

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

Interim guidance

27 February 2020



Coronavirus disease (COVID-19), caused by COVID-19 virus, was first detected in Wuhan city, 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 recommendations for the rational use of personal protective equipment (PPE), which includes gloves, medical masks, goggles/face shield, gowns, as well as respirators (e.g. N95 or FFP2) and aprons for specific procedures, in health care and community settings, including the handling of cargo. This document is intended for those involved in the distribution and management of PPE, as well as public health authorities and individuals in health care and community settings to understand when PPE use is most appropriate.

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

## Preventive measures for COVID-19

Based on currently available evidence, the COVID-19 virus is transmitted between people through close contact and droplets; not airborne transmission. 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 health care and community settings. The most effective preventive measures in the community include:

- Perform hand hygiene frequently with alcohol-based hand rub if your hands are not visibly dirty or with soap and water if hands are dirty;
- Avoid touching your eyes, nose and mouth;
- Practicing respiratory hygiene by coughing or sneezing into a flexed elbow or tissue, immediately disposing of tissue,
- Wearing a medical mask if you have respiratory symptoms, followed by performing hand hygiene after disposal of mask;
- Maintaining social distance (minimum of 1 meter) from individuals with respiratory symptoms.

Additional precautions are required by health care workers to protect themselves and prevent health care transmission. Precautions to be implemented by health care workers taking care of COVID-19 patients include the appropriate use of PPE; this implies the proper selection of PPE to be used, and training on how to put on, remove and dispose of PPE.

PPE is only one effective measure within a package that comprises of administrative and environmental/engineering controls as described in the WHO Infection Prevention and Control (IPC) for epidemic and pandemic-prone acute respiratory infections ([Infection prevention and control during epidemic- and pandemic-prone respiratory infection in healthcare](#))

1. **Administrative controls:** ensure availability of resources for IPC, including infrastructure, clear IPC policies, facilitated access to laboratory testing, appropriate triage and placement of the patients, and adequate staff-to-patient ratios and training.
2. **Environmental and engineering controls:** these measures aim at reducing the spread of the pathogens and to reduce the contamination of surface and inanimate objects. This includes the provision of adequate space to allow social distance (at least 1 meter) between patients and between patients and health care workers, and availability of well-ventilated isolation rooms for suspect or confirmed COVID-19 patients.

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

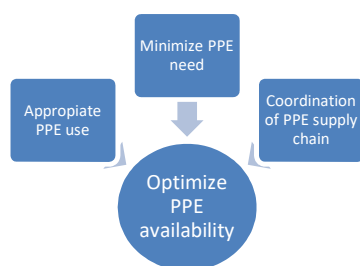
## Disruptions in the global supply chain of PPE

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

## Recommendations for optimizing PPE availability.

In view of the global PPE shortage, the following strategies can facilitate optimal PPE availability.

Figure 1: Strategies to optimize PPE availability



### 1) Minimize the need for PPE

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

- Consider telemedicine<sup>1</sup> to evaluate suspect cases of COVID-19, minimizing the need for these individuals to come to health care facilities for evaluation;
- Implement physical barriers to reduce exposure to COVID-19 virus such as glass/plastic windows. This approach can be implemented in areas of the health care setting where patients will first present such as triage areas, registration desk at emergency departments, or pharmacy window for collection of medication;
- Limit number of healthcare workers entering the room of COVID-19 patients if not involved in direct care. Consider bundle activities to minimize room entry (e.g. check vital signs during medication administration or food delivery by health care workers performing other care) and plan ahead what activities will be performed at the bed side to avoid multiple entry and exits to patient's room;

Ideally, do not allow visitors or, if not possible, restrict number of visitors where COVID-19 patients are being isolated, restrict the amount of time visitors are allowed, and provide clear instructions on how to put on and remove the PPE to avoid self-contamination

<https://www.who.int/csr/resources/publications/putontakeoffPPE/en/>

### 2) Ensure rational/appropriate PPE use

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

- The type of PPE for COVID-19 will vary according to setting, personnel and activity type (see Table 1);
- Health care 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

etc.). respirators, eye protection, gloves, gowns and aprons, (if gowns are not fluid resistant), should be used. See [Infection prevention and control during epidemic- and pandemic-prone respiratory infection in healthcare](#)

