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

Interim guidance

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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 30-45º) • 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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Discharge Protocol for COVID-19 confirmed cases and contacts

Discharge criteria for COVID-19 confirmed cases admitted to treatment center

1. Patient diagnosed with COVID-19 pneumonia can be discharged when the symptoms have subsided, the body temperature remains at a normal range for at least three days and two consecutive laboratory tests are negative.

Discharge criteria for contacts of COVID-9 confirmed cases admitted to Quarantine center

2. Any person who has contact with confirmed COVID-19 case has to be followed for 14 days:

- ✓ If no symptoms develop within 14 days follow up, discharge the person from the follow up.
- ✓ If symptoms develop during the 14 days follow up, admit the patient to COVID-19 Isolation/treatment center, treat and follow the above protocols to discharge.
- ✓ Identify all the contacts of this person after he/she become symptomatic and continue 14 days follow-up for the identified contacts

Protocol for Infection Prevention and Control during Novel Coronavirus (COVID-19) Outbreak

Prepared by: EPHI EOC

March 22, 2020

Part I: General Delineation

This protocol will be used by health care providers, professionals working in isolation units and treatment centers, rumor verification and investigating professionals, laboratory professionals, supportive staff (ambulance drivers, cleaners and laundry personnel) and the public in general and will help in preventing the transmission of infection with in isolation units, treatment centers and in the community.

This IPC protocols are based on WHO infection prevention and control during health care COVID-19 infection interim guidance, Ethiopian National Infection Prevention and Control Guideline, WHO guideline on hand hygiene in health care, WHO rational use of PPEs, and WHO Guidelines for donning and doffing of PPE.

IPC is key to containment/ slowing the spread of COVID-19 and varies along the screening, investigation, treatment and burial continuum. These scenarios are described and addressed below as:

- Port of Entry screening (see POE standard operating procedures document), which includes persons at POEs classified as possibly having symptoms or suspect cases
- Rumor verification and rapid response team in the community for persons classified as possibly having symptoms or suspect cases
- Transportation of suspect cases to medical facilities
- Treatment of persons classified as suspect or confirmed cases of COVID-19
- Handling of persons who have died as either suspect or confirmed COVID-19 cases

The protocol addresses the above circumstances, plus other key aspects of IPC. They include:

- Early recognition of possible cases and source control
- General considerations for the community setting
- IPC materials and supplies
- Hand hygiene
- Procedures to properly put on and take off personal protection equipment (PPE)
- Environmental considerations, and
- Waste management

Part II: General Precautions

- This part of the protocol will be applicable when people are at risk of infection or the infection is confirmed in country. Cough hygiene should be implemented by the general public including covering mouth during coughing and sneezing with tissue or flexed elbow.
- Put on surgical mask if you have respiratory symptoms
- Avid close contact with or keep a 1.5-meter distance
- Do not shake hands, and if you do wash hands thoroughly with soap and water or apply alcohol-based hand rub (ABHR)
- Avoid contact with a person that is suspected or confirmed of COVID-19 cases
- Limit movement to essential purpose only
- Ensure adequate ventilation at homes
- Drink adequate amount of water and avoid dehydration

Part III:Rumor Verification and Rapid Response Team (RRT) Follow IPC Standard precautionary measures

- Rumors of cases and persons suspected of possibly being infected with COVID-19 will be investigated by rapid response teams (RRTs). These persons may already be under monitoring by public health officials, may be self-monitoring, or could be in the community (especially in the event of an outbreak with disseminated transmission).
- Every effort should be made to initially interview rumored cases or possible suspect cases via the telephone before dispatching a RRT to the residence.
- If a telephone interview is not possible, the RRT should proceed to the location of the possible case.
- Before departure ensure that all the necessary IPC supplies are available within the vehicle [Part VI: **List of IPC Materials Required**]
- Each team member should be proficient on rational, correct, and consistent use of available PPE and appropriate hand hygiene.
- During investigation wear appropriate PPE based on the risk assessment [Part VIII: **Putting on and Taking off Personal Protective Equipment**]
- Ensure proper IPC protocols are followed during specimen collection and transport [Part IX: **Sample Transportation**].
- After investigation ensure disinfection of temperature monitoring devices, any reusable Personal Protective Equipment and any other non-critical equipment using 70% Alcohol based Swabs using new gloves.
- After investigation, if the suspected case is isolated ensure proper disinfection and cleaning for all contaminated environmental surfaces [Part X: **Environmental Cleaning**].
- Ensure that all wastes are secured and sealed in a leak proof biohazard bag for appropriate disposal [Part XI: **Waste Management**].

Part IV: Point of Entry

- Ensure a 1 meter (3 feet) distance between health care worker (screener) and passenger.
- Ensure there is an adequate ventilation between health care worker (screener) and passenger
- Avoid over-crowding around the health screening-desk. Queuing on line is recommended.
- During temperature screening health care workers should wear medical-face mask [Part VIII: **Putting on and Taking off Personal Protective Equipment].**
- Refrain from touching eyes, nose or mouth with potentially contaminated hands.
- When handling a suspected case, use a medical mask; eye/facial protection (i.e. goggles or a face shield); clean, non-sterile, long-sleeved fluid resistant gown; gloves. [for appropriate donning and doffing or PPE please refer Part VIII: **Putting on and Taking off Personal Protective Equipment**]
- Ensure strict hand hygiene practice, wash hands with soap and water, if hands are visible clean use Alcohol Based Hand Rub [Part VII: **Hand Hygiene Procedure]**
- Ensure routine environmental cleaning and disinfect non-critical equipment using 70% alcohol.
- Ensure to properly dispose single use personal protective equipment's [Part XI: **Waste Management**].

Part V:Early Recognition and Source Control

- Ensure establishment of sustainable IPC infrastructures and interventions.
- Ensure HCWs training, patients' care givers education.
- Ensure prompt reporting for laboratory testing for identification of the etiologic agent.
- Ensure that professional working in clinical triage team have adequate training on COVID-19 to ensure high level of clinical suspicion.
- Ensure that Posters are posted in public areas reminding symptomatic patients to alert HCWs that includes case definitions of suspected, probable and conformed cases for COVID-19.
- Ensure to conduct regular health Education programs which emphasize on respiratory hygiene as an important preventative measure that take account of covering mouth during coughing and sneezing with tissue or flexed elbow.
- Ensure appropriate waste management protocol [Part XI: **Waste Management]**
- Ensure provision of dedicated waiting areas for patients with respiratory symptoms and appropriate placement of hospitalized patients promoting an adequate patient-to-staff ratio.
- Suspected COVID-19 patients should be placed in an area separate from other patients, and additional IPC (droplet and contact) precautions promptly implemented.

Part VI: Isolation Unit / Treatment Unit

- Patients in this category should meet the case definition of either a suspect or confirmed case of COVID-19.
- In addition to Standard Precautions, all individuals, including family members, visitors and HCWs should apply Contact and Droplet precautions.
- Ensure patients are placed in adequately ventilated single rooms
- If single rooms are not available, cohort COVID-19 suspected patients of together but never place suspected cases with confirmed patients and ensure 1 m distance between cases.
- Ensure placement of policies on prevention of overcrowding especially in the Emergency department and isolation/ treatment units
- Each healthcare worker cohorted to work in COVID-19 infected or suspected cases should be proficient on rational, correct, and consistent use of available PPE and appropriate hand hygiene.
- During patient-care health care workers should wear appropriate Personal Protective Equipment based on the risk assessment [Part VIII: **Putting on and Taking off Personal Protective Equipment].**
- Health workers having close-contact with patients in treatment or isolation centers, , Use a medical mask covering nose and mouth; eye/facial protection (i.e. goggles or a face shield); clean, non-sterile, long-sleeved fluid resistant gown; gloves. [for appropriate donning and doffing or PPE please refer Part VIII: **Putting on and Taking off Personal Protective Equipment**]
- Use either single use disposable equipment or dedicated equipment for each patient (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use (e.g. ethyl alcohol 70%).
- Always refrain from touching eyes, nose or mouth with potentially contaminated hands.
- Ensure strict hand hygiene practice, if hands are visibly soiled, wash hands with soap and water, if visible clean use Alcohol Based Hand Rub [Part VII: **Hand Hygiene Procedure]**
- Ensure proper IPC protocols are followed during sample collection and transport [Part IX: **Sample Transportation**].
- Avoid the movement and transport of patients out of the room or area unless medically necessary. Use designated portable X-ray equipment and/or other important diagnostic equipment.
- If transport is required, use pre-determined transport routes within the healthcare facility to minimize exposures to staff, other patients and visitors and apply medical mask to patient.
- Ensure that HCWs who are transporting patients wear appropriate PPE as described in this section and perform hand hygiene [Part VII: **Hand Hygiene Procedure**; Part VIII: **Putting on and Taking off Personal Protective Equipment]**
- Notify the receiving area of necessary precautions as soon as possible before the patient's arrival

- Ensure routine environmental cleaning and patient-contact surfaces using 0.5% chlorine Solution and disinfect non-critical equipment using 70% alcohol at list two times a day.
- Limit the number of HCWs, family members and visitors in contact with a patient with suspected COVID-19 infection.
- Ensure proper waste management protocols [Part XII: **Waste Management]**.
- Maintain a record of all persons entering the patient's room including all staff and visitors.

Part VII: List of IPC Materials Required

- Medical masks
- N95 respirator masks for aerosol-producing procedures
- Eye protection (goggles or face-shield)
- Long sleeved disposable gown
- Disposable glove
- Infra-red (remote) Temperature monitoring device
- Alcohol Based Hand Rub (ABHR)/ Sanitizer
- 70% Alcohol
- Leak-proof biohazard bag
- 0.5% Chlorine Solution

Part VIII: Hand Hygiene Procedure

- All team members should perform correct, consistent and appropriate hand hygiene procedure
    - **Hand hygiene** is the process of removing soil, debris, and microbes by cleansing hands using soap and water, ABHR, antiseptic agents, or antimicrobial soap.
    - **Hand washing** is the process of mechanically removing soil, debris, and transient flora from hands using soap and clean water.
    - **Alcohol-Based Hand Rub (ABHR)** is a fast-acting, antiseptic hand rub that does not require water to reduce resident flora, kills transient flora on the hands, and has the potential to protect the skin (depending on the ingredients).

Hand Washing Procedure

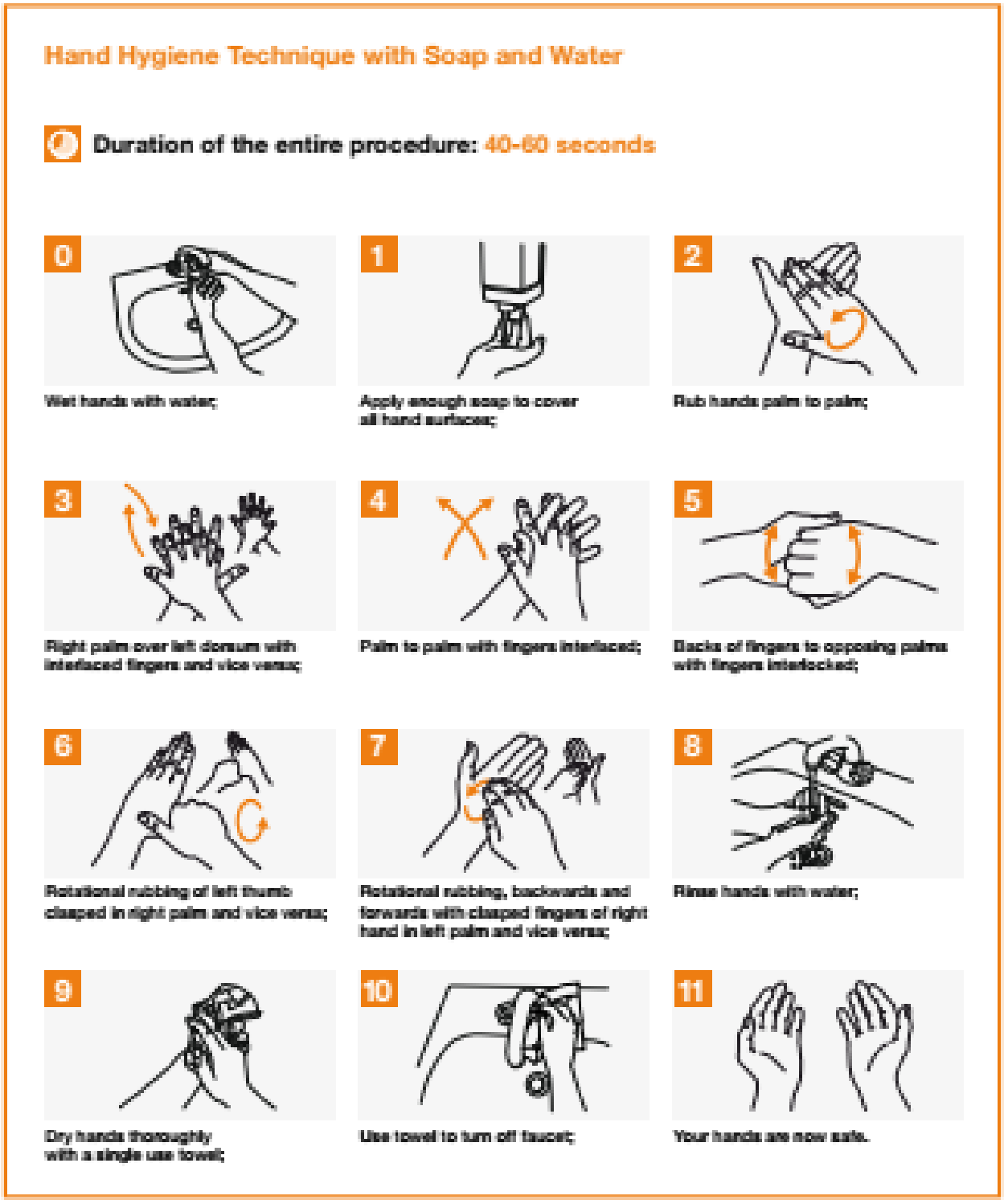


Figure 1: Hand washing procedure

Alcohol Based Hand Rub Procedure

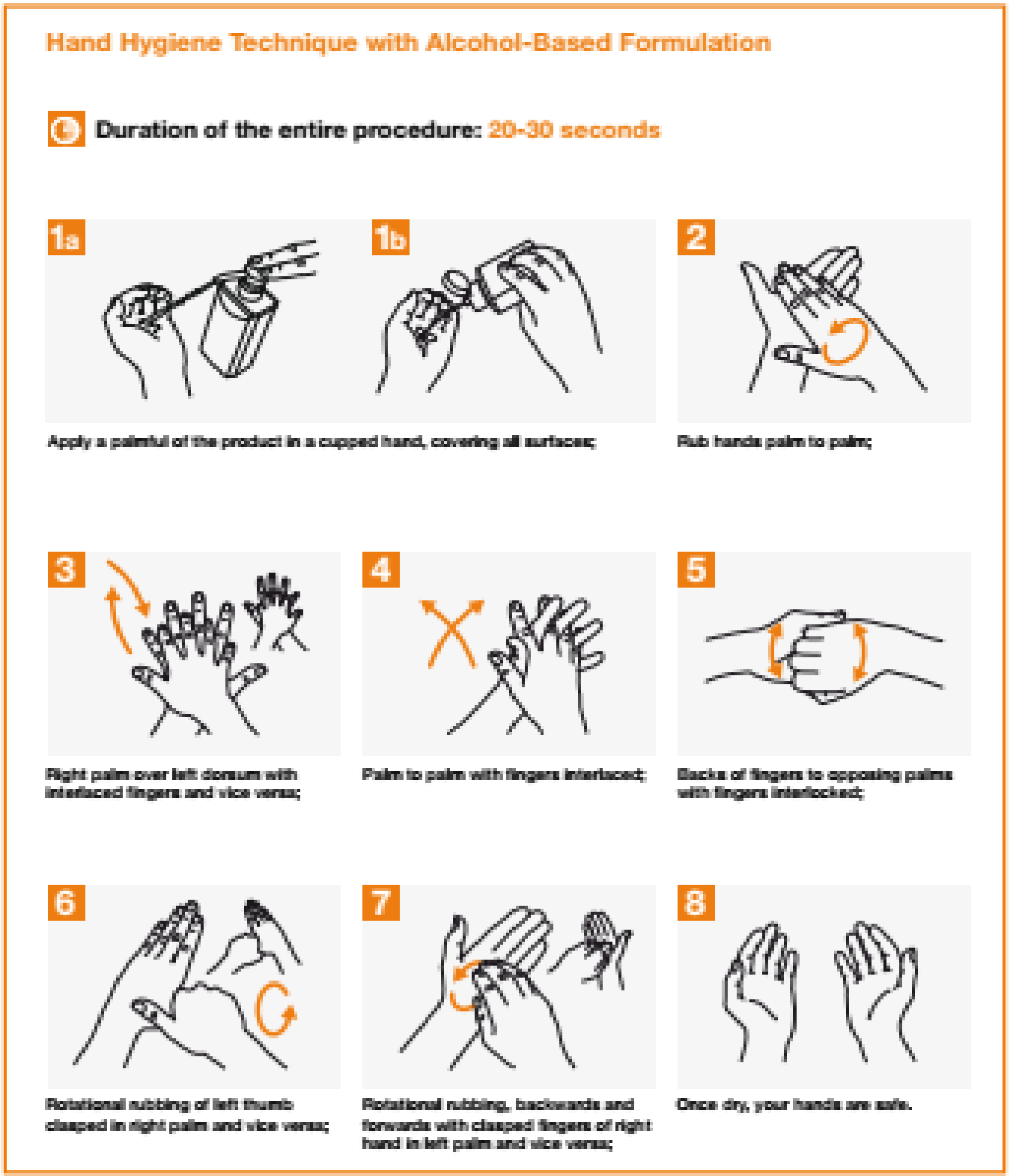


Figure 2: How to Perform Alcohol Based Hand Rub

Part IX: Putting on and Taking off Personal Protective Equipment

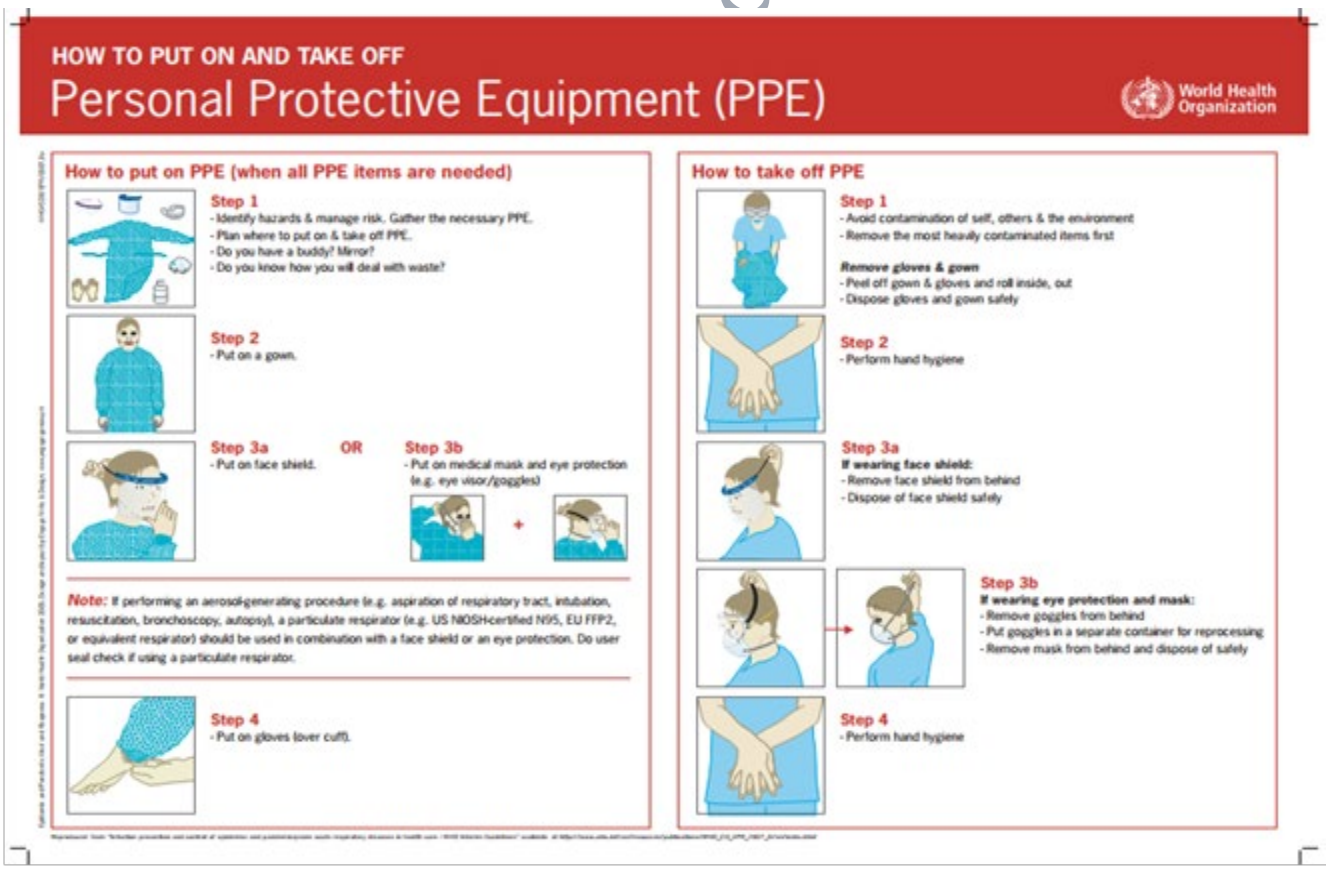
Proper donning sequence include **[**Figure 3: How to Put on and Take Off Personal Protective Equipment**]**

1. Wash your hands if visibly soiled, if visibly clean use ABHR
2. Put on single use disposable gowns
3. Put on medical mask (Check for fitness)
4. Put on goggles
5. Put on disposable gloves

- Refrain from touching other surfaces with contaminated gloves

Proper doffing sequence includes **[**Figure 3: How to Put on and Take Off Personal Protective Equipment**]**

1. Remove your single use disposable gown with your gloves and put both a biohazard bag.
2. Wash hands with running water and soap or use ABHR if visibly clean.
3. Remove goggles, touching them only from the back strap.
4. Remove mask, touching only the ear straps.
5. Wash hands with running water and soap or use ABHR if visibly clean.



Part X:Precautions during Specimen Transportation

- Ensure that personnel who transport specimens are trained in safe handling practices and spill decontamination procedures
- Follow the requirements in the national or international regulations for the transport of dangerous goods (infectious substances) as applicable
- Deliver all specimens by hand whenever possible. Do not use pneumatic-tube systems to transport specimens.
- Notify the receiving laboratory as soon as possible that the specimen is being transported.
- Packaging and shipment to another laboratory transport of specimens within national borders should comply with applicable national regulations
- International Transport Regulations: Novel coronavirus specimens should follow the UN Model Regulations for international transportations
- Effective usage of Global Laboratory Networking Timely and accurate laboratory testing of specimens from cases under investigation is an essential part of the management of emerging infections.

Part XI: Environmental Considerations

- Ensure provision of dedicated waiting areas for symptomatic patients and appropriate placement of hospitalized patients promoting an adequate patient-to-staff ratio.
- Suspected COVID-19 patients should be placed in an area separate from other patients, and additional IPC (droplet and contact) precautions promptly implemented.
- All contaminated surfaces should be cleaned with 0.5% chlorine solution, prior to cleaning with water and detergent.
- Ambulances should be cleaned with 0.5% chlorine solution only after they transport a suspected patients or when vehicle becomes contaminated, otherwise clean with water and detergent.

Part XII: Waste Management

- All medical and non-medical wastes including single use personal protective equipment's should be collected, sealed and secured in leak proof biohazard bag.
- And be transported in a manner that poses minimum risk to heath care provider, patients and community.
- Ensure to dispose any sharp materials in a sharps container (safety box).
- Wastes should be disposed in an incinerator designed for medical waste disposal.

Part XIII: Dead body management

- The act of moving deceased patient onto a hospital trolley for transportation to the mortuary might be sufficient to expel small amounts of air from the lungs and thereby present a minor risk
- A body bag should be used for transferring the body and those handling the body at this point should use full PPE
- The outer surface of the body bag should be decontaminated; immediately before the body bag leaves the anteroom area.
- This may require at least 2 individuals wearing such protective clothing, in order to manage this process
- The trolley carrying the body must be disinfected prior to leaving the anteroom prior to leaving the anteroom, the staff members must remove their protective clothing once in the hospital mortuary, full PPE should be used if the body bag is opened
- Washing or preparing the body is acceptable if those carrying out the task wear PPE. Mortuary staff and funeral directors must be advised of the biohazard risk. Embalming is not recommended
- If a post mortem is required safe working techniques (for example manual rather than power tools) should be used and full PPE worn, in the event that power tools are used. High security post mortem suites are available if needed and can be discussed with the PHE incident team
- After use, empty body bags should be disposed of as category B waste

GUIDANCE FOR MANAGING COVID-19 IN THE COMMUNITY

what the community needs to know

How does COVID-19 spread

- People can catch COVID-19 from others who have the virus.
- The disease can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales (breath out).
- These droplets land on objects and surfaces around the person.
- Other people then catch COVID-19 by touching these objects or surfaces, then touching their eyes, nose or mouth.
- People can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs out or exhales droplets.
- This is why it is very important to stay more than 1 meter (3 feet) away from a person who is sick.

What can I do to protect members of my community from COVID-19

- wash your hands regularly with soap and water or use an alcohol-based hand rub;
- Clean surfaces regularly with disinfectant – for example kitchen benches and work desks;
- Educate yourself about COVID-19. Make sure your information comes from reliable sources;
- Avoid traveling if you have a fever or cough;
- Cough or sneeze into your sleeve, or use a tissue. Dispose of the tissue immediately into a closed rubbish bin, and then clean your hands;
- If you are sick, stay at home, and eat and sleep separately from your family, use different utensils and cutlery to eat;
- If you feel unwell, stay home (Do not go to work, to school or to public spaces) to avoid transmission of COVID-19 to others in the community.
- If you are unwell, you should self-isolate and self-monitor to avoid possible transmission to people in your community and family
- If you develop shortness of breath, go to the nearest health facility immediately;

What is self-isolation

Self-isolation is when a person who is ill (i.e., fever or respiratory symptoms), voluntarily or based on his/her health care provider's recommendation, stays at home and does not go to work, school, or public places.

- Self-isolation is an important measure to avoid transmission of infection to others in the community, including family members.
- If a person is in self-isolation it is because he/she is ill but not severely ill (requiring medical attention).
- The person in self-isolation should ideally have a room at home that is separated from other family members. If not possible, spatial distance of at least 1 meter (3 feet) from other family members and the use of a medical mask is recommended for the ill person with respiratory symptoms. The person in self-isolation should have dedicated utensils, plates, cups, towels and linens.
- The duration of isolation must be discussed with your health care provider

What is self-monitoring

Self-monitoring is done when a person is asymptomatic, and it includes daily measurement of temperature and monitoring for development of clinical symptoms such as cough or difficulty breathing

- Self-monitoring is recommended for those who have been exposed to an individual known to have COVID-19 or who have been in a COVID-19 affected country.
- Self-monitoring is recommended for 14 days after the date of last exposure.
- If any symptoms appear, stay home and practice self-isolation. Call your health-care provider or hotline, explain your symptoms and possible exposure and follow the advice provided.
- **Contact your medical provider urgently if you have difficulty breathing**.

