ≥50; 1–5 years, ≥40.[2] The diagnosis is clinical; chest imaging can exclude complications.
Acute Respiratory Distress Syndrome[7-9]	**Onset:** new or worsening respiratory symptoms within one week of known clinical insult. **Chest imaging (radiograph, CT scan, or lung ultrasound):** bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules. **Origin of oedema:** respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of oedema if no risk factor present. **Oxygenation (adults):** • Mild ARDS: 200 mmHg < PaO_2/FiO_2 ≤ 300 mmHg (with PEEP or CPAP ≥5 cmH_2O,[7] or non-ventilated[8]) • Moderate ARDS: 100 mmHg < PaO_2/FiO_2 ≤200 mmHg with PEEP ≥5 cmH_2O,[7] or non-ventilated[8]) • Severe ARDS: PaO_2/FiO_2 ≤ 100 mmHg with PEEP ≥5 cmH_2O,[7] or non-ventilated[8]) • When PaO_2 is not available, SpO_2/FiO_2 ≤315 suggests ARDS (including in non-ventilated patients) **Oxygenation (children; note OI = Oxygenation Index and OSI = Oxygenation Index using SpO_2):** • Bilevel NIV or CPAP ≥5 cmH_2O via full face mask: PaO_2/FiO_2 ≤ 300 mmHg or SpO_2/FiO_2 ≤264 • Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5 • Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI < 12.3 • Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3
Sepsis[10,11]	Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection, with organ dysfunction*. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia. Children: suspected or proven infection and ≥2 SIRS criteria, of which one must be abnormal temperature or white blood cell count.
Septic shock[10,12]	Adults: persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥65 mmHg and serum lactate level >2 mmol/L. Children (based on [12]): any hypotension (SBP <5th centile or >2 SD below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR <90 bpm or >160 bpm in infants and HR <70 bpm or >150 bpm in children); prolonged capillary refill (>2 sec) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.

Abbreviations: ARI, acute respiratory infection; BP, blood pressure; bpm, beats/minute; CPAP, continuous positive airway pressure; FiO_2, fraction of inspired oxygen; MAP, mean arterial pressure; NIV, noninvasive ventilation; OI, Oxygenation Index; OSI, Oxygenation Index using SpO_2; PaO_2, partial pressure of oxygen; PEEP, positive end-expiratory pressure; SBP, systolic blood pressure; SD, standard deviation; SIRS, systemic inflammatory response syndrome; SpO_2, oxygen saturation. *If altitude is higher than 1000m, then correction factor should be calculated as follows: PaO_2/FiO_2 x Barometric pressure/760.

* The SOFA score ranges from 0 to 24 and includes points related to 6 organ systems: respiratory (hypoxemia defined by low PaO_2/FiO_2), coagulation (low platelets), liver (high bilirubin), cardiovascular (hypotension), central nervous system (low level of consciousness defined by Glasgow Coma Scale), and renal (low urine output or high creatinine). Sepsis is defined by an increase in the Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score[13] of ≥2 points. Assume the baseline score is zero if data are not available

2. Immediate implementation of appropriate IPC measures

IPC is a critical and integral part of clinical management of patients and should be initiated at the point of entry of the patient to hospital (typically the Emergency Department). Standard precautions should always be routinely applied in all areas of health care facilities. Standard precautions include hand hygiene; use of PPE to avoid direct contact with patients' blood, body fluids, secretions (including respiratory secretions) and non-intact skin. Standard precautions also include prevention of needle-stick or sharps injury; safe waste management; cleaning and disinfection of equipment; and cleaning of the environment.

