

## Background

Masks constitute a physical barrier at the level of mouth and nose (and sometimes eyes if they include a face shield) to prevent transmission through the upper airways if worn correctly.

Different masks are needed to for different levels of protection:

N95/FFP2 respirators and similar devices will protect from droplets and aerosols.

Surgical/medical masks will protect from droplets.

The COVID pandemic is demanding a huge and continuous supply of masks as they are supposed to be single use and their indication of use starts with all health care workers and frontline workers, but they are also needed for patients and finally are proposed as a strategy for either the vulnerable (at risk) populations or even the general population the bend the curve of this seemingly uncontrolled outbreak.

It has been widely accepted that N95/FFP2 respirators and surgical/medical masks should be reserved to the health care workers and frontline workers.

And as supply of these items are more and more problematic in many places, alternatives to reduce transmission must be proposed.

For details on the indications and use of PPE, please refer to:

COVID19 Task Force SharePoint/medical/IPC-PPE-WASH /OCB *position on Masks*

COVID19 Task Force SharePoint/medical/IPC-PPE-WASH / PPE how to use it- contingency plan

## Cloth masks

In the absence of surgical/medical masks, a cloth mask constitutes an alternative, even if it is clearly a less effective and performant option.

**FILTRATION OF SARS-CoV-2 VIRUS** (NB virus dimensions around 0,1 $\mu$ m) → cannot be surely filtered by cloth masks but can prevent part of it [1].

Cloth masks constitute also a physical barrier reducing the onwads and outwards transmission [2], as well as preventing the wearer of touching nose and mouth with the hands (but unfortunately not the eyes which a face shield might prevent).

Cloths masks do not have the same efficacy as surgical masks and less even than N95/FFP2 masks and their capacity of preventing transmission is linked to its specificities (shape, material) and its use.

## Indications for cloth masks

For all the indications below, ideally disposable surgical masks should be given, but whenever supply is limited HCW/FLW should be prioritized and the alternative would be to give a cloth mask.

### 1. Patients and their caretakers

**Patients (and care takers) who are entering a health structure should wear a mask.**

In low transmission contexts, the distribution of masks can be limited to patients accessing a health care structure that are coughing and/or are COVID-19 suspects (identified in triage and/or during consultation/admission).

In context where there is probably sustained transmission (even if not necessarily clearly identified), all patients and caretakers should be given a mask, as it must be presumed many patients and caretakers are potentially asymptomatic but still shedding virus and transmitting.

This will reduce the risk of provoking nosocomial infections in the health structure, both for the patient and caretaker (that might be negative even if coughing) and for HCW/FLW and other patients.

Patients and caretakers must be explained how to wear the mask, don and doff them. And depending on the context, the epidemiologic situation and the capacity of the health structure, the masks can be given to the patient/caretaker to take back home at discharge or handed over to the health structure (disposal in a dedicated laundry bag at the exit) for disinfection and cleaning, so they can be re-used.

**Patients with mild/moderate COVID-19 managed outside of a health facility** (at home or in specifically designated structure) to protect their entourage. Masks can also be given to their caregiver to protect them from being infected by the patient.

**HEALTH PROMOTION ON USE, DONNING and DOFFING, STORAGE, CLEANING AND DISPOSAL WILL NEED TO BE ENSURED.**

## 2. Community members- general population

**Community members that are moving in public places or are in contact with at risk people** (elderly – chronic pathologies...) should wear a mask to prevent spreading the virus and to avoid risking the infection, through preventing the hands to reach mouth and nose. And this even for asymptomatic people.

In some contexts where the widespread use of mask might not be feasible or acceptable, distribution (and appropriate health promotion) can be prioritized to certain groups:

- Any setting where the other prevention measures will be either difficult to implement or perceived as insufficient such as in camps (displaced/IDP/refugee camps), slums, prisons or in closed settings such as senior homes/revalidation - nursing centers.
- For people at risk of making the severe disease<sup>1</sup>.
- For people at risk due to their frequent contact with people as for example taxi drivers, commercial sex workers, shop keepers

**Office & workshop staff** that NEED to remain in an office and cannot do homeworking: provided masks are changed when wet or spoiled and washed at home correctly once a day.

