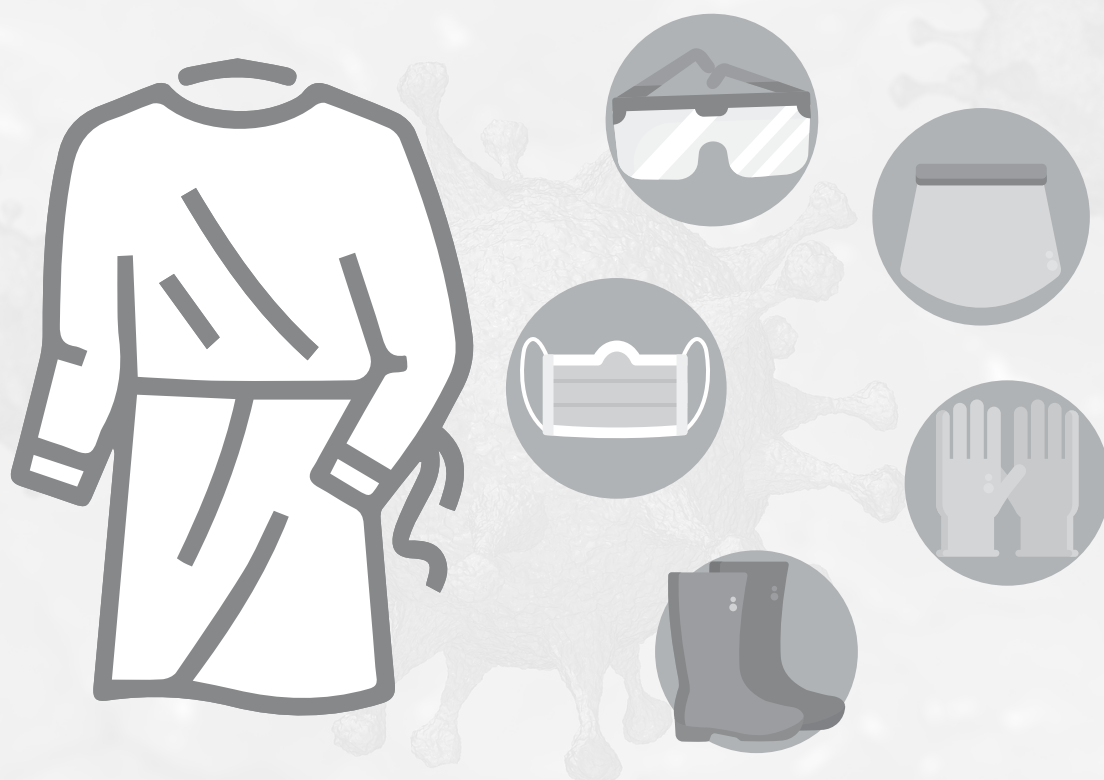


Africa Centres for Disease Control and Prevention

# Strategies for Managing Acute Shortages of PPE during the COVID-19 Pandemic



Recommendations for Personal Protective Equipment (PPE) are detailed in the Africa CDC guidance on the use of personal protective equipment for different clinical settings and activities (1). However, due to the disruptions in the global supply chain of PPE, African settings may face the risk of an acute shortage of PPE.

African health systems should make the prevention of a crisis such as an acute shortage of PPE for health workers a priority. The COVID-19 response team/ IPC team should include planning for PPE shortages and this planning should be done in advance. There should be a plan for effective mitigations and clear triggers for implementation. Standard practice should be resumed as soon possible.

This guidance provides considerations and a series of options that can be used to inform country strategies to minimise risk associated with shortages of personal protective equipment (PPE).

Re-use and reprocessing of single use PPE must be a last-resort temporary measure that is implemented only until stocks are replenished (2). This remains an area of active research and further updates to this evidence base are anticipated.

## Optimise use of PPE

Conserve PPE by rationally using PPE and adopting strategies to ensure it is used appropriately (3). PPE is the most visible control measure to prevent transmission, however administrative and engineering controls can be more effective at protecting both health workers and patients, and must be prioritised. Properly implemented engineering and administrative controls will reduce the amount PPE required.

