

**Hospital Infection Control Committee**  
**AIIMS, New Delhi**

**Infection Prevention & Control Guidelines for**  
**2019-nCoV (COVID-19)**



## Introduction

Coronaviruses (CoV) belong to a family of viruses that cause illness ranging from the common cold to more severe diseases. A novel coronavirus (2019-nCoV) is a new strain that has not been previously identified in humans. The infection is spread through respiratory route i.e. respiratory droplets and direct human contact. Healthcare personnel (HCP) are at risk of infection through respiratory routes and direct contact with infectious patients.

In view the current situation regarding COVID -19 disease in India, we need to be prepared for the handling of suspect and confirmed cases, who might present to the AIIMS hospital.

These guidelines are supplementary to the existing Hospital Infection control Manual of AIIMS. The guidelines have been adapted from the existing WHO & CDC recommendations.

**Standard recommendations to prevent infection spread include standard precautions, contact precautions and respiratory precautions.**

Patients suspected of having 2019-nCoV infection should be shifted to the isolation facility from the triage area as soon as possible. The HCP should do this after donning appropriate PPE. The patient should wear mask/respirator.

### **Standard precautions**

Health-care workers caring for PUI (Patient under investigation) patients should implement standard infection control precautions. **These include basic hand hygiene, use of personal protective equipment, respiratory etiquettes, and environmental disinfection.**

### **Patient placement**

The PUI has to be admitted in an isolation room with negative pressure and at least 6 air changes per hour.

- Only essential personnel should enter the room. Implement staffing policies to minimize the number of HCP who enter the room.
- Facilities should keep a log of all persons who care for or enter the rooms or care area of these patients.
- Use dedicated or disposable noncritical patient-care equipment (e.g., blood pressure cuffs). If equipment will be used for more than one patient, clean and disinfect such equipment before use on another patient according to manufacturer's instructions.
- HCP entering the room soon after a patient vacates the room should use respiratory protection.

## **Advice on the usage of PPE in the context of COVID-19**

The following are recommendations for the rational use of personal protective equipment (PPE) at health care facilities. PPE includes gloves, medical masks, goggles or a face shield, and gowns, as well as for specific procedures, respirators (i.e., N95) and aprons. It is intended for HCPs, infection prevention and control (IPC) professionals and health care managers.

### **General Advice**

**Hand hygiene remains one of the most important measures** for all persons for the prevention and control of majority of the respiratory viral infections -, including 2019-nCoV infections or COVID-19. This can be performed with soap and water or alcohol-based hand rubs. Wearing a medical mask is one of the prevention measures to limit spread of certain respiratory diseases, including 2019-nCoV, is useful when worn by the persons suffering from the disease or contacts of the patients. These measures must be combined with other IPC measures to prevent the human-to-human transmission of COVID-19, depending on the specific situation.

### **Community setting (Applicable to all staff)**

#### ***Individuals without respiratory symptoms should:***

- i. avoid agglomerations and frequency of closed crowded spaces;
- ii. maintain distance of at least 1 meter from any individual with 2019-nCoV respiratory symptoms (e.g., coughing, sneezing);
- iii. perform hand hygiene frequently, using alcohol-based hand rub if hands are not visibly soiled or soap and water when hands are visibly soiled;
- iv. if coughing or sneezing, cover nose and mouth with flexed elbow or paper tissue, dispose-off tissue immediately after use and perform hand hygiene;
- v. refrain from touching mouth and nose;
- vi. a medical mask is not required, as no evidence is available on its usefulness to protect non-sick persons. However, masks might be worn according to local cultural habits. If masks are used, best practices should be followed on how to wear, remove, and dispose of them and on hand hygiene action after removal (see below advice regarding appropriate mask management).

#### ***Individuals with respiratory symptoms should:***

- i. wear a medical mask and seek medical care if experiencing fever, cough and difficulty breathing, as soon as possible or in accordance with to local protocols;
- ii. follow the below advice regarding appropriate mask management.