Table 2. How to implement infection prevention and control measures for patients with suspected or confirmed 2019-nCoV infection [14,15]

At triage	Give suspect patient a medical mask and direct patient to separate area, an isolation room if available. Keep at least 1meter distance between suspected patients and other patients. Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. Perform hand hygiene after contact with respiratory secretions
Apply droplet precautions	Droplet precautions prevent large droplet transmission of respiratory viruses. Use a medical mask if working within 1-2 metre s of the patient. Place patients in single rooms, or group together those with the same etiological diagnosis. If an etiological diagnosis is not possible, group patients with similar clinical diagnosis and based on epidemiological risk factors, with a spatial separation. When providing care in close contact with a patient with respiratory symptoms (e.g. coughing or sneezing), use eye protection (face-mask or goggles), because sprays of secretions may occur. Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms.
Apply contact precautions	Droplet and contact precautions prevent direct or indirect transmission from contact with contaminated surfaces or equipment (i.e. contact with contaminated oxygen tubing/interfaces). Use PPE (medical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving. If possible, use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use. Ensure that health care workers refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands. Avoid contaminating environmental surfaces that are not directly related to patient care (e.g. door handles and light switches). Ensure adequate room ventilation. Avoid movement of patients or transport. Perform hand hygiene.
Apply airborne precautions when performing an aerosol generating procedure	Ensure that healthcare workers performing aerosol-generating procedures **(i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation)** use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators (N95 or equivalent, or higher level of protection). (The scheduled fit test should not be confused with user seal check before each use.) Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 litres/second/patient in facilities with natural ventilation. Avoid the presence of unnecessary individuals in the room. Care for the patient in the same type of room after mechanical ventilation commences.

Abbreviations: ARI, acute respiratory infection; PPE, personal protective equipment

3. Early supportive therapy and monitoring

✔ **Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxaemia, or shock.**

Remarks: Initiate oxygen therapy at 5 L/min and titrate flow rates to reach target SpO_2 ≥90% in non-pregnant adults and SpO_2 ≥92-95 % in pregnant patients.[1,2] Children with emergency signs (obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma or convulsions) should receive oxygen therapy during resuscitation to target SpO_2 ≥94%; otherwise, the target SpO_2 is ≥90%.[4] All areas where patients with SARI are cared for should be equipped with pulse oximeters, functioning oxygen systems and disposable, single-use, oxygen-delivering interfaces (nasal cannula, simple face mask, and mask with reservoir bag). Use contact precautions when handling contaminated oxygen interfaces of patients with nCoV infection.

✔ **Use conservative fluid management in patients with SARI when there is no evidence of shock.**

Remarks: Patients with SARI should be treated cautiously with intravenous fluids, because aggressive fluid resuscitation may worsen oxygenation, especially in settings where there is limited availability of mechanical ventilation.[16]

✔ **Give empiric antimicrobials to treat all likely pathogens causing SARI. Give antimicrobials within one hour of initial patient assessment for patients with sepsis.**

Remarks: Although the patient may be suspected to have nCoV, administer appropriate empiric antimicrobials within **ONE hour** of identification of sepsis.[17] Empiric antibiotic treatment should be based on the clinical diagnosis (community-acquired pneumonia, health care-associated pneumonia [if infection was acquired in healthcare setting], or sepsis), local epidemiology and susceptibility data, and treatment guidelines. Empiric therapy includes a neuraminidase inhibitor for treatment of influenza when there is local circulation or other risk factors, including travel history or exposure to animal influenza viruses.[18] Empiric therapy should be de-escalated on the basis of microbiology results and clinical judgment.

✘ **Do not routinely give systemic corticosteroids for treatment of viral pneumonia or ARDS outside of clinical trials unless they are indicated for another reason.**

Remarks: A systematic review of observational studies of corticosteroids administered to patients with SARS reported no survival benefit and possible harms (avascular necrosis, psychosis, diabetes, and delayed viral clearance).[19] A systematic review of observational studies in influenza found a higher risk of mortality and secondary infections with corticosteroids; the evidence was judged as very low to low quality due to confounding by indication.[20] A subsequent study that addressed this limitation by adjusting for time-varying confounders found no effect on mortality.[21] Finally, a recent study of patients receiving corticosteroids for MERS used a similar statistical approach and found no effect of corticosteroids on mortality but delayed lower respiratory

tract (LRT) clearance of MERS-CoV.[22] Given lack of effectiveness and possible harm, routine corticosteroids should be avoided unless they are indicated for another reason. See section 6 for the use of corticosteroids in sepsis.