- Extended use of respirators (e.g. N95, FFP2 or equivalent) has previously been implemented in public health emergencies of acute respiratory illness during PPE supply shortages.<sup>2</sup> This involves wearing the same respirator for multiple patients with the same diagnosis without removing it, and current evidence indicates that respirators keep their protection when used for extended hours. However, extended use over four (4) hours can lead to discomfort and should be avoided;<sup>3-5</sup>
- For the general public, persons with respiratory symptoms or those caring for COVID-19 patients at home should receive medical masks. See [Home care \(nCoV\) infection presenting with mild symptoms and management of contacts](#)
- For asymptomatic individuals, wearing a mask, of any type, is not recommended. The wearing of medical masks when not indicated may cause unnecessary cost, procurement burden and create a false sense of security that can lead to neglecting other essential preventive measures. See [Advice on the Use of Masks](#).

### 3) Coordination of PPE supply chain management mechanism.

Management of PPE should be coordinated through essential national and international supply chain management mechanisms including but not restricted to:

- PPE forecasts based on rational quantification models to ensure rationality of requested supplies;
- Monitoring and control PPE request from countries and large-responders;
- Promotion of a centralized request management approach to avoid duplication of stock with strict adherence to essential stock management rules to limit wastage, over stock and stock ruptures;
- Monitoring of end to end distribution;
- Monitoring and control of consumption in medical facilities storage.

### Handling of cargo from affected countries

Further recommendations for the rational use and distribution of PPE in the context of the handling cargo from and to COVID-19 affected countries include:

- Wearing a mask – of any type – is not recommended for the handling of cargo from an affected country;
- Gloves are not required unless they are for protection against mechanical hazards such as 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;

- For the disinfection of 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 COVID-19 affected countries

have been the source of COVID-19 in humans. WHO will continue to closely monitor the evolution of COVID-19, and will update the recommendations as needed.

Table 1: Recommended type of Personal Protective Equipment (PPE) in the context of COVID-19, according to the type of setting, target personnel and type of activity\*.

Type of setting	Target personnel in setting	Type of activity	Type of PPE
<b>Healthcare facilities</b>			
<b>Inpatient facilities</b>			
Patient room	Health care workers	Direct care of COVID-19 patient(s)	Medical mask Gown Gloves Eye protection (goggles or face shield)
		Aerosol generating procedures (AGP) on COVID-19 patient(s)	Respirator N95 or FFP2 Gown Gloves Eye protection Apron
	Cleaners	Entering room of COVID-19 patient(s)	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash of organic material or chemicals) Boots or closed work shoes
	Visitors**	Entering the COVID-19 patient room	Medical Mask Gown Gloves
Other areas of patient transit (wards, corridors)	All staff, including health care workers	Any, <u>not involving</u> contact with COVID-19 patient(s)	No PPE required
Triage	Health care workers	Preliminary screening not involving direct contact <sup>§</sup>	Spatial distance of at least 1 meter. No PPE required
	Patients with respiratory symptoms	Any	Spatial distance of at least 1 meter. Medical mask if tolerated
	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 health care workers	Administrative tasks without contact with COVID-19 patient(s)	No PPE required

<b>Outpatient facilities</b>			
Consultation room	Health care workers	Physical examination of patient with respiratory symptoms	Medical mask Gown Gloves Eye protection
	Health care workers	Physical examination of patients without respiratory symptoms	PPE according to standard precautions and risk assessment
	Patients with respiratory symptoms	Any type	Medical mask if tolerated
	Patients without respiratory symptoms	Any	No PPE required
	Cleaners	After/between consultations with patient with respiratory symptoms	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash of organic material or chemicals) Boots or closed work shoes
Waiting room	Patients with respiratory symptoms	Any	Medical mask <i>Immediate placement of person in an isolation room or separate area away from others. If not feasible, spatial distance of at least 1 meter from other patients</i>
	Patients without respiratory symptoms	Any	No PPE required
Administrative areas	All staff, including health care workers	Administrative tasks	No PPE required
Triage	Health care workers	Preliminary screening not involving direct contact <sup>§</sup>	Spatial distance of at least 1 meter No PPE required
	Patients with respiratory symptoms	Any	Spatial distance of at least 1 meter Medical mask if tolerated
	Patients without respiratory symptoms	Any	No PPE required
<b>Community</b>			
Home	Patients with respiratory symptoms	Any (except when sleeping)	Spatial distance of at least 1 meter Medical mask if tolerated
	Caregiver	When entering the patient room, but not providing direct care assistance	Medical mask
	Caregiver	When providing direct care or when handling stool, urine or waste from COVID-19 patient in home case.	Gloves Medical mask Apron (if risk of splash)
	Health care workers	Direct home care assistance of COVID-19 patient	Medical mask Gown Gloves Eye protection
Public areas (schools, shopping mall, train station, etc.)	Individuals without respiratory symptoms	Any	No PPE required