## **Health Care Facilities**

### ***Individuals with respiratory symptoms should:***

- i. wear a medical mask while waiting in triage or waiting areas or during transportation within the facility;
- ii. wear a medical mask when staying in cohorting areas dedicated to suspected or confirmed cases;
- iii. do not wear a medical mask when isolated in single rooms but cover mouth and nose when coughing or sneezing with disposable paper tissues. Dispose them appropriately and perform hand hygiene immediately afterwards.

### ***Health care workers should:***

- a. wear a medical mask when entering a room where patients suspected or confirmed of being infected with 2019-nCoV are admitted and in any situation of care provided to a suspected or confirmed case;
- b. 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, when performing aerosol-generating procedures such as:
  - tracheal intubation
  - non-invasive ventilation
  - tracheotomy
  - cardiopulmonary resuscitation
  - manual ventilation before intubation and
  - bronchoscopy

## **Masks management**

If medical masks are worn, appropriate use and disposal is essential to ensure they are effective and to avoid any increase in risk of transmission associated with the incorrect use and disposal of masks.

The following information on correct use of medical masks derives from the practices in health-care settings:

- a. place mask carefully to cover mouth and nose and tie securely to minimise any gaps between the face and the mask;
- b. while in use, avoid touching the mask;
- c. remove the mask by using appropriate technique (i.e. do not touch the front but remove the lace from behind);
- d. after removal or whenever you inadvertently touch a used mask, clean hands by using an alcohol-based hand rub or soap and water if visibly soiled
- e. replace masks with a new clean, dry mask as soon as they become damp/humid;
- f. do not re-use single-use masks;
- g. discard single-use masks after each use and dispose-off them immediately upon removal.

## Rational use of personal protective equipment

PPE use is based on the risk of exposure (e.g., type of activity) and the transmission dynamics of the pathogen (e.g., contact, droplet or aerosol). Observing the following recommendations will ensure rational use of PPE.

1. The type of PPE used when caring for COVID-19 patients will vary according to the setting and type of personnel and activity (Below Table).
2. Healthcare workers involved in the direct care of patients should use the following PPE:
  - a. gowns,
  - b. gloves,
  - c. medical mask and
  - d. eye protection (goggles or face shield).
3. 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 (N95), eye protection, gloves and gowns; aprons should also be used if gowns are not fluid resistant.
4. 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. 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.
5. Among the general public, persons with respiratory symptoms or those caring for COVID-19 patients at home should receive medical masks.
6. For asymptomatic individuals, wearing a mask of any type is not recommended.
7. **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.**

**Table: Guidance for use of PPE in different settings**

Setting	Target personnel or patients	Activity	Type of PPE or procedure
<b>Healthcare facilities</b>			
<b>Inpatient facilities</b>			
<b>Patient room</b>	Healthcare personnel	Providing direct care to COVID-19 patients.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Gloves</li> <li>• Eye protection (goggles or face shield).</li> </ul>
		Aerosol-generating procedures performed on COVID-19	<ul style="list-style-type: none"> <li>• Respirator N95 or FFP2 standard, or equivalent.</li> <li>• Gown</li> </ul>

Setting	Target personnel or patients	Activity	Type of PPE or procedure
		patients.	<ul style="list-style-type: none"> <li>• Gloves</li> <li>• Eye protection</li> <li>• Apron</li> </ul>
	Cleaners	Entering the room of COVID-19 patients.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Heavy duty gloves</li> <li>• Eye protection (if risk of splash from organic material or chemicals).</li> <li>• Boots or closed work shoes</li> </ul>
	Visitors	Entering the room of a COVID-19 patient	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Gloves</li> </ul>
<b>Other areas of patient transit (e.g., wards, corridors).</b>	All staff, including healthcare workers.	Any activity that does not involve contact with COVID-19 patients.	<ul style="list-style-type: none"> <li>• No PPE required</li> </ul>
<b>Triage</b>	Healthcare personnel	Preliminary screening not involving direct contact (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.)	<ul style="list-style-type: none"> <li>• Maintain spatial distance of at least 1 m.</li> <li>• Medical Mask</li> </ul>
	Patients with respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• Maintain spatial distance of at least 1 m.</li> <li>• Provide medical mask if tolerated by patient.</li> </ul>
	Patients without respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• No PPE required</li> </ul>
Laboratory	Lab technician	Manipulation of respiratory samples.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Gloves</li> </ul>

Setting	Target personnel or patients	Activity	Type of PPE or procedure
			<ul style="list-style-type: none"> <li>• Eye protection (if risk of splash)</li> </ul>
Administrative areas	All staff, including healthcare workers.	Administrative tasks that do not involve contact with COVID-19 patients.	<ul style="list-style-type: none"> <li>• No PPE required</li> </ul>
<b>Outpatient facilities</b>			
Consultation room	Healthcare personnel	Physical examination of patient <b>with</b> respiratory symptoms.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Gloves</li> <li>• Eye protection</li> </ul>
	Healthcare personnel	Physical examination of patients <b>without</b> respiratory symptoms.	<ul style="list-style-type: none"> <li>• PPE according to standard precautions and risk assessment.</li> </ul>
	Patients with respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• Provide medical mask.</li> </ul>
	Patients without respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• No PPE required</li> </ul>
	Cleaners	After and between consultations with patients with respiratory symptoms.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Heavy duty gloves</li> <li>• Eye protection (if risk of splash from organic material or chemicals).</li> <li>• Boots or closed work shoes</li> </ul>
Waiting room	Patients with respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• Provide medical mask.</li> <li>• Immediately move the patient to an isolation room or separate area away from mothers; if this is not feasible,</li> <li>• ensure spatial distance of at least 1 m from other patients.</li> </ul>
	Patients without respiratory symptoms.	Any	<ul style="list-style-type: none"> <li>• No PPE required</li> </ul>

Setting	Target personnel or patients	Activity	Type of PPE or procedure
Administrative areas	All staff, including healthcare workers.	Administrative tasks	<ul style="list-style-type: none"> <li>No PPE required</li> </ul>

### Transport teams

Ambulance or transfer vehicle	Healthcare personnel	Transporting suspected COVID-19 patients to the referral healthcare facility.	<ul style="list-style-type: none"> <li>Medical mask</li> <li>Gowns</li> <li>Gloves</li> <li>Eye protection</li> </ul>
	Driver	Involved only in driving the patient with suspected COVID-19 disease and the driver's compartment is separated from the COVID-19 patient.	<ul style="list-style-type: none"> <li>Maintain spatial distance of at least 1 m.</li> <li>No PPE required</li> </ul>
		Assisting with loading or unloading patient with suspected COVID-19 disease.	<ul style="list-style-type: none"> <li>Medical mask</li> <li>Gowns</li> <li>Gloves</li> <li>Eye protection</li> </ul>
		No direct contact with patient with suspected COVID-19, but no separation between drivers' and patients' compartments.	<ul style="list-style-type: none"> <li>Medical mask</li> </ul>
	Patient with suspected COVID-19 disease.	Transport to the referral healthcare facility.	<ul style="list-style-type: none"> <li>Medical mask if tolerated</li> </ul>



	Cleaners	Cleaning after and between transport of patients with suspected COVID-19 disease to the referral healthcare facility.	<ul style="list-style-type: none"> <li>• Medical mask</li> <li>• Gown</li> <li>• Heavy duty gloves</li> <li>• Eye protection (if risk of splash from organic material or chemicals).</li> <li>• Boots or closed work shoes</li> </ul>
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### **Decontamination and Waste Management**

- 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.
- Any surface or material known to be, or potentially be, contaminated by biological agents during laboratory operations must be correctly disinfected to control infectious risks.
- Proper processes for the identification and segregation of contaminated materials must be adopted before decontamination and/or disposal.
- Where decontamination cannot be performed in the laboratory area or onsite, the contaminated waste must be packaged in an approved (that is, leakproof) manner, for transfer to another facility with decontamination capacity.

### **Donning (putting on) PPE:**

These requirements apply to all staff entering the room of a corona virus infected patient. The following PPE is required to be donned prior to entry into the patient room. Donning in the following order is recommended.

#### **1. Gown**

A clean, nonsterile, disposable, isolation gown must be worn. Ensure that gown is tied in back and provides full coverage.