✓ **Closely monitor patients with SARI for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately.**

Remarks: Application of timely, effective, and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of 2019-nCoV.

✓ **Understand the patient's co-morbid condition(s) to tailor the management of critical illness and appreciate the prognosis. Communicate early with patient and family.**

Remarks: During intensive care management of SARI, determine which chronic therapies should be continued and which therapies should be stopped temporarily. Communicate proactively with patients and families and provide support and prognostic information. Understand the patient's values and preferences regarding life-sustaining interventions.

4. Collection of specimens for laboratory diagnosis

WHO guidance on specimen collection, processing, and laboratory testing, including related biosafety procedures, is available.[23]

✓ **Collect blood cultures for bacteria that cause pneumonia and sepsis, ideally before antimicrobial therapy. DO NOT delay antimicrobial therapy to collect blood cultures.**

✓ **Collect specimens from BOTH the upper respiratory tract (URT; nasopharyngeal and oropharyngeal) AND lower respiratory tract (LRT; expectorated sputum, endotracheal aspirate, or bronchoalveolar lavage) for 2019-nCoV testing by RT-PCR. Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients).**

✓ **Serology for diagnostic purposes is recommended only when RT-PCR is not available.[23]**

Remarks: Use appropriate PPE for specimen collection (droplet and contact precautions for URT specimens; airborne precautions for LRT specimens). When collecting URT samples, use viral swabs (sterile Dacron or rayon, not cotton) and viral transport media. Do not sample the nostrils or tonsils. In a patient with suspected novel coronavirus, especially with pneumonia or severe illness, a single URT sample does not exclude the diagnosis, and additional URT and LRT samples are recommended.[23] LRT (vs. URT) samples are more likely to be positive and for a longer period.[23] Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients). Sputum induction should be avoided due to increased risk of increasing aerosol transmission.

Remarks: Dual infections with other respiratory viral infections have been found in SARS and MERS cases. At this stage we need detailed microbiologic studies in all suspected cases. Both URT and LRT specimens can tested for other respiratory viruses, such as influenza A and B (including zoonotic influenza A), respiratory syncytial virus, parainfluenza viruses, rhinoviruses, adenoviruses, enteroviruses (e.g. EVD68), human metapneumovirus, and endemic human coronaviruses (i.e. HKU1, OC43, NL63, and 229E). LRT specimens can also be tested for bacterial pathogens, including *Legionella pneumophila*.

✓ **In hospitalized patients with confirmed 2019-nCoV infection, repeat URT and LRT samples should be collected to demonstrate viral clearance. The frequency of specimen collection will depend on local circumstances but should be at least every 2 to 4 days until there are two consecutive negative results (both URT and LRT samples if both are collected) in a clinically recovered patient at least 24 hours apart. If local infection control practice requires two negative results before removal of droplet precautions, specimens may be collected as often as daily.**

5. Management of hypoxemic respiratory failure and ARDS

✓ **Recognize severe hypoxemic respiratory failure when a patient with respiratory distress is failing standard oxygen therapy.**

Remarks: Patients may continue to have increased work of breathing or hypoxemia even when oxygen is delivered via a face mask with reservoir bag (flow rates of 10-15 L/min, which is typically the minimum flow required to maintain bag inflation; FiO_2 0.60-0.95). Hypoxemic respiratory failure in ARDS commonly results from intrapulmonary ventilation-perfusion mismatch or shunt and usually requires mechanical ventilation.

High-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) should only be used in selected patients with hypoxemic respiratory failure. The risk of treatment failure is high in patients with MERS treated with NIV, and patients treated with either HFNO or NIV should be closely monitored for clinical deterioration.