What can I do to take care of members of my family that are suspected of COVID-19

The most effective ways to protect yourself and others against COVID-19 are:

- to frequently clean your hands,
- cover your cough with the bend of elbow or tissue
- and maintain a distance of at least 1 meter (3 feet) from people who are coughing or sneezing.

Use a mask only if you have respiratory symptoms (coughing or sneezing), have suspected COVID-19 infection with mild symptoms, or are caring for someone with suspected COVID-19 infection.

Commented [KAG1]: Can we suggest local alternatives

If you think a surface may be infected, clean it with simple disinfectant to kill the virus and protect yourself and others. Clean your hands with an alcohol-based hand rub or wash them with soap and water.

Avoid touching your eyes, mouth, or nose.

Home care for patients with suspected COVID-19 infection who present with mild symptoms

If the COVID-19 is presenting with mild illness, hospitalization may not be required and provision of care at home may be considered.

Homecare may be considered when inpatient care is unavailable or unsafe (e.g., capacity is limited, and resources are unable to meet the demand for healthcare services).

In any of these situations, patients with mild symptoms and without underlying chronic conditions – such as lung or heart disease, renal failure or immunocompromising conditions that place the patient at increased risk of developing

complications – may be cared for at home. This decision requires careful clinical judgment and should be informed by an assessment of the safety of the patient's home environment

The community Health worker will support patient and the family to adhere to the following recommended procedures recommended for home care isolation:

Home Care

A communication link with a healthcare provider or public health personnel, or both, should be established for the

duration of the home care period – that is, until the patient's symptoms have completely resolved.

The patient and the family should be provided with ongoing support and education, and monitoring should continue for the duration of home care. Patients and families should adhere to the following recommendations.

1. Place the patient in a well-ventilated single room (i.e., with open windows and an open door).
2. Limit the movement of the patient in the house and minimize shared space. Ensure that shared spaces (e.g., kitchen, bathroom) are well ventilated (e.g., keep windows open).
3. Household members should stay in a different room or, if that is not possible, maintain a distance of at least 1 m from the ill person (e.g., sleep in a separate bed).
4. Limit the number of caregivers. Ideally, assign one person who is in a good health and has no underlying
5. chronic or immunocompromising conditions. Visitors should not be allowed until the patient has completely recovered and has no signs and symptoms.
6. Wash your hands with soap and water after any type of contact with patients or their immediate environment. Wash your hands with soap and water
    a. before and after preparing food,
    b. before eating,
    c. after using the toilet and whenever hands look dirty.

If hands are not visibly dirty, an alcohol-based hand rub can be used. For visibly dirty hands, use soap and water. When washing hands with soap and water, it is preferable to air dry your hands.

7. To contain respiratory secretions, a medical mask should be provided to the patient and worn as much as possible. Individuals who cannot tolerate a medical mask should use rigorous respiratory hygiene – that is,
    a. the mouth and nose should be covered with a disposable paper tissue when coughing or sneezing.
    b. Materials used to cover the mouth and nose should be discarded or
    c. cleaned appropriately after use (e.g., wash handkerchiefs using regular soap or detergent and water)
8. Caregivers should wear a tightly fitted medical mask that covers their mouth and nose when in the same room as the patient.
    a. Masks should not be touched or handled during use.
    b. If the mask gets wet or dirty from secretions, it must be replaced immediately with a new clean, dry mask.
    c. Remove the mask using the appropriate technique
        i. Do not touch the front, but instead untie it.
        ii. Discard the mask immediately after use and
        iii. Wash your hands with soap and water
9. Avoid direct contact with body fluids, particularly oral or respiratory secretions, and stool. Use disposable gloves and a mask when providing oral or respiratory care and when handling stool, urine and other waste. Wash your hand before and after removing gloves and masks.
10. Do not reuse masks or gloves.

11. Use dedicated linen and eating utensils for the patient; these items should be washed with soap and water after use and may be re-used
12. Clean and disinfect daily surfaces that are frequently touched in the room where the patient is being cared for, such as bedside tables, bedframes and other bedroom furniture.
    a. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite (i.e., equivalent to 5000 pm or 1 part bleach 5 to 9 parts water) should be applied.
13. Clean and disinfect bathroom and toilet surfaces at least once daily. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite should be applied.
14. Clean the patient's clothes, bed linen, and bath and hand towels using regular laundry soap and water or machine wash at 60–90 °C with common household detergent, and dry thoroughly.
15. Place contaminated linen into a laundry bag.
16. Do not shake soiled laundry and avoid contaminated materials coming into contact with skin and clothes.
17. Gloves and protective clothing (e.g., plastic aprons) should be used when cleaning surfaces or handling clothing or linen soiled with body fluids. Depending on the context, either utility or single-use gloves can be used.
    a. After use, utility gloves should be cleaned with soap and water and decontaminated with 0.5% sodium hypochlorite solution.
    b. Single-use gloves (e.g., nitrile orlatex) should be discarded after each use.
    c. Wash hands with soap and water before and after removing the gloves
18. Gloves, masks and other waste generated during at-home patient care should be placed into a waste bin with a lid in the patient's room before being disposed of as infectious waste.
19. Avoid other types of exposure to contaminated items room the patient's immediate environment (e.g., do not share toothbrushes, cigarettes, eating utensils, dishes, drinks, towels, washcloths or bed linen).

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Version: 1.1
Date: 25 January 2020

World Health Organization

Household transmission investigation protocol for 2019-novel coronavirus infection

Protocol summary

Household transmission investigation protocol for 2019-novel coronavirus infection	
Study population	All household contacts of a confirmed 2019-nCoV case
Potential output and analysis	Transmissibility in household settings Estimates of: • Secondary Infection rate (SIR) among close contacts and factors associated with secondary infection • Range of clinical presentation, risk factors for infection, and the extent and fraction of asymptomatic infections • Serologic response following confirmed 2019-nCoV infection Epidemiological modeling parameters: • Reproduction numbers: R_0 and R • Serial intervals specific to household setting • Incubation period • Infection attack rates
Study design	Prospective study of household contacts of confirmed 2019-nCoV cases, ideally before widespread community transmission occurs
Study duration	At a minimum, enrolled household contacts will complete four home visits within 28 days of enrolment/follow-up
Minimum information and specimens to be obtained from participants	Data collection: Epidemiological data including: clinical symptoms, exposures, including contact with confirmed case. Specimens: Respiratory (and other) to diagnose current 2019-nCoV infection, serum to inform seroepidemiological inferences

1 Background

The detection and spread of an emerging respiratory pathogen are accompanied by uncertainty over the key epidemiological, clinical and virological characteristics of the novel pathogen and particularly its ability to spread in the human population and its virulence (case-severity). This is the case for the novel coronavirus (2019-nCoV), first detected in Wuhan city, China in December 2019 (1).

Closed settings, such as the household, have a defined population that do not mix readily with the larger surrounding community, and therefore such settings provide a strategic way to track emerging respiratory infections and characterize virus transmission patterns because the denominator can be well defined. Also, exposure is within the setting, and follow-up of household contacts is generally more feasible in this well-defined setting as compared to an undefined one. Household setting studies allow us to determine transmission dynamics (reproduction number and serial interval) of the virus as well as to understand the clinical spectrum of illness in secondary cases (2). Closed settings are also useful to observe chains of transmission in an epidemic as the pool of susceptible, exposed individuals is larger. Therefore, in the case of multiple waves of infection through the closed setting, unique insight into transmission dynamics can be derived in the early epidemic stages.

To date initial surveillance has focused primarily on patients with severe disease, and, as such, the full spectrum of the disease, including the extent and fraction of mild or asymptomatic infection that do not require medical attention are not clear. Infections identified in close contacts may potentially be generalizable to naturally-acquired infections (in contrast to cases presenting for emergency care among which there would be fewer mild cases). Following close contacts with similar levels of exposure to infection from primary cases can also permit identification of the asymptomatic fraction. Principally, follow-up and testing of respiratory specimens and serum of close contacts can provide useful information about newly identified cases, as well as the spectrum of illness and frequency (by for example age) of asymptomatic and symptomatic infection.

With the emergency of a novel coronavirus, initial seroprevalence in the population will be low due to the virus being new in origin. Therefore, surveillance of antibody seroprevalence in a population can allow inferences to be made about the cumulative incidence of infection in the population. Household transmission studies also can provide the opportunity to follow-up confirmed cases to understand antibody kinetics.

The following protocol has been designed to investigate household transmission of 2019-nCoV in any country in which 2019-nCoV infection has been reported and households are exposed. Each country may need to tailor some aspects of this protocol to align with public health, laboratory and clinical systems, according to capacity, availability of resources and cultural appropriateness. However, using a standardized protocol such as the protocol described below, epidemiological exposure data and biological samples can be systematically collected and shared rapidly in a format that can be easily aggregated, tabulated and analyzed across many different settings globally for timely estimates of 2019-nCoV infection severity and attack rates, as well as to inform public health responses and policy decisions. This is particularly important in the context of a novel respiratory pathogen, such as 2019-nCoV.

Comments for the user's consideration are provided in purple text throughout the document as the user may need to modify methods slightly because of the local context in which this study will be carried out.

1.1 Objectives

There are three primary objectives of this household transmission study:

1. To better understand the extent of transmission within a household by estimating the secondary infection rate[1] for household contacts at an individual level, and factors associated with any variation in the secondary infection risk.
2. To characterize secondary cases including the range of clinical presentation, risk factors for infection, and the extent and fraction of asymptomatic infections.
3. To characterize serologic response following confirmed 2019-nCoV infection (highly encouraged, but optional depending on laboratory capacity and resources)

Household transmission studies provide rich data that can permit evaluation of secondary objectives such as, but not limited to:

1. To estimate the serial interval[2] in a household setting.
2. To estimate incubation period[3], duration of infectiousness[4] and duration of detected shedding[5]
3. To characterize duration and severity of 2019-nCoV-associated disease.
4. Others (context specific/ optional)

[1] In this context the **secondary infection rate (SIR)** is a measure of the frequency of new cases of 2019-nCoV infection among the household contacts of a primary confirmed case in a defined period of time, as determined by a confirmed 2019-nCoV positive lab result. In simple terms: the proportion of household contacts of a primary case who subsequently become infected with 2019-nCoV

[2] The **serial interval** is defined as the period of time from the onset of symptoms in the primary case to the onset of symptoms in a contact case.

[3] **Incubation period** is defined as the period of time between an exposure resulting in infection and the onset of clinical symptoms of disease.

[4] The **duration of infectiousness** is the time which virus is shed and able to be transmitted regardless of clinical symptoms

[5] It is currently not known how long **detectable 2019-nCoV virus shedding** lasts; information from this study would help to clarify the duration of shedding among individuals with confirmed infection.

2 Study procedures

2.1 Study design

The household transmission investigation is a case-ascertained prospective study of all identified household contacts of a laboratory confirmed 2019-nCoV infection (see 2.2 Study population). It is intended to provide rapid and early information on the clinical, epidemiological and virological characteristics of 2019-nCoV.

This investigation should be conducted following the identification of a laboratory-confirmed 2019-nCoV infection in any country. It should also ideally be conducted before widespread community transmission occurs. That is, within the early phases of an epidemic following the identification of a laboratory confirmed 2019-nCoV infection.

2.2 Study population

The study population is derived from the identification of any laboratory confirmed 2019-nCoV infection. This is distinct from a household cohort study in which a group of disease-free households are recruited and then followed over time. Every effort should be made to include all identified household contacts of cases of a laboratory confirmed 2019-nCoV infection.

For the purpose of this investigation, primary cases will be identified through surveillance of individuals who are diagnosed with laboratory confirmed 2019-nCoV infection. 2019-nCoV case definitions for reporting are available on the WHO website, although they are subject to further updates as more information becomes available.

COMMENT: All WHO guidance material for 2019-nCoV is available on the WHO website. This currently includes case definitions, laboratory guidance, infection prevention and control and travel guidance.

For the purpose of this investigation, a **household** is defined as a group of people (2 or more) living in the same residence. In practice, the technical definition may vary due to social, political and cultural practices.
Definitions of a household which may be used (but are not limited to):

- Two or more people living together in a domestic residence (residential institutions, such as boarding schools, dormitories, hostels or prisons will be excluded).
- A dwelling or group of dwellings with a shared kitchen or common opening onto a shared household space.

For the purpose of this investigation, **a household contact** is defined as a person who has resided in the same household as the primary 2019-nCoV case while the case was symptomatic.

COMMENT: For the purposes of comparability between investigations, it is important that whichever definition of a household contact is well detailed in any reporting on the investigation.

2.3 Exclusion criteria

Households may need to be excluded (or not, if it is possible to tease out the transmission dynamics) if:

- Date of onset is the same for more than one family member

2.4 Study duration

The investigation can continue for as long as is determined feasible by the country implementing the investigation. However, ideally, enrolled household contacts will complete **four home visits within 28 days of enrolment/follow-up**. Specimens, and information on risk factors and symptoms will be collected from primary cases and from each of his/her household contacts. The duration of follow-up may vary depending on further secondary objectives.

Study enrolment **could be extended as far as desired, however** the most valuable period in order to use data for targeted public health action is in the early phases of the epidemic.

2.5 Data collection

Information on primary cases and their close contacts should be sought through a combination of face-to-face or telephone interview of the case (or family members if the case is too ill to be interviewed), household members, self-reporting, interview of health care providers and/or review of medical records where required.

An investigation questionnaire can be found in Appendix 1 of this document. These forms are not exhaustive, but outline the data collection required for insight into the epidemiology of 2019-nCoV and may be updated further. This will still need to be adapted based on the local setting, and outbreak characteristics.

Once a case of 2019-nCoV infection has been identified and recruited into the investigation, a home visit will need to be conducted to identify all eligible household contacts, to collect relevant socio-demographic and clinical information and to allow molecular confirmation of secondary infections and establish baseline antibody status, (or at a minimum to collect serum to test seroprevalence once serology capacity is available).

2.6 Follow up of cases and contacts

For the purposes of this investigation, data and specimens will be collected through home visits from cases and contacts on the day of recruitment (Day 1), followed by home visits on day 7, day 14, and day 28 if possible.

COMMENT: For surveillance, follow up needs to be more frequent. The specimen collection schedule for the household transmission investigation described here, is added on top of normal follow up of contacts.

For cases, data will be collected using **Form 1a** for the first visit, followed by **Forms 2, 3 and 4**. For contacts, data will be collected using **Form 1b** for the first visit, followed by **Forms 2, 3 and 4**.

Symptom diaries (template available in Appendix 1 of this protocol) will be provided for all household contacts to complete for up to 28 days after the administration of the baseline questionnaire, with a minimum of 14 days, to record presence or absence of various signs or symptoms. A proxy may fill out the symptom diaries on behalf of those unable to complete the form themselves.

Any household contact with clinical symptoms within 14 days of the last exposure/contact with the primary case should be considered as a symptomatic contact and so a possible/suspected case, and therefore managed as such.

The table below provides an overview of the follow-up procedures

	Purpose of form	**Collecting from whom?**	**When should it be collected?**
Confirmed cases			
Form 1a	Minimum data reporting form	For **confirmed** cases	As soon as possible after laboratory confirmation of a case **(Day 1)**
Forms 2, 3 and 4	Case **follow-up** forms	For **confirmed** cases (outcomes)	At home visits (**Days 7, 14 and 28**) respectively
Household contacts			
Form 1b	Contact data reporting form	For households contacts	As soon as possible, ideally within 24 hours after laboratory confirmation of the primary case (**Day 1**)
Forms 2, 3 and 4	Contact **follow-up** forms	For households contacts (outcomes)	At home visits (**Days 7, 14 and 28**) respectively
Symptom diaries	Record presence or absence of various signs or symptoms.	For confirmed cases (if possible) and households contacts	For up to 28 days after the administration of the baseline questionnaire (Form 1b), with a **minimum of 14 days**
Confirmed cases and household contacts			
Laboratory results report	Track and summarize all laboratory results (and methods used)	For confirmed cases and households contacts	This table will need to be filled/ updates to at each specimen collection time point above

2.7 Specimen collection

COMMENT: The following is intended to guide minimum specimen collection from confirmed cases and their household contacts. It may be more useful to collect respiratory specimens from study participants at a more frequent interval to provide more detailed insight into the duration of shedding and the serial interval (not just the symptomatic serial interval).

2.7.1 Confirmed cases

All baseline respiratory and serum samples (as directed by specimen collection guidance in the country) should be collected from confirmed cases, as soon as possible after laboratory confirmation. Liaise with the relevant local public health laboratory or the nearest relevant laboratory to determine which specimens have already been collected for confirmed cases and if they are of sufficient quality and quantity for this investigation.

Follow-up samples (and other samples) may include upper respiratory tract samples, clotted blood, but also oral fluid, urine, feces and should be collected at a frequency described in Figure 1. Lower respiratory tract samples can also be collected, if feasible but recommended infection prevention and control precautions should be in place prior to collection (see 2.9.3 Prevention of 2019-nCoV infection in investigation personnel). Appropriate PPE should be worn when specimens are being collected from confirmed cases.[6]

2.7.2 Household contacts

All baseline upper respiratory specimens (nasopharyngeal/oropharyngeal swab) and serum samples should be collected at the initial home visit. Respiratory specimens should be collected for molecular testing, as well as serum samples for serology, from all members of the household, regardless of symptoms, together with the administration of the baseline questionnaire. At the day 7 and day 14 visits, respiratory samples (and other relevant specimens) will be collected from all members of the household for virologic testing, regardless of symptoms, and at the day 28 visit, serum sample, (and other potentially relevant specimens) could be collected from all household contacts – see Figure 1

Paired serological samples from all household contacts allow for confirmation of seroconversion, and are useful to confirm the secondary-infection attack rate and the proportion of infections that are asymptomatic. They can be taken regardless of symptoms.

Other specimens (as described for confirmed cases) may be collected according to clinical presentation, resources and observed patterns of viral shedding (described earlier) and may be collected by research staff depending on resources, logistics and training.

2.7.3 Note on serology

Paired clotted blood samples should be taken for serology and handled and separated correctly by the laboratory. Paired serological samples from confirmed cases are needed to aid the development of serological testing, to determine an accurate secondary-infection attack rate.

Serum samples should be taken on all 2019-nCoV confirmed cases.

- An acute baseline clotted blood sample should be taken as soon as possible, and ideally no later than 7 days after symptom onset.
- A follow up (or convalescent) clotted blood sample should be taken:
    - at least 14 days after the baseline sample,

[6] Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care - WHO Guidelines. Geneva, World Health Organization, 2014. Available at http://apps.who.int/iris/bitstream/10665/112656/1/97892 41507134_eng.pdf

- OR 28 days after symptom onset if an acute sample couldn't be taken when the case was symptomatic.

Figure 1: Timeline of data and specimen collection in the household transmission study

Day since recruitment	**0** (±1)	…	**7**	…	**14**	…	**28**
Home visit and data collection							
Respiratory sample		(optional)		(optional)		(optional)	(optional)
Serum sample (dependent on country)			(optional)		Highly encouraged		
Other specimens (if relevant)	(optional- situation dependent)						
Symptom diaries						Highly encouraged	

Legend:
Blue boxes indicate activities which are needed for the study
Light blue boxes indicate when serum collection (or symptom diaries) is highly encouraged, but not essential according to resources and capacity.
Green boxes indicate where additional specimens could be collected above the minimum specimen requirements of this study to increase information available. Please note that this could also include collecting specimens from household contacts when they first become symptomatic.

2.8 Specimen transport

All those involved in collection and transporting specimens should be trained in safe handling practices and spill decontamination procedures. or details regarding the transport of samples collected and infection control advice, please refer to case management algorithm and laboratory guidance in the country or WHO laboratory guidance, available on the WHO website.

For each biological sample collected, the time of collection, the conditions for transportation and the time of arrival at the study laboratory will be recorded. Specimens should reach the laboratory as soon as possible after collection. If the specimen is not likely to reach the laboratory within 72 hours, specimens should be frozen, preferably at -80°C, and shipped on dry ice. It is, however, important to avoid repeated freezing and thawing of specimens. The storage of respiratory and serum specimens in domestic frost-free freezers should be avoided, owing to their wide temperature fluctuations. Serum should be separated from whole blood and can be stored and shipped at 4°C or frozen to -20°C or lower and shipped on dry ice.

Transport of specimens within national borders should comply with applicable national regulations. International transport of specimens should follow applicable international regulations as described in the WHO Guidance on Regulations for the Transport of Infectious Substances 2013- 2014.

2.9 Ethical considerations

Ethical requirements will vary by country. In some countries, this investigation may fall under public health surveillance (emergency response) acts and may not require ethical approval from an Institutional Review Board.

2.9.1 Informed consent

The purpose of the investigation will be explained to all known contacts of a confirmed 2019-nCoV infected patient. Informed consent will be obtained from all cases and contacts willing to participate in the investigation before any procedure is performed as part of the investigation by a trained member of the investigation team. Consent for children under the legal age of consent will be obtained from a parent or legal guardian. Each participant must be informed that participation in the investigation is voluntary and that s/he is free to withdraw, without justification, from the investigation at any time without consequences and without affecting professional responsibilities.

COMMENT: The age of consent may vary by country. Check the requirements of local, regional or national authorities.

Informed consent will seek approval to collect blood, respiratory samples and epidemiological data for the intended purpose of this investigation, that samples may be shipped outside of the country for additional testing and that samples may be used for future research purposes.

2.9.2 Risks and benefits for subjects

This investigation poses minimal risk to participants, involving the collection of a small amount of blood and respiratory specimens. The direct benefit to the participant is the possibility for early detection of 2019-nCoV infection which would allow for appropriate monitoring and treatment. The primary benefit of the study is indirect in that data collected will help improve and guide efforts to understand transmission of 2019-nCoV and prevent further spread of 2019-nCoV.

2.9.3 Prevention of 2019-nCoV infection in investigation personnel

All personnel involved in the investigation need to be trained in infection prevention and control procedures (standard contact, droplet or airborne precautions, as determined by national or local guidelines). These procedures should include proper hand hygiene and the correct use of surgical or respiratory face masks, if necessary, not only to minimize their own risk of infection when in close contact with 2019-nCoV infected patients, but also to minimize the risk of spread among contacts of 2019-nCoV infected patients.

WHO technical guidance on infection prevention and control specific to 2019-nCoV can be found on the WHO website.

3 Laboratory testing

Laboratory guidance for 2019-nCoV can be found on the WHO website.

Several assays that detect the novel coronaviruses detected in Wuhan, China have been recently developed and the protocols or SOPs can also be found on the WHO website.

4 Statistical analyses

4.1 Sample size

This investigation is intended to be implemented to provide rapid and early information on the clinical, epidemiological and virological characteristics of 2019-nCoV. Larger studies will undoubtedly permit more robust analysis of potential factors affecting the secondary infection risk, more precise estimation of the asymptomatic fraction, and more detailed characterization of serologic responses following infection

4.2 Epidemiological parameters

The table below provides an overview of the epidemiological parameters that can be measured as part of this investigation

Parameter	**Definition** (*in bracket*: "simplified" expression of it)	**Form and questions where to get the data to calculate the parameters concerned**	**Comments, limitations**
Course of disease	A description of the distribution of cases by time, person and place	Form 1: Q3, Q4, Q5 Form 2: Q3 Form 3,4,5	*Location will need to be supplemented by notification data to recognize geospatial trends
Symptomatic proportion of cases (asymptomatic fraction)	The proportion of cases who show symptoms or signs of 2019-nCoV infection	Form 1: Q6 Form 2: Q5 Form 3,4,5 Form 6	*The numerators of interest are the numbers of those contacts reporting various signs and symptoms of infection (e.g. fever, cough) and the number/proportion of those contacts reporting no signs or symptoms (i.e. the asymptomatic fraction); the denominator is the total number of cases.
Secondary infection rate (also called secondary infection incidence)	A measure of the frequency of new cases of 2019-nCoV infection among the close contacts of confirmed cases in a defined period of time *(The rate of contacts being infected. Assessed through serological assays on paired samples)*	Form 3,4,5	*The numerator will be determined as the number of household contacts with confirmed 2019-nCoV infection, while the denominator will be determined as the total number of household contacts. *represents an overall risk of infection among household contacts for a defined time period.
Clinical presentation	The range of clinical symptoms in cases and contacts. (*Severity*)	Form 1: Q6 Form 2: Q5	*In-hospital clinical studies will enhance understanding of clinical course, severity and risk determinants, as well as case fatality.
Serological response to infection	Change in serum level of specific antibodies to 2019-nCoV (*Increase in titre*)	Form 3,4,5	*This will only be able to be calculated with the addition of laboratory data *Will be supplemented by findings of clinical studies and first few outbreak studies to confirm that seroconversion

			following an infection is anticipated
Incubation period	The time period between 2019-nCoV exposure and the appearance of the first sign or symptom of the disease (from infection to disease)	Form 6	
Serial interval distribution	The time between onset of symptoms in the case to onset of symptoms in the close contact	Form 1: Q6 Form 2: Q5 Form 3,4,5 Form 6	*Will be greatly enhanced by information from first few outbreaks where transmission chains may be more identifiable and prolonged
Generation time distribution	Time between infection in the case and infection in the close contact	Form 3,4,5	*Will be greatly enhanced by information from first few outbreaks where transmission chains may be more identifiable and prolonged
Population groups most at risk	Determining the groups who are most vulnerable to 2019-nCoV infection (e.g. age groups, gender, occupation)	Form 1: Q4, Q5 Form 2: Q3, Q4	*May only be an early signal, other sources of information will need to be used to inform decision making (line listing of cases and other clinical case series) *This may be biased from this study, as we are recruiting on the basis of being detected and confirmed to have 2019-nCoV and healthcare seeking behaviour may vary between population groups
Genomic data		Form 3,4,5	*An alternate means to estimate the reproduction number *May supplement other transmission data to inform transmission parameter estimates, although likely to be delayed beyond the initial public health response phase.
Basic reproduction number R_0	A measure of the number of infections produced, on average, by an infected individual in the early stages of the epidemic, when	Form 2: Q5 Form 3,4,5 Form 6	*Can be calculated using different approaches; identifying clusters and cluster size (using epi methods and

	virtually all contacts are susceptible. *(average number of infections/disease arising from one infection*) Reminder: Basic reproductive ratio (R_0) – everyone is susceptible and there is no control, maximum value that R can take is equal to the transmission potential.		potentially genetic information to identify how many secondary cases are occurring), and using the epidemic curve and how steep it is *R can be calculated using multiple sources of information incident case notifications, incident hospitalisation by age (as a potentially more stable alternative) or genomic data, all of which will be taken together as an estimate of transmissibility.
Reproductive ratio (R)	Ever-changing quantity of the amount of secondary cases produced by a primary case across time and space (i.e. context-specific)	Form 2: Q5 Form 3,4,5 Form 6	*Not the main aim of household transmission studies, but if the study is continued and transformed into a long-term "cohort" study we may be able to calculate it.

5 Reporting of findings

5.1 Reporting

Any investigation of this nature should include reporting on the following information:

(1) the number of households, the number of household contacts included;
(2) the number of PCR-confirmed 2019-nCoV cases among the household contacts;
(3) the number of symptomatic household contacts;
(4) the number of household contacts with serologic evidence of 2019-nCoV infection. If sample size permits, these numbers should be stratified by age.

It is also important to fully document the study design, including the definition of households and household contacts, the approach to ascertainment of primary cases and secondary cases, the duration of follow-up, and the laboratory methods used to ensure that data can be pooled to increase power in estimating epidemiological parameters.