#### **2. N-95 respirator**

- a. All staff must wear approved respiratory protection (N-95 respirator).
- b. Before using an N-95 respirator, staff must be medically cleared and trained in how to wear/use each device.
- c. For N-95 respirators, staff must have been fit-tested within the past year to ensure proper size and fit.
- d. A “fit-check” (also known as a “seal check”) should be performed before each N-95 respirator use.
- e. The N-95 respirator must be discarded after each use.

### 3. Goggles/Face shield

All staff must wear goggles or face shield to protect mucous membranes from exposure due to splash or potential for hand contamination of eyes, nose or mouth.

### 4. Gloves

All staff must wear clean, nonsterile gloves. Gloves must be pulled over the sleeves/cuffs of gown.

## Removal

### **For Airborne Infection Isolation (AII) room with anteroom:**

**Remove all PPE in anteroom.** Make sure the door from the anteroom into the patient room is closed and negative airflow into patient room has been confirmed.

### **For AII room without anteroom**

Except for respiratory protection, remove and discard PPE (gloves, gown, face shield or goggles) just inside doorway before exiting to hall. **Remove respiratory protection (N-95) after leaving the patient room and closing door.**

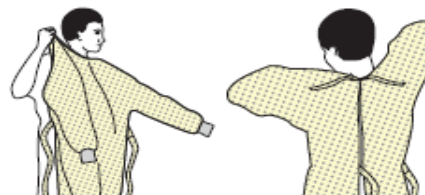
**3. Doffing sequence if N-95 respirator is worn - See Doffing Checklist- N-95 Respirator** (for removal sequence. Avoid touching face.

## SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

### 1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



### 2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



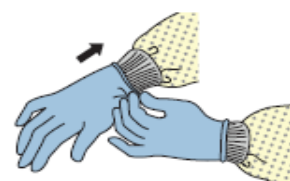
### 3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



### 4. GLOVES

- Extend to cover wrist of isolation gown



## USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



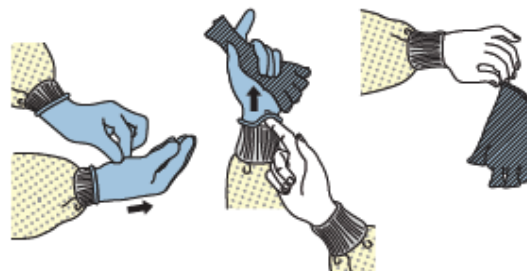
Figure 1: Sequence for Putting on PPE

## HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door.** Remove PPE in the following sequence:

### 1. GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
- Discard gloves in a waste container



### 2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield are contaminated!
- If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Remove goggles or face shield from the back by lifting head band or ear pieces
- If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container



### 3. GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard in a waste container

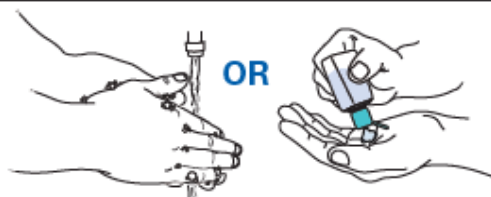


### 4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated — **DO NOT TOUCH!**
- If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
- Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
- Discard in a waste container



### 5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE



**PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS  
BECOME CONTAMINATED AND IMMEDIATELY AFTER  
REMOVING ALL PPE**



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Figure 2: Example for Removal of PPE

## **Practices for Environmental Cleaning in Healthcare Facilities**

Environmental cleaning is part of Standard Precautions, which should be applied to all patients in all healthcare facilities

Ensure that cleaning and disinfection procedures are followed consistently and correctly. Cleaning environmental surfaces with water and detergent and applying commonly used hospital disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure.

(Reference: Health Organization. (2019). Infection Prevention and Control during Health Care when Novel Coronavirus (nCoV) Infection is Suspected. WHO/2019-nCoV/IPC/v2020.1)

### **Cleaning agents and disinfectants**

1. 1% Sodium Hypochlorite can be used as a disinfectant for cleaning and disinfection
2. The solution should be prepared fresh.
3. Leaving the solution for a contact time of at least 10 minutes is recommended.
4. Alcohol (e.g. isopropyl 70% or ethyl alcohol 70%) can be used to wipe down surfaces where the use of bleach is not suitable, e.g. metals.
- 5.