Remark 1: HFNO systems can deliver 60 L/min of gas flow and FiO_2 up to 1.0; paediatric circuits generally only handle up to 15 L/min, and many children will require an adult circuit to deliver adequate flow. Compared to standard oxygen therapy, HFNO reduces the need for intubation.[24] Patients with hypercapnia (exacerbation of obstructive lung disease, cardiogenic pulmonary oedema), hemodynamic instability, multi-organ failure, or abnormal mental status should generally not receive HFNO, although emerging data suggest that HFNO may be safe in patients with mild-moderate and non-worsening hypercapnia.[25] Patients receiving HFNO should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hr). Evidence-based guidelines on HFNO do not exist, and reports on HFNO in MERS patients are limited.[26]

Remark 2: NIV guidelines make no recommendation on use in hypoxemic respiratory failure (apart from cardiogenic pulmonary oedema and post-operative respiratory failure) or pandemic viral illness (referring to studies of SARS and pandemic influenza).[27] Risks include delayed intubation, large tidal volumes, and injurious transpulmonary pressures. Limited data suggest a high failure rate when MERS patients receive NIV.[28] Patients receiving a trial of NIV should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hr). Patients with hemodynamic instability, multiorgan failure, or abnormal mental status should not receive NIV.

Remark 3: Recent publications suggest that newer HFNO and NIV systems with good interface fitting do not create widespread dispersion of exhaled air and therefore should be associated with low risk of airborne transmission.[29-31]

Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions.
Remarks: Patients with ARDS, especially young children or those who are obese or pregnant, may desaturate quickly during intubation. Pre-oxygenate with 100% FiO_2 for 5 minutes, via a face mask with reservoir bag, bag-valve mask, HFNO, or NIV. Rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation[32].

The following recommendations in this section pertain to mechanically ventilated patients with ARDS.[17,33] *These focus on adults; consensus-based recommendations for children are available.*[34]

Implement mechanical ventilation using lower tidal volumes (4–8 ml/kg predicted body weight, PBW) and lower inspiratory pressures (plateau pressure <30 cmH_2O).
Remarks: This is a strong recommendation from a clinical guideline for patients with ARDS,[33] and is suggested for patients with sepsis-induced respiratory failure who do not meet ARDS criteria.[17] The initial tidal volume is 6 ml/kg PBW; tidal volume up to 8 ml/kg PBW is allowed if undesirable side effects occur (e.g. dyssynchrony, pH <7.15). Hypercapnia is permitted if meeting the pH goal of 7.30-7.45. Ventilator protocols are available.[35] The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets. Although high driving pressure (plateau pressure–PEEP) may more accurately predict increased mortality in ARDS compared to high tidal volume or plateau pressure,[36] RCTs of ventilation strategies that target driving pressure are not currently available.

In patients with severe ARDS, prone ventilation for >12 hours per day is recommended.
Remarks: Application of prone ventilation is strongly recommended for adult and paediatric patients with severe ARDS[33] but requires sufficient human resources and expertise to be performed safely.[37,38]

Use a conservative fluid management strategy for ARDS patients without tissue hypoperfusion.
Remarks: This is a strong guideline recommendation;[17] the main effect is to shorten the duration of ventilation. See reference [39] for details of a sample protocol.

In patients with moderate or severe ARDS, higher PEEP instead of lower PEEP is suggested.
Remarks: PEEP titration requires consideration of benefits (reducing atelectrauma and improving alveolar recruitment) vs. risks (end-inspiratory overdistension leading to lung injury and higher pulmonary vascular resistance). Tables are available to guide PEEP titration based on the FiO_2 required to maintain SpO_2.[35] A related intervention of recruitment manoeuvres (RMs) is delivered as episodic periods of high continuous positive airway pressure [30–40 cm H_2O], progressive incremental increases in PEEP with constant driving pressure, or high driving pressure; considerations of benefits vs. risks are similar. Higher PEEP and RMs were both conditionally recommended in a clinical practice guideline.[33] For PEEP, the guideline considered an individual patient data meta-analysis[40] of 3 RCTs. However, a subsequent RCT of high PEEP and prolonged high-pressure RMs showed harm, suggesting that the protocol in this RCT should be avoided.[41] Monitoring of patients to identify those who respond to the initial application of higher PEEP or a different RM protocol, and stopping these interventions in non-responders, is suggested.[42]

In patients with moderate-severe ARDS (PaO_2/FiO_2 <150), neuromuscular blockade by continuous infusion should not be routinely used.
Remarks: One trial found that this strategy improved survival in patients with severe ARDS (PaO_2/FiO_2 <150) without causing significant weakness,[43] but results of a recent larger trial found that use of neuromuscular blockage with high PEEP strategy was not associated with survival when compared to a light sedation strategy without neuromuscular blockade[44]. Continuous neuromuscular blockade may still be considered in patients with ARDS in certain situations: ventilator dyssnchony despite sedation, such that tidal volume limitation cannot be reliably achieved; or refractory hypoxemia or hypercapnia.

In settings with access to expertise in extracorporeal life support (ECLS), consider referral of patients with refractory hypoxemia despite lung protective ventilation.
Remarks: A recent guideline made no recommendation about ECLS in patients with ARDS.[33] Since then, an RCT of ECLS for patients with ARDS was stopped early and found no statistically significant difference in the primary outcome of 60-day mortality between ECLS and standard medical management (including prone positioning and neuromuscular blockade).[45] However, ECLS was associated with a reduced risk of the composite outcome of mortality and crossover to ECLS,[45] and a *post hoc* Bayesian analysis of this RCT showed that ECLS is very likely to reduce mortality across a range of prior assumptions.[46] In patients with MERS-CoV infection, ECLS vs. conventional treatment was associated with reduced mortality in a cohort study.[47] ECLS should

only be offered in expert centres with a sufficient case volume to maintain expertise and that can apply the IPC measures required for 2019-nCoV patients.[48]

Avoid disconnecting the patient from the ventilator, which results in loss of PEEP and atelectasis. Use in-line catheters for airway suctioning and clamp endotracheal tube when disconnection is required (for example, transfer to a transport ventilator).

6. Management of septic shock

Recognize septic shock in adults when infection is suspected or confirmed AND vasopressors are needed to maintain mean arterial pressure (MAP) ≥65 mmHg AND lactate is ≥2 mmol/L, in absence of hypovolemia.
Recognize septic shock in children with any hypotension (systolic blood pressure [SBP] <5th centile or >2 SD below normal for age) or 2-3 of the following: altered mental state; tachycardia or bradycardia (HR <90 bpm or >160 bpm in infants and HR <70 bpm or >150 bpm in children); prolonged capillary refill (>2 sec) or warm vasodilation with bounding pulses; tachypnea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.

Remarks: In the absence of a lactate measurement, use MAP and clinical signs of perfusion to define shock. Standard care includes early recognition and the following treatments within 1 hour of recognition: antimicrobial therapy and fluid loading and vasopressors for hypotension.[49] The use of central venous and arterial catheters should be based on resource availability and individual patient needs. Detailed guidelines are available for the management of septic shock in adults[17] and children.[2,3,12]

In resuscitation from septic shock in adults, give at least 30 ml/kg of isotonic crystalloid in adults in the first 3 hours. In resuscitation from septic shock in children in well-resourced settings, give 20 ml/kg as a rapid bolus and up to 40-60 ml/kg in the first 1 hr.

Do not use hypotonic crystalloids, starches, or gelatins for resuscitation.

Fluid resuscitation may lead to volume overload, including respiratory failure. If there is no response to fluid loading and signs of volume overload appear (for example, jugular venous distension, crackles on lung auscultation, pulmonary oedema on imaging, or hepatomegaly in children), then reduce or discontinue fluid administration. This step is particularly important where mechanical ventilation is not available. Alternate fluid regimens are suggested when caring for children in resource-limited settings[50]

Remarks: Crystalloids include normal saline and Ringer's lactate. Determine need for additional fluid boluses (250-1000 ml in adults or 10-20 ml/kg in children) based on clinical response and improvement of perfusion targets. Perfusion targets include MAP (>65 mmHg or age-appropriate targets in children), urine output (>0.5 ml/kg/hr in adults, 1 ml/kg/hr in children), and improvement of skin mottling, capillary refill, level of consciousness, and lactate. Consider dynamic indices of volume responsiveness to guide volume administration beyond initial resuscitation based on local resources and experience.[17] These indices include passive leg raises, fluid challenges with serial stroke volume measurements, or variations in systolic pressure, pulse pressure, inferior vena cava size, or stroke volume in response to changes in intrathoracic pressure during mechanical ventilation.