Healthcare facilities should consider implementing the following measures:

- Adopt screening and triage practices for anyone who enters the health care facility (HCF), including those accompanying the patient, and recording the results.
- Separate suspect or confirmed COVID-19 patients from other patients by placing COVID-19 patients in isolation areas or specialist care facilities.
- Use physical barriers (e.g. glass/plastic screens and curtains) to support physical distancing between patients and between patients and healthcare workers to reduce the risk of exposure.
- Improve natural ventilation in health care settings wherever possible to minimise the build up of virus particles in the air. (9)
- Designate dedicated healthcare workers/teams to COVID-19 patients' care areas so that the PPE can be worn for a session of care<sup>1</sup>.
- Plan care and bundle tasks together to minimise the number of times the room is entered e.g. Use SPACES guidance from British Thoracic Society <https://bit.ly/BTSSPACES> (4)
- Maintain physical distancing, a minimum of 1 meter, 2 meters preferred, and reduce face-to-face contact in staff meetings.
- Gowns, coats or coveralls that are not water-resistant can be protected with a plastic impermeable apron during use and therefore provide a reasonable level of protection for direct patient care.

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**1 A single session refers to a period of time where a healthcare worker is undertaking duties in a specific care setting/ environment**

- N95 respirators should be worn in high-risk areas and in the immediate proximity of aerosol generating procedures (AGP) (5)
- Fabric masks may be encouraged for use by health care workers outside work to preserve the surgical and N95 masks for use by those providing direct patient care.



## Contingency planning for extreme shortages of PPE

- Consider reasonable replacements for medical PPE e.g. laboratory coats, coveralls, other non-surgical gowns, face guards.
- Identify potential alternative sources/suppliers of PPE e.g. local manufacturers, private healthcare organizations, local businesses, other health care facilities in areas of low incidence.
- Engage with alternative suppliers/manufacturers, reprocessing and laundry service providers to establish surge capacity in the event of extreme shortages.



## Eye protection

- This may be either goggles or face shields. Full face shields may protect the front of the mask from contamination and provide some additional benefit.
- Full face shields or goggles should be reusable to minimise the ongoing pressure on the supply chain. A decontamination process should be put in place for these and staff should be trained and supervised in this process.
- If locally manufactured face shields are available, these may be used instead of imported supplies. A face shield should cover the whole of the face, sides and under the chin, and should be comfortable to wear. It should be made of materials that can be decontaminated fully and provide good visibility.



## Gloves

- There is no validated way of decontaminating single use examination gloves, these should continue to be regarded as single use items and discarded after use. The outside of single use gloves should not be gelled/ disinfected during use.
- The need for gloves should be minimised by only using them when indicated. Double gloving is not necessary, but gloves must be changed between patients, and hand hygiene performed after glove removal.
- In situations of extreme shortages, limit glove use to situations where exposure to blood and body fluids is anticipated (as per standard precautions) and perform thorough hand hygiene between patients at each of the '5 moment' (WHO) to prevent transmission of COVID 19 between HWs and patients. Clinical examination or surgical gloves should not be used by staff who are not involved in direct care of patients.
- Cleaning and support staff should use reusable heavy duty gloves which are decontaminated and reused.



## Gowns and Aprons

- Single use fluid repellent gowns provide effective protection to the clothes and body but they are expensive, bulky to transport and create a significant amount of waste requiring treatment.
- Reusable, tight weave cotton surgical style gowns are an alternative as long as an effective decontamination regime is in place. These may be locally manufactured with a locally applied quality check by the procurer.
- Single use plastic aprons, or reusable heavy duty aprons do not cover the arms or all of the body. They may be used when a gown (reusable or single use) is not available, or if minimal patient contact is expected, a protocol for cleaning exposed forearms between patients should be established. For clinical staff who are providing close clinical care to patient, an apron will not fully cover arms or clothing.
- Ensure the laundry has capacity for reprocessing reusable gowns if these are adopted.
- Implement a system that ensures that reusable PPE is segregated for transport to laundry or decontamination and not discarded into the clinical waste stream.