**HEALTH PROMOTION ON USE, DONNING and DOFFING, STORAGE, CLEANING AND DISPOSAL WILL NEED TO BE ENSURED.**

---

<sup>1</sup> Severe disease and mortality have been significantly associated to age > 60 yrs and co-morbidities at whichever age such as chronic respiratory infections, including TB, chronic cardiovascular diseases, including hypertension, diabetes, obesity, malignancy and most probably any immune depressive disease such as HIV/AIDS, malnutrition

### 3. Health care workers not in close contact with patients

**Medical/paramedical workers that are not in close contact with patients:** watchmen, lab, pharmacists, health promoters, psychologists, etc.

**Community health workers,** including community engagers, health promoters and providers of community-based activities.

They should all be wearing a surgical mask but in case of supply shortages, the next best alternative would be to wear a cloth mask provided it is worn together with a face shield for additional protection. Enough supply of cloth masks should be provided, as they need to be changed whenever wet, spoiled or damaged.

It is important to note that keeping the necessary physical distance (2 meters) to reduce the risk of droplet transmission is not always possible continuously. It is therefore important to avoid small confined places and ensure good ventilation or promote when possible the activities outside. And additional protection can be to give the patients/community members a mask as well.



**HAND HYGIENE, PHYSICAL DISTANCING, COUGHING ETIQUETTE, GOOD VENTILATION & APPROPRIATE CLEANING and DISINFECTION, including WASTE MANAGEMENT REMAIN THE MAIN AXES OF TRANSMISSION REDUCTION.**

### Essential specifications of cloth masks

(deduction from surgical/procedure specifications and current available evidence)

IN CASE surgical mask rupture, cloth masks can be a better option than no mask at all provided:

1. They are made following to the specifications – see below
2. They are used following the SOP – see below
3. They are regularly changed and washed at least once a day.
4. People made aware of the limits of cloth mask protection



**If these conditions are not met, cloth mask can be part of the problem and become medium for bacterial growth and give a fake feeling of safety**

#### A. SHAPE:

- **Complete coverage of nose; mouth; chin** (extending high on the nose bridge and as close as possible to the ears on the side)
- **Nose tight fit** (to imitate the malleable application of the disposable ones and be as close as possible to the nose bridge) and as close as possible to the skin (reducing droplets and microdroplets from passing between the mask and the face)
- **Inside and outside faces clearly identified**
- 2 pairs of ties
- We all come in different shape, it should accommodate for different noses/faces

2 main models available

1. Made in 2 pre-shaped pieces to allow central bending around the nose, no need of folds when making it. See Improved model of the one developed by Grenoble CHU – *See in Annex*



2. Rectangular cloth then sewn in folds to allow extension to cover down to chin, but no nose accommodation. *see in annex*. Ex:



**CONCLUSION** → both models offer complete coverage nose/chin/mouth, but only the pre-shaped offer some snug fit on nose.

**1<sup>st</sup> choice:** the improved version of Grenoble CHU

**2<sup>nd</sup> choice:** the rectangular one

## B. MATERIAL:

3 options in order of preference: ideally 3 layers with an inner layer that has some filtrating capacity.

1. Three layers of fabric: **2 external layers sewed in a pocket shape** to allow insertion of **disposable filtering material** (such as anti-dust disposable tissue 100% polyester, e.g. swipfer). The opening to insert the filtering material should be big enough to comfortably

position and inspect the filter. It should be big enough to cover from the nose to down below the mouth. This will provide a longer life of the cloth mask and easy to inspect the filtering layer conditions.