Ideally, information would be collected in a standardized format according to the questionnaires and tools in this generic protocol to assist with data harmonization and comparison of results (see forms in Appendix A).

If the data is shared by the implementing organization to WHO or any agency or institution providing support for data analysis, data shared will include only the study identification number and not any personably identifiable information.

6 References

1. World Health Organization. Disease Outbreak News: Pneumonia of unknown cause – China https://www.who.int/csr/don/05-january-2020-pneumonia-of-unkown-cause-china/en/?fbclid=IwAR2v89e9lp70O6GTra13FIPHCLw4WJ8kL20Uylx5zZNtWAYvbR0sEATr_rg (Accessed 22 January 2020)

2. Lau LL, Nishiura H, Kelly H, Ip DK, Leung GM, Cowling BJ. Household transmission of 2009 pandemic influenza A(H1N1): a systematic review and meta-analysis. Epidemiology 2012 (in press)

6.1 References for 2019-nCoV

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https://www.who.int/csr/don/en/

Surveillance and case definitions
https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-ncov)

Laboratory guidance
https://www.who.int/health-topics/coronavirus/laboratory-diagnostics-for-novel-coronavirus

Clinical management
https://www.who.int/internal-publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected

Infection prevention and control
https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected

Risk communications
https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-(-ncov)

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Appendices

Appendix A: Sample questionnaires - Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 1a : Report Form for cases - Day 1
Form 1b : Report Form for household contacts - Day 1

Form 2: Report Form for cases and household contacts – Day 7
Form 3: Report Form for cases and household contacts – Day 14
Form 4: Report Form for cases and household contacts – Day 28

Form 5: Laboratory results

Form 6: Symptom diary

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 1a : Report Form for cases - Day 1

Unique Primary Case ID / Household Number	

1. Current Status	□ Alive □ Dead

2. Data Collector Information	
Name of data collector	
Data collector Institution	
Data collector telephone number	
Mobile number	
Email	
Form completion date (DD/MM/YYYY)	___/___/___
Date of interview with informant (DD/MM/YYYY)	___/___/___

3. Interview respondent information (if the persons providing the information is not the primary case)	
First name	
Surname	
Sex	□ Male □ Female □ Not known
Date of Birth (DD/MM/YYYY)	___/___/___
Relationship to primary case	
Respondent address	
Telephone (mobile) number	

4. Primary case Identifier Information	
First name	
Surname	
Sex	□ Male □ Female □ Not known
Date of Birth (DD/MM/YYYY)	___/___/___
Telephone (mobile) number	
Age (years, months)	
Email	
National social number/ identifier (if applicable)	
Country of residence	
Nationality	
Ethnicity (optional)	
Responsible Health Centre	
Nursery/School/College if appropriate Work/ Stay home etc	

5. Household information	
Location of household / Address of primary case	
Household size (number of people who usually live in the house, this will be varied depending on culture)	
Number of rooms in house	

Number of bedrooms	
Age of each household member	_____ _____ _____ _____ _____

6a. Primary case symptoms from onset of illness	
Date of first symptom onset* (DD/MM/YYYY)	___/___/___ □ Asymptomatic □ Unknown
Fever (≥38 °C) or history of fever*	□ Yes □ No □ Unknown If yes, specify maximum temperature from onset of illness:
Date of first health facility visit (including traditional care)* (DD/MM/YYYY)	___/___/___ □ NA □ Unknown
Total number of visits to health facilities since onset of illness	
Total number of health facilities visited since onset of illness	□ NA □ Unknown Specify:
6b. Respiratory symptoms	
Sore throat*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Cough*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Runny nose*	□ Yes □ No □ Unknown
Shortness of breath*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
6c. Other symptoms	
Chills	□ Yes □ No □ Unknown
Vomiting	□ Yes □ No □ Unknown
Nausea	□ Yes □ No □ Unknown
Diarrhoea	□ Yes □ No □ Unknown
Headache	□ Yes □ No □ Unknown
Neurological signs If Yes, specify	□ Yes □ No □ Unknown
Rash	□ Yes □ No □ Unknown
Conjunctivitis	□ Yes □ No □ Unknown
Muscle ache	□ Yes □ No □ Unknown
Joint ache	□ Yes □ No □ Unknown
Loss of appetite	□ Yes □ No □ Unknown
Nose bleed	□ Yes □ No □ Unknown
Fatigue	□ Yes □ No □ Unknown
General malaise	□ Yes □ No □ Unknown
Seizures	□ Yes □ No □ Unknown
Altered consciousness	□ Yes □ No □ Unknown

Other symptoms	□ Yes □ No □ Unknown If yes, specify:

7. Primary case pre-existing condition(s)	
Obesity	□ Yes □ No □ Unknown
Cancer	□ Yes □ No □ Unknown
Diabetes	□ Yes □ No □ Unknown
HIV/other immune deficiency	□ Yes □ No □ Unknown
Heart disease	□ Yes □ No □ Unknown
Asthma (requiring medication)	□ Yes □ No □ Unknown
Chronic lung disease (non-asthma)	□ Yes □ No □ Unknown
Chronic liver disease	□ Yes □ No □ Unknown
Chronic haematological disorder	□ Yes □ No □ Unknown
Pregnancy	□ Yes □ No □ Unknown If yes, specify trimester: □ First □ Second □ Third □ NA Estimated delivery date (DD/MM/YYYY) ___/___/___
Chronic kidney disease	□ Yes □ No □ Unknown
Chronic neurological impairment/disease	□ Yes □ No □ Unknown
Organ or bone marrow recipient	□ Yes □ No □ Unknown
Other pre-existing condition(s)	□ Yes □ No □ Unknown If yes, specify:
Primary case was vaccinated for influenza in the 12 months prior to onset of illness	□ Yes □ No □ Unknown If Yes, date of vaccination, (DD/MM/YYYY) ___/___/___ Country of vaccination:
Primary case was vaccinated with pneumococcal vaccine If Yes, date (DD/MM/YYYY)	□ Yes □ No □ Unknown (DD/MM/YYYY) ___/___/___

8. Case specimen collection (Day 1- baseline)	
Date baseline respiratory sample collected (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ □ NA
What type of respiratory sample was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others
Has baseline serum been taken?	□ Yes □ No □ Unknown If yes, specify date (DD/MM/YYYY):
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	___/___/___
9. Laboratory results reporting	

Please impute laboratory results once they become available in the "Laboratory results report"

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 1b : Report Form for household contacts - Day 1

Unique Primary Case ID / Household Number	

1. Current Status	□ Alive □ Dead

2. Data Collector Information	
Name of data collector	
Data collector Institution	
Data collector telephone number	
Mobile number	
Email	
Form completion date (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___
Date of interview with informant (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___

3. Contact Identifier Information	
First name	
Surname	
Sex	□ Male □ Female □ Not known
Date of Birth (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___
Relation to confirmed case	
Telephone (mobile) number	
Age (years, months)	
Email	
National social number/ identifier (if applicable)	
Country of residence	
Nationality	
Ethnicity (optional)	
Responsible Health Centre	
Nursery/School/College if appropriate Work/ Stay home etc	

4. Household information	
Location of household / Address of contact if different to address of primary case	
Date of last contact with the confirmed case (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___
Does the contact share a room (or usually does) with the primary case?	□ Yes □ No □ Unknown
Number of days during the time the case was ill at home that were spent in contact with case (refer to household contact definition)	
Did the contact take care of the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact hug the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact kiss the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact shake hands with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown

Did the contact share a meal with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact eat from the same plate with hands with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact share a drinking cup/glass with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact share utensils with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact sleep in the same room as the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown
Did the contact share a toilet with the case during the time he/she was ill at home before hospitalization?	□ Yes □ No □ Unknown

5a. Contact symptoms	
Has the contact experienced any respiratory symptoms (sore throat, cough, running nose, shortness of breath) in the period from 10 days before onset in the confirmed case until the present?	□ Yes □ No If no, please skip to next section 5c
Date of first symptom onset (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ □ Asymptomatic □ Unknown
Fever (≥38 °C) or history of fever	□ Yes □ No □ Unknown If yes, specify maximum temperature:
5b. Respiratory symptoms	
Sore throat	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Cough	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Runny nose	□ Yes □ No □ Unknown
Shortness of breath	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
5c. Other symptoms	
Chills	□ Yes □ No □ Unknown
Vomiting	□ Yes □ No □ Unknown
Nausea	□ Yes □ No □ Unknown
Diarrhoea*	□ Yes □ No □ Unknown
Headache*	□ Yes □ No □ Unknown
Neurological signs* If Yes, specify	□ Yes □ No □ Unknown
Rash*	□ Yes □ No □ Unknown
Conjunctivitis*	□ Yes □ No □ Unknown
Muscle aches*	□ Yes □ No □ Unknown
Joint ache	□ Yes □ No □ Unknown
Loss of appetite	□ Yes □ No □ Unknown

Nose bleed	□ Yes □ No □ Unknown
Fatigue	□ Yes □ No □ Unknown
General malaise	□ Yes □ No □ Unknown
Seizures	□ Yes □ No □ Unknown
Altered consciousness	□ Yes □ No □ Unknown
Other symptoms*	□ Yes □ No □ Unknown If yes, specify:

6. Contact pre-existing condition(s)	
Obesity	□ Yes □ No □ Unknown
Cancer	□ Yes □ No □ Unknown
Diabetes	□ Yes □ No □ Unknown
HIV/other immune deficiency	□ Yes □ No □ Unknown
Heart disease	□ Yes □ No □ Unknown
Asthma (requiring medication)	□ Yes □ No □ Unknown
Chronic lung disease (non-asthma)	□ Yes □ No □ Unknown
Chronic liver disease	□ Yes □ No □ Unknown
Chronic haematological disorder	□ Yes □ No □ Unknown
Pregnancy	□ Yes □ No □ Unknown If yes, specify trimester: □ First □ Second □ Third □ NA Estimated delivery date (DD/MM/YYYY) ___/___/___
Chronic kidney disease	□ Yes □ No □ Unknown
Chronic neurological impairment/disease	□ Yes □ No □ Unknown
Organ or bone narrow recipient	□ Yes □ No □ Unknown
Other pre-existing condition(s)	□ Yes □ No □ Unknown If yes, specify:
Contact was vaccinated for influenza in the 12 months prior to onset of illness in the case	□ Yes □ No □ Unknown If Yes, date of vaccination (DD/MM/YYYY) ___/___/___ Country of vaccination:
Contact was vaccinated with pneumococcal vaccine If Yes, date (DD/MM/YYYY)	□ Yes □ No □ Unknown (DD/MM/YYYY) ___/___/___

7. Contact specimen collection (Day 1- baseline)	
Date baseline respiratory sample collected* (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ □ NA
What type of respiratory sample was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others
Has baseline serum been taken?	□ Yes □ No □ Unknown If yes, specify date (DD/MM/YYYY):
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	___/___/___
8. Laboratory results reporting	
Please impute laboratory results once they become available in the "Laboratory results report"	

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Form 2: Report Form for cases and household contacts – Day 7

10. Respiratory specimen collection (Day 7)	
Unique Primary Case ID / Household number	□ NA
Date of sample collection (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ □ NA
What type of respiratory specimen was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others
Who collected the respiratory specimen?	□ Study staff/ research nurse □ Self-collected
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	___/___/___ Specify laboratory:
11. Laboratory results reporting	
Please impute laboratory results once they become available in the "Laboratory results report"	

12. Outcome (Day 7)	
Outcome	□ Alive □ Died □ NA □ Unknown If dead, cause:
Outcome current as of date (DD/MM/YYYY)	___/___/___ □ Unknown □ NA
Hospitalization	□ Yes □ No □ Unknown If yes, date of first hospitalization ___/___/___ □ Unknown If yes, specify reason for hospitalisation:

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 3: Report Form for cases and household contacts – Day 14

13. Respiratory specimen collection (Day 14)	
Unique Primary Case ID / Household number	□ NA
Date of sample collection (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ □ NA
What type of respiratory specimen was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others
Who collected the respiratory specimen?	□ Study staff/ research nurse □ Self-collected
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ Specify laboratory:
14. Laboratory results reporting	
Please impute laboratory results once they become available in the "Laboratory results report"	

15. Outcome (Day 14)	
Outcome	□ Alive □ Died □ NA □ Unknown If dead, cause:
Outcome current as of date (DD/MM/YYYY)	___/___/___ □ Unknown □ NA
Hospitalization	□ Yes □ No □ Unknown If yes, date of first hospitalization ___/___/___ □ Unknown If yes, specify reason for hospitalisation:

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Form 4: Report Form for cases and household contacts – Day 28

16. Respiratory specimen collection (Day 28)	
Unique Primary Case ID / Household number	□ NA
Date of sample collection (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ □ NA
What type of respiratory specimen was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others
Who collected the respiratory specimen?	□ Study staff/ research nurse □ Self-collected
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ Specify lab:
17. Laboratory results reporting	
Please impute laboratory results once they become available in the "Laboratory results report"	

18. Outcome (Day 28)	
Outcome	□ Alive □ Died □ NA □ Unknown If dead, cause:
Outcome current as of date (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ □ Unknown □ NA
Hospitalization	□ Yes □ No □ Unknown If yes, date of first hospitalization ___/___/___ □ Unknown If yes, specify reason for hospitalisation:

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 5: Laboratory results

This table will need to be completed for every specimen collection at each point in the follow-up, depending on the chosen specimen collection schedule.

19a. Molecular testing methods and results:	
Lab identification number	
Date sample collected (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Date sample received (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Type of sample	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others, specify:
Type of test	□ PCR □ Whole genome sequencing □ Partial genome sequencing □ Other, specify
Result	□ 2019-nCoV □ Others, specify:
Date of result (DD/MM/YYYY)	___/___/___
Specimen shipped to other laboratory for confirmation - Date (DD/MM/YYYY)	□ Yes □ No (DD/MM/YYYY)___/___/___

19b. Serology testing methods and results:	
Lab identification number	
Date sample collected (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Date sample received (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Type of sample	□ Serum □ Others, specify:
Result (2019-nCoV antibody titres)	
Date of result (DD/MM/YYYY)	___/___/___
Specimen shipped to other laboratory for confirmation - Date (DD/MM/YYYY)	□ Yes □ No (DD/MM/YYYY)___/___/___

Household transmission investigation protocol for 2019-novel coronavirus (2019-nCoV) infection

Form 6: Symptom diary

Each household contact will be asked to record the presence or absence of various signs or symptoms each day for up to 28 days after the administration of the baseline questionnaire (minimum 14 days).

With 2019-nCoV, the extent of clinical presentation and spectrum remains unclear, so symptom diaries may be broadened to include vomiting, diarrhea, abdominal pain, etc., as relevant and may need to be altered to include symptom data for longer than 14 days.

If no symptoms are experienced, ensure that *None* is selected in the second column.

Day	**Symptoms**						
	No symptoms (check if none experienced)	**Fever ≥38°C**	**Sore throat**	**Cough**	**Runny nose**	**Shortness of breath**	**Other symptoms: specify**
0	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
1	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
2	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
3	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
4	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
6	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
7	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
8	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
9	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
10	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
11	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
12	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
13	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
14	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
…							
28	□ None	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	

Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected

Interim guidance

25 January 2020

World Health Organization

Introduction

This is the first edition of guidance on infection prevention and control (IPC) strategies for use when infection with a novel coronavirus (2019-nCoV) is suspected. It has been adapted from WHO's *Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection*,[1] based on current knowledge of the situation in China and other countries where cases were identified and experiences with severe acute respiratory syndrome (SARS)-CoV and MERS-CoV.[2]

WHO will update these recommendations as new information becomes available.

This guidance is intended for healthcare workers (HCWs), healthcare managers and IPC teams at the facility level but it is also relevant for the national and district/provincial level. Full guidelines are available from WHO.[2]

Principles of IPC strategies associated with health care for suspected nCoV infection

To achieve the highest level of effectiveness in the response to an 2019-nCoV outbreak using the strategies and practices recommended in this document, an IPC programme with a dedicated and trained team or at least an IPC focal point should be in place and supported by the national and facility senior management.[3] In countries where IPC is limited or inexistent, it is critical to start by ensuring that at least *minimum requirements* for IPC are in place as soon as possible, both at the national and facility level, and to gradually progress to the full achievement of all requirements of the IPC core components according to local priority plans.[4]

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

1. ensuring triage, early recognition, and source control (isolating patients with suspected nCoV infection);
2. applying standard precautions for all patients;
3. implementing empiric additional precautions (droplet and contact and, whenever applicable, airborne precautions) for suspected cases of nCoV infection;
4. implementing administrative controls;
5. using environmental and engineering controls.

1. Ensuring triage, early recognition, and source control

Clinical triage includes a system for assessing all patients at admission allowing early recognition of possible 2019-nCoV infection and immediate isolation of patients with suspected nCoV infection in an area separate from other patients (source control). To facilitate the early identification of cases of suspected nCoV infection, healthcare facilities should:

- encourage HCWs to have a high level of clinical suspicion;
- establish a well-equipped triage station at the entrance of health care facility, supported by trained staff;
- institute the use of screening questionnaires according to the updated case definition (https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-ncov) and
- post signs in public areas reminding symptomatic patients to alert HCWs.

The promotion of hand hygiene and respiratory hygiene are essential preventive measures.

2. Applying standard precautions for all patients

Standard precautions include hand and respiratory hygiene, the use of appropriate personal protective equipment (PPE) according to risk assessment, injection safety practices, safe waste management, proper linens, environmental cleaning and sterilization of patient-care equipment.

Ensure that the following respiratory hygiene measures are used:

- ensure that all patients cover their nose and mouth with a tissue or elbow when coughing or sneezing;
- offer a medical mask to patients with suspected 2019-nCoV infection while they are in waiting/public areas or in cohorting rooms;
- perform hand hygiene after contact with respiratory secretions.

HCWs should apply the WHO's My 5 Moments for Hand Hygiene approach before touching a patient, before any clean or aseptic procedure is performed, after exposure to body fluid, after touching a patient, and after touching a patient's surroundings.[5]

- hand hygiene includes either cleansing hands with an alcohol-based hand rub (ABHR) or with soap and water;
- alcohol-based hand rubs are preferred if hands are not visibly soiled;
- wash hands with soap and water when they are visibly soiled.

The rational, correct, and consistent use of PPE also helps to reduce the spread of pathogens. The use of PPE effectiveness strongly depends on adequate and regular supplies, adequate staff training, appropriate hand hygiene and specifically appropriate human behaviour. [2,5,6]

It is important to ensure that environmental cleaning and disinfection procedures are followed consistently and correctly. Thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital-level disinfectants (such as sodium hypochlorite) are effective and sufficient procedures.[7] Medical devices and equipment, laundry, food service utensils and medical waste should be managed in accordance with safe routine procedures.[2,8]

3. Implementing empiric additional precautions

3.1 Contact and droplet precautions

- in addition to using standard precautions, all individuals, including family members, visitors and HCWs, should use contact and droplet precautions before entering the room where suspected or confirmed nCoV patients are admitted;
- 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;[9]
- 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 [a] (for specifications, please see references 2);
- HCWs should wear eye protection (googles) or facial protection (face shield) to avoid contamination of mucous membranes;
- HCWs should wear a clean, non-sterile, long-sleeved gown;
- HCWs should also use gloves;
- the use of boots, coverall and apron is not required during routine care;
- after patient care, appropriate doffing and disposal of all PPE's and hand hygiene should be carried out.[5,6] Also, a new set of PPE's is needed, when care is given to a different patient;
- equipment should be either single-use and disposable or dedicated equipment (e.g., stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect it between use for each individual patient (e.g., by using ethyl alcohol 70%);[8]
- HCWs should refrain from touching eyes, nose or mouth with potentially contaminated gloved or bare hands;
- avoid moving and transporting patients out of their room or area unless medically necessary. Use designated portable X-ray equipment and/or other designated diagnostic equipment. If transport is required, use predetermined transport routes to minimize exposure for staff, other patients and visitors, and have the patient using a medical mask;
- ensure that HCWs who are transporting patients perform hand hygiene and wear appropriate PPE as described in this section;
- notify the area receiving the patient of any necessary precautions as early as possible before the patient's arrival;
- routinely clean and disinfect surfaces which the patient is in contact;
- limit the number of HCWs, family members and visitors who are in contact with a suspected and confirmed 2019-nCoV patient;
- maintain a record of all persons entering the patient's room, including all staff and visitors.

3.2 Airborne precautions for aerosol-generating procedures

Some aerosol-generating procedures have been associated with an increased risk of transmission of coronaviruses (SARS-CoV and MERS-CoV), such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy.[10,11]

Ensure that HCWs performing aerosol-generating procedures:

- perform procedures in an adequately ventilated room – that is, natural ventilation with air flow of at least 160 L/s per patient or in negative pressure rooms with at least 12 air changes per hour and controlled direction of air flow when using mechanical ventilation;[9]
- use a particulate respirator at least as protective as a US National Institute for Occupational Safety and Health (NIOSH)-certified N95, European Union (EU) standard FFP2, or equivalent.[2,12] When HCWs put on a disposable particulate respirator, they must always perform the seal check.[12] Note that if the wearer has facial hair (i.e., a beard) it may prevent a proper respirator fit;[12]
- use eye protection (i.e., goggles or a face shield);
- wear a clean, non-sterile, long-sleeved gown and gloves. If gowns are not fluid resistant, HCWs should use a waterproof apron for procedures expected to have high volumes of fluid that might penetrate the gown;[2]

[a] Medical masks are surgical or procedure masks that are flat or pleated (some are like cups); they are affixed to the head with straps[2]

- limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

4. **Implementing administrative controls**

Administrative controls[2] and policies for the prevention and control of transmission of 2019-nCoV infections within the healthcare setting include, but may not be limited to: 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 adequate supplies of PPE; ensure the adherence of IPC policies and procedures for all facets of health care.

4.1. **Administrative measures related to healthcare workers**

- provision of adequate training for HCWs;
- ensuring an adequate patient-to-staff ratio;
- establishing a surveillance process for acute respiratory infections potentially caused by nCoV among HCWs;
- ensuring that HCWs and the public understand the importance of promptly seeking medical care;
- monitoring HCW compliance with standard precautions and providing mechanisms for improvement as needed.

5. **Using environmental and engineering controls**

These controls address the basic infrastructure of the health care facility.[13] These controls aim to ensure there is adequate ventilation[9] 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.[14]

Ensure that cleaning and disinfection procedures are followed consistently and correctly.[8] Cleaning environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure.[7] Manage laundry, food service utensils and medical waste in accordance with safe routine procedures.

Duration of contact and droplet precautions for patients with nCoV infection

Standard precautions should be applied at all times. Additional contact and droplet precautions should continue until the patient is asymptomatic. More comprehensive information about the mode of 2019-nCoV infection transmission is required to define the duration of additional precautions.

Collecting and handling laboratory specimens from patients with suspected 2019-nCoV infection

All specimens collected for laboratory investigations should be regarded as potentially infectious. HCWs who collect, handle or transport any clinical specimens should adhere rigorously to the following standard precaution measures and biosafety practices to minimize the possibility of exposure to pathogens.[15,16,17]

- ensure that HCWs who collect specimens use appropriate PPE (i.e., eye protection, a medical mask, a long-sleeved gown, gloves). If the specimen is collected with an aerosol-generating procedure, personnel should wear a particulate respirator at least as protective as a NIOSH-certified N95, an EU standard FFP2, or the equivalent;
- ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures;[7]
- place specimens for transport in leak-proof specimen bags (i.e., secondary containers) that have a separate sealable pocket for the specimen (i.e., a plastic biohazard specimen bag), with the patient's label on the specimen container (i.e., the primary container), and a clearly written laboratory request form;
- ensure that laboratories in health care facilities adhere to appropriate biosafety practices and transport requirements, according to the type of organism being handled;
- deliver all specimens by hand whenever possible. DO NOT use pneumatic-tube systems to transport specimens;
- document clearly each patient's full name, date of birth and suspected nCoV of potential concern on the laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported.

Recommendation for outpatient care

The basic principles of IPC and standard precautions should be applied in all health care facilities, including outpatient care and primary care. For 2019-nCoV infection, the following measures should be adopted:

- triage and early recognition;
- emphasis on hand hygiene, respiratory hygiene and medical masks to be used by patients with respiratory symptoms;
- appropriate use of contact and droplet precautions for all suspected cases;
- prioritization of care of symptomatic patients;
- when symptomatic patients are required to wait, ensure they have a separate waiting area;
- educate patients and families about the early recognition of symptoms, basic precautions to be used and which health care facility they should refer to.

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WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

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Mental Health Considerations during COVID-19 Outbreak

6 March 2020

In January 2020 the World Health Organization (WHO) declared the outbreak of a new coronavirus disease in Hubei Province, China to be a Public Health Emergency of International Concern. WHO stated there is a high risk of the 2019 coronavirus disease (COVID-19) spreading to other countries around the world.

WHO and public health authorities around the world are taking action to contain the COVID-19 outbreak. However, this time of crisis is generating stress in the population. These mental health considerations were developed by the Mental Health Department as support for mental and psychological well-being during COVID-19 outbreak.

General population

1. COVID-19 has and is likely to affect people from many countries, in many geographical locations. Don't attach it to any ethnicity or nationality. Be empathetic to those who got affected, in and from any country, those with the disease have not done anything wrong.

2. Don't - refer to people with the disease as "COVID-19 cases", "victims" "COVID-19 families" or the "diseased". They are "people who have COVID-19", "people who are being treated for COVID-19", "people who are recovering from COVID-19" and after recovering from COVID-19 their life will go on with their jobs, families and loved ones.

3. Avoid watching, reading or listening to news that cause you to feel anxious or distressed; seek information mainly to take practical steps to prepare your plans and protect yourself and loved ones. Seek information updates at specific times during the day once or twice. The sudden and near-constant stream of news reports about an outbreak can cause anyone to feel worried. Get the facts. Gather information at regular intervals, from WHO website and local health authorities platforms, in order to help you distinguish facts from rumors.

4. Protect yourself and be supportive to others. Assisting others in their time of need can benefit the person receiving support as well as the helper.

5. Find opportunities to amplify the voices, positive stories and positive images of local people who have experienced the new coronavirus (COVID-19) and have recovered or who have supported a loved one through recovery and are willing to share their experience.

6. Honor caretakers and healthcare workers supporting people affected with COVID-19 in your community. Acknowledge the role they play to save lives and keep your loved ones safe.

Health care workers

7. For health workers, feeling stressed is an experience that you and many of your health worker colleagues are likely going through; in fact, it is quite normal to be feeling this way in the current situation. Stress and the feelings associated with it are by no means a reflection that you cannot do your job or that you are weak. Managing your stress and psychosocial wellbeing during this time is as important as managing your physical health.

8. Take care of your basic needs and employ helpful coping strategies- ensure rest and respite during work or between shifts, eat sufficient and healthy food, engage in physical activity, and stay in contact with family and friends. Avoid using unhelpful coping strategies such as tobacco, alcohol or other drugs. In the long term, these can worsen your mental and physical wellbeing. This is a unique and unprecedent scenario for many workers, particularly if they have not been involved in similar responses. Even so, using the strategies that you have used in the past to manage times of stress can benefit you now. The strategies to benefit feelings of stress are the same, even if the scenario is different.

9. Some workers may unfortunately experience avoidance by their family or community due to stigma or fear. This can make an already challenging situation far more difficult. If possible, staying connected with your loved ones including through digital methods is one way to maintain contact. Turn to your colleagues, your manager or other trusted persons for social support- your colleagues may be having similar experiences to you.

10. Use understandable ways to share messages with people with intellectual, cognitive and psychosocial disabilities. Forms of communication that do not rely solely on written information should be utilized If you are a team leader or manager in a health facility.