Starches are associated with an increased risk of death and acute kidney injury vs. crystalloids. The effects of gelatins are less clear, but they are more expensive than cyrstalloids.[51,52] Hypotonic (vs. isotonic) solutions are less effective at increasing intravascular volume. Surviving Sepsis also suggests albumin for resuscitation when patients require substantial amounts of crystalloids, but this conditional recommendation is based on low-quality evidence.[17]

Administer vasopressors when shock persists during or after fluid resuscitation. The initial blood pressure target is MAP ≥65 mmHg in adults and age-appropriate targets in children.

If central venous catheters are not available, vasopressors can be given through a peripheral IV, but use a large vein and closely monitor for signs of extravasation and local tissue necrosis. If extravasation occurs, stop infusion. Vasopressors can also be administered through intraosseous needles.

If signs of poor perfusion and cardiac dysfunction persist despite achieving MAP target with fluids and vasopressors, consider an inotrope such as dobutamine.

Remarks: Vasopressors (i.e. norepinephrine, epinephrine, vasopressin, and dopamine) are most safely given through a central venous catheter at a strictly controlled rate, but it is also possible to safely administer them via peripheral vein[53] and intraosseous needle. Monitor blood pressure frequently and titrate the vasopressor to the minimum dose necessary to maintain perfusion and prevent side effects. Norepinephrine is considered first-line in adult patients; epinephrine or vasopressin can be added to achieve the MAP target. Because of the risk of tachyarrhythmia, reserve dopamine for selected patients with low risk of tachyarrhythmia or those with bradycardia. In children with cold shock (more common), epinephrine is considered first-line, while norepinephrine is used in patients with warm shock (less common).

No RCTs have compared dobutamine to placebo for clinical outcomes.[17]

7. Prevention of complications

Implement the following interventions (Table 3) to prevent complications associated with critical illness. These interventions are based on Surviving Sepsis[17] or other guidelines,[54-57] and are generally limited to feasible recommendations based on high quality evidence.

Table 3. Prevention of complications

Anticipated Outcome	Interventions
Reduce days of invasive mechanical ventilation	• Use weaning protocols that include daily assessment for readiness to breathe spontaneously • Minimize continuous or intermittent sedation, targeting specific titration endpoints (light sedation unless contraindicated) or with daily interruption of continuous sedative infusions
Reduce incidence of ventilator-associated pneumonia	• Oral intubation is preferable to nasal intubation in adolescents and adults • Keep patient in semi-recumbent position (head of bed elevation 30-45°) • Use a closed suctioning system; periodically drain and discard condensate in tubing • Use a new ventilator circuit for each patient; once patient is ventilated, change circuit if it is soiled or damaged but not routinely • Change heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days
Reduce incidence of venous thromboembolism	• Use pharmacological prophylaxis (low molecular-weight heparin [preferred if available] or heparin 5000 units subcutaneously twice daily) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices).
Reduce incidence of catheter-related bloodstream infection	• Use a checklist with completion verified by a real-time observer as reminder of each step needed for sterile insertion and as a daily reminder to remove catheter if no longer needed
Reduce incidence of pressure ulcers	• Turn patient every two hours
Reduce incidence of stress ulcers and gastrointestinal bleeding	• Give early enteral nutrition (within 24–48 hours of admission) • Administer histamine-2 receptor blockers or proton-pump inhibitors in patients with risk factors for GI bleeding. Risk factors for gastrointestinal bleeding include mechanical ventilation for ≥48 hours, coagulopathy, renal replacement therapy, liver disease, multiple comorbidities, and higher organ failure score
Reduce incidence of ICU-related weakness	• Actively mobilize the patient early in the course of illness when safe to do so

8. Specific anti-Novel-CoV treatments and clinical research

There is no current evidence from RCTs to recommend any specific anti-nCoV treatment for patients with suspected or confirmed 2019-nCoV infection.