2. Three layers of fabric alternated made up together **2 external layers in cotton with the central layer in polyester or electrostatic material**. This is easier to maintain and has no disposable part to resupply; but more difficult to understand when the need to change internal layer as it is assumed that the filtering properties of the polyester inner layer will likely to get damaged by washing.
3. If making 3 layers is not possible: a 3<sup>rd</sup> option could be to use only 2 layers (see <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>)

**Material should be:**

- Ideally thick woven cotton material on the external layers and polyester or electrostatic material in the central layer
- Latex-free, glass fiber-free material
- Breathable
- Offer some level of fluid resistance
- Can resist minimum 60°C degree washing
- Best fabric would be cotton (see table)
  - o cotton with tight weaving (e.g. fabric used for pillow case, men shirts, poplin). Avoid cottons with large spaces between threads (e.g. gauze)
  - o 2<sup>nd</sup> choice for external layers: if 100% suitable cotton is not available, polyester can be used but it will be less resistant to washing(therefore not advisable)

COTTON		POLYESTER	
Positive points	Negative points	Positive points	Negative points
Natural fiber Flexible fiber Breathable fiber	Hydrophile: absorbance capacity of 20% more or less	Hydrophobic: doesn't absorb humidity	Synthetic fiber Rough touch
Can be washed at high temperature without losing its properties		Attracts particles as easily electrified	Loss of textile properties when washed at 30/40°C (warps and creases)
Doesn't macerate		Good abrasion resistance	



If people are purchasing a cloth mask, they should prefer masks that consist of 3 layers

SOP to use cloth masks

Donning/doffing

→ same as surgical/procedure mask (hand washing/don't touch the front...) but placed in an identified container with lid or bag that will go to laundry. [ See posters]

While in use: same precautions as per surgical mask, remove whenever:

- The mask is wet (by the breathing of the wearer)
- The mask receive splashes or droplets or is soiled
- The mask is damaged and still fits correctly
- It is difficult to breathe through it

Re-use of the mask by the same user. Masks can be temporarily removed and stored safely for later re-use (e.g. when an HCW needs to remove the mask before eating or changing of environment; e.g. for a patient at night or for a home-based caretaker when leaving the patient room). This is provided the mask is removed as explained above (when wet, soiled etc.) and that between uses the mask is safely stored:

- The mask should be carefully folded so that the outer surface is held inward and against itself to reduce contact with the outer surface during storage. The folded mask can be stored between uses in a clean sealable paper bag or breathable container.
- The mask can be hanged in designated storage areas on a dedicated hook in the wall long enough to allow the mask not to touch any surface. Place the hook at enough distance that the hanging masks do not touch each other.

Masks should be placed in a specific dedicated laundry container or bag for further washing (see below). For the cloth masks with the disposable inner layer, the disposable filter must be removed and discarded in a dustbin (plastic bag inside a closed dustbin), before putting the mask into the laundry bag.

### Cleaning

Health care workers should have several masks for every shift so they can change whenever necessary. Their masks should be cleaned daily (as they have potentially a lot of exposure)

Patients and community members can use the masks longer but washing should also be done regularly: ideally every day, but if not possible/feasible at least every 3 or 4 days.

## Maintenance/laundry

1. In hospital settings, see laundry protocol

2. At home:

### Washing by machine :

- Wash it between 30 to 60 °C (according to the fabric material)
- Dry it in the sun
- Iron it if it is suitable for fabric

### Hand washing:

- Wash it in a hot water bucket (between 30- 60 °C according to fabric) with soap using a brush or stick
- Rinse it in water
- Dry it in the sun - Iron it if it is suitable for fabric material

## REFERENCES

1. [MacIntyre CR](#)<sup>1</sup>, [Seale H](#)<sup>1</sup>, [Dung TC](#)<sup>2</sup>, [Hien NT](#)<sup>2</sup>, [Nga PT](#)<sup>2</sup>, [Chughtai AA](#)<sup>1</sup>, [Rahman B](#)<sup>1</sup>, [Dwyer DE](#)<sup>3</sup>, [Wang Q](#)<sup>4</sup>. A cluster randomised trial of cloth masks compared with medical masks in healthcare workers. [BMJ Open](#). 2015 Apr 22;5(4):e006577. doi: 10.1136/bmjopen-2014-006577.
2. 17. van der Sande M<sub>1</sub>, Teunis P, Sabel R. Professional and home-made face masks reduce exposure to respiratory infections among the general population. [PLoS One](#). 2008 Jul 9;3(7):e2618. doi: 10.1371/journal.pone.0002618.

## ANNEXES



1st\_choice\_Grenoble\_  
modifie\_linen\_mask



2nd  
choice\_rectangular\_lir