Team leaders or managers in health facility

11. Keeping all staff protected from chronic stress and poor mental health during this response means that they will have a better capacity to fulfil their roles.

12. Ensure good quality communication and accurate information updates are provided to all staff. Rotate workers from high-stress to lower-stress functions. Partner inexperienced workers with their more experiences colleagues. The buddy system helps to provide support, monitor stress and reinforce safety procedures. Ensure that outreach personnel enter the community in pairs. Initiate, encourage and monitor work breaks. Implement flexible schedules for workers who are directly impacted or have a family member impacted by a stressful event.

13. If you are a team leader or manager in a health facility, facilitate access to, and ensure staff are aware of where they can access mental health and psychosocial support services. Managers and team leads are also facing similar stressors as their staff, and potentially additional pressure in the level of responsibility of their role. It is important that the above provisions and strategies are in place for both workers and managers, and that managers are able to role-model self-care strategies to mitigate stress.

14. Orient responders, including nurses, ambulance drivers, volunteers, case identifiers, teachers and community leaders and workers in quarantine sites, on how to provide basic emotional and practical support to affected people using psychological first aid.

For caretakers of children

15. Help children find positive ways to express disturbing feelings such as fear and sadness. Every child has his/her own way to express emotions. Sometimes engaging in a creative activity, such as playing, and drawing can facilitate this process. Children feel relieved if they can express and communicate their disturbing feelings in a safe and supportive environment.

16. Keep children close to their parents and family, if considered safe for the child, and avoid separating children and their caregivers as much as possible. If a child needs to be separated from his/her primary caregiver, ensure that appropriate alternative care is and that a social worker, or equivalent, will regularly follow up on the child. Further, ensure that during periods of separation, regular contact with parents and caregivers is maintained, such as twice-daily scheduled phone or video calls or other age-appropriate communication (e.g., social media depending on the age of the child).

17. Maintain familiar routines in daily life as much as possible, especially if children are confined to home. Provide engaging age appropriate activities for children. As much as possible, encourage children to continue to play and socialize with others, even if only within the family when advised to restrict social contract.

18. During times of stress and crisis, it is common for children to seek more attachment and be more demanding on parents Discuss the COVID-19 with your Children in honest and age-appropriate information. If your children have concerns, addressing those together may ease their anxiety. Children will observe adults' behaviors and emotions for cues on how to manage their own emotions during difficult times.

For caretakers of older adults

19. Older adults, especially in isolation and those with cognitive decline/dementia, may become more anxious, angry, stressed, agitated, and withdrawn during the outbreak/while in quarantine. Provide practical and emotional support through informal networks (families) and health professionals.

20. Share simple facts about what is going on and give clear information about how to reduce risk of infection in words older people with/without cognitive impairment can understand. Repeat the information whenever necessary. Instructions need to be communicated in a clear, concise, respectful and patient way. and it may also be helpful for information to be displayed in writing or pictures. Engage their family and other support networks in providing information and helping them practice prevention measures (e.g. handwashing etc.)

21. Encourage older adults with expertise, experiences and strengths to volunteer in community efforts to respond to the COVID-19 outbreak (for example the well/healthy retired older population can provide peer support, neighbor checking, and childcare for medical personnel restricted in hospitals fighting against COVID-19.)

People in isolation

22. Stay connected and maintain your social networks. Even in situations of isolations, try as much as possible to keep your personal daily routines. If health authorities have recommended limiting your physical social contact to contain the outbreak, you can stay connected via e-mail, social media, video conference and telephone.

23. During times of stress, pay attention to your own needs and feelings. Engage in healthy activities that you enjoy and find relaxing. Exercise regularly, keep regular sleep routines and eat healthy food. Keep things in perspective. Public health agencies and experts in all countries are working on the outbreak to ensure the availability of the best care to those affected.

24. A near-constant stream of news reports about an outbreak can cause anyone to feel anxious or distressed. Seek information updates and practical guidance at specific times during the day from health professionals and WHO website and avoid listening to or following rumors that make you feel uncomfortable.

Stay informed:

Find the latest information from WHO on where COVID-19 is spreading:
https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/

Advice and guidance from WHO on COVID-19
https://www.who.int/emergencies/diseases/novel-coronavirus-2019
https://www.epi-win.com/

Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19)

Interim guidance
27 February 2020

World Health Organization

Coronavirus disease 2019 (COVID-19), caused by the COVID-19 virus, 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.

This document summarizes WHO's recommendations for the rational use of personal protective equipment (PPE) in healthcare and community settings, as well as during the handling of cargo; in this context, PPE includes gloves, medical masks, goggles or a face shield, and gowns, as well as for specific procedures, respirators (i.e., N95 or FFP2 standard or equivalent) and aprons. This document is intended for those who are involved in distributing and managing PPE, as well as public health authorities and individuals in healthcare and community settings, and it aims to provide information about when PPE use is most appropriate.

WHO will continue to update these recommendations as new information becomes available.

Preventive measures for COVID-19 disease

Based on the available evidence, the COVID-19 virus is transmitted between people through close contact and droplets, not by airborne transmission. The people most at risk of infection are those who are in close contact with a COVID-19 patient or who care for COVID-19 patients.

Preventive and mitigation measures are key in both healthcare and community settings. The most effective preventive measures in the community include:

- performing hand hygiene frequently with an alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty;
- avoiding touching your eyes, nose and mouth;
- practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and then immediately disposing of the tissue;
- wearing a medical mask if you have respiratory symptoms and performing hand hygiene after disposing of the mask;
- maintaining social distance (a minimum of 1 m) from individuals with respiratory symptoms.

Additional precautions are required by healthcare workers to protect themselves and prevent transmission in the healthcare setting. Precautions to be implemented by healthcare workers caring for patients with COVID-19 disease include using PPE appropriately; this involves selecting the proper PPE and being trained in how to put on, remove and dispose of it.

PPE is only one effective measure within a package that comprises administrative and environmental and engineering controls, as described in WHO's *Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care* (*1*). These controls are summarized here.

- **Administrative controls** include ensuring the availability of resources for infection prevention and control measures, such as appropriate infrastructure, the development of clear infection prevention and control policies, facilitated access to laboratory testing, appropriate triage and placement of patients, adequate staff-to-patient ratios and training of staff.
- **Environmental and engineering controls** aim at reducing the spread of pathogens and reducing the contamination of surfaces and inanimate objects. They include providing adequate space to allow social distance of at least 1 m to be maintained between patients and between patients and healthcare workers and ensuring the availability of well-ventilated isolation rooms for patients with suspected or confirmed COVID-19 disease.

COVID-19 is a respiratory disease that is different from Ebola virus disease, which is transmitted through infected bodily fluids. Due to these differences in transmission, the PPE requirements for COVID-19 are different from those required for Ebola virus disease. Specifically, coveralls (sometimes called Ebola PPE) are not required when managing COVID-19 patients.

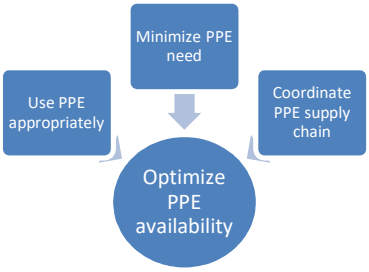
Disruptions in the global supply chain of PPE

The current global stockpile of PPE is insufficient, particularly for medical masks and respirators; the supply of gowns and goggles is soon expected to be insufficient also. Surging global demand − driven not only by the number of COVID-19 cases but also by misinformation, panic buying and stockpiling − will result in further shortages of PPE globally. The capacity to expand PPE production is limited, and the current demand for respirators and masks cannot be met, especially if the widespread, inappropriate use of PPE continues.

Recommendations for optimizing the availability of PPE.

In view of the global PPE shortage, the following strategies can facilitate optimal PPE availability (Fig. 1).

Fig. 1. Strategies to optimize the availability of personal protective equipment (PPE)



(1) Minimize the need for PPE

The following interventions can minimize the need for PPE while protecting healthcare workers and other individuals from exposure to the COVID-19 virus in healthcare settings.

- Consider using telemedicine to evaluate suspected cases of COVID-19 disease (*2*), thus minimizing the need for these individuals to go to healthcare facilities for evaluation.
- Use physical barriers to reduce exposure to the COVID-19 virus, such as glass or plastic windows. This approach can be implemented in areas of the healthcare setting where patients will first present, such as triage areas, the registration desk at the emergency department or at the pharmacy window where medication is collected.
- Restrict healthcare workers from entering the rooms of COVID-19 patients if they are not involved in direct care. Consider bundling activities to minimize the number of times a room is entered (e.g., check vital signs during medication administration or have food delivered by healthcare workers while they are performing other care) and plan which activities will be performed at the bedside.

Ideally, visitors will not be allowed but if this is not possible, restrict the number of visitors to areas where COVID-19 patients are being isolated; restrict the amount of time visitors are allowed to spend in the area; and provide clear instructions about how to put on and remove PPE and perform hand hygiene to ensure visitors avoid self-contamination (see https://www.who.int/csr/resources/publications/putontakeoffPPE/en/).

(2) Ensure PPE use is rationalized and appropriate

PPE should be used based on the risk of exposure (e.g., type of activity) and the transmission dynamics of the pathogen (e.g., contact, droplet or aerosol). The overuse of PPE will have a further impact on supply shortages. Observing the following recommendations will ensure that the use of PPE rationalized.

- The type of PPE used when caring for COVID-19 patients will vary according to the setting and type of personnel and activity (Table 1).
- Healthcare workers involved in the direct care of patients should use the following PPE: gowns, gloves, medical mask and eye protection (goggles or face shield).
- Specifically, for aerosol-generating procedures (e.g., tracheal intubation, non-invasive ventilation, tracheostomy, cardiopulmonary resuscitation, manual ventilation before intubation, bronchoscopy) healthcare workers should use respirators, eye protection, gloves and gowns; aprons should also be used if gowns are not fluid resistant (*1*).
- Respirators (e.g., N95, FFP2 or equivalent standard) have been used for an extended time during previous public health emergencies involving acute respiratory illness when PPE was in short supply (*3*). This refers to wearing the same respirator while caring for multiple patients who have the same diagnosis without removing it, and evidence indicates that respirators maintain their protection when used for extended periods. However, using one respirator for longer than 4 hours can lead to discomfort and should be avoided (*4–6*).
- Among the general public, persons with respiratory symptoms or those caring for COVID-19 patients at home should receive medical masks. For additional information, see *Home care for patients with suspected novel coronavirus (COVID-19) infection presenting with mild symptoms, and management of their contacts* (7).
- For asymptomatic individuals, wearing a mask of any type is not recommended. Wearing medical masks when they are not indicated may cause unnecessary cost and a procurement burden and create a false sense of security that can lead to the neglect of other essential preventive measures. For additional information, see *Advice on the use of masks in the community, during home care and in healthcare settings in the context of the novel coronavirus (2019-nCoV) outbreak* (*8*).

(3) Coordinate PPE supply chain management mechanisms.

The management of PPE should be coordinated through essential national and international supply chain management mechanisms that include but are not restricted to:

- using PPE forecasts that are based on rational quantification models to ensure the rationalization of requested supplies;
- monitoring and controlling PPE requests from countries and large responders;
- promoting the use of a centralized request management approach to avoid duplication of stock and ensuring strict adherence to essential stock management rules to limit wastage, overstock and stock ruptures;
- monitoring the end-to-end distribution of PPE;
- monitoring and controlling the distribution of PPE from medical facilities stores.

Handling cargo from affected countries

The rationalized use and distribution of PPE when handling cargo from and to countries affected by the COVID-19 outbreak includes following these recommendations.

- Wearing a mask of any type is not recommended when handling cargo from an affected country.
- Gloves are not required unless they are used for protection against mechanical hazards, such as may occur when manipulating rough surfaces.
- Importantly, the use of gloves does not replace the need for appropriate hand hygiene, which should be performed frequently, as described above.
- When disinfecting supplies or pallets, no additional PPE is required beyond what is routinely recommended. To date, there is no epidemiological information to suggest that contact with goods or products shipped from countries affected by the COVID-19 outbreak have been the source of COVID-19 disease in humans. WHO will continue to closely monitor the evolution of the COVID-19 outbreak and will update recommendations as needed.

Table 1. Recommended type of personal protective equipment (PPE) to be used in the context of COVID-19 disease, according to the setting, personnel and type of activity[a]

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Healthcare facilities			
Inpatient facilities			
Patient room	Healthcare workers	Providing direct care to COVID-19 patients.	Medical mask Gown Gloves Eye protection (goggles or face shield).
		Aerosol-generating procedures performed on COVID-19 patients.	Respirator N95 or FFP2 standard, or equivalent. Gown Gloves Eye protection Apron
	Cleaners	Entering the room of COVID-19 patients.	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes
	Visitors[b]	Entering the room of a COVID-19 patient	Medical mask Gown Gloves
Other areas of patient transit (e.g., wards, corridors).	All staff, including healthcare workers.	Any activity that does not involve contact with COVID-19 patients.	No PPE required
Triage	Healthcare workers	Preliminary screening not involving direct contact[c].	Maintain spatial distance of at least 1 m. No PPE required
	Patients with respiratory symptoms.	Any	Maintain spatial distance of at least 1 m. Provide medical mask if tolerated by patient.
	Patients without respiratory symptoms.	Any	No PPE required
Laboratory	Lab technician	Manipulation of respiratory samples.	Medical mask Gown Gloves Eye protection (if risk of splash)
Administrative areas	All staff, including healthcare workers.	Administrative tasks that do not involve contact with COVID-19 patients.	No PPE required

Outpatient facilities			
Consultation room	Healthcare workers	Physical examination of patient with respiratory symptoms.	Medical mask Gown Gloves Eye protection
	Healthcare workers	Physical examination of patients without respiratory symptoms.	PPE according to standard precautions and risk assessment.
	Patients with respiratory symptoms.	Any	Provide medical mask if tolerated.
	Patients without respiratory symptoms.	Any	No PPE required
	Cleaners	After and between consultations with patients with respiratory symptoms.	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes
Waiting room	Patients with respiratory symptoms.	Any	Provide medical mask if tolerated. Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1 m from other patients.
	Patients without respiratory symptoms.	Any	No PPE required
Administrative areas	All staff, including healthcare workers.	Administrative tasks	No PPE required
Triage	Healthcare workers	Preliminary screening not involving direct contact[c].	Maintain spatial distance of at least 1 m. No PPE required
	Patients with respiratory symptoms.	Any	Maintain spatial distance of at least 1 m. Provide medical mask if tolerated.
	Patients without respiratory symptoms.	Any	No PPE required
Community			
Home	Patients with respiratory symptoms.	Any	Maintain spatial distance of at least 1 m. Provide medical mask if tolerated, except when sleeping.
	Caregiver	Entering the patient's room, but not providing direct care or assistance.	Medical mask
	Caregiver	Providing direct care or when handling stool, urine or waste from COVID-19 patient being cared for at home.	Gloves Medical mask Apron (if risk of splash)
	Healthcare workers	Providing direct care or assistance to a COVID-19 patient at home	Medical mask Gown Gloves Eye protection
Public areas (e.g., schools, shopping malls, train stations).	Individuals without respiratory symptoms	Any	No PPE required

Points of entry			
Administrative areas	All staff	Any	No PPE required
Screening area	Staff	First screening (temperature measurement) not involving direct contact[c.]	Maintain spatial distance of at least 1 m. No PPE required
	Staff	Second screening (i.e., interviewing passengers with fever for clinical symptoms suggestive of COVID-19 disease and travel history).	Medical mask Gloves
	Cleaners	Cleaning the area where passengers with fever are being screened.	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes
Temporary isolation area	Staff	Entering the isolation area, but not providing direct assistance.	Maintain spatial distance of at least 1 m. Medical mask Gloves
	Staff, healthcare workers	Assisting passenger being transported to a healthcare facility.	Medical mask Gown Gloves Eye protection
	Cleaners	Cleaning isolation area	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes
Ambulance or transfer vehicle	Healthcare workers	Transporting suspected COVID-19 patients to the referral healthcare facility.	Medical mask Gowns Gloves Eye protection
	Driver	Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID-19 patient.	Maintain spatial distance of at least 1 m. No PPE required
		Assisting with loading or unloading patient with suspected COVID-19 disease.	Medical mask Gowns Gloves Eye protection
		No direct contact with patient with suspected COVID-19, but no separation between driver's and patient's compartments.	Medical mask
	Patient with suspected COVID-19 disease.	Transport to the referral healthcare facility.	Medical mask if tolerated
	Cleaners	Cleaning after and between transport of patients with suspected COVID-19 disease to the referral healthcare facility.	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash from organic material or chemicals). Boots or closed work shoes

Special considerations for rapid response teams assisting with public health investigations[d]			
Community			
Anywhere	Rapid response team investigators.	Interview suspected or confirmed COVID-19 patients or their contacts.	No PPE if done remotely (e.g., by telephone or video conference). Remote interview is the preferred method.
		In-person interview of suspected or confirmed COVID-19 patients without direct contact.	Medical mask Maintain spatial distance of at least 1 m. The interview should be conducted outside the house or outdoors, and confirmed or suspected COVID-19 patients should wear a medical mask if tolerated.
		In-person interview with asymptomatic contacts of COVID-19 patients.	Maintain spatial distance of at least 1 m. No PPE required The interview should be performed outside the house or outdoors. If it is necessary to enter the household environment, use a thermal imaging camera to confirm that the individual does not have a fever, maintain spatial distance of at least 1 m and do not touch anything in the household environment.

[a] In addition to using the appropriate PPE, frequent hand hygiene and respiratory hygiene should always be performed. PPE should be discarded in an appropriate waste container after use, and hand hygiene should be performed before putting on and after taking off PPE.

[b] The number of visitors should be restricted. If visitors must enter a COVID-19 patient's room, they should be provided with clear instructions about how to put on and remove PPE and about performing hand hygiene before putting on and after removing PPE; this should be supervised by a healthcare worker.

[c] This category includes the use of no-touch thermometers, thermal imaging cameras, and limited observation and questioning, all while maintaining a spatial distance of at least 1 m.

[d] All rapid response team members must be trained in performing hand hygiene and how to put on and remove PPE to avoid self-contamination.

For PPE specifications, refer to WHO's novel coronavirus (COVID-19) disease commodity packages at https://www.who.int/emergencies/what-we-do/prevention-readiness/disease-commodity-packages/dcp-ncov.pdf?ua=1.

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WHO reference number: WHO/2019-nCov/IPC PPE_use/2020.1

3 March 2020

Getting your workplace ready for COVID-19

In January 2020 the World Health Organization (WHO) declared the outbreak of a new coronavirus disease in Hubei Province, China to be a Public Health Emergency of International Concern. WHO stated there is a high risk of the 2019 coronavirus disease (COVID-19) spreading to other countries around the world.

WHO and public health authorities around the world are taking action to contain the COVID-19 outbreak. However, long term success cannot be taken for granted. All sections of our society – including businesses and employers – must play a role if we are to stop the spread of this disease.

How COVID-19 spreads

When someone who has COVID-19 coughs or exhales they release droplets of infected fluid. Most of these droplets fall on nearby surfaces and objects - such as desks, tables or telephones. People could catch COVID-19 by touching contaminated surfaces or objects – and then touching their eyes, nose or mouth. If they are standing within one meter of a person with COVID-19 they can catch it by breathing in droplets coughed out or exhaled by them. In other words, COVID-19 spreads in a similar way to flu. Most persons infected with COVID-19 experience mild symptoms and recover. However, some go on to experience more serious illness and may require hospital care. Risk of serious illness rises with age: people over 40 seem to be more vulnerable than those under 40. People with weakened immune systems and people with conditions such as diabetes, heart and lung disease are also more vulnerable to serious illness.

This document gives advice on:

1. Simple ways to prevent the spread of COVID-19 in your workplace
2. How to manage COVID-19 risks when organizing meetings & events
3. Things to consider when you and your employees travel
4. Getting your workplace ready in case COVID-19 arrives in your community

1. Simple ways to prevent the spread of COVID-19 in your workplace

The low-cost measures below will help prevent the spread of infections in your workplace, such as colds, flu and stomach bugs, and protect your customers, contractors and employees.

Employers should start doing these things now, even if COVID-19 has not arrived in the communities where they operate. They can already reduce working days lost due to illness and stop or slow the spread of COVID-19 if it arrives at one of your workplaces.

- Make sure your workplaces are clean and hygienic

- Surfaces (e.g. desks and tables) and objects (e.g. telephones, keyboards) need to be wiped with disinfectant regularly
- Why? Because contamination on surfaces touched by employees and customers is one of the main ways that COVID-19 spreads

- Promote regular and thorough hand-washing by employees, contractors and customers
  - Put sanitizing hand rub dispensers in prominent places around the workplace. Make sure these dispensers are regularly refilled
  - Display posters promoting hand-washing – ask your local public health authority for these or look on www.WHO.int.
  - Combine this with other communication measures such as offering guidance from occupational health and safety officers, briefings at meetings and information on the intranet to promote hand-washing
  - Make sure that staff, contractors and customers have access to places where they can wash their hands with soap and water
  - Why? Because washing kills the virus on your hands and prevents the spread of COVID-19
- Promote good respiratory hygiene in the workplace
  - Display posters promoting respiratory hygiene. Combine this with other communication measures such as offering guidance from occupational health and safety officers, briefing at meetings and information on the intranet etc.
  - Ensure that face masks[1] and / or paper tissues are available at your workplaces, for those who develop a runny nose or cough at work, along with closed bins for hygienically disposing of them
  - Why? Because good respiratory hygiene prevents the spread of COVID-19
- Advise employees and contractors to consult national travel advice before going on business trips.
- Brief your employees, contractors and customers that if COVID-19 starts spreading in your community anyone with even a mild cough or low-grade fever (37.3 C or more) needs to stay at home. They should also stay home (or work from home) if they have had to take simple

[1] Ordinary surgical face masks rather than N95 face masks

medications, such as paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection

- Keep communicating and promoting the message that people need to stay at home even if they have just mild symptoms of COVID-19.
- Display posters with this message in your workplaces. Combine this with other communication channels commonly used in your organization or business.
- Your occupational health services, local public health authority or other partners may have developed campaign materials to promote this message
- Make clear to employees that they will be able to count this time off as sick leave.

2. How to manage COVID-19 risk when organizing meetings & events

Why do employers and organizers need to think about COVID-19?

Organizers of meetings and events need to think about the potential risk from COVID-19 because:

- There is a risk that people attending your meeting or event might be unwittingly bringing the COVID-19 virus to the meeting. Others might be unknowingly exposed to COVID-19.
- While COVID-19 is a mild disease for most people, it can make some very ill. Around 1 in every 5 people who catch COVID-19 needs hospital treatment.

Key considerations to prevent or reduce COVID-19 risks

BEFORE the meeting or event

- Check the advice from the authorities in the community where you plan to hold the meeting or event. Follow their advice.
- Develop and agree a preparedness plan to prevent infection at your meeting or event.
  - Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
  - Could the meeting or event be scaled down so that fewer people attend?
  - Ensure and verify information and communication channels in advance with key partners such as public health and health care authorities.

- Pre-order sufficient supplies and materials, including tissues and hand sanitizer for all participants. Have surgical masks available to offer anyone who develops respiratory symptoms.
- Actively monitor where COVID-19 is circulating. Advise participants in advance that if they have any symptoms or feel unwell, they should not attend.
- Make sure all organizers, participants, caterers and visitors at the event provide contact details: mobile telephone number, email and address where they are staying. State clearly that their details will be shared with local public health authorities if any participant becomes ill with a suspected infectious disease. If they will not agree to this they cannot attend the event or meeting.

- Develop and agree a response plan in case someone at the meeting becomes ill with symptoms of COVID-19 (dry cough, fever, malaise). This plan should include at least:
  - Identify a room or area where someone who is feeling unwell or has symptoms can be safely isolated
  - Have a plan for how they can be safely transferred from there to a health facility.
  - Know what to do if a meeting participant, staff member or service provider tests positive for COVID-19 during or just after the meeting
  - Agree the plan in advance with your partner healthcare provider or health department.

DURING the meeting or event

- Provide information or a briefing, preferably both orally and in writing, on COVID-19 and the measures that organizers are taking to make this event safe for participants.
  - Build trust. For example, as an icebreaker, practice ways to say hello without touching.
  - Encourage regular hand-washing or use of an alcohol rub by all participants at the meeting or event
  - Encourage participants to cover their face with the bend of their elbow or a tissue if they cough or sneeze. Supply tissues and closed bins to dispose of them in.
  - Provide contact details or a health hotline number that participants can call for advice or to give information.
- Display dispensers of alcohol-based hand rub prominently around the venue.
- If there is space, arrange seats so that participants are at least one meter apart.

- Open windows and doors whenever possible to make sure the venue is well ventilated.
- If anyone who starts to feel unwell, follow your preparedness plan or call your hotline.
    - Depending on the situation in your area, or recent travel of the participant, place the person in the isolation room. Offer the person a mask so they can get home safely, if appropriate, or to a designated assessment facility.
- Thank all participants for their cooperation with the provisions in place.

AFTER the meeting

1. Retain the names and contact details of all participants for at least one month. This will help public health authorities trace people who may have been exposed to COVID-19 if one or more participants become ill shortly after the event.
2. If someone at the meeting or event was isolated as a suspected COVID-19 case, the organizer should let all participants know this. They should be advised to monitor themselves for symptoms for 14 days and take their temperature twice a day.
3. If they develop even a mild cough or low-grade fever (i.e. a temperature of 37.3 C or more) they should stay at home and self-isolate. This means avoiding close contact (1 meter or nearer) with other people, including family members. They should also telephone their healthcare provider or the local public health department, giving them details of their recent travel and symptoms.
4. Thank all the participants for their cooperation with the provisions in place.

3. Things to consider when you and your employees travel

- **Before traveling**
    - Make sure your organization and its employees have the latest information on areas where COVID-19 is spreading. You can find this at https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/
    - Based on the latest information, your organization should assess the benefits and risks related to upcoming travel plans.
    - Avoid sending employees who may be at higher risk of serious illness (e.g. older employees and those with medical conditions such as diabetes, heart and lung disease) to areas where COVID-19 is spreading.
    - Make sure all persons travelling to locations reporting COVID-19 are briefed by a qualified professional (e.g. staff health services, health care provider or local public health partner)
    - Consider issuing employees who are about to travel with small bottles (under 100 CL) of alcohol-based hand rub. This can facilitate regular hand-washing.

- **While traveling:**
    - Encourage employees to wash their hands regularly and stay at least one meter away from people who are coughing or sneezing
    - Ensure employees know what to do and who to contact if they feel ill while traveling.
    - Ensure that your employees comply with instructions from local authorities where they are traveling. If, for example, they are told by local authorities not to go somewhere they should comply with this. Your employees should comply with any local restrictions on travel, movement or large gatherings.

- **When you or your employees return from traveling:**
    - Employees who have returned from an area where COVID-19 is spreading should monitor themselves for symptoms for 14 days and take their temperature twice a day.
    - If they develop even a mild cough or low grade fever (i.e. a temperature of 37.3 C or more) they should stay at home and self-isolate. This means avoiding close contact (one meter or nearer) with other people, including family members. They should also telephone their

healthcare provider or the local public health department, giving them details of their recent travel and symptoms.

