

are the most prevalent forms of face coverings for the prevention of infections in hospital settings. These flat, thin, paper-like guises are usually white inside and light blue outside. Medical masks have three layers: an outer water resistant (hydrophobic) material, an inner water absorbent (hydrophilic) material and a middle filter layer.

Medical masks create a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment. They are recommended for healthcare workers who are at risk of being infected by patients and others. They protect against large droplets (>10µm in diameter), offering about 60% protection. However, surgical masks are less effective against smaller particles like aerosols (i.e. droplets <5µm).

Fabric or Cloth Face-Masks

These are made from fabric materials. Most cloth masks consist of two layers made up of fabric material and may or may not be water repellent or absorbent. Several materials have good filtering properties; these include cotton pillowcases and T-materials. Some may contain a middle filter layer. Cloth masks can reduce the number of large particles (>10 µm) from reaching those around the wearer. This type of mask may be worn by the general populace when in a crowd or in closed spaces like buses, trains and

in meetings. They are not recommended for patients with COVID-19 or healthcare providers. Fabric masks are not recommended for healthcare workers who are at risk of being infected by patients and others.

Face Shields or Visors

Visors, more frequently referred to as face shields, (see Figure 2) are transparent guards that should cover the face and up to below the chin. They consist of two main parts: a transparent visor that covers the face and a system of holding the visor in place, such as a headband or strap.

Visors help prevent infectious droplets from getting to the eyes, nose and mouth. Face shields offer a high degree of protection to the wearer from close range exposure to viral particles emitted into the air through talking, singing, coughing and sneezing. However, they offer low level of source control. They are less effective than masks in preventing the transmission of respiratory infections. Besides blocking splashes and sprays from reaching the face, visors prevent people from touching their faces. Visors may be worn separately but are more effective when used adjunctively in conjunction with masks (See Figure 2). Face shields are durable and can be worn an indefinite number of times. Importantly, visors/face shields create a relative cover for all the

portals of entry for the virus: the eyes, the nose, and the mouth. They are available in various sizes, including for children but should not be worn by children under three years of age.

Respirators in the prevention of the spread of COVID-19

Respirators are tight fitting masks, designed to create a facial seal and to achieve efficient filtration of airborne particles from entering the respiratory tracts of the wearer. The most used respirator type is the N95 (an American CDC NIOSH standard). Europe uses two standards: the 'filtering face piece' (FFP) and the EN 143 standard covers (P1/P2/P3 ratings); See Figure 3. Respirators reduce the spread of the virus from the wearer to others and from others to the wearer. Those with one-way valves pose a threat to those who come in contact with an infected wearer from the exhaled unfiltered air. Thus, hospitals and other medical facilities should not patronize valved respirators. If you must wear a valved respirator, then put on a surgical mask or 'cloth face covering' over the valved respirator. This to some extent filters out the particles out of the breath. Non-valved respirators provide good two-way protection for the wearer and those around them, by filtering both inflow and outflow of air.

Wearing and Removing a Facemask

It is important to acquire appropriate face coverings but probably more so is their proper use. The WHO guidelines on the use (and sic, non misuse of face masks) adequately covers the topic⁵ and may be summarized as follows:

- Medical masks are to be worn by
- a. Health workers
 - b. Those caring for someone with COVID-19 symptoms.
 - c. Persons aged 60 years and over.
 - d. Anyone with pre-existing medical conditions and people who have symptoms suggestive of COVID-19.

How to properly wear a face mask

- a. Before touching the mask, clean your hands with alcohol based hand rub for 20 seconds or soap and water for 40 seconds.