### **Personal Protective Equipment (PPE) to wear while carrying out cleaning and disinfection works**

1. Wear heavy duty/disposable gloves, disposable long-sleeved gowns, eye goggles or a face shield, and a medical mask (please see the PPE document for details)
2. Avoid touching the nose and mouth (goggles may help as they will prevent hands from touching eyes)
3. Disposable gloves should be removed and discarded if they become soiled or damaged, and a new pair worn
4. All other disposable PPE should be removed and discarded after cleaning activities are completed. Eye goggles, if used, should be disinfected after each use, according to the manufacturer's instructions.
5. Hands should be washed with soap and water/alcohol-based hand rub immediately after each piece of PPE is removed, following completion of cleaning.

### **Cleaning guidelines**

1. Where possible, seal off areas where the confirmed case has visited, before carrying out cleaning and disinfection of the contaminated environmental surfaces. This is to prevent unsuspecting persons from being exposed to those surfaces
2. When cleaning areas where a confirmed case has been, cleaning staff should be attired in suitable PPE. Disposable gloves should be removed and discarded if they become soiled or damaged, and a new pair worn. All other disposable PPE should be removed and discarded, after cleaning activities are completed. Goggles, if used, should be disinfected

after each use, according to manufacturer's instructions. Hands should be washed with soap and water immediately after the PPE is removed.

3. Mop floor with routinely available disinfectant.
4. Wipe all frequently touched areas (e.g. lift buttons, hand rails, doorknobs, arm rests, tables, air/ light controls, keyboards, switches, etc.) and toilet surfaces with chemical disinfectants and allow to air dry. 1% sodium hypochlorite solution can be used. Alcohol can be used for surfaces, where the use of bleach is not suitable.
5. Clean toilets, including the toilet bowl and accessible surfaces in the toilet with disinfectant or 1% sodium hypochlorite solution.
6. Wipe down all accessible surfaces of walls as well as blinds with disinfectant or bleach solution.
7. Remove curtains/ fabrics/ quilts for washing, preferably using the hot water cycle. For hot-water laundry cycles, wash with detergent or disinfectant in water at 70°C for at least 25 minutes.
8. Discard cleaning items made of cloth and absorbent materials, e.g. mop head and wiping cloths, into biohazard bags after cleaning and disinfecting each area. Wear a new pair of gloves and fasten the double-bagged biohazard bag with a cable tie.
9. Disinfect buckets by soaking in disinfectant or bleach solution, or rinse in hot water before filling.
10. Disinfectant or 1% sodium hypochlorite solution should be applied to surfaces using a damp cloth. **They should not be applied to surfaces using a spray pack, as coverage is uncertain and spraying may promote the production of aerosols.** The creation of aerosols caused by splashing liquid during cleaning should be avoided. A steady sweeping motion should be used when cleaning either floors or horizontal surfaces, to prevent the creation of aerosols or splashing. Cleaning methods that might aerosolize infectious material, such as the use of compressed air, must not be used.
11. Biohazard bags should be properly disposed-off, upon completion of the disinfection work.

### Frequency of cleaning of surfaces:

1. **High touch surfaces:** Disinfection of high touch surfaces like (doorknobs, telephone, call bells, bedrails, stair rails, light switches, wall areas around the toilet) should be done every 3-4 hours.
2. **Low-touch surfaces:** For Low-touch surfaces (walls, mirrors, etc.) mopping should be done at least once daily.

(Reference: Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. CDC. November, 2019)

**Precautions to take after completing the clean-up and disinfection**

1. Staff should wash their hands with soap and water immediately after removing the PPE, and when cleaning and disinfection work is completed.
2. Discard all used PPE in a double-bagged biohazard bag, which should then be securely sealed and labelled.
3. The staff should be aware of the symptoms, and should report to their occupational health service if they develop symptoms.

References- <https://www.cdc.gov/coronavirus/2019-ncov/index.html>  
[www.who.int/coronaviruse/20200126-ncov-ipc-during-health-care](http://www.who.int/coronaviruse/20200126-ncov-ipc-during-health-care)