4. Getting your workplace ready in case COVID-19 arrives in your community

- Develop a plan of what to do if someone becomes ill with suspected COVID-19 at one of your workplaces
    - The plan should cover putting the ill person in a room or area where they are isolated from others in the workplace, limiting the number of people who have contact with the sick person and contacting the local health authorities.
    - Consider how to identify persons who may be at risk, and support them, without inviting stigma and discrimination into your workplace. This could include persons who have recently travelled to an area reporting cases, or other personnel who have conditions that put them at higher risk of serious illness (e.g. diabetes, heart and lung disease, older age).
    - Tell your local public health authority you are developing the plan and seek their input.
- Promote regular teleworking across your organization. If there is an outbreak of COVID-19 in your community the health authorities may advise people to avoid public transport and crowded places. Teleworking will help your business keep operating while your employees stay safe.
- Develop a contingency and business continuity plan for an outbreak in the communities where your business operates
    - The plan will help prepare your organization for the possibility of an outbreak of COVID-19 in its workplaces or community. It may also be valid for other health emergencies
    - The plan should address how to keep your business running even if a significant number of employees, contractors and suppliers cannot come to your place of business - either due to local restrictions on travel or because they are ill.
    - Communicate to your employees and contractors about the plan and make sure they are aware of what they need to do – or not do – under the plan. Emphasize key points such as the importance of staying away from work even if they have only mild symptoms or have had to take simple medications (e.g. paracetamol, ibuprofen) which may mask the symptoms
    - Be sure your plan addresses the mental health and social consequences of a case of COVID-19 in the workplace or in the community and offer information and support.

- For small and medium-sized businesses without in-house staff health and welfare support, develop partnerships and plans with your local health and social service providers in advance of any emergency.
- Your local or national public health authority may be able to offer support and guidance in developing your plan.

Remember:

Now is the time to prepare for COVID-19. Simple precautions and planning can make a big difference. Action now will help protect your employees and your business.

How to stay informed:

Find the latest information from WHO on where COVID-19 is spreading:

https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/

Advice and guidance from WHO on COVID-19

https://www.who.int/emergencies/diseases/novel-coronavirus-2019

https://www.epi-win.com/

Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19)

Interim guidance
29 February 2020

World Health Organization

On 30 January 2020, the WHO Director General determined that the outbreak of coronavirus disease (COVID-19) constitutes a Public Health Emergency of International Concern.[1] As the outbreak continues to evolve, Member States are considering options to prevent introduction of the disease to new areas or to reduce human-to-human transmission in areas where COVID-19 virus is already circulating.

Public health measures to achieve these goals may include quarantine, which involves the restriction of movement or separation of healthy individuals who may have been exposed to the virus, from the rest of the population, with the objective of monitoring symptoms and the early detection of cases. Many countries have legal authority to impose quarantine. When doing so, quarantine should be implemented as part of a comprehensive package of public health response and containment measures and, as per Article 3 of the International Health Regulations (2005), be fully respectful of the dignity, human rights and fundamental freedoms of persons.[2]

The purpose of this document is to offer guidance to Member States on quarantine measures for individuals in the context of COVID-19. It is intended for those responsible for establishing local or national policy for quarantine of individuals, and adherence to infection prevention and control measures.

This document is informed by current knowledge of the COVID-19 outbreak and by similar considerations for other respiratory pathogens, including SARS-CoV, MERS-CoV and influenza viruses. WHO will continue to update these recommendations as new information becomes available.

Quarantine of persons is the restriction of activities or separation of persons who are not ill, but who may be exposed to an infectious agent or disease, with the objective of monitoring symptoms and early detection of cases. Quarantine is different from isolation, which is the separation of ill or infected persons from others, so as to prevent the spread of infection or contamination.

Quarantine is included within the legal framework of the International Health Regulations (2005), specifically:

- Article 30. Travellers under public health observation
- Article 31. Health measures relating to entry of travellers
- Article 32. Treatment of travellers.[2]

Member States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to legislate, and to implement legislation, in pursuance of their health policies, even if this involves the restriction of movement of individuals.

Before implementing quarantine, countries should properly communicate and socialize such measures, in order to reduce panic and improve compliance:[3]

- People must be provided by authorities of clear, up-to-date, transparent and consistent guidelines, and reliable information about quarantine measures;
- Constructive engagement with communities is essential if quarantine measures are to be accepted;
- Persons who are quarantined need to be provided with health care, financial, social and psychosocial support, and basic needs including as food, water and other essentials. The needs of vulnerable populations should be prioritised;
- Cultural, geographic and economic factors affect the effectiveness of quarantine. Rapid assessment of the local context should evaluate both the drivers of success and the potential barriers to quarantine and inform the design of the most appropriate and culturally accepted measures.

When to use quarantine measures

Introducing quarantine measures early in an outbreak may delay the introduction of the disease to a country or area and/or may delay the peak of an epidemic in an area where local transmission is ongoing. However, if not implemented properly, quarantine may also create additional sources of contamination and dissemination of the disease.

In the context of the current COVID-19 outbreak, the global containment strategy includes the rapid identification of

[1] World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV)

[2] World Health Organization International Health Regulations (2005)

[3] Key considerations: quarantine in the context of COVID-Social science in humanitarian action. www.socialscienceinaction.org.

laboratory-confirmed cases, and their isolation and management in either a medical facility[4] or at home[5]

For contacts of laboratory-confirmed cases WHO recommends that such persons be quarantined for 14 days from the last time they were exposed to a COVID-19 patient.

For the purpose of implementing quarantine, a contact is defined as a person:

- Providing direct care without proper personal protective equipment (PPE)[6] for COVID-19 patients;
- Staying in the same close environment of a COVID-19 patient (including workplace, classroom, household, gatherings);
- Traveling together in close proximity (within 1 meter) with a COVID-19 patient in any kind of conveyance within a 14-day period after the onset of symptoms in the case under consideration.[7]

Recommendations for implementation of quarantine measures.

If a decision to implement quarantine is taken, the authorities, should ensure:

1. Appropriate quarantine setting and adequate provisions for the quarantine period;
2. Minimum infection prevention and control measures;
3. Minimum requirements for health monitoring of quarantined persons during the quarantine period.

1. Appropriate quarantine setting and adequate provisions for quarantine period

Quarantine implies the use or creation of appropriate facilities in which a person or persons are physically separated from the community while being attended to.

Appropriate quarantine arrangements include the following:

- those in quarantine be placed in adequately ventilated, spacious single rooms, with ensuite toilet (hand hygiene and toilet facilities). If single rooms are not available, beds should be placed at least 1 meter apart;
- suitable environmental infection controls, such as adequate air ventilation, filtration systems and waste-management protocols;
- maintenance of social distancing (more than 1 meter) of the persons quarantined;
- accommodation with an appropriate level of comfort, including:
    - food, water and hygiene provisions;
    - protection for baggage and other possessions;
    - appropriate medical treatment for existing conditions;
    - communication in a language that they can understand explaining: their rights; provisions that will be made available to them; how long they will need to stay; what will happen if they get sick; contact information of their local embassy or consular support;
- assistance for quarantined travellers, isolated or subject to medical examinations or other procedures for public health purposes;
- assistance with communication with family members outside the quarantine facility;
- if possible, access to the internet, news and entertainment;
- psychosocial support; and
- special considerations for older individuals and individuals with co-morbid conditions, due to their increased risk for severe COVID-19 disease.

Possible quarantine settings are hotels, dormitories, other facilities catering to groups, or the home of the contact. Regardless of the setting, an assessment must ensure that the appropriate conditions for safe and effective quarantine are being met.

When home quarantine is chosen, the person should occupy a well-ventilated single room, or if a single room is not possible, maintain a distance of at least 1 meter from other household members, minimizing the use of shared spaces and cutlery and ensuring that shared spaces (kitchen, bathroom) are well ventilated.

2. Minimum infection prevention and control measures

The following infection prevention and control measures should be used to ensure a safe environment for quarantined persons.

Early recognition and control

- Any person in quarantine who develops febrile illness or respiratory symptoms, at any point during the quarantine period, should be treated and managed as a suspect COVID-19 case;
- Apply standard precautions for all persons quarantined and quarantine personnel:
    - Perform hand hygiene frequently, particularly after contact with respiratory secretions, before eating and after using the toilet. Hand hygiene includes either cleaning hands with soap and water or with an alcohol-based hand rub. Alcohol-based hand rubs are preferred if hands are not visibly soiled; wash hands with soap and water when they are visibly soiled;
    - Ensure that all persons quarantined are practicing respiratory hygiene, and are aware of the importance of covering their nose and mouth with a flexed elbow or paper tissue when coughing or sneezing and disposing immediately of the tissue and performing hand hygiene;
    - Refrain from touching mouth and nose;

[4] World Health Organization. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected
[5] World Health Organization. Home care for patients with suspected novel coronavirus (nCoV) infection presenting with mild symptoms and management of contacts
[6] World Health Organization. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected
[7] World Health Organization. Global Surveillance for human infection with coronavirus disease (COVID-19)

- A medical mask is not required for persons with no symptoms. There is no evidence that wearing a mask of any type protects people who are not sick.[8]

Administrative controls

Administrative controls and policies for IPC within quarantine facilities include, but may not be limited to:

- establishing sustainable IPC infrastructures (design of facility) and activities;
- educating persons quarantined and quarantine personnel about IPC; all personnel working in the quarantine facility need to have training on standard precautions before the quarantine measures are implemented. The same advice on standard precautions should be given to all quarantined persons on arrival. Both personnel and quarantined persons should understand the importance of promptly seeking medical care if they develop symptoms;
- developing policies on the early recognition and referral of a suspect COVID-19 case.

Environmental controls

Environmental cleaning and disinfection procedures must be followed consistently and correctly. Cleaning personnel need to be educated and protected from COVID-19 infection and ensure that environmental surfaces are regularly and thoroughly cleaned throughout the quarantine period:

- Clean and disinfect frequently touched surfaces such as bedside tables, bedframes, and other bedroom furniture daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water). For surfaces that do not tolerate bleach, 70% ethanol can be used;
- Clean and disinfect bathroom and toilet surfaces at least once daily with regular household disinfectant containing a diluted bleach solution (1-part bleach to 99 parts water);
- Clean clothes, bedclothes, bath and hand towels, etc., using regular laundry soap and water or machine wash at 60–90 °C with common laundry detergent and dry thoroughly;
- Countries should consider measures to ensure that waste is disposed of in a sanitary landfill, and not in an unmonitored open area;
- Cleaning personnel should wear disposable gloves when cleaning or handling surfaces, clothing or linen soiled with body fluids, and should perform hand hygiene before and after removing gloves.

3. Minimum requirements for health monitoring of quarantined persons during the quarantine period

Daily follow-up of persons quarantined should be conducted within the quarantine facility for the duration of the quarantine and should include daily body temperature and symptom screening. Groups of persons at higher risk of infection and severe disease may require additional surveillance for chronic conditions or specific medical treatments.

Consideration should be given to the resources, personnel and rest period of staff at quarantine facilities. This is particularly important in the context of an ongoing outbreak, during which limited public health resources may be better prioritised towards health care facilities and case-detection activities.

Laboratory testing of a respiratory sample from quarantined persons, irrespective of symptoms, is advised at the end of the quarantine period.

WHO reference number: WHO/2019-nCov/IHR_Quarantine/2020.1

[8] Advice on the use of masks in the community, during home care and in healthcare settings in the context of the novel coronavirus (2019-nCoV) outbreak.

Key Messages and Actions for COVID-19 Prevention and Control in Schools

March 2020

unicef

World Health Organization

IFRC

CONTENTS

ANNEXES (TO FOLLOW SHORTLY IN AN UPDATED DOCUMENT, INDICATIVE CONTENT BELOW)

I. FACTS ABOUT COVID-19

What is COVID-19?
COVID-19 is a disease caused by a new strain of coronavirus. 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel coronavirus' or '2019-nCoV.'
The COVID-19 virus is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some types of common cold.

What are the symptoms of COVID-19?
Symptoms can include fever, cough and shortness of breath. In more severe cases, infection can cause pneumonia or breathing difficulties. More rarely, the disease can be fatal. These symptoms are similar to the flu (influenza) or the common cold, which are a lot more common than COVID-19. This is why testing is required to confirm if someone has COVID-19.

How does COVID-19 spread?
The virus is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing). Individuals can also be infected from and touching surfaces contaminated with the virus and touching their face (e.g., eyes, nose, mouth). The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it.

Who is most at risk?
We are learning more about how COVID-19 affects people every day. Older people, and people with chronic medical conditions, such as diabetes and heart disease, appear to be more at risk of developing severe symptoms. As this is a new virus, we are still learning about how it affects children. We know it is possible for people of any age to be infected with the virus, but so far there are relatively few cases of COVID-19 reported among children. This is a new virus and we need to learn more about how it affects children. The virus can be fatal in rare cases, so far mainly among older people with pre-existing medical conditions.

What is the treatment for COVID-19?
There is no currently available vaccine for COVID-19. However, many of the symptoms can be treated and getting early care from a healthcare provider can make the disease less dangerous. There are several clinical trials that are being conducted to evaluate potential therapeutics for COVID-19.

How can the spread of COVID-19 be slowed down or prevented?
As with other respiratory infections like the flu or the common cold, public health measures are critical to slow the spread of illnesses. Public health measures are everyday preventive actions that include:

- ✓ staying home when sick;
- ✓ covering mouth and nose with flexed elbow or tissue when coughing or sneezing. Dispose of used tissue immediately;
- ✓ washing hands often with soap and water; and
- ✓ cleaning frequently touched surfaces and objects.

As we learn more about COVID-19 public health officials may recommend additional actions.

II. INTRODUCTION

The outbreak of coronavirus disease (COVID-19) has been declared a Public Health Emergency of International Concern (PHEIC) and the virus has now spread to many countries and territories. While a lot is still unknown about the virus that causes COVID-19, we do know that it is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing) Individuals can also be infected from touching surfaces contaminated with the virus and touching their face (e.g., eyes, nose, mouth). While COVID-19 continues to spread it is important that communities take action to prevent further transmission, reduce the impacts of the outbreak and support control measures.

The protection of children and educational facilities is particularly important. Precautions are necessary to prevent the potential spread of COVID-19 in school settings; however, care must also be taken to avoid stigmatizing students and staff who may have been exposed to the virus. It is important to remember that COVID-19 does not differentiate between borders, ethnicities, disability status, age or gender. Education settings should continue to be welcoming, respectful, inclusive, and supportive environments to all. Measures taken by schools can prevent the entry and spread of COVID-19 by students and staff who may have been exposed to the virus, while minimizing disruption and protecting students and staff from discrimination.

Purpose

Today, children and young people are global citizens, powerful agents of change and the next generation of caregivers, scientists, and doctors. Any crisis presents the opportunity to help them learn, cultivate compassion and increase resilience while building a safer and more caring community. Having information and facts about COVID-19 will help diminish students' fears and anxieties around the disease and support their ability to cope with any secondary impacts in their lives. This guidance provides key messages and considerations for engaging school administrators, teachers and staff, parents, caregivers and community members, as well as children themselves in promoting safe and healthy schools.

The purpose of this document is to provide clear and actionable guidance for safe operations through the prevention, early detection and control of COVID-19 in schools and other educational facilities. The guidance, while specific to countries that have already confirmed the transmission of COVID-19, is still relevant in all other contexts. Education can encourage students to become advocates for disease prevention and control at home, in school, and in their community by talking to others about how to prevent the spread of viruses. Maintaining safe school operations or reopening schools after a closure requires many considerations but, if done well, can promote public health.

III. SCHOOL ADMINISTRATORS, TEACHERS AND STAFF

Key Messages & Actions

Basic principles

Following basic principles can help keep students, teachers, and staff safe at school and help stop the spread of this disease. Recommendations for healthy schools are:

- Sick students, teachers and other staff should not come to school
- Schools should enforce regular hand washing with safe water and soap, alcohol rub/hand sanitizer or chlorine solution and, at a minimum, daily disinfection and cleaning of school surfaces
- Schools should provide water, sanitation and waste management facilities and follow environmental cleaning and decontamination procedures
- Schools should promote social distancing (a term applied to certain actions that are taken to slow down the spread of a highly contagious disease, including limiting large groups of people coming together)

Know the latest facts

Understand basic information about coronavirus disease (COVID-19), including its symptoms, complications, how it is transmitted and how to prevent transmission. Stay informed about COVID-19 through reputable sources such as UNICEF, WHO and national health ministry advisories. Be aware of fake information/myths that may circulate by word-of-mouth or online.

Ensure safe school operations

See 'Checklist on Safe School Environments' below

Update or develop school emergency and contingency plans. Work with officials to guarantee schools are not used as shelters, treatment units, etc. Consider cancelling any community events/meetings that usually take place on school premises, based on risk.

Reinforce frequent handwashing and sanitation and procure needed supplies. Prepare and maintain handwashing stations with soap and water, and if possible, place alcohol-based hand rub (hand sanitizers) in each classroom, at entrances and exits, and near lunchrooms and toilets.

Clean and disinfect school buildings, classrooms and especially water and sanitation facilities at least once a day, particularly surfaces that are touched by many people (railings, lunch tables, sports equipment, door and window handles, toys, teaching and learning aids etc.)

Implement social distancing practices that may include:

- Staggering the beginning and end of the school day
- Cancelling assemblies, sports games and other events that create crowded conditions
- When possible, create space for children's desks to be at least one metre apart
- Teach and model creating space and avoiding unnecessary touching

Establish procedures if students or staff become unwell

Plan ahead with local health authorities, school health staff and update emergency contact lists. Ensure a procedure for separating sick students and staff from those who are well – without creating stigma – and a process for informing parents/caregivers, and consulting with health care providers/health authorities wherever possible. Students/staff may need to be referred directly to a health facility, depending on the situation/context, or sent home. Share procedures with staff, parents and students ahead of time.

Promote information sharing

Coordinate and follow guidelines from the national health and education authorities. Share known information with staff, caregivers and students, providing updated information on the disease situation, including prevention and control efforts at school. Reinforce that caregivers should alert the school and health care authorities if someone in their home has been diagnosed with COVID-19 and keep their child at home. Utilize parent-teacher committees and other mechanisms to promote information sharing. Also be sure to address children's questions and concerns, including through the development of child-friendly materials such as posters which can be placed on notice boards, in restrooms, and other central locations.

Adapt school policies where appropriate

Develop flexible attendance and sick leave policies that encourage students and staff to stay home when sick or when caring for sick family members. Discourage the use of perfect attendance awards and incentives. Identify critical job functions and positions, and plan for alternative coverage by cross-training staff. Plan for possible academic calendar changes, particularly in relation to breaks and exams.

Monitor school attendance

Implement school absenteeism monitoring systems to track student and staff absence and compare against usual absenteeism patterns at the school. Alert local health authorities about large increases in student and staff absenteeism due to respiratory illnesses.

Plan for continuity of learning

In the case of absenteeism/sick leave or temporary school closures, support continued access to quality education. This can include:

- Use of online/e-learning strategies
- Assigning reading and exercises for home study
- Radio, podcast or television broadcasts of academic content
- Assigning teachers to conduct remote daily or weekly follow up with students
- Review/develop accelerated education strategies

Implement targeted health education

Integrate disease prevention and control in daily activities and lessons. Ensure content is age-, gender-, ethnicity-, and disability-responsive and activities are built into existing subjects. (See Section on Age-Appropriate Health Education)

Address Mental Health/Psychosocial support needs

Encourage children to discuss their questions and concerns. Explain it is normal that they may experience different reactions and encourage them to talk to teachers if they have any questions or concerns. Provide information in an honest, age-appropriate manner. Guide students on how to support their peers and prevent exclusion and bullying. Ensure teachers are aware of local resources for their own well-being. Work with school health workers/social workers to identify and support students and staff who exhibit signs of distress.

Support vulnerable populations

Work with social service systems to ensure continuity of critical services that may take place in schools such as health screenings, feeding programs or therapies for children with special needs. Consider the specific needs of children with disabilities, and how marginalized populations may be more acutely impacted by the illness or its secondary effects. Examine any specific implications for girls that may increase their risk, such as responsibility for taking care of the sick at home, or exploitation when out of school.

CHECKLIST FOR SCHOOL ADMINISTRATORS, TEACHERS AND STAFF

- ☐ **1.** Promote and demonstrate regular hand washing and positive hygiene behaviors and monitor their uptake. Ensure adequate, clean and separate toilets for girls and boys
    - Ensure soap and safe water is available at age-appropriate hand washing stations
    - Encourage frequent and thorough washing (at least 20 seconds)
    - Place hand sanitizers in toilets, classrooms, halls, and near exits where possible
    - Ensure adequate, clean and separate toilets or latrines for girls and boys
- ☐ **2.** Clean and disinfect school buildings, classrooms and especially water and sanitation facilities at least once a day, particularly surfaces that are touched by many people (railings, lunch tables, sports equipment, door and window handles, toys, teaching and learning aids etc.)
    - Use sodium hypochlorite at 0.5% (equivalent 5000ppm) for disinfecting surfaces and 70% ethyl alcohol for disinfection of small items, and ensure appropriate equipment for cleaning staff
- ☐ **3.** Increase air flow and ventilation where climate allows (open windows, use air conditioning where available, etc.)
- ☐ **4.** Post signs encouraging good hand and respiratory hygiene practices
- ☐ **5**. Ensure trash is removed daily and disposed of safely

IV. PARENTS/CAREGIVERS AND COMMUNITY MEMBERS

Key Messages and Actions

COVID-19 is a new virus and we are still learning about how it affects children. We know it is possible for people of any age to be infected with the virus, but so far there have been relatively few cases of COVID-19 reported among children. The virus can be fatal in cases, so far mainly among older people with pre-existing medical conditions.

Know the latest facts
Understand basic information about coronavirus disease (COVID-19), including its symptoms, complications, how it is transmitted and how to prevent transmission. Stay informed about COVID-19 through reputable sources such as UNICEF and WHO and national health ministry advisories. Be aware of fake information/myths that may circulate by word-of-mouth or online.

Recognize the symptoms of COVID-19 (coughing, fever, shortness of breath) in your child
Seek medical advice by first calling your health facility/provider and then take your child in, if advised. Remember that symptoms of COVID-19 such as cough or fever can be similar to those of the flu, or the common cold, which are a lot more common. If your child is sick, keep them home from school and notify the school of your child's absence and symptoms. Request reading and assignments so that students can continue learning while at home. Explain to your child what is happening in simple words and reassure them that they are safe.

Keep children in school when healthy
If your child isn't displaying any symptoms such as a fever or cough it's best to keep them in school – unless a public health advisory or other relevant warning or official advice has been issued affecting your child's school.

Instead of keeping children out of school, teach them good hand and respiratory hygiene practices for school and elsewhere, like frequent handwashing (see below), covering a cough or sneeze with a flexed elbow or tissue, then throwing away the tissue into a closed bin, and not touching their eyes, mouths or noses if they haven't properly washed their hands.

Washing hands properly
Step 1: Wet hands with safe running water
Step 2: Apply enough soap to cover wet hands
Step 3: Scrub all surfaces of the hands – including backs of hands, between fingers and under nails – for at least 20 seconds
Step 4: Rinse thoroughly with running water
Step 5: Dry hands with a clean, dry cloth, single-use towel or hand drier as available

Wash your hands often, especially before and after eating; after blowing your nose, coughing, or sneezing; going to the bathroom/ toilets/latrines and whenever your hands are visibly dirty. If soap

and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water, if hands are visibly dirty.

Help children cope with the stress

Children may respond to stress in different ways. Common responses include having difficulties sleeping, bedwetting, having pain in the stomach or head, and being anxious, withdrawn, angry, clingy or afraid to be left alone. Respond to children's reactions in a supportive way and explain to them that they are normal reactions to an abnormal situation. Listen to their concerns and take time to comfort them and give them affection, reassure them they're safe and praise them frequently.

If possible, create opportunities for children to play and relax. Keep regular routines and schedules as much as possible, especially before they go to sleep, or help create new ones in a new environment. Provide age-appropriate facts about what has happened, explain what is going on and give them clear examples on what they can do to help protect themselves and others from infection. Share information about what could happen in a reassuring way.

For example, if your child is feeling sick and staying at home or the hospital, you could say, "You have to stay at home/at the hospital because it is safer for you and your friends. I know it is hard (maybe scary or even boring) at times, but we need to follow the rules to keep ourselves and others safe. Things will go back to normal soon."

CHECKLIST FOR PARENTS/CAREGIVERS & COMMUNITY MEMBERS

- ☐ 1. Monitor your child's health and keep them home from school if they are ill
- ☐ 2. Teach and model good hygiene practices for your children
    - Wash your hands with soap and safe water frequently. If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water, if hands are visibly dirty
    - Ensure that safe drinking water is available and toilets or latrines are clean and available at home
    - Ensure waste is safely collected, stored and disposed of
    - Cough and sneeze into a tissue or your elbow and avoid touching your face, eyes, mouth, nose
- ☐ 3. Encourage your children to ask questions and express their feelings with you and their teachers. Remember that your child may have different reactions to stress; be patient and understanding.
- ☐ 4. Prevent stigma by using facts and reminding students to be considerate of one another
- ☐ 5. Coordinate with the school to receive information and ask how you can support school safety efforts (though parent-teacher committees, etc.)

V. STUDENTS AND CHILDREN

Children and young people should understand basic, age-appropriate information about coronavirus disease (COVID-19), including its symptoms, complications, how it is transmitted and how to prevent transmission. Stay informed about COVID-19 through reputable sources such as UNICEF, WHO and national health ministry advisories. Be aware of fake information/myths that may circulate by word-of-mouth or online.

CHECKLIST FOR STUDENTS AND CHILDREN

☐ **1.** In a situation like this it is normal to feel sad, worried, confused, scared or angry. Know that you are not alone and talk to someone you trust, like your parent or teacher so that you can help keep yourself and your school safe and healthy.

- Ask questions, educate yourself and get information from reliable sources

☐ **2.** Protect yourself and others

- Wash your hands frequently, always with soap and water for at least 20 seconds
- Remember to not touch your face
- Do not share cups, eating utensils, food or drinks with others

☐ **3.** Be a leader in keeping yourself, your school, family and community healthy.

- Share what you learn about preventing disease with your family and friends, especially with younger children
- Model good practices such as sneezing or coughing into your elbow and washing your hands, especially for younger family members

☐ **4.** Don't stigmatize your peers or tease anyone about being sick; remember that the virus doesn't follow geographical boundaries, ethnicities, age or ability or gender.

☐ **5.** Tell your parents, another family member, or a caregiver if you feel sick, and ask to stay home.

Age-specific health education

Below are suggestions on how to engage students of different ages on preventing and controlling the spread of COVID-19 and other viruses. Activities should be contextualized further based on the specific needs of children (language, ability, gender, etc.).

Preschool

- Focus on good health behaviors, such as covering coughs and sneezes with the elbow and washing hands frequently
- Sing a song while washing hands to practice the recommended 20 second duration.
  - Children can "practice" washing their hands with hand sanitizer
- Develop a way to track hand washing and reward for frequent/timely hand washing
- Use puppets or dolls to demonstrate symptoms (sneezing, coughing, fever) and what to do if they feel sick (i.e. their head hurts, their stomach hurts, they feel hot or extra tired) and how to comfort someone who is sick (cultivating empathy and safe caring behaviors)
- Have children sit further apart from one another, have them practice stretching their arms out or 'flap their wings', they should keep enough space to not touch their friends.