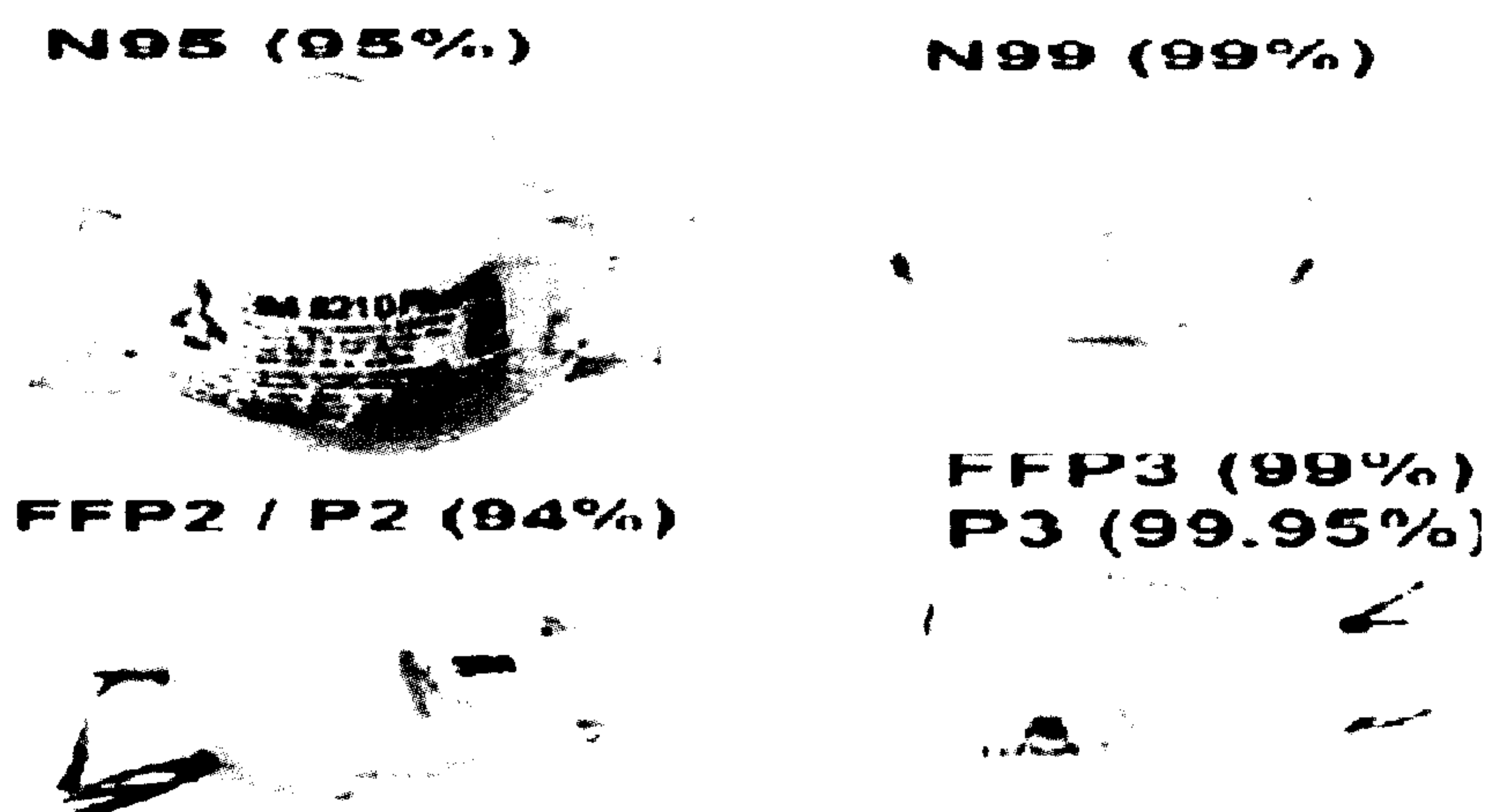


Fig. 3: Types of respirators. There are two main standards of respirators- the N-95 American approved and the filtering face piece(FFP) series recommended in Europe. Respirators offer the highest protection against spread of virus from the wearer to others and from others to wearer. They filter out particles less than 5nm in diameter. Valved respirators can pose a threat to those around the wearer.

COMPARISON OF PROPERTIES OF MAJOR FACE COVERINGS

Table 1: A Comparison of the Properties of the Major Face Coverings

Characteristic	Visors	Fabric Facemasks	Medical Facemasks	Respirators
Standard	None	Variable	Universal	Europe or American
Layers	1	1-3	3	4-5
Variable Sizes	Yes	Yes	No, one size	Yes
Intended usage	General public	For general public	HCWs*, carers of COVID-19 patients, patients	Covid-19 settings, aerosolized atmosphere
Re-usability and durability	High	High	Low	High
Filter elements	None	Often missing	Present, non replaceable	Replaceable
Type of air filtered >inhalation	No filtration	Inhalation & exhalation	Inhalation > exhalation	Exhalation
Type of particles filtered	Droplets	Droplets	Droplets > aerosols	Droplets and aerosols
Filtration efficiency	Low, if any	Uncertain	<90%	94-99.9%
Airflow rate	Normal	85l/min	20l/min	85l/min
Direction of protection	Wearer > Contacts	Contacts > wearer	Contacts > wearer	Wearer > Contacts
Face seal fit	Loose	Loose	Loose	Tight
Deafness friendly	Yes	No	No	No
Restriction on breathing	Little	Yes	Yes	Yes
Impairment to breathing	No	Yes	Yes	Yes
Size variation	Yes	Yes	One size	Vary from 1 to 3

*HCW, healthcare worker depending on fabric used.

- b. Inspect the mask for tears and holes. If any, discard it.
- c. Verify which side is the top (the side with the metal strip).
- d. Identify the hydrophilic inside of the mask (usually white side).
- e. Place the mask on your face, covering your nose, mouth and chin and making sure there are no gaps between your face and mask. Pinch the metal strip so that it moulds to the shape of your nose.
- f. Do not touch the front of the mask while wearing it to avoid contamination. If you accidentally touch it, clean your hands.

Replace mask if damaged or moist.

Conclusion

The Covid-19 pandemic is exerting an enormous toll on humanity. In terms of resources, loss of jobs, morbidity, and mortality. While we await the development of drugs and vaccines to contain the disease, the most effective course of action is following the simple instructions on preventing the disease, viz, social distancing, personal hygiene and use of PPEs of which face masks are a major component. There are several types of face coverings. The right one

should be chosen for the right situation. It is also particularly important that the face coverings should be properly taken care of including proper wearing, removing and disposal.

RESOURCES/REFERENCES

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Removing a face mask

- a. Before touching the mask, clean your hands with alcohol based hand rub for 20 to 30 seconds or soap and water for 40 to 60 seconds.
- b. