African Union

AFRICA CDC
Centres for Disease Control and Prevention
Safeguarding Africa's Health

Africa Centres for Disease Control and Prevention

Strategies for managing acute shortages of personal protective equipment during COVID-19 pandemic

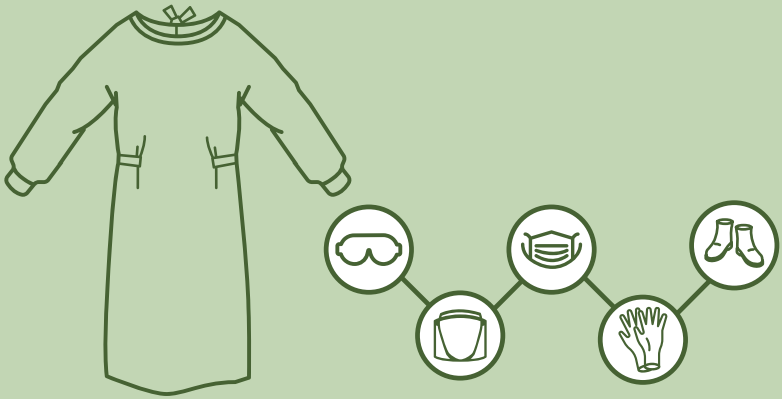
Introduction

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 disruptions in the global supply chain, some African countries may face the risk of an acute shortage of PPE.

Preventing a crisis such as acute shortage of PPE for healthcare workers should be prioritised by health authorities in Africa, and in this context as part of the COVID-19 response. The COVID-19 response team or IPC team should include actions to prevent PPE shortages in their planning, as adequate planning may minimise the negative consequences of an acute shortage. Planning to prevent critical shortages should be done in advance, with clear triggers for implementation and resumption of standard practice.

This guidance provides considerations and a series of options that can be used to inform country strategies in managing any shortages of personal protective equipment.

Re-use and reprocessing of single-use PPE must be a last resort temporary measure to be adopted until stocks are replenished.[2] The WHO and other agencies are currently conducting research about this and further guidance will likely become available soon.



Optimising use of PPE

Member States are encouraged to conserve PPE by using it rationally and appropriately[3]. PPE is the most visible control measure to prevent COVID-19 transmission, but administrative and engineering controls can be more effective and minimise the need for PPE.

Healthcare facilities should consider the following:

Adopt screening and triage practices to separate COVID-19 patients from other patients and place COVID-19 patients in isolation care facilities.

Use physical barriers (e.g. glass/plastic screens and curtains) to support physical and distancing between patients and between patients and healthcare workers to reduce the risk of exposure.

Designate healthcare workers or teams for COVID-19 patient care areas so that they can wear PPE for a session of care[1].

Plan and bundle care at the facility to minimise the number of times service providers enter the room, e.g. use the SPACES guidance from the British Thoracic Society https://bit.ly/BTSSPACES[4].

Maintain physical distancing and reduce face-to-face contact during staff meetings.

Protect gowns, coats or coveralls that are not water-resistant with plastic apron during use and, therefore, provide a reasonable level of protection for direct patient care.

Wear N95 respirators only for high-risk areas and in the immediate proximity of aerosol generating procedures (AGPs)[5].

Consider reprocessing and decontamination of single use PPE ahead of extreme shortages to create a stock that can be used ONLY in emergencies.

Cloth masks may be encouraged for use by healthcare 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 or suppliers of PPE, e.g. local manufacturers, private healthcare organizations, local businesses or other healthcare facilities in areas of low incidence.

Engage with alternative suppliers and manufacturers, reprocessing and laundry service providers to establish surge capacity in the event of extreme shortages.

Eye protection

Equipment for eye protection may be googles or face shields. Full face shields may protect the front of the mask and provide some additional benefit.

Re-usable face shields will minimise ongoing pressure on the supply chain. Full face shields or goggles should be reusable wherever possible to minimise pressure on the supply chain. A decontamination process should be established for these and staff should be trained and supervised to operate the process.

If locally manufactured face shields are available, these may be used as alternatives to imported supplies. Face shields should cover the whole face, including the sides and underneath the chin, and should be comfortable to wear. They should be either single-use or made of materials that can be decontaminated fully and should allow good visibility.

To preserve medical masks, consider using face shields (which cover the sides of the face and underneath the chin), instead of medical masks, in clinical areas where staff are not directly involved in patient care.

Scrubs and shoes

Wear scrub type suits underneath the PPE to avoid contaminating personal clothing of healthcare workers. The suits may be manufactured locally with quality[1] control by local authorities.

Healthcare workers involved in COVID-19 patient care may wear closed toe 'theatre' type clogs instead of personal shoes, but these should be decontaminated at the end of the shift according to local policy.

If none of these is available, it is prudent for healthcare workers to change their work clothes and wash them before leaving the facility or as soon as they return home. In this case, staff must bring extra clean clothes to work and a bag to take the dirty work clothes home for laundry.

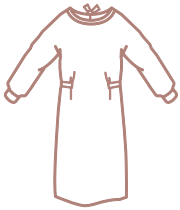
Gloves

There is no safe way to decontaminate single use examination gloves, they should continue to be regarded as single use items and discarded after use.

It is not necessary to use double gloves, and the surface of gloves should not be gelled or disinfected, but they must be changed after removal and the hands decontaminated.

Staff who are not involved in direct care of patients should not use clinical gloves.

Cleaning and support staff should use re-usable heavy-duty gloves and should decontaminate them using a locally defined process before re-using.



Gowns and aprons

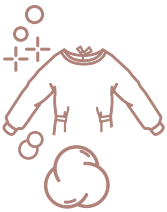
Single use fluid-repellent gowns provide effective protection to the clothes and body but they are expensive and bulky to transport and need effective waste treatment.

Re-usable, tight weave cotton surgical style gowns are an alternative, if there is an effective decontamination regime for them. These may be locally manufactured if imports are not available.

Single use plastic aprons or re-usable heavy duty aprons do not cover the arms or all of the body and should be used when any sort of gown (re-usable or single-use) is not available, or if minimal patient contact is expected. For clinical staff who are providing close clinical care to patients, an apron will not fully protect the arms or clothing. Scrub suits and washing facilities must be provided for staff use at the end of their shifts if only aprons are available for body protection.

Ensure that the laundry has capacity to re-process extra materials (you may need a new system for this).

Adopt a system that ensures that re-usable PPE is not discarded into the clinical waste stream but segregated for decontamination.



Laundry of single use gowns (last resort)

Laundry of single use gowns should not be attempted if the gown is damaged or visibly soiled. Some types of single-use gowns will not maintain integrity after washing.

If fluid repellence is lost after washing, the gown may still provide protection if used with a plastic apron for patient contact.

If possible, consult the product specification to determine what material the single use gown is made of and check compatibility with the washing process.

Medical masks

Masks are one of the most critical pieces of PPE for healthcare workers using droplet precautions and these should be a high priority for external procurement.

Single use medical masks are appropriate for general care of COVID-19 patients. They are are designed to be used only once and there is no method to decontaminate them safely for re-use.

Medical masks or respirators can be used for up to six hours without removing them when caring for a cohort of patients. The longer the mask remains on the face the higher the chances of touching it, of becoming wet, soiled or damaged or becoming difficult to breathe through (and will need to be changed).

The mask should be removed and discarded when leaving the clinical area, taking a break, or completing a shift or if the mask becomes wet soiled or damaged or difficult to breath through.

If there is a limited supply of single use medical masks, they should be saved for healthcare workers and cloth masks may be considered in the first instance for source protection from patients.

Cloth masks are not recommended for use by healthcare workers[1,3] and should only be considered as a last resort. There is weak evidence on the protective capability of cloth masks[3,6,9]. However, in extreme circumstances, these may be the only option available for healthcare workers. The limited available evidence suggests that they should have multiple layers of non-woven fabric and should be changed when 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 respirator masks

Filtration masks (i.e. N95) should be available for staff who are working near aerosol-generating procedures[1]. They are often manufactured to precise standards and may become difficult to procure due to challenges in the international supply chains. N95 respirator masks are designed for single use, they may be reprocessed only if there are not enough to be used as single use items 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.

Decontamination and reprocessing N95 respirators

Reprocessing single use respirators should only be considered if the supply of new respirators is inadequate. There are issues with the reliability, safety, feasibility and practicality of decontamination systems for reprocessing. In addition, the respirator may lose integrity when wearing it, and damage is unpredictable. 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. There should be a decontamination system and training for staff if decontamination is being considered.

Questions to consider

Is there an option for local reprocessing? Many of the systems require expensive capital equipment that will not be available in most African settings.

What respirator manufacturer data is available about evaluated methods of decontamination for each type of respirator in use? Refer to the respirator manufacturer manual[8], the WHO Rational Use Guidelines[3] and US CDC decontamination and re-use of filtering facepiece respirators[7].

Does the decontamination process alter the shape or fit of the respirator?

Does reprocessing affect the efficacy of the filtration capability of the mask?

Are there residual re-processing chemicals that could affect the wearer, e.g. ethylene oxide?

How would respirators that have been reprocessed be labelled and returned to the original user, and fit-checked (seal-checked) prior to use?

Is there a dedicated area for re-processing (e.g. endoscopy unit, sterile supplies, outside supplier)?

Re-use of medical masks or N95 respirators by the same user (last resort)

Re-use of respirators during a shift is not recommended because it would mean handling contaminated masks or respirators.

Discard N95 respirators visibly contaminated with blood, respiratory or nasal secretions, or other body fluids from patients.

The mask or respirator should only be re-used by the same person who used it originally.

Masks should be stored in breathable labelled containers between uses.

Care should be taken to avoid touching and contaminating the inner surface of the respirator.

Clean hands with soap and water or alcohol-based hand sanitizer before and after touching or adjusting the respirator.

The labelled container should be decontaminated or replaced between uses.

Wear the respirator with a face shield wherever possible to limit surface contamination of the mask.

US CDC recommends that 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 when the virus could be considered to be no longer viable to infect[7].

Decontamination of re-usable PPE

Type of PPE	Decontamination (stage 1)	Procedure (stage 2)
Face shield or goggles	Clean with detergent and water	Soak in 0.05% chlorine for 30 minutes or wipe with 70% alcohol
Scrubs and gowns	Launder at >60°C and detergent	
	Launder <60°C and detergent	Soak in 0.05% chlorine for 20 minutes and rinse with clean water
Heavy duty aprons	Clean with detergent and water	Soak in 0.05% chlorine for 30 minutes or wipe with 70% alcohol
Heavy duty gloves	Clean with detergent and water	Soak in 0.05% chlorine and rinse with clean water
N95 respirators	Refer to manufacturer's guidelines and local capability to use reprocessing systems	

References

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