Primary School

- Make sure to listen to children's concerns and answer their questions in an age-appropriate manner; don't overwhelm them with too much information. Encourage them to express and communicate their feelings. Discuss the different reactions they may experience and explain that these are normal reactions to an abnormal situation.
- Emphasize that children can do a lot to keep themselves and others safe.
  - Introduce the concept of social distancing (standing further away from friends, avoiding large crowds, not touching people if you don't need to, etc.)
  - Focus on good health behaviors, such as covering coughs and sneezes with the elbow and washing hands
- Help children understand the basic concepts of disease prevention and control. Use exercises that demonstrate how germs can spread. For example, by putting colored water in a spray bottle and spraying over a piece of white paper. Observe how far the droplets travel.
- Demonstrate why it is important to wash hands for 20 seconds with soap and water
  - Put a small amount of glitter in students' hands and have them wash them with just water, notice how much glitter remains, then have them wash for 20 seconds with soap and water
- Have students analyze texts to identify high risk behaviors and suggest modifying behaviors

- For example, a teacher comes to school with a cold. He sneezes and covers it with his hand. He shakes hands with a colleague. He wipes his hands after with a handkerchief then goes to class to teach. What did the teacher do that was risky? What should he have done instead?

Lower Secondary School

- Make sure to listen to students' concerns and answer their questions.
- Emphasize that students can do a lot to keep themselves and others safe.
  - Introduce the concept of social distancing
  - Focus on good health behaviors, such as covering coughs and sneezes with the elbow and washing hands
  - Remind students that they can model healthy behaviors for their families
- Encourage students to prevent and address stigma
  - Discuss the different reactions they may experience and explain these are normal reactions to an abnormal situation. Encourage them to express and communicate their feelings
- Build students' agency and have them promote facts about public health.
  - Have students make their own Public Service Announcements through school announcements and posters
- Incorporate relevant health education into other subjects
  - Science can cover the study of viruses, disease transmission and the importance of vaccinations
  - Social studies can focus on the history of pandemics and evolution of policies on public health and safety
  - Media literacy lessons can empower students to be critical thinkers and makers, effective communicators and active citizens

Upper Secondary School

- Make sure to listen to students' concerns and answer their questions.
- Emphasize that students can do a lot to keep themselves and others safe.
  - Introduce the concept of social distancing
- - Focus on good health behaviors, such as covering coughs and sneezes with the elbow and washing hands Encourage students to prevent and address stigma
  - Discuss the different reactions they may experience and explain these are normal reactions to an abnormal situation. Encourage them to express and communicate their feelings.
- Incorporate relevant health education into other subjects
  - Science courses can cover the study of viruses, disease transmission and the

importance of vaccinations

- Social studies can focus on the history of pandemics and their secondary effects and investigate how public policies can promote tolerance and social cohesion.

- Have students make their own Public Service Announcements via social media, radio or even local tv broadcasting
  - Media literacy lessons can empower students to be critical thinkers and makers, effective communicators and active citizens.

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SOP for IDENTIFICATION, ISOLATION OF COVID-19 AT PUBLIC AND PRIVATE HEALTH FACILITIES

Please make sure that the following are on place:

- ✓ Post information, like posters and flyers, that remind patients and visitors to practice good respiratory and hand hygiene.
- ✓ Post information for self-identification patient entering the hospital those having symptoms such as cough, fever, shortness of breath, and difficulty breathing
- ✓ Have alcohol-based hand rub or soap and water handwashing stations readily available for the use of healthcare workers, patients and visitors
- ✓ Prepare a well-defined and separate waiting area and isolation rooms for COVID-19 suspected cases.

Steps for triage and isolation of COVID-19 suspected cases

1. Conduct triage all patients entering the hospital by wearing a medical mask or standing at least 1m away from patients,
2. Identify anyone that have symptoms such as cough, fever, shortness of breath, and difficulty breathing.
3. Provide the identified cases with hand-hygiene service and medical mask
4. Isolate identified case with respiratory symptoms at designated isolation area
5. implement other infection prevention and control (IPC) measures (like: Keeping 1 m distance between patients,)
6. Determine if patient is a suspected case of COVID-19 infection using current standard case definition.
7. Alert the EPHI surveillance team on toll free phone **8335**: For those cases you make a provisional diagnosis of a suspected COVID-19 infection.
8. Refer none suspected case to emergency or OPD triage area
9. Admit suspected case to COVID-19 Isolation room and provide supportive treatment to the patient until rapid response team(RRT) arrives
10. RRT determines if patient is indeed a suspected case using most up to date standard case definition
11. Clinician hand-over suspected patient to RRT if patient history meets the standard case definition.
12. RRT immediately transfers the patient to designated isolation center.

ANNEX- Guidance on how to establish triage and isolation unit at health facilities

Novel Coronavirus COVID-19

FOR: HEALTHCARE FACILITY MANAGEMENT

Preparing for COVID-19 at your healthcare facility

Have a triage station at the healthcare facility entrance, prior to any waiting area, to screen patients for COVID-19. This limits potential infection throughout the health care center.

Post information, like posters and flyers, that remind patients and visitors to practice good respiratory and hand hygiene.

Prepare a well-defined and separate waiting area for suspected cases.

Have alcohol-based hand rub or soap and water handwashing stations readily available for the use of healthcare workers, patients and visitors.

Be alert for anyone that may have symptoms such as cough, fever, shortness of breath, and difficulty breathing.

Protect your workforce

Be ready! Ensure your healthcare and triage workers:

- Are trained on the importance, selection and proper use of personal protective equipment
- Are trained to spot symptoms of a potential COVID-19 infection and offer a medical mask to suspected cases
- Know the case definition and have a decision flow diagram available and accessible for reference at the triage station
- Isolate a suspected case promptly
- Perform hand hygiene frequently

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Novel Coronavirus COVID-19

FOR: HEALTHCARE FACILITY MANAGEMENT

Managing patients with suspected or confirmed COVID-19 at your healthcare facility

Staff should wear appropriate personal protective equipment when screening patients at the triage station. Provide medical masks to all patients presenting with flu-like symptoms or reporting possible COVID-19 infection. Remind all patients to use good respiratory and hand hygiene.

Managing Placement

- Immediately isolate suspected and confirmed cases
- To reduce stress and anxiety, explain to patients what you do and why you do it
- If possible, place patients in single rooms
- Suspected and confirmed cases should be kept separate
- Maintain at least 1-metre distance between all patients
- Do not put more than one patient in a single hospital bed

Managing the Environment

- Limit the movement of patients within the health center to reduce potential infection throughout the healthcare facility
- If a patient needs to be moved, plan the move ahead: all staff and visitors who come into direct contact with the patient should wear personal protective equipment
- Perform regular environmental cleaning and disinfection
- Maintain good ventilation – if possible open doors and windows

Managing Visitors

- Limit the number of visitors per patient
- All visitors should wear the required personal protective equipment and their visits should be recorded

World Health Organization
Western Pacific Region

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Surface sampling of coronavirus disease (COVID-19): A practical “how to” protocol for health care and public health professionals

Version: 1.1
Date: 18 February 2020
Contact: EarlyInvestigations-2019-nCoV@who.int

World Health Organization

Surface sampling of coronavirus disease (COVID-19): A practical “how to” protocol for health care and public health professionals

Protocol summary

Surface sampling of COVID-19: A practical "how to" protocol for health care and public health professionals	
Objectives	To assess the extent and persistence of surface contamination with COVID-19 To identify environmental surfaces which may play a role in onwards transmission of COVID-19
Minimum information and specimens to be obtained from participants	Daily environmental samples of high-touch surfaces linked to where COVID-19 infected patient is receiving care in a health care setting or is in isolation in a closed setting (household, hotel room etc.)
Study duration	Up to 7 days after patient has left sampling location
Potential output and analysis	Identification of COVID-19 contaminated surfaces and possible routes of transmission

1 Background

The detection and spread of an emerging respiratory pathogen are accompanied by uncertainty over, among other factors, key virological characteristics of the novel pathogen and particularly its persistence in certain environments. This is the case for the coronavirus disease (COVID-19), for which the virus was first detected in Wuhan city, China in December 2019 (1).

During past coronavirus outbreaks, a number of studies evaluating virus persistence and stability have been carried out. For example, the role of environmental contamination has been evaluated in a number of hospitals following the 2015 MERS-CoV outbreak in the Republic of Korea, as well as experimental studies on viability and persistence of MERS-CoV on surfaces and in the air (2-4). In these settings, MERS-CoV environmental contamination has been identified, but the extent of environmental contamination, the amount of viable virus that can be isolated and therefore the role of environmental contamination in transmission are not clear. These virological characteristics also need to be determined for COVID-19. This information will then be able to inform risk assessments and infection prevention and control measures, with an aim of limiting onwards transmission.

This protocol has been designed to determine (viable) virus presence and persistence on fomites in various locations where a patient infected with COVID-19 is currently receiving care or being isolated, and to understand how this may relate to COVID-19 transmission events in these settings. It is therefore important that it is done as part of a comprehensive outbreak investigation and that information obtained by environmental studies is combined with the results of epidemiological, laboratory and sequence data from COVID-19 patient investigations. COVID-19 investigation protocols currently under development include:

- Household transmission investigation protocol for COVID-19
- Assessment of potential risk factors for COVID-19 infection among health care workers in a health care setting.
- First Few X (FFX): Cases and contact investigation protocol for COVID-19 infection.

These protocols are available on the WHO website.

With any novel pathogen, it is particularly important that such information can be gathered quickly and in a way that enables the results to be easily aggregated, tabulated and analyzed across many different settings globally to inform public health responses and policy decisions. For this reason, the following protocol has been designed to conduct surface sampling for COVID-19. Each country may need to tailor some aspects of this protocol to align with public health, laboratory and clinical systems, according to capacity, availability of resources and cultural appropriateness.

Comments for the user's consideration are provided in purple text throughout the document as the user may need to modify methods slightly because of the local context in which this study will be carried out.

1.1 Objectives

The specific objectives of this protocol are to:

- Assess the extent and persistence of surface contamination of COVID-19
- Identify environmental surfaces and fomites which may play a role in onwards transmission of COVID-19.

This investigation can permit evaluation of secondary objectives such as, but not limited to:

- Characterize the sequence diversity of COVID-19 in environmental samples, as capacity and resources permit.

2 Study procedures

2.1 Study setting

Once a case of COVID-19 has been identified, the patient should be isolated. This investigation should be conducted in any setting in which the patient is receiving care, such as a health care facility, or is isolated in a closed setting, such as a household, hotel room, cruise ship etc.

In order to link data from environmental sampling to outbreak investigations, and to identify risk factors for environmental contamination and for onwards transmission to other individuals, it is important to collect background information, including:

1. Link with COVID-19 outbreak investigation: environmental sampling data provide supplementary information, which need to be interpreted in the context of the outbreak dynamics and characteristics, patient sampling and sequencing, and testing of contacts.
2. A detailed plan of the location layout, including ventilation inlets, doors, placement of major furniture and beds, etc. For health care settings this includes: area function (Emergency Department, Intensive Care Unit, ward, primary health clinic etc.), hospital equipment and the location of other COVID-19 patient(s). The layout should be detailed as a map and the exact sampling locations can be determined using the information on the maps.
3. The movements of the COVID-19 patient and/or the locations that the patient visited prior to being isolated. Each room or location where the patient stayed should be noted, with a list of activities done there, and an estimate of the amount of time spent. This information should be known when developing the sampling plan.
4. In health care settings: information on the routes, patients and treatment procedures that healthcare workers in the affected hospital were involved in. For each health care worker, the rooms and patients that were visited and treatments that were given, including dates and time, should be recorded.

COMMENT: Patients in an Intensive Care Unit may remain hospitalized for extended periods of time and, as such daily sampling may not be possible, particularly if there are multiple COVID-19 cases within the same health care facility. Feasibility and the outbreak context will determine the frequency and duration of repeated sampling.

2.2 COVID-19 case data collection

As previously mentioned, environmental sampling should be done as part of a comprehensive outbreak investigation and combined with the results of from COVID-19 patient investigations. For reference, a questionnaire covering patient and clinical information from the COVID-19 infected patient can be found in the Appendix.

2.3 Environmental sampling collection sites

The following sampling sites have been recommended based on 1) possible disease transmission routes and 2) current literature of high-touch surfaces (5-8). Moreover, standardizing the sampling sites across COVID-19 surface sampling studies will improve the comparability of results of multiple studies.

Recommended sampling sites based on location in a health care setting (9-12)

Possible route of COVID-19 hospital transmission	**Essential sampling sites**		**Other sampling sites**	
1. Patient (entry) routing	Ambulance	Medic bag handle, inside of blood pressure cuff, wall next to the patient stretcher	Ambulance	Front of defibrillator, handlebar ambulance ceiling,
	Entrance	Ventilation exits or air purifier filters, guardrails	Entrance, corridor, waiting room	Doorknob, light switch, sink, faucet handles
	Corridor	Ventilation exits or air purifier filters, guardrails	Elevator	Buttons, Ventilation exits or air purifier filters, guardrails
	Waiting room	Ventilation exits or air purifier filters, guardrails	X-ray room	Ventilation exits or air purifier filters, doorknob, light switch, X-ray table, sink, faucet handles
2. Hospital staff	Staff room	Doorknob, key board, clothes, ventilation exits or air purifier filters	Staff room, anteroom	Sink, faucet handles, desk/table, light switch, chairs
	Ante room	Doorknob, light switch, ventilation exits or air purifier filters	Patient room	Monitor controls, monitor touch screen, charts
3. Patient handling and care/patient virus excretion and risk procedures	Patient room	Doorknob, bed rails, bedside table, bed controller, call button, floor (<1meter from the patient, 2m, 3m, etc.), tubing, masks and filters of aerosol generating procedures, control panels	Patient room	Bedding, IV pole, telephone, chair, curtain, clothes , light switch, stethoscope, thermometer, hand soap dispenser, garbage bin, cup, curtains, oxygen flow meter
	Patient bathroom	Doorknob, faucet handles, sink, toilet/bed pan	Patient bathroom	Light switch, bed pan cleaner, guard rails
4. Air flow*	Patient room	Ventilation exits or air purifier filters	Patient room	Wall (<1meter from the patient, 2m, 3m, etc. if possible)
	Patient bathroom	Ventilation exits or air purifier filters	Patient bathroom	Wall (<1meter from the patient, 2m, 3m, etc. if possible)

Recommended sampling sites in a closed setting outside health care settings (household, hotel room, cruise ship etc.)

Possible route of COVID-19 transmission	**Essential sampling sites**		**Other sampling sites**	
1. Patient virus excretion	Patient room	Doorknob, bed rails, bedside table, floor (<1meter from the patient, 2m, 3m, etc.).	Patient room	Bedding, telephone, chair, curtain, clothes, light switch, hand soap dispenser, garbage bin, cup, curtains, oxygen flow meter (if applicable).
	Patient bathroom	Doorknob, faucet handles, sink, toilet/bed pan	Patient bathroom	Light switch, bed pan cleaner, guard rails
2. Air flow*	Patient room	Ventilation exits or air purifier filters	Patient room	Wall (<1meter from the patient, 2m, 3m, etc. if possible)
	Patient bathroom	Ventilation exits or air purifier filters	Patient bathroom	Wall (<1meter from the patient, 2m, 3m, etc. if possible)

Information on the timing and details of factors that can influence the outcomes of environmental sampling need to be systematically collected alongside the environmental samples:

- The time, frequency and details (e.g. disinfectant) of the cleaning and disinfection activities should be collected for all sampling locations.
- In health care settings, the place, time and duration of aerosol generating procedures, if any, should be indicated, including: positive pressure ventilation (bi-level positive airway pressure [BiPAP] and continuous positive airway pressure [CPAP]), endotracheal intubation, high flow nasal cannula, open airway suction, high frequency oscillatory ventilation, tracheostomy, chest physiotherapy, nebulizer treatment, sputum suction and bronchoscopy.

2.3 Timing of environmental sampling collection

Ideally, sampling should take place in patient rooms each day, from the day COVID-19 was suspected and/or diagnosed in a patient until at least 7 days after the discharge or passing of the patient. In case of aerosol generating procedures (listed above) in health care facilities, the environment should be sampled before and after (within 1 hour and 24h later) each procedure. Ideally, the temperature and humidity of the sampled rooms should be measured and noted daily, as well as the time the bed of the patient was made.

In the case of an extensive outbreak, the number of samples and the work that is associated with sampling may be too extensive. In this case, the sampling interval may be increased from 1 day to sampling every 2-3 days starting on day 1. Moreover, high quality sampling of sufficiently high frequency of one or two patients would have priority over sampling all patients involved in the outbreak.

2.4 Environmental sampling methods and procedures

Environmental samples need to be taken using a swab with a synthetic tip and a plastic shaft (2,3,9-12). The swab specimen collection vials should contain 1-3ml of viral transport medium (e.g. protein stabilizer, antibiotics and buffer solution) including neutralizing buffer to counteract the effects of any residual disinfectant (e.g. Tween 80). Viral transport medium is required for virus

isolation. However, viral transport medium is not always efficient in case of long shipping times, uncontrolled storage temperature and minute virus concentrations. The use of chaotropic lysis buffers will stabilize viral genomes which is recommended in situations in which storage and transport conditions are not optimal and concentrations of viable virus are expected to be low.

The first step of the sampling procedure is to put sterile, non-powdered nitrile or vinyl examination gloves over the gloves that are part of standard PPE and clothing (see 2.6.4 Prevention of COVID-19 infection in investigation personnel). Then, remove the swab from the package. Wet the swab with viral transport medium. When applying pressure with the wet swab onto the surface, move in at least two different directions while rotating the swab stick. Avoid letting the swab dry completely. The recommended swab surface area is 25cm^2. To increase the positive predictive value of the environmental sampling process, each sampling area may require multiple swabs.

After labelling the vial, place in a self-sealing bag and clean the outside of the sealed bag with a 60-80% ethanol, 80% isopropyl alcohol or 5% hypochlorite solution just prior to leaving the contaminated area. Then, place the cleaned sealed bag in another unused similar self-sealing bag.

In each sampling round, a set of control samples also need to be collected. The first set of control samples are handled in the same way as the environmental samples from the potentially contaminated area, including opening the package and removing the swab from the tube, but without sampling any surfaces. The second set of control samples remain sealed, but will be shipped, stored and tested with the surface samples, to exclude contamination later on.

COMMENT: If only a single patient is involved, it would be ideal to include an additional control sample from the room of patient within the same health care facility without COVID-19 infection. This would strengthen evidence that any positive specimens from the COVID-19 patient's room are true positives, and not laboratory or other contamination. However, inclusion of this additional control will need to be determined by feasibility and the outbreak context.

COMMENT: Wipes can also be used for larger surfaces.

2.5 Labeling, shipment and storage of samples

All those involved in collection and transporting specimens should be trained in safe handling practices and spill decontamination procedures. For details regarding the transport of samples collected and infection control advice, please refer to case management algorithm and laboratory guidance in the country or WHO laboratory guidance, available on the WHO website.

For each sample, the date and time of sampling and the exact location should be noted, as well as the conditions for transportation and the time of arrival at the laboratory. At least two aliquots of viral transport medium (VTM) should be made before the specimens are stored or shipped. One of two aliquots should be stored at -70°C or -80°C as soon as possible. Specimens should reach the laboratory as soon as possible after collection. If the specimen is not likely to reach the laboratory within 72 hours, specimens should be frozen, preferably at -80°C, and shipped on dry ice. It is, however, important to avoid repeated freezing and thawing of specimens. The storage of respiratory and serum specimens in domestic frost-free freezers should be avoided, owing to their wide temperature fluctuations. Serum should be separated from whole blood and can be stored and shipped at 4°C or frozen to -20°C or lower and shipped on dry ice.

Transport of specimens within national borders should comply with applicable national regulations. International transport of specimens should follow applicable international regulations as described in the WHO Guidance on regulations for the transport of infectious substances 2019–2020.

2.6 Ethical considerations

Ethical requirements will vary by country. In some countries, this investigation may fall under public health surveillance (emergency response) acts and may not require ethical approval from an Institutional Review Board.

2.6.1 Informed consent

The purpose of the investigation will be explained to the confirmed COVID-19 infected patient and informed consent will be obtained if the patient is willing to participate in the investigation before any procedure is performed as part of the investigation by a trained member of the investigation team. Each participant must be informed that participation in the investigation is voluntary and that s/he is free to withdraw, without justification, from the investigation at any time without consequences and without affecting professional responsibilities.

COMMENT: The age of consent may vary by country. Check the requirements of local, regional or national authorities.

Informed consent will seek approval to collect epidemiological data and clinical information for the intended purpose of this investigation.

2.6.2 Risks and benefits for subjects

This investigation poses no risk to participants, as no collection of biological specimens is involved. The primary benefit of the study is indirect in that data collected will help improve and guide efforts to understand the role of environmental contamination in the transmission of COVID-19 and prevent further spread of COVID-19.

2.6.3 Confidentiality

Participant confidentiality will be maintained throughout the investigation. All subjects who participate in the investigation will be assigned a study identification number by the investigation team for the labelling of questionnaires. The link of this identification number to individuals will be maintained by the investigation team and the Ministry of Health (or equivalent) and will not be disclosed elsewhere.
If the data is shared by the implementing organization to WHO or any agency or institution providing support for data analysis, data shared will include only the study identification number and not any personably identifiable information.

Article 45 of the IHR (2005) describes the "treatment of personal data".[1] Person identifiable data collected under the IHR should be kept confidential and processed anonymously, as required by national law. However, such data may be disclosed for assessments and management of public health risks, provided the data are processed fairly and lawfully.

2.6.4 Prevention of COVID-19 infection in investigation personnel

All personnel involved in the investigation need to be trained in infection prevention and control procedures (standard contact, droplet or airborne precautions, as determined by national or local guidelines). These procedures should include proper hand hygiene and the correct use of surgical or respiratory face masks, if necessary, to minimize their own risk of infection when in close contact with COVID-19 infected patients. All personnel involved in the environmental sampling should use personal protective equipment (PPE).

[1] https://www.who.int/ihr/publications/9789241580496/en/

WHO technical guidance on infection prevention and control specific to COVID-19 can be found on the WHO website.

3 Laboratory evaluations

Any testing for the presence of COVID-19 should be performed in appropriately equipped laboratories by staff trained in the relevant technical and safety procedures. Laboratory guidance for COVID-19 can be found on the WHO website.

Several assays that detect COVID-19 have been recently developed and the protocols or SOPs can also be found on the WHO website.

COMMENT: It is important to note that negative environmental testing results cannot exclude the presence of virus within the setting where the investigation has been conducted.

COMMENT: Genome sequencing of COVID-19 isolates may provide further details on transmission. Full genomes obtained by NGS using sets of specific primers to amplify the full genome for instance delivers a detailed picture of genetic differences between viruses but sequencing of environmental samples may be challenging and may need to be discussed with laboratories with coronavirus sequencing expertise.

COMMENT: Genetic information acquired from viral sequencing should be shared and reported via publicly available databases such as GenBank/GISAID.

4 Reporting of findings

4.1 Reporting

Any investigation of this nature should include reporting on the following information:

(1) the number of COVID-19 patients included

(2) the number of sampling sites included, location and description of the sites in relation to each patient;

(3) the number of samples collected, the number of samples with detectable RNA and the number of samples with viable virus identified.

It is also important to fully document the study design, including the definition of the sampling sites, the frequency and timing of sampling, storage and shipping conditions, and the laboratory methods used to ensure that data can be pooled.

Ideally, information would be collected in a standardized format according to the questionnaires and tools in this generic protocol to assist with data harmonization and comparison of results (see forms in the Appendix).

If the data is shared by the implementing organization to WHO or any agency or institution providing support for data analysis, data shared will include only the study identification number and not any personably identifiable information.

5 References

5.1 References

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5.2 Further references for COVID-19

WHO Disease Outbreak News
https://www.who.int/csr/don/en/

Surveillance and case definitions
https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-ncov)

Laboratory guidance
https://www.who.int/publications-detail/laboratory-testing-for-2019-novel-coronavirus-in-suspected-human-cases-20200117

Clinical management
https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected

Infection prevention and control
https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected

Risk communication
https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novel-coronaviruses-(-ncov)

6 Acknowledgements

This protocol has been adapted from the previously published WHO protocol for Middle East respiratory syndrome coronavirus (MERS-CoV), entitled 'Surface sampling of MERS-CoV in health care settings: A practical "how to" protocol for health care and public health professionals'. Both protocols were developed by Reina Sikkema, Bart Haagmans and Marion Koopmans from Erasmus Medical Center, Rotterdam, the Netherlands, with input and review by WHO.

Appendices

Appendix A: Sample questionnaire - Surface sampling of COVID-19: A practical “how to” protocol for health care and public health professionals.

Form 1: Environmental sampling of COVID-19

Form 2: Environmental sampling of COVID-19 – further sampling information

Form 3: Laboratory results of environmental samples

Form 4: Epidemiological and clinical information from COVID-19 patient (if necessary)

Form 5: Laboratory results of biological specimens from COVID-19 patient (if necessary)

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Form 1: Environmental sampling of COVID-19

This table will need to be completed every time a room in which the COVID-19 infected patient has been/is currently in is sampled, as described by the sampling schedule (e.g. daily until at least 7 days after discharge). A second table (Form 2) covers further detail on locations and type of samples collected within each room.

1. Sample location information (complete new table for each sampling collection):	
Identification number	
Date sample collected (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ Time:
Room temperature at time of sampling (°C)	
Room humidity at time of sampling (%)	
Location of room in which sample was collected	(options to be defined by investigators: consider including a map of layout of rooms the patient has entered to help identify where samples were collected) □ Patient's bedroom □ Patient's bathroom □ Entry routing □ Other:
When was the room last cleaned?	(DD/MM/YYYY)___/___/___ Time:
When was the room last disinfected?	(DD/MM/YYYY)___/___/___ Time:
Was the sample collected after an aerosolizing procedure or other high-risk procedure?	□ Yes □ No □ Unknown
- If yes, when was the last aerosolizing procedure or high-risk procedure performed?	(DD/MM/YYYY)___/___/___ Time:
- If yes, which procedure?	□ Positive pressure ventilation (bi-level positive airway pressure and continuous positive airway pressure) □ Endotracheal intubation □ High flow nasal cannula □ Open airway suction □ High frequency oscillatory ventilation □ Tracheostomy □ Chest physiotherapy □ Nebulizer treatment □ Sputum suction □ Bronchoscopy □ Other:

2. Sampling information :	
If yes, were multiple swabs taken?	□ Yes □ No □ Unknown
What storage medium was used?	□ Viral transport medium □ Tryzol □ RNAlater □ Other:

3. Storage and transport information :	
When were the samples stored at the laboratory?	(DD/MM/YYYY)___/___/___ Time:
How were the samples stored at the laboratory?	□ 4°C □ -20°C □ -80°C □ Other:
When were the samples transported to the laboratory?	(DD/MM/YYYY)___/___/___ Time:
How were the samples transported to the laboratory?	□ 4°C □ -20°C □ -80°C □ Other:

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Form 2: Environmental sampling of COVID-19 – further sampling information

Environmental sampling usually involves the collection of a large number of samples. This form covers further detail on locations and type of samples collected within each room. This should be completed alongside Form 1 at the frequency with which environmental sampling is conducted, as described by the sampling schedule (e.g. daily until at least 7 days after discharge). As an example, the first five sampling collections are shown below:

Sample collection 1

Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table □ Light switch □ Ventilation exits □ Wall □ Other:	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits □ Wall □ Other:	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall □ Light switch □ Elevator buttons □ Other:	(enter options as appropriate) □ □ □
Remarks, other rooms sampled:				
Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table □ Light switch □ Ventilation exits □ Wall □ Other:	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits □ Wall □ Other:	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall □ Light switch □ Elevator buttons □ Other:	(enter options as appropriate) □ □ □
Remarks, other rooms sampled:				
Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall	(enter options as appropriate) □ □ □

	□ Light switch □ Ventilation exits □ Wall □ Other:	□ Wall □ Other:	□ Light switch □ Elevator buttons □ Other:	
Remarks, other rooms sampled:				
Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table □ Light switch □ Ventilation exits □ Wall □ Other:	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits □ Wall □ Other:	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall □ Light switch □ Elevator buttons □ Other:	(enter options as appropriate) □ □ □
Remarks, other rooms sampled:				
Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table □ Light switch □ Ventilation exits □ Wall □ Other:	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits □ Wall □ Other:	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall □ Light switch □ Elevator buttons □ Other:	(enter options as appropriate) □ □ □
Remarks, other rooms sampled:				
Identification of samples collected	**Patient's bedroom**	**Patient's bathroom**	**Entry routing**	**Other room:**
(enter as many as collected)	□ Bed □ Linen □ Clothes □ Medical equipment: □ Doorknob □ Bedside table □ Light switch □ Ventilation exits □ Wall □ Other:	□ Toilet/ bed pan □ Faucet handles □ Hand soap dispenser □ Doorknob □ Light switch □ Ventilation exits □ Wall □ Other:	□ Medic bag handle □ Medical equipment: □ Corridor □ Ventilation exits □ Wall □ Light switch □ Elevator buttons □ Other:	(enter options as appropriate) □ □ □
Remarks, other rooms sampled:				

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Form 3: Laboratory results of environmental samples

This table will need to be completed for every environmental sample collected, as described by the sampling schedule.