Unlicensed treatments should be administered only in the context of ethically-approved clinical trials or the Monitored Emergency Use of Unregistered Interventions Framework (MEURI), with strict monitoring.
https://www.who.int/ethics/publications/infectious-disease-outbreaks/en/

Clinical characterization protocols are available, at the WHO 2019 nCoV website:
https://www.who.int/emergencies/diseases/novel-coronavirus-2019. WHO has established Global 2019-nCoV Clinical Data Platform, for member countries to contribute. Contact EDCARN@who.int for additional questions.

9. Special considerations for pregnant patients

Pregnant women with suspected or confirmed 2019-nCoV infection should be treated with supportive therapies as described above, taking into account the physiologic adaptations of pregnancy.

The use of investigational therapeutic agents outside of a research study should be guided by individual risk-benefit analysis based on potential benefit for mother and safety to fetus, with consultation from an obstetric specialist and ethics committee.

Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and fetal stability. Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential.

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Annex C. Decision Tool for Novel Coronavirus Assessment for Bureau of Quarantine and Hospitals
(Version as of January 30, 2020)

Fever ≥38°C (current fever or with history of fever)	Respiratory Infection (cough AND/OR colds)	Travel History for the past 14 days in China	History of Exposure[1]	Case Category/ Intervention
+	+	+	+	**Category: Patient Under Investigation (PUI)** **Bureau of Quarantine (BoQ)** • Gives mask and isolate PUI • Collects and evaluates the BoQ Health Declaration Card • Endorses patient for admission in a hospital. • Arranges transportation of PUI to hospital **Hospitals** • Completes the case investigation form (CIF) • Trained hospital staff collects specimens (nasopharyngeal swab [NPS] and oral pharyngeal swab [OPS]) and sends to RITM. (NPS/OPS must be collected upon admission and after 24 to 48 hours) • Coordinates with RESU for reporting and transport of specimens • Manages PUI accordingly
+	+	+	-	
+	+	-	+	
+	-	+	+	
-	+	+	+	
+	-	+	-	
-	+	+	-	
+	-	-	+	
-	+	-	+	
-	-	+	+	**Category: Person under Monitoring*** **Bureau of Quarantine** • Collects and evaluates the BoQ Health Declaration Card • Advises person to go on self-quarantine for 14 days, monitor body temperature daily, and observe any signs and symptoms of respiratory infection • If symptoms worsen, immediately notify the nearest hospital for consultation and provide travel history **Centers for Health Development** • Monitor strictly those who are self-quarantined *Anyone who came from <u>other parts of the world with confirmed 2019-nCoV ARD infection</u> except China, has <u>no history of exposure</u>, but <u>with fever and/or cough</u>, is considered **<u>Person under Monitoring</u>** and is advised to go on self-quarantine for 14 days
-	-	+	-	
-	-	-	+	

[1] History of exposure Include:
a. close contact who took care, handled specimens and/or lived with a confirmed case of 2019-nCoV infection; or
- Close contact is defined as:
  - o Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with novel coronavirus, visiting patients or staying in the same close environment as a nCoV patient
  - o Working together in close proximity or sharing the same classroom environment with a nCoV patient
  - o Traveling together with a nCoV patient in any kind of conveyance
  - o Living in the same household as a nCoV patient

b. visiting/working in a live animal market in China
c. direct contact with animals in China with circulating 2019-nCoV in human and animals

Annex D. Interim Case Reporting Form for 2019 Novel Coronavirus (2019-nCoV) of Confirmed And Probable Cases

World Health Organization

WHO Case ID (International): _____

Interim case reporting form for 2019 Novel Coronavirus (2019-nCoV) of confirmed and probable cases

WHO Minimum Data Set Report Form

Date of reporting to national health authority: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

Reporting institution: _____

Reporting country: _____

Case classification: □ Confirmed □ Probable

Detected at point of entry □ No □ Yes □ Unknown If yes, date [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