Points of Entry			
Administrative areas	All staff	Any type	No PPE required
Screening area	Staff	First screening (temperature measurement) not involving direct contact <sup>§</sup>	Spatial distance of at least 1 meter No PPE required
	Staff	Second screening (interviewing passengers with fever for clinical symptoms suggestive of COVID-19 and travel history)	Medical mask Gloves
	Cleaners	When cleaning the area where passengers with fever are being screened	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash of organic material or chemicals) Boots or closed work shoes
Temporary isolation area	Staff	When entering isolation area, but not providing direct assistance	Spatial distance of at least 1 meter Medical mask Gloves
	Staff/Health care workers	Providing assistance to the passenger for transportation to a healthcare facility	Medical mask Gown Gloves Eye protection
	Cleaners	When cleaning isolation area	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash of organic material or chemicals) Boots or closed work shoes
Ambulance/transfer vehicle	Health care workers	Transport of suspected COVID-19 patients to the referral health care facility	Medical mask Gowns Gloves Eye protection
	Driver	Only involved in driving suspected COVID-19 patient and driver's compartment is separated from suspected COVID-19 patient	Spatial distance of at least 1 meter No PPE required
		Assisting with loading of suspected COVID-19 patient	Medical mask Gowns Gloves Eye protection
		No direct contact with suspected COVID-19 patient, but no separation between driver's and suspected patient's compartments	Medical mask
	Suspected COVID-19 patient	Transport to the referral health care facility	Medical mask if tolerated
	Cleaners	After/between transport of suspected COVID-19 patients to the referral healthcare facility	Medical mask Gown Heavy duty gloves Eye protection (if risk of splash of organic material or chemicals) Boots or closed work shoes

Special consideration for Rapid Response Teams (RRT) assisting with public health investigations <sup>a</sup>			
Community			
	RRT Investigators	Interview of suspected or confirmed COVID-19 patients or their contacts	No PPE if done remotely (e.g. telephone or video conference). <i>This should be the preferred method.</i>
		In-person interview of suspected or confirmed COVID-19 patients with no direct contact	Medical mask Spatial distance of at least 1 meter <i>Interview should be performed outside of household or outdoors and COVID-19 patients should also be wearing a medical mask as described above.</i>
		In-person interview with asymptomatic contacts of COVID-19 patients	Spatial distance of at least 1 meter No PPE required <i>Interview should be performed outside of household or outdoors. If entering household environment, confirm using a thermal scanner that individual does not have fever, keep spatial distance of at least 1 meter and do not touch anything in the household environment.</i>

\* In addition to the appropriate PPE use, frequent hand hygiene and respiratory hygiene should always be performed. PPE should be discarded in an appropriate waste container after each use and hand hygiene should be performed before and after PPE use.

\*\*Visitors should be restricted. If the entry into the room of a COVID-19 case is deemed necessary, the process of putting on and removing PPE and hand hygiene performance by non-trained visitors should be supervised by a health care worker.

§ Includes non-touch thermometers, thermal image cameras, and limited observation/questions with spatial distance of at least 1 meter.

<sup>a</sup> All RRT members must be trained on how to perform hand hygiene and on how to put on and remove PPE without contamination.

For PPE specifications, refer to [Disease Commodity Package COVID-19](#)

## References

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