4. Molecular testing methods and results (complete new table for each environmental sample collected):	
Identification of samples	
Date sample collected (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ Time:
Date sample received (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___ Time:
Location of sample collected	(options to be defined by investigators) □ Patient's bedroom □ Patient's bathroom □ Entry routing □ Other:
Type of test	□ PCR □ Whole genome sequencing □ Partial genome sequencing □ Other, specify Method used:
Result	□ COVID-19 detectable RNA □ COVID-19 viable virus □ Other, specify:
Date of result (DD/MM/YYYY)	___/___/___
Specimen shipped to other laboratory for confirmation - Date (DD/MM/YYYY)	□ Yes □ No (DD/MM/YYYY)___/___/___

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Form 4: Epidemiological and clinical information from COVID-19 patient (if necessary)

The following information should be collected as part of an outbreak investigation. The following forms are here for reference and cover the information needed to help with interpretation of the environmental sampling results.

Patient identification number	
1. Current Status	□ Alive □ Dead

2. Data Collector Information	
Name of data collector	
Data collector Institution	
Data collector telephone number	
Mobile number	
Email	
Form completion date (DD/MM/YYYY)	___/___/___
Date of interview with informant (DD/MM/YYYY)	___/___/___

3. COVID-19 patient information	
First name	
Surname	
Sex	□ Male □ Female □ Not known
Date of birth (DD/MM/YYYY)	___/___/___
Telephone (mobile) number	
Country of residence	
Nationality	
Ethnicity (optional)	
Responsible Health Centre	
Nursery/School/College if appropriate Work/ Stay home etc	
Have you travelled within the last 14 days domestically?	□ Yes □ No □ Unknown If Yes, dates of travel (DD/MM/YYYY): ___/___/___ to ___/___/___ Regions: Cities visited:
Have you travelled within the last 14 days internationally?	□ Yes □ No □ Unknown If Yes, dates of travel (DD/MM/YYYY): ___/___/___ to ___/___/___ Countries visited: Cities visited:
In the past 14 days, have you had contact with a anyone with suspect or confirmed COVID-19 infection?	□ Yes □ No □ Unknown If Yes, dates of last contact (DD/MM/YYYY): ___/___/___

4a. Primary case symptoms from onset of illness	
Date of first symptom onset* (DD/MM/YYYY)	___/___/___ □ Asymptomatic □ Unknown
Fever (≥38 °C) or history of fever*	□ Yes □ No □ Unknown If yes, specify maximum temperature from onset of illness:
Date of first health facility visit (including traditional care)* (DD/MM/YYYY)	___/___/___ □ NA □ Unknown
Total number of visits to health facilities since onset of illness	
Total number of health facilities visited since onset of illness	□ NA □ Unknown Specify:
4b. Respiratory symptoms	
Sore throat*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Cough*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
Runny nose*	□ Yes □ No □ Unknown
Shortness of breath*	□ Yes □ No □ Unknown If Yes, date (DD/MM/YYYY): ___/___/___
4c. Other symptoms	
Chills	□ Yes □ No □ Unknown
Vomiting	□ Yes □ No □ Unknown
Nausea	□ Yes □ No □ Unknown
Diarrhoea	□ Yes □ No □ Unknown
Headache	□ Yes □ No □ Unknown
Neurological signs If Yes, specify	□ Yes □ No □ Unknown
Rash	□ Yes □ No □ Unknown
Conjunctivitis	□ Yes □ No □ Unknown
Muscle ache	□ Yes □ No □ Unknown
Joint ache	□ Yes □ No □ Unknown
Loss of appetite	□ Yes □ No □ Unknown
Nose bleed	□ Yes □ No □ Unknown
Fatigue	□ Yes □ No □ Unknown
General malaise	□ Yes □ No □ Unknown
Seizures	□ Yes □ No □ Unknown
Altered consciousness	□ Yes □ No □ Unknown
Other symptoms	□ Yes □ No □ Unknown If yes, specify:

5. Primary case pre-existing condition(s)	
Obesity	□ Yes □ No □ Unknown
Cancer	□ Yes □ No □ Unknown
Diabetes	□ Yes □ No □ Unknown

HIV/other immune deficiency	□ Yes □ No □ Unknown
Heart disease	□ Yes □ No □ Unknown
Asthma (requiring medication)	□ Yes □ No □ Unknown
Chronic lung disease (non-asthma)	□ Yes □ No □ Unknown
Chronic liver disease	□ Yes □ No □ Unknown
Chronic haematological disorder	□ Yes □ No □ Unknown
Pregnancy	□ Yes □ No □ Unknown If yes, specify trimester: □ First □ Second □ Third □ NA Estimated delivery date (DD/MM/YYYY) ___/___/___
Chronic kidney disease	□ Yes □ No □ Unknown
Chronic neurological impairment/disease	□ Yes □ No □ Unknown
Organ or bone marrow recipient	□ Yes □ No □ Unknown
Other pre-existing condition(s)	□ Yes □ No □ Unknown If yes, specify:

6. Case specimen collection (Day 1- baseline)	
Date baseline respiratory sample collected (DD/MM/YYYY)	(DD/MM/YYYY) ___/___/___ □ NA
What type of respiratory sample was collected?	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Other:
Has baseline serum been taken?	□ Yes □ No □ Unknown If yes, specify date (DD/MM/YYYY):
Were other samples collected?	□ Yes □ No □ Unknown If yes: □ Stool □ Urine □ Other:
Which laboratory was the specimen sent to?	
Date sent to other laboratory with coronavirus expertise (if applicable) (DD/MM/YYYY)	___/___/___
7. Laboratory results reporting	
Please impute laboratory results once they become available in the "Laboratory results report"	

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Form 5: Laboratory results of biological specimens from COVID-19 patient (if necessary)

This table will need to be completed for every specimen collection from the COVID-19 patient, depending on the chosen specimen collection schedule.

8. Molecular testing methods and results (complete new table for each specimen collected):	
Lab identification number	
Date sample collected (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Date sample received (DD/MM/YYYY)	(DD/MM/YYYY)___/___/___
Type of sample	□ Nasal swab □ Throat swab □ Nasopharyngeal swab □ Others, specify:
Type of test	□ PCR □ Whole genome sequencing □ Partial genome sequencing □ Other, specify
Result	□ COVID-19 □ Others, specify:
Date of result (DD/MM/YYYY)	___/___/___
Specimen shipped to other laboratory for confirmation - Date (DD/MM/YYYY)	□ Yes □ No (DD/MM/YYYY)___/___/___

WHO reference number: WHO/2019-nCoV/Environment_protocol/2020.1

Template contingency plan

Title: [name of Institution/ country/region]
Contingency Plan for [name of hazard]
Date of approval
Signed by [name]

Introduction

Results of risk assessment related to hazard

Please provide a short description of:
- the hazard and its characteristics (seasonality, transmission/amplification, scale, etc.)
- impact and likelihood of the hazard.

Situation analysis

Please provide a short overview of:
- the demographic and health profile of the country and the affected population
- health system structure and services provision at national and sub-national levels
- recent disasters/emergencies with public health impact.

Scenarios and assumptions

- Description of specific contingency plan scenario(s)
- Description of early warning systems
- Description of health needs and risks linked to the hazard
- Description of planning assumptions.

Mitigation strategy

List all mitigation measures for the identified health risks linked to the hazard:

Identified health risks	Mitigation measures

Preparedness strategy

List **all** preparedness actions to deliver and which are linked to the identified response needs:

Health risk	Response needs	Preparedness action

Action plan

List all mitigation and preparedness actions that will be implemented by WHO and define the means and resources (human, logistics, financial) needed to implement these activities according to an agreed schedule.

Objectives	Activity	Priority	Start	In place	Resources needed	Responsible Institution/ staff	Estimated cost in USD
Risk mitigation							
Preparedness actions							

Preliminary response plan

From the identified response needs, define the key strategic objectives of the response and list the related main activities that will need to be implemented in the first weeks of the emergency in order to reach these objectives. Clearly identify the population targetted (based on assumptions) and the indicators, enabling monitoring of progress and/or achievments. If already identified, responsible actors can be listed for each activity. Estimating preliminary funding needs for the response avoids difficult discussions at the time of the response and developing the appeal.

Activity	Target population	Indicator	Responsible actors	Estimated cost
First strategic objective				
Second strategic objective				

Testing and maintaining the contingency plan

Test calendar

Date	Objective of test	Type of exercise	Responsible staff

References

- Coularton R. Contingency planning and humanitarian action: A review of practice. UK: Humanitarian Practice Network (HPN); March 2007.
- Emergency response framework. Second edition. Geneva: World Health Organization; 2017.
- International Health Regulations (2005): second edition. Geneva: World Health Organization; 2008.
- Framework for a Public Health Emergency Operations Centre. Geneva: World Health Organization; November 2015.
- WHO Exercise Manual. Geneva: World Health Organization; July 2016. http://www.who.int/ihr/publications/WHO-WHE-CPI-2017.10/en/
- Risk analysis and monitoring, minimum preparedness, advanced preparedness and contingency planning. Draft for field testing. Inter-Agency Standing Committee; 2015.
- Readiness checklist. Geneva: World Health Organization; July 2015. https://intranet.who.int/homes/erm/readiness/
- Approach for the integrated and strategic risk assessment of public health threats. Draft version. Geneva: World Health Organization; September 2016.
- Early detection, assessment and response to acute public health events: implementation of early warning and response with a focus on event-based surveillance. Interim version. Geneva: World Health Organization; 2014.
- Technical brief. Scenario building: how to build scenarios in preparation for or during humanitarian crises. Geneva: ACAPS; August 2016.
- Contingency planning guide. Geneva: International Federation of Red Cross and Red Crescent Societies (IFRC); 2012.

NOVEL CORONAVIRUS (nCoV)

ACUTE RESPIRATORY INFECTION CLINICAL CHARACTERISATION DATA TOOL

DESIGN OF THIS CASE RECORD FORM (CRF)

This CRF is divided into a "CORE" form and a "DAILY" form for daily laboratory and clinical data.

Complete the CORE CRF + complete the DAILY CRF on the first day of hospital admission and on ICU admission, and daily upto discharge or death.

GENERAL GUIDANCE

- The CRF is designed to collect data obtained through examination, interview and review of hospital notes. Data may be collected retrospectively if the patient is enrolled after the admission date.
- **DO NOT INPUT ANY PATIENT IDENTIFIERS: THIS INCLUDES NAMES, ADDRESSES, DATE OF BIRTH OR PLACE OF BIRTH.**
- Step 1: Contact EDCARN@who.int to become a contributor to the nCoV global platform.
- Step 2: You will be contacted by ISARIC, platform manager, for assignment informational pack and instructions on how to use the REDCap nCoV platform.
- Step 3: Participant Identification Numbers will include a 3-digit country code, a 3 digit site code and a 4 digit participant number. Participant numbers should be assigned sequentially for each site beginning with 0001. In the case of a single site recruiting participants on different wards, or where it is otherwise difficult to assign sequential numbers, it is acceptable to assign numbers in blocks or incorporating alpha characters. E.g. Ward X will assign numbers from 0001 or A001 onwards and Ward Y will assign numbers from 5001 or B001 onwards. Enter the Participant Identification Number at the top of every page.
- Step 4: Data should be entered to the central electronic database. Printed paper CRFs may be used for later transfer of the data onto the electronic database. In the case of a participant transferring between sites, it is preferred to maintain the same Participant Identification Number across the sites. When this is not possible, space for recording the new number is provided.
- The contributor will:
    - Complete every line of every section, except for where the instructions say to skip a section based on certain responses.
    - Selections with square boxes (☐) are single selection answers (choose one answer only). Selections with circles (¢) are multiple selection answers (choose as many answers as are applicable)
    - Mark 'N/A' for any results of laboratory values that are not available, not applicable or unknown.
    - Avoid recording data outside of the dedicated areas. Sections are available for recording additional information.
    - If using paper CRFs, we recommend writing clearly in ink, using BLOCK-CAPITAL LETTERS. Place an (X) when you choose the corresponding answer. To make corrections, strike through (-------) the data you wish to delete and write the correct data above it. Please initial and date all corrections.
    - Please keep all of the sheets for a single participant together e.g. with a staple or participant-unique folder.
    - Please transfer all paper CRF data to the electronic database. All paper CRFs needs to be stored locally, do not send any forms with patient identifiable information to us via e-mail or post. All data should be transferred to the secure electronic database.
- If your site would like to collect data independently, establishment of locally hosted database is possible.
- Standard reports will be provided on regular basis to all contributors. Additional analysis for operational public health purposes will be determined by an independent WHO clinical advisory group.

CORE CASE RECORD FORM

CLINICAL INCLUSION CRITERIA
Suspected or proven acute novel Coronavirus (nCoV) infection as main cause for admission: ☐ YES ☐ NO

EPIDEMIOLOGICAL FACTORS	
In the 14 days before onset of illness had the patient any of the following:	
A history of travel to an area with documented cases of nCoV infection	☐ YES ☐ NO ☐ Unknown
Close contact* with a confirmed or probable case of nCoV infection, while that patient was symptomatic	☐ YES ☐ NO ☐ Unknown
Presence in a healthcare facility where nCoV infections have been managed	☐ YES ☐ NO ☐ Unknown
Presence in a laboratory handling suspected or confirmed nCoV samples	☐ YES ☐ NO ☐ Unknown
Direct contact with animals in countries where the nCoV is known to be circulating in animal populations or where human infections have occurred as a result of presumed zoonotic transmission	☐ YES ☐ NO ☐ Unknown

* Close contact' is defined as:
- Health care associated exposure, including providing direct care for novel coronavirus patients, e.g. health care worker, working with health care workers infected with novel coronavirus, visiting patients or staying in the same close environment of a novel coronavirus patient, or direct exposure to body fluids or specimens including aerosols.
- Working together in close proximity or sharing the same classroom environment with a novel coronavirus patient.
- Traveling together with novel coronavirus patient in any kind of conveyance.
- Living in the same household as a novel coronavirus patient.

CORE CASE RECORD FORM

DEMOGRAPHICS

Clinical centre name:_____ **Country:**_____

Enrolment date: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_]

Ethnic group *(check all that apply)*: O Arab O Black O East Asian O South Asian O West Asian O Latin American O White

O Aboriginal/First Nations O Other: _____ ☐Unknown

Employed as a Healthcare Worker? ☐YES ☐NO ☐N/A

Employed in a microbiology laboratory? ☐YES ☐NO ☐N/A

Sex at Birth: ☐ Male ☐ Female ☐ Not specified

Estimated Age [___][___][___]years OR ___][___]months

Pregnant? ☐ YES ☐ NO ☐ Unknown ☐ N/A **If YES: Gestational weeks assessment:** [___][___] weeks

POST PARTUM? ☐YES ☐NO ☐ N/A *(if NO or N/A skip this section - go to INFANT)*

Pregnancy Outcome: ☐Live birth ☐Still birth **Delivery date:** [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_]

Baby tested for Mother's ARI infection? ☐YES ☐NO ☐N/A **If YES:** ☐Positive ☐Negative **Method:** ☐PCR ☐Other:_____

INFANT – Less than 1 year old? ☐YES ☐NO *(If NO skip this section)*

Birth weight: [___][___].[___]☐kg or ☐lbs ☐N/A

Gestational outcome: ☐ Term birth (≥37wk GA) ☐Preterm birth (<37wk GA) ☐N/A

Breastfed? ☐YES ☐NO ☐N/A **If YES:** ☐Currently breastfed ☐Breastfeeding discontinued at [___][___]weeks☐N/A

Appropriate development for age? ☐YES ☐NO ☐Unknown

Vaccinations appropriate for age/country? ☐YES ☐NO ☐Unknown ☐N/A

CORE CASE RECORD FORM

CO-MORBIDITIES			
Co-morbidities and risk factors – Charlson Index will be calculated for each patient at analysis.			
Chronic cardiac disease, including congenital heart disease *(not hypertension)*	☐YES ☐NO ☐N/A	Obesity *(as defined by clinical staff)*	☐YES ☐NO ☐N/A
Chronic pulmonary disease *(not asthma)*	☐YES ☐NO ☐N/A	Diabetes with complications	☐YES ☐NO ☐N/A
Asthma *(physician diagnosed)*	☐ YES ☐NO ☐N/A	Diabetes without complications	☐YES ☐NO ☐N/A
Chronic kidney disease	☐YES ☐NO ☐N/A	Rheumatologic disorder	☐YES ☐NO ☐N/A
Moderate or severe liver disease	☐YES ☐NO ☐N/A	Dementia	☐YES ☐NO ☐N/A
Mild liver disease	☐YES ☐NO ☐N/A	Malnutrition	☐YES ☐NO ☐N/A
Chronic neurological disorder	☐YES ☐NO ☐N/A	Smoking	☐YES ☐Never smoked ☐Former smoker
Malignant neoplasm	☐YES ☐NO ☐N/A	Other relevant risk factor ☐YES ☐NO ☐N/A	
Chronic hematologic disease	☐YES ☐NO ☐N/A	If yes, specify:_____	
AIDS / HIV	☐YES ☐NO ☐N/A	_____	

ONSET & ADMISSION

Onset date of first/earliest symptom: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_]

Admission date at this facility: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_]

Time of admission (24-hr format):[_H_][_H_]/[_M_][_M_]

Transfer from other facility? ☐YES-facility is a study site ☐YES-facility is not a study site ☐NO ☐N/A

If YES: **Name of transfer facility**:_____ ☐N/A

If YES: **Admission date at transfer facility** *(DD/MM/YYYY)*: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐N/A

If YES-Study Site: **Participant ID # at transfer facility:** ☐Same as above ☐Different: [___][___][___]–[___][___][___][___] ☐N/A

Travel in the 14 days prior to first symptom onset? ☐YES ☐NO ☐Unknown

If YES, *state location(s) & date(s):* Country:_____ City/Geographic area:_____

Return Date: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐ N/A *(more space at the end if required)*

Contact with animals, raw meat or insect bites in the 14 days prior to symptom onset?

☐YES ☐NO ☐Unknown ☐ N/A *If YES, complete the ANIMAL EXPOSURE section*

World Health Organization ISARIC

PARTICIPANT IDENTIFICATION #: [___][___][___]--- [___][___][___][___]

CORE CASE RECORD FORM

SIGNS AND SYMPTOMS AT HOSPITAL ADMISSION *(first available data at presentation/admission – within 24 hours)*

Temperature: [_][_][_].[_]☐☐°C *or* ☐☐°F **HR:** [_][_][_]beats per minute **RR:** [_][_]breaths per minute

Systolic BP: [_] [_] [_]mmHg **Diastolic BP:** [_][_][_]mmHg **Severe dehydration:** ☐YES ☐NO ☐Unknown

Sternal capillary refill time >2seconds ☐YES ☐NO ☐Unknown

Oxygen saturation: [_][_][_]% **On:** ☐Room air ☐Oxygen therapy ☐N/A

Admission signs and symptoms *(observed/reported at admission and associated with this episode of acute illness)*

History of fever	☐YES ☐NO ☐Unknown
Cough	☐YES ☐NO ☐ Unknown
with sputum production	☐YES ☐NO ☐ Unknown
bloody sputum/haemoptysis	☐YES ☐NO ☐ Unknown
Sore throat	☐YES ☐NO ☐ Unknown
Runny nose (Rhinorrhoea)	☐YES ☐NO ☐ Unknown
Ear pain	☐YES ☐NO ☐ Unknown
Wheezing	☐YES ☐NO ☐ Unknown
Chest pain	☐YES ☐NO ☐ Unknown
Muscle aches (Myalgia)	☐YES ☐NO ☐ Unknown
Joint pain (Arthralgia)	☐YES ☐NO ☐ Unknown
Fatigue / Malaise	☐YES ☐NO ☐ Unknown
Shortness of breath (Dyspnea)	☐YES ☐NO ☐ Unknown
Lower chest wall indrawing	☐YES ☐NO ☐ Unknown
Headache	☐YES ☐NO ☐ Unknown
Altered consciousness/confusion	☐YES ☐NO ☐ Unknown
Seizures	☐YES ☐NO ☐ Unknown
Abdominal pain	☐YES ☐NO ☐ Unknown
Vomiting / Nausea	☐YES ☐NO ☐ Unknown
Diarrhoea	☐YES ☐NO ☐ Unknown
Conjunctivitis	☐YES ☐NO ☐ Unknown
Skin rash	☐YES ☐NO ☐ Unknown
Skin ulcers	☐YES ☐NO ☐ Unknown
Lymphadenopathy	☐YES ☐NO ☐ Unknown
Bleeding (Haemorrhage)	☐YES ☐NO ☐ Unknown
If Bleeding: specify site(s):	_____ _____ _____

CORE CASE RECORD FORM

PATHOGEN TESTING:

Was pathogen testing done during this illness episode? ☐YES *(complete section)* ☐NO ☐N/A

Influenza : ☐ YES- Confirmed ☐ YES- Probable ☐ NO **If YES:** ☐ A/H3N2 ☐ A/H1N1pdm09 ☐ A/H7N9

☐ A/H5N1 ☐ A, not typed ☐ B ☐ Other:___________________________

Coronavirus: ☐ YES- Confirmed ☐ YES- Probable ☐ NO **If YES:** ☐ Novel CoV ☐ MERS CoV

☐ Other CoV: _____________________

RSV: ☐ YES- Confirmed ☐ YES- Probable ☐ NO

Adenovirus: ☐ YES- Confirmed ☐ YES- Probable ☐ NO

Bacteria: : ☐ Yes – confirmed : ☐ No

Other Infectious Respiratory diagnosis: ☐ YES- Confirmed ☐ YES- Probable ☐ NO

If yes Other Infectious Respiratory diagnosis, specify:____

Clinical pneumonia: ☐ YES ☐ NO ☐ Unknown **If NONE OF THE ABOVE: Suspected Non-infective:** ☐ YES ☐ N/A

Collection Date *(DD/MM/YYYY)*	Biospecimen Type	Laboratory test Method	Result	Pathogen Tested/Detected
__ __/__ __/20__ __	☐Nasal/NP swab ☐Throat swab ☐Combined nasal/NP+throat swab ☐Sputum ☐BAL ☐ETA ☐Urine ☐Feces/rectal swab ☐Blood ☐Other, *Specify:* ___________________	☐PCR ☐Culture ☐Other, *Specify:* _____________	☐Positive ☐Negative ☐N/A	_______________
__ __/__ __/20__ __	☐Nasal/NP swab ☐Throat swab ☐Combined nasal/NP+throat swab ☐Sputum ☐BAL ☐ETA ☐Urine ☐Feces/rectal swab ☐Blood ☐Other, *Specify:* ___________________	☐PCR ☐Culture ☐Other, *Specify:* _____________	☐Positive ☐Negative ☐N/A	_______________
__ __/__ __/20__ __	☐Nasal/NP swab ☐Throat swab ☐Combined nasal/NP+throat swab ☐Sputum ☐BAL ☐ETA ☐Urine ☐Feces/rectal swab ☐Blood ☐Other, *Specify:* ___________________	☐PCR ☐Culture ☐Other, *Specify:* _____________	☐Positive ☐Negative ☐N/A	_______________
__ __/__ __/20__ __	☐Nasal/NP swab ☐Throat swab ☐Combined nasal/NP+throat swab ☐Sputum ☐BAL ☐ETA ☐Urine ☐Faeces/rectal swab ☐Blood ☐Other, *Specify:* ___________________	☐PCR ☐Culture ☐Other, *Specify:* _____________	☐Positive ☐Negative ☐N/A	_______________
__ __/__ __/20__ __	☐Nasal/NP swab ☐Throat swab ☐Combined nasal/NP+throat swab ☐Sputum ☐BAL ☐ETA ☐Urine ☐Feces/rectal swab ☐Blood ☐Other, *Specify:* ___________________	☐PCR ☐Culture ☐Other, *Specify:* _____________	☐Positive ☐Negative ☐N/A	_______________

DAILY CASE RECORD FORM (complete one form on admission, one form on admission to ICU, and daily up to 14 days or until discharge or death if earlier)

DAILY ASSESSMENT FORM (on admission, on any admission to ICU, then daily) – complete every line

DATE OF ASSESSMENT *(DD/MM/YYYY):* [_D_][_D_]/[_M_][_M_]/[__2_][__0_][_Y_][_Y_]

Record the worst value between 00:00 to 24:00 on day of assessment (if Not Available write 'N/A'):

Current admission to ICU/ITU/IMC/HDU? ☐YES ☐NO ☐N/A

Record the worst value (within the previous 24 hours *(if Not Available write 'N/A'))*:

Done ☐YES ☐NO FiO_2 *(0.21-1.0)* [___].[___][___] or [___][___]L/min

Done ☐YES ☐NO SaO_2 [___][___][___]%

Done ☐YES ☐NO PaO_2 *at time of* FiO_2 *above* [___][___][___] ☐kPa *or* ☐mmHg

Done ☐YES ☐NO PaO_2 sample type: ☐ Arterial ☐ Venous ☐ Capillary ☐N/A

Done ☐YES ☐NO From same blood gas record as PaO_2 PCO_2 _____☐kPa *or* ☐mmHg

Done ☐YES ☐NO pH _____

Done ☐YES ☐NO HCO_3- _____mEq/L

Done ☐YES ☐NO Base excess _____ mmol/L

AVPU Alert [___] Verbal[___] Pain [___] Unresponsive[___]

Glasgow Coma Score (GCS / 15) [___][___]

Done ☐YES ☐NO Richmond Agitation-Sedation Scale (RASS) [___]

Done ☐YES ☐NO Riker Sedation-Agitation Scale (SAS**)** [___]

Done ☐YES ☐NO Systolic Blood Pressure [___][___][___]mmHg

Done ☐YES ☐NO Diastolic Blood Pressure [___][___][___]mmHg

Done ☐YES ☐NO Mean Arterial Blood Pressure [___][___][___]mmHg

Done ☐YES ☐NO Urine flow rate [___][___][___][___][___]mL/24 hours ☐ Check if estimated

Is the patient currently receiving, or has received (between 00:00 to 24:00 on day of assessment) *(apply to all questions in this section)*:

Non-invasive ventilation *(e.g. BIPAP, CPAP)*? ☐ YES ☐ NO ☐ N/A **Invasive ventilation?** ☐ YES ☐ NO ☐N/A

Extra corporeal life support (ECLS)? ☐ YES ☐ NO ☐ N/A **High-flow nasal canula oxygen therapy** ☐YES ☐NO ☐N/A

Dialysis/Hemofiltration? ☐YES ☐NO ☐N/A

Any vasopressor/inotropic support? ☐ YES ☐ NO *(if NO, answer the next 3 questions NO)* ☐N/A

Dopamine <5µg/kg/min OR Dobutamine OR milrinone OR levosimendan: ☐ YES ☐ NO

Dopamine 5-15µg/kg/min OR Epinephrine/Norepinephrine < 0.1µg/kg/min OR vasopressin OR phenylephrine:☐ YES ☐ NO

Dopamine >15µg/k/min OR Epinephrine/Norepinephrine > 0.1µg/kg/min: ☐ YES ☐ NO

Neuromuscular blocking agents? ☐ YES ☐ NO ☐ N/A **Inhaled Nitric Oxide?** ☐YES ☐NO ☐N/A

Tracheostomy inserted? ☐YES ☐NO ☐N/A **Prone positioning?** ☐ YES ☐ NO ☐ N/A

Other intervention or procedure: ☐ YES ☐ NO ☐ N/A If YES, Specify: _____

_____

DAILY CASE RECORD FORM (complete one form on admission, one form on admission to ICU, and daily up to 14 days or till discharge or death if earlier)

DAILY LABORATORY RESULTS (on admission, on any admission to ICU, then daily) – complete every line

DATE OF ASSESSMENT *(DD/MM/YYYY):* [_D_][_D_]/[_M_][_M_]/[__2_][__0_][_Y_][_Y_]

Record the worst value between 00:00 to 24:00 on day of assessment (if Not Available write 'N/A'):

Done ☐YES ☐NO **Haemoglobin** _____ ☐g/L *or* ☐g/dL

Done ☐YES ☐NO **WBC count** _____ ☐x10^9/L *or* ☐x10^3/µL

Done ☐YES ☐NO **Lymphocyte count** _____ _____ ☐cells/ µL

Done ☐YES ☐NO **Neutrophil count** _____ _____ ☐ cells/ µL

Done ☐YES ☐NO **Haematocrit** [___][___]%

Done ☐YES ☐NO **Platelets** _____ ☐x10^9/L *or* ☐x10^3/µL

Done ☐YES ☐NO **APTT/APTR** _____

Done ☐YES ☐NO **PT** _____ seconds

Done ☐YES ☐NO **INR**_____

Done ☐YES ☐NO **ALT/SGPT** _____ U/L

Done ☐YES ☐NO **Total Bilirubin** _____☐µmol/L *or* ☐mg/dL

Done ☐YES ☐NO **AST/SGOT** _____ U/L

Done ☐YES ☐NO **Glucose** _____☐mmol/L *or* ☐mg/dL

Done ☐YES ☐NO **Blood Urea Nitrogen (urea)** _____ ☐mmol/L *or* ☐mg/dL

Done ☐YES ☐NO **Lactate** _____☐mmol/L *or* ☐mg/dL

Done ☐YES ☐NO **Creatinine** _____ ☐µmol/L *or*☐mg/dL

Done ☐YES ☐NO **Sodium** [___][___][___][___] mEq/L

Done ☐YES ☐NO **Potassium** [___][___].[___] mEq/L

Done ☐YES ☐NO **Procalcitonin** [___][___].[___][___]ng/mL

Done ☐YES ☐NO **CRP**_[___][___][___].[___]_mg/L

Chest X-Ray performed? ☐YES ☐NO ☐N/A **IF Yes: Were infiltrates present?** ☐YES ☐NO ☐N/A

CORE CASE RECORD FORM

COMPLICATIONS: At any time during hospitalisation did the patient experience:							
Viral pneumonitis	☐ YES	☐ NO	☐N/A	**Cardiac arrest**	☐ YES	☐ NO	☐N/A
Bacterial pneumonia	☐ YES	☐ NO	☐N/A	**Bacteremia**	☐ YES	☐ NO	☐N/A
Acute Respiratory Distress Syndrome	☐ YES	☐ NO	☐N/A	**Coagulation disorder / Disseminated Intravascular Coagulation**	☐ YES	☐ NO	☐N/A
IF yes, specify: ☐ Mild ☐ Moderate ☐ Severe ☐ Unknown				**Anemia**	☐ YES	☐ NO	☐N/A
Pneumothorax	☐ YES	☐ NO	☐N/A	**Rhabdomyolysis / Myositis**	☐ YES	☐ NO	☐N/A
Pleural effusion	☐ YES	☐ NO	☐N/A	**Acute renal injury/ Acute renal failure**	☐ YES	☐ NO	☐N/A
Cryptogenic organizing pneumonia (COP)	☐ YES	☐ NO	☐N/A	**Gastrointestinal haemorrhage**	☐ YES	☐ NO	☐N/A
Bronchiolitis	☐ YES	☐ NO	☐N/A	**Pancreatitis**	☐ YES	☐ NO	☐N/A
Meningitis / Encephalitis	☐ YES	☐ NO	☐N/A	**Liver dysfunction**	☐ YES	☐ NO	☐N/A
Seizure	☐ YES	☐ NO	☐N/A	**Hyperglycemia**	☐ YES	☐ NO	☐N/A
Stroke / Cerebrovascular accident	☐ YES	☐ NO	☐N/A	**Hypoglycemia**	☐ YES	☐ NO	☐N/A
Congestive heart failure	☐ YES	☐ NO	☐N/A	**Other**	☐ YES	☐ NO	☐N/A
Endocarditis / Myocarditis / Pericarditis	☐ YES	☐ NO	☐N/A	**If yes specify**: _____			
Cardiac arrhythmia	☐ YES	☐ NO	☐N/A	_____			
Cardiac ischaemia	☐ YES	☐ NO	☐N/A				

CORE CASE RECORD FORM

TREATMENT: At ANY time during hospitalisation, did the patient receive/undergo:

ICU or High Dependency Unit admission? ☐YES ☐NO ☐N/A If YES, total duration: _____days

If yes, date of ICU admission: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐N/A

date of ICU discharge: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐N/A

Oxygen therapy? ☐YES ☐NO ☐N/A

Non-invasive ventilation? *(e.g. BIPAP, CPAP)* ☐YES ☐NO ☐N/A

Invasive ventilation *(Any)***?** ☐YES ☐NO ☐N/A If YES, total duration: _____days

Prone Ventilation? ☐YES ☐NO ☐N/A

Inhaled Nitric Oxide? ☐YES ☐NO ☐N/A

Tracheostomy inserted ☐YES ☐NO ☐N/A,

Extracorporeal support? ☐YES ☐NO ☐N/A

Renal replacement therapy (RRT) or dialysis? ☐YES ☐NO ☐N/A

Inotropes/vasopressors? ☐YES ☐NO ☐N/A

If YES: First/Start date: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐N/A

Last/End date: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐N/A

OTHER intervention or procedure *(please specify)***:** _____

MEDICATION: While hospitalised or at discharge, were any of the following administered?

Antiviral agent? ☐YES ☐NO ☐N/A **If YES:** ☐Ribavirin ☐Lopinavir/Ritonavir ☐Interferon alpha ☐Interferon beta

☐ Neuraminidase inhibitor ☐Other _____

Antibiotic? ☐YES ☐NO ☐N/A

Corticosteroid? ☐YES ☐NO ☐N/A **If YES, Route:** ☐Oral ☐Intravenous ☐Inhaled

If YES, please provide type and dose: _____

Antifungal agent? ☐YES ☐NO ☐N/A

CORE CASE RECORD FORM

OUTCOME

Outcome: ☐ Discharged alive ☐ Hospitalization ☐ Transfer to other facility ☐ Death

☐ Palliative discharge ☐ Unknown

Outcome date: [_D_][_D_]/[_M_][_M_]/[_2_][_0_][_Y_][_Y_] ☐ N/A

If Discharged alive:

Ability to self-care at discharge versus before illness: ☐ Same as before illness ☐ Worse ☐ Better ☐ N/A

If Discharged alive: Post-discharge treatment:

Oxygen therapy? ☐ YES ☐ NO ☐ N/A **Dialysis/renal treatment?** ☐ YES ☐ NO ☐ N/A

Other intervention or procedure? ☐ YES ☐ NO ☐ N/A

If YES: Specify *(multiple permitted):* _____

If Transferred: Facility name: _____ ☐ N/A

If Transferred: Is the transfer facility a study site? ☐ YES ☐ NO ☐ N/A

If a Study Site: Participant ID# at new facility: ☐ Same as above ☐ Different: [___][___][___] – [___][___][___][___] ☐N/A

CORE CASE RECORD FORM

TRAVEL: Did the patient travel in the 14 days prior to first symptom onset? If > 1 *location & date list:*
Country:_____ City/Geographic area: _____ Return Date *(DD/MM/20YY):* ____ /____ /20_____
Country:_____ City/Geographic area: _____ Return Date *(DD/MM/20YY):* ____ /____ /20_____
Country:_____ City/Geographic area: _____ Return Date *(DD/MM/20YY):* ____ /____ /20_____

ANIMAL EXPOSURES: Did the patient have contact with live/dead animals, raw meat or insect bites in the 14 days prior to first symptom onset? ☐YES ☐NO ☐N/A If yes, *Complete each line below.*
If YES, specify the animal/insect, type of contact and date of exposure (DD/MM/YYYY) ⬇ *here:*

Bird/Aves (e.g. chickens, turkeys, ducks)	☐YES ☐NO ☐N/A	
Bat	☐YES ☐NO ☐N/A	
Livestock (e.g. goats, cattle, camels)	☐YES ☐NO ☐N/A	
Horse	☐YES ☐NO ☐N/A	
Hare/ Rabbit	☐YES ☐NO ☐N/A	
Pigs	☐YES ☐NO ☐N/A	
Non-human primates	☐YES ☐NO ☐N/A	
Rodent (e.g. rats, mice, squirrels)	☐YES ☐NO ☐N/A	
Insect or tick bite (e.g. tick, flea, mosquito)	☐YES ☐NO ☐N/A	
Reptile / Amphibian	☐YES ☐NO ☐N/A	
Domestic animals living in his/her home (e.g. cats, dogs, other)	☐YES ☐NO ☐N/A	
Animal feces or nests	☐YES ☐NO ☐N/A	
Sick animal or dead animal	☐YES ☐NO ☐N/A	
Raw animal meat / animal blood	☐YES ☐NO ☐N/A	
Skinned, dressed or eaten wild game	☐YES ☐NO ☐N/A	
Visit to live animal market, farm or zoo	☐YES ☐NO ☐N/A	
Participated in animal surgery or necropsy	☐YES ☐NO ☐N/A	
Other animal contacts:	☐YES ☐NO ☐N/A	

Critical preparedness, readiness and response actions for COVID-19.

Interim guidance
7 March 2020

World Health Organization

Background

On 30 January 2020, WHO announced that the COVID-19 outbreak was a Public Health Emergency of International Concern. As of 4 March 2020, cases of COVID-19 have been reported in 77 countries. To date, most cases were reported from China with cases in some other countries among individuals with travel history to China. In February 2020, the number of cases in China declined while the number of cases and countries reporting cases increased.

Several countries have demonstrated that COVID-19 transmission from one person to another can be slowed or stopped. These actions have saved lives and have provided the rest of the world with more time to prepare for the arrival of COVID-19: to ready emergency response systems; to increase capacity to detect and care for patients; to ensure hospitals have the space, supplies and necessary personnel; and to develop life-saving medical interventions. Every country should urgently take all necessary measures to slow further spread and to avoid that their health systems become overwhelmed due to seriously ill patients with COVID-19.

The Strategic Preparedness and Response Plan for COVID-19 aims to:

- Slow and stop transmission, prevent outbreaks and delay spread.
- Provide optimized care for all patients, especially the seriously ill.
- Minimize the impact of the epidemic on health systems, social services and economic activity.

All countries should increase their level of preparedness, alert and response to identify, manage and care for new cases of COVID-19. Countries should prepare to respond to different public health scenarios, recognizing that there is no one-size-fits-all approach to managing cases and outbreaks of COVID-19. Each country should assess its risk and rapidly implement the necessary measures at the appropriate scale to reduce both COVID-19 transmission and economic, public and social impacts.

Scenarios

WHO has defined four transmission scenarios for COVID-19:

1. Countries with no cases (No Cases);
2. Countries with 1 or more cases, imported or locally detected (Sporadic Cases);
3. Countries experiencing cases clusters in time, geographic location and/or common exposure (Clusters of cases);
4. Countries experiencing larger outbreaks of local transmission (Community transmission).

Countries could experience one or more of these scenarios at the sub-national level and should adjust and tailor their approach to the local context.

Countries should prepare to respond to all of the transmission scenarios, following the framework laid out in the Strategic Preparedness and Response Plan for COVID-19. Prioritization and focus of resources for each technical area will depend on which transmission scenario(s) a country is managing.

COVID-19 is a new disease that is distinct from other SARS, MERS and influenza. Although coronavirus and influenza infections may present with similar symptoms, the virus responsible for COVID-19 is different with respect to community spread and severity. There is still much to discover about the disease and its impact in different contexts. Preparedness, readiness and response actions will continue to be driven by rapidly accumulating scientific and public health knowledge.

The Table describes the preparedness, readiness and response actions for COVID-19 for each transmission scenario. Hyperlinks to existing WHO Technical Guidance are provided.

All technical guidance for WHO can be found here: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance.

Table 1. Critical preparedness, readiness and response actions for each transmission scenario for COVID-19

	No Cases	Sporadic Cases	Clusters of Cases	Community Transmission
Transmission scenario	No reported cases	One or more cases, imported or locally acquired.	Most cases of local transmission linked to chains of transmission.	Outbreaks with the inability to relate confirmed cases through chains of transmission for a large number of cases, or by increasing positive tests through sentinel samples (routine systematic testing of respiratory samples from established laboratories.
Aim	Stop transmission and prevent spread.	Stop transmission and prevent spread	Stop transmission and prevent spread.	Slow transmission, reduce case numbers, end community outbreaks.
Priority areas of work				
Emergency response mechanisms.	Activate emergency response mechanisms.	Enhance emergency response mechanisms.	Scale up emergency response mechanism.	Scale up emergency response mechanism
Risk communication and public engagement.	Educate and actively communicate with the public through risk communication and community engagement.	Educate and actively communicate with the public through risk communication and community engagement.	Educate and actively communicate with the public through risk communication and community engagement.	Educate and actively communicate with the public through risk communication and community engagement.
Case finding, contact tracing and management.	Conduct active case finding, contact tracing and monitoring; quarantine of contacts and isolation of cases.	Enhance active case finding, contact tracing and monitoring; quarantine of contacts and isolation of cases.	Intensify case finding, contact tracing, monitoring, quarantine of contacts, and isolation of cases.	Continue contact tracing where possible, especially in newly infected areas, quarantine of contacts, & isolation of cases; apply self-initiated isolation for symptomatic individuals.
Surveillance	Consider testing for COVID-19 using existing respiratory disease surveillance systems and hospital-based surveillance.	Implement COVID-19 surveillance using existing respiratory disease surveillance systems and hospital-based surveillance.	Expand COVID-19 surveillance using existing respiratory disease surveillance systems and hospital-based surveillance.	Adapt existing surveillance systems to monitor disease activity (e.g. through sentinel sites).
Public health measures.	Hand hygiene, respiratory etiquette, practice social distancing.	Hand hygiene, respiratory etiquette, practice social distancing.	Hand hygiene, respiratory etiquette, practice social distancing.	Hand hygiene, respiratory etiquette, practice social distancing.

Laboratory testing	Test suspect cases per WHO case definition, contacts of confirmed cases; test patients identified through respiratory disease surveillance.	Test suspect cases per WHO case definition, contacts of confirmed cases; test patients identified through respiratory disease surveillance.	Test suspect cases per WHO case definition, contacts of confirmed cases; test patients identified through respiratory disease surveillance.	Test suspect cases per WHO case definition and symptomatic contacts of probable/confirmed cases; test patients identified through respiratory disease surveillance. If testing capacity is overwhelmed prioritize testing in health care settings and vulnerable groups. In closed settings test only the first symptomatic suspect cases.
Case management	Prepare to treat patients, Ready hospitals for potential surge	Treat patients and ready hospitals for surge; develop triage procedures	Treat patients and ready hospitals for surge; enhance triage procedures; activate surge plans for health facilities	Prioritize care and activate triage procedures. Scale up surge plans for health facilities (designate referral hospitals, defer elective procedures)
	Promote self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health systems	Promote self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health system	Activate surge plans for health facilities (designate referral hospitals, defer elective procedures)	Implement self-initiated isolation of people with mild respiratory symptoms to reduce the burden on health systems
IPC	Train staff in IPC and clinical management specifically for COVID-19	Train staff in IPC and clinical management specifically for COVID-19	Train staff in IPC and clinical management specifically for COVID-19	Retrain staff in IPC and clinical management specifically for COVID-19
	Prepare for surge in health care facility needs, including respiratory support and PPE	Prepare for surge in health care facility needs, including respiratory support and PP	Advocate for home care for mild cases, if health care systems are overwhelmed, and identify referral systems for high risk groups	Implement health facilities surge plans
Societal response	Develop all-of-society and business continuity plans	Implement all-of-society, repurpose government and ready business continuity plans	Implement all-of-society resilience, repurpose government, business continuity, and community services plans	Implement all-of-society resilience, repurpose government, business continuity, and community services plans

WHO reference number: WHO/COVID-19/Community_Actions/2020.1

Home care for patients with suspected novel coronavirus (COVID-19) infection presenting with mild symptoms, and management of their contacts

Interim guidance
04 February 2020

World Health Organization

Introduction

WHO has developed this rapid advice to meet the need for recommendations on safe home care for patients with suspected novel coronavirus (COVID-19) infection who present with mild symptoms[1] and on public health measures related to the management of contacts.

This document was adapted from the interim guidance that addressed Middle East respiratory syndrome coronavirus (MERS-CoV) infection that was published in June 2018 (*1*) and is informed by evidence-based guidelines published by WHO, including *Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care* (*2*), and based on current information regarding COVID-19 infection.

This rapid advice is intended to guide public health and infection prevention and control (IPC) professionals, healthcare managers and healthcare workers (HCWs) when addressing issues related to home care for patients with suspected COVID-19 infection who present with mild symptoms and when managing contacts. This guidance is based on evidence about COVID-19 infection and the feasibility of implementing IPC measures at home. For the purpose of this document, caregivers refer to parents, spouses, other family members or friends without formal healthcare training.

For COVID-19 disease case definitions, please refer to https://apps.who.int/iris/bitstream/handle/10665/330857/WHO-2019-nCoV-SurveillanceGuidance-2020.3-eng.pdf.

For guidance on IPC at the facility level, please refer to https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected.

Home care for patients with suspected COVID-19 infection who present with mild symptoms

In view of the current data on the disease and its transmission, WHO recommends that all patients with suspected COVID-19 infection who have severe acute respiratory infection be triaged at the first point of contact with the healthcare system and that emergency treatment should be started based on disease severity. For those presenting with mild illness, hospitalization may not be required unless there is concern about rapid deterioration (*3*). If there is only mild illness, providing care at home may be considered. Other patients who may be cared for at home include those who are symptomatic but no longer require hospitalization and cases in which an informed decision has been made to refuse hospitalization; home care may also be considered when inpatient care is unavailable or unsafe (e.g., capacity is limited, and resources are unable to meet the demand for healthcare services).

In any of these situations, patients with mild symptoms[1] and without underlying chronic conditions − such as lung or heart disease, renal failure or immunocompromising conditions that place the patient at increased risk of developing complications − may be cared for at home. This decision requires careful clinical judgment and should be informed by an assessment of the safety of the patient's home environment.[2]

In cases in which care is to be provided at home, a trained HCW should conduct an assessment to verify whether the residential setting is suitable for providing care; the HCW must assess whether the patient and the family are capable of adhering to the precautions that will be recommended as part of home care isolation (e.g., hand hygiene, respiratory hygiene, environmental cleaning, limitations on movement around or from the house) and can address safety concerns (e.g., accidental ingestion of and fire hazards associated with using alcohol-based hand rubs).

A communication link with a healthcare provider or public health personnel, or both, should be established for the duration of the home care period – that is, until the patient's symptoms have completely resolved. More comprehensive information about the mode of COVID-19 infection and transmission is required to define the duration of home isolation precautions.

Patients and household members should be educated about personal hygiene, basic IPC measures and how to care for the member of the family suspected of having COVID-19 disease as safely as possible to prevent the infection from spreading to household contacts. The patient and the family should be provided with ongoing support and education, and monitoring should continue for the duration of home care. Patients and families should adhere to the following recommendations.

- Place the patient in a well-ventilated single room (i.e., with open windows and an open door).
- Limit the movement of the patient in the house and minimize shared space. Ensure that shared spaces

[1] Mild symptoms include low-grade fever; cough; malaise; rhinorrhoea; or sore throat without any warning signs, such as shortness of breath or difficulty in breathing; increased respiratory difficulty, such as sputum or haemoptysis; gastrointestinal symptoms, such as nausea, vomiting, and/or diarrhoea; and without changes in mental status, such as confusion or lethargy.

[2] A sample checklist for assessing environmental conditions in the home is available in the Annex C of reference 2.

(e.g., kitchen, bathroom) are well ventilated (e.g., keep windows open).

- Household members should stay in a different room or, if that is not possible, maintain a distance of at least 1 m from the ill person (e.g., sleep in a separate bed).[3]
- Limit the number of caregivers. Ideally, assign one person who is in a good health and has no underlying chronic or immunocompromising conditions (*3*). Visitors should not be allowed until the patient has completely recovered and has no signs and symptoms.
- Perform hand hygiene after any type of contact with patients or their immediate environment (*4*). Hand hygiene should also be performed before and after preparing food, before eating, after using the toilet and whenever hands look dirty. If hands are not visibly dirty, an alcohol-based hand rub can be used. For visibly dirty hands, use soap and water.
- When washing hands with soap and water, it is preferable to use disposable paper towels to dry hands. If these are not available, use clean cloth towels and replace them when they become wet.
- To contain respiratory secretions, a medical mask[4] should be provided to the patient and worn as much as possible. Individuals who cannot tolerate a medical mask should use rigorous respiratory hygiene – that is, the mouth and nose should be covered with a disposable paper tissue when coughing or sneezing. Materials used to cover the mouth and nose should be discarded or cleaned appropriately after use (e.g., wash handkerchiefs using regular soap or detergent and water).
- Caregivers should wear a tightly fitted medical mask that covers their mouth and nose when in the same room as the patient. Masks should not be touched or handled during use. If the mask gets wet or dirty from secretions, it must be replaced immediately with a new clean, dry mask. Remove the mask using the appropriate technique – that is, do not touch the front, but instead untie it. Discard the mask immediately after use and perform hand hygiene.
- Avoid direct contact with body fluids, particularly oral or respiratory secretions, and stool. Use disposable gloves and a mask when providing oral or respiratory care and when handling stool, urine and other waste. Perform hand hygiene before and after removing gloves and the mask.
- Do not reuse masks or gloves.
- Use dedicated linen and eating utensils for the patient; these items should be cleaned with soap and water after use and may be re-used instead of being discarded.
- Clean and disinfect daily surfaces that are frequently touched in the room where the patient is being cared for, such as bedside tables, bedframes and other bedroom furniture. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite (i.e., equivalent to 5000 pm or 1 part bleach[5] to 9 parts water) should be applied.
- Clean and disinfect bathroom and toilet surfaces at least once daily. Regular household soap or detergent should be used first for cleaning, and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite should be applied.[5]
- Clean the patient's clothes, bed linen, and bath and hand towels using regular laundry soap and water or machine wash at 60–90 °C with common household detergent, and dry thoroughly. Place contaminated linen into a laundry bag. Do not shake soiled laundry and avoid contaminated materials coming into contact with skin and clothes.
- Gloves and protective clothing (e.g., plastic aprons) should be used when cleaning surfaces or handling clothing or linen soiled with body fluids. Depending on the context, either utility or single-use gloves can be used. After use, utility gloves should be cleaned with soap and water and decontaminated with 0.5% sodium hypochlorite solution. Single-use gloves (e.g., nitrile or latex) should be discarded after each use. Perform hand hygiene before and after removing gloves.
- Gloves, masks and other waste generated during at-home patient care should be placed into a waste bin with a lid in the patient's room before being disposed of as infectious waste.[6]
- Avoid other types of exposure to contaminated items from the patient's immediate environment (e.g., do not share toothbrushes, cigarettes, eating utensils, dishes, drinks, towels, washcloths or bed linen).
- When HCWs provide home care, they should perform a risk assessment to select the appropriate personal protective equipment and follow the recommendations for droplet and contact precautions.

Management of contacts

Persons (including caregivers and HCWs) who have been exposed to individuals with suspected COVID-19disease are considered contacts and should be advised to monitor their health for 14 days from the last possible day of contact.

A contact is a person who has had any of the following exposures:

- a healthcare-associated exposure, including providing direct care for patients with COVID-19 disease, working with HCWs infected with the virus that causes COVID-19 disease, visiting patients or staying in the same environment as a patient with COVID-19 disease;
- an exposure through working together in close proximity to or sharing the same classroom with a patient with COVID-19 disease;
- an exposure through traveling with a patient who has COVID-19 disease in any kind of vehicle;
- an exposure through living in the same household as a patient with COVID-19 disease within 14 days after the onset of symptoms in the patient (*5*).

[3] An exception may be made for breastfeeding mothers. Considering the benefits of breastfeeding and the insignificant role of breast milk in the transmission of other respiratory viruses, a mother could can continue breastfeeding. The mother should wear a medical mask when she is near her baby and perform hand hygiene before and after having close contact with the baby. She will also need to follow the other hygiene measures described in this document.

[4] Medical masks are surgical or procedure masks that are flat or pleated (some are shaped like a cup); they are held in place by strings that tie around the back of the head.

[5] Most household bleach solutions contain 5% sodium hypochlorite. Recommendations on how to calculate the dilution from a given concentration of bleach can be found at https://www.cdc.gov/hai/pdfs/resource-limited/environmental-cleaning-508.pdf.

[6] The local sanitary authority should adopt measures to ensure that the waste is disposed of at a sanitary landfill and not at an unmonitored open dump.

A way for caregivers to communicate with a healthcare provider should be established for the duration of the observation period. Also, healthcare personnel should review the health of contacts regularly by phone but, ideally and if feasible, through daily in-person visits, so specific diagnostic tests can be performed as necessary.

The healthcare provider should give instructions to contacts in advance about when and where to seek care if they become ill, what is the most appropriate mode of transportation to use, when and where to enter the designated healthcare facility, and which IPC precautions should be followed.

If a contact develops symptoms, the following steps should be taken.

- Notify the receiving medical facility that a symptomatic contact will be arriving.
- While traveling to seek care, the person who is ill should wear a medical mask.
- The contact should avoid taking public transportation to the facility if possible; an ambulance can be called, or the ill contact can be transported in a private vehicle with all of the windows open, if possible.
- The symptomatic contact should be advised to always perform respiratory hygiene and hand hygiene and to stand or sit as far away from others as possible (at least 1 m) when in transit and when in the healthcare facility.
- Any surfaces that become soiled with respiratory secretions or other body fluids during transport should be cleaned with soap or detergent and then disinfected with a regular household product containing a 0.5% diluted bleach solution.

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