Section 1: Patient information

Unique Case Identifier (used in country): _____

Date of Birth: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_] or estimated age: [__][__][__] in years

if < 1 year old, [__][__] in months or if < 1 month, [__][__] in days

Sex at birth: □ Male □ Female

Place where the case was diagnosed: Country: _____

Admin Level 1 (province): _____ Admin Level 2 (district): _____

Patient usual place of residency: Country: _____

Admin Level 1 (province): _____ Admin Level 2 (district): _____

Section 2: Clinical information

Patient clinical course

Date of onset of symptoms: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_] □ Asymptomatic □ Unknown

Admission to hospital: □ No □ Yes □ Unknown

First date of admission to hospital: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

Name of hospital: _____

Date of isolation: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

Was the patient ventilated: □ No □ Yes □ Unknown

Health status (circle) at time of reporting: recovered / not recovered / death / unknown

Date of death, if applicable: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

Patient symptoms (check all reported symptoms):

□ History of fever / chills
□ General weakness
□ Cough
□ Sore throat
□ Runny nose
□ Shortness of breath
□ Diarrhoea
□ Nausea/vomiting
□ Headache
□ Irritability/Confusion
□ Pain (check all that apply)
( ) Muscular ( ) Chest
( ) Abdominal ( ) Joint
□ Other, specify _____

Patient signs:

Temperature: [__][__][__] □°C / □ F

Check all observed signs:

□ Pharyngea exudate
□ Conjunctival injection
□ Seizure
□ Coma
□ Dyspnea / tachypnea
□ Abnormal lung auscultation
□ Abnormal lung X-Ray findings
□ Other, specify: _____

Underlying conditions and comorbidity (check all that apply):

- □ Pregnancy (trimester: _____)
- □ Post-partum (< 6 weeks)
- □ Cardiovascular disease, including hypertension
- □ Immunodeficiency, including HIV
- □ Diabetes
- □ Renal disease
- □ Liver disease
- □ Chronic lung disease
- □ Chronic neurological or neuromuscular disease
- □ Malignancy
- □ Other, specify: _____

Section 3: Exposure and travel information in the 14 days prior to symptom onset (prior to reporting if asymptomatic)

Occupation: (tick any that apply)

□ Student □ Health care worker □ Other, specify: _____

□ Working with animals □ Health laboratory worker

Has the patient **travelled** in the 14 days prior to symptom onset? □ No □ Yes □ Unknown

If yes, please specify the places the patient travelled:

	Country	City
1.	_____	_____
2.	_____	_____
3.	_____	_____

Has the patient **visited any health care facility(ies)** in the 14 days prior to symptom onset? □ No □ Yes □ Unknown

Has the patient had **close contact**[1] with a person with acute respiratory infection in the 14 days prior to symptom onset?

□ No □ Yes □ Unknown

If yes, contact setting (check all that apply):

□ Health care setting □ Family setting □ Work place □ Unknown □ Other, specify: _____

Has the patient **had contact with a probable or confirmed case** in the 14 days prior to symptom onset? :

□ No □ Yes □ Unknown

If yes, please list unique case identifiers of all probable or confirmed cases:

Case 1 identifier. _____ Case 2 identifier. _____ Case 3 identifier. _____

If yes, contact setting (check all that apply):

□ Health care setting □ Family setting □ Work place □ Unknown □ Other, specify: _____

If yes, location/city/country for exposure: _____

Have you visited any **live animal markets** in the 14 days prior to symptom onset? □ No □ Yes □ Unknown

If yes, location/city/country for exposure: _____

Section 4: Laboratory Information

Name of confirming laboratory: : _____

Please specify which assay was used: _____ Sequencing done?: □ Yes □ No □ Unknown

Date of laboratory confirmation: [_D_][_D_]/[_M_][_M_]/[_Y_][_Y_][_Y_][_Y_]

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[1] Close contact' is defined as: 1. Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with novel coronavirus, visiting patients or staying in the same close environment of a nCoV patient. 2. Working together in close proximity or sharing the same classroom environment with a with nCoV patient. 3. Traveling together with nCoV patient in any kind of conveyance. 4. Living in the same household as a nCoV patient