## Medical masks

- Masks are the most critical piece of PPE for HCW protection from droplet transmission. These should be a high priority for external procurement.
- For general care of patients with COVID-19 single use medical masks are appropriate. These are designed to be single use. No safe way for these to be reused or decontaminated has been developed or approved yet.
- A medical masks can be used without removing for up to 6 hours when caring for a cohort of patients. It should be removed and discarded on leaving the clinical area, taking a break or completing a shift. The longer the mask is worn the more likely it will be touched, become wet, soiled or damaged or become difficult to breathe through. If any of this occurs, the mask should be changed.
- If there is limited supply of single use medical masks these should be saved for health care workers in patient care areas, and fabric masks may be considered in the first instance as source control for patients.
- Fabric masks are not recommended for use by health care workers, (unless they comply with the same performance standards as single use medical masks). (1) (3) and should only be considered as a last resort in clinical settings. The limited evidence suggests they should have multiple layers of non-woven fabric and should be changed if they become wet with sweat, or contaminated with body fluids. They should be worn with a face shield to protect the mask surface (6).



## N95 Respirators

- Respirators (i.e. N95) should be available for staff who are working near aerosol generating procedures (1). These are manufactured to precise quality and functional standards, and may become difficult to procure as they are vulnerable to international supply chain disruptions. These are designed to be single use items, only if there are not enough to be used as single use items they may be reprocessed or, as a last resort, reused in accordance with US CDC guidelines (7).
- These measures should be considered as temporary and should be avoided when there are adequate supplies.

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### Decontamination and reprocessing N95 respirators

- Reprocessing single use respirators is not advisable and should only be considered when the supply of new respirators is inadequate. There are issues with the reliability, safety, feasibility and practicality of decontamination systems for reprocessing (whether they are based on UVC, H<sub>2</sub>O<sub>2</sub> or Methylene blue). In addition, the respirator may lose integrity while it is being worn, and damage is unpredictable. If reprocessing is necessary, respirators should remain single-person use and must be returned to the original user. Respirators should be carefully inspected both before and after every decontamination cycle. Systems and training for staff should be put in place as part of a decontamination programme.
- Reusable elastomeric respirators such as industrial half masks with P3 filters may be considered as an alternative to single use N95 in some settings. The higher upfront investment may be offset by reduced need for ongoing resupply. If reusable half masks are employed, a supply chain for filter replacement should be ensured, with a programme for fitting, decontamination and filter replacement put in place to support health workers (8).

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### Reuse of N95 respirators by the same user (last resort)

- Reuse of respirators presents risks of cross transmission of infectious diseases, not only of COVID-19 but of other many respiratory or skin pathogens.
- Reuse of respirators during a shift is not recommended, as it would mean handling contaminated masks or respirators.
- Discard N95 respirators visibly contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.
- The same mask or respirator should only be reused by the same member of staff.
- Masks should be stored in breathable labelled containers between uses.

- Care should be taken not to avoid touching and contaminating the inner surface of the respirator.
- Clean hands with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator.
- The labelled container should be decontaminated or replaced between uses.
- The respirator should be worn with a face shield wherever possible to limit surface contamination of the mask.
- US CDC suggest an alternative option is to issue each healthcare worker a personal supply of N95 respirators. After each use it is stored in a breathable container and marked for re-use after 72 hours has elapsed and the virus could be considered to be no longer viable (7). This should be discontinued as soon as additional supply becomes available.

## Decontamination of Reusable PPE

Users should refer to manufacturers' guidelines whenever available.

Type of PPE	Step 1	Step 2
Face shield or goggles	Clean with detergent and water	Soak in 0.05% Chlorine for 30 mins or wipe with 70% alcohol
Scrubs and gowns	1. Launder at >60degC and detergent	
	2. If not possible to launder >60degC, then launder at <60 degC and detergent and proceed to step 2	Soak in 0.05% chlorine for 20 minutes and rinse with clean water
Aprons	Clean with detergent and water	Soak in 0.05% Chlorine for 30 mins or wipe with 70% alcohol
Heavy duty gloves used by cleaners	Clean with detergent and water	Soak in 0.05% chlorine and rinse with clean water
Reusable half mask respirators with P3 filters	Refer to manufacturers guidelines and local capability to use reprocessing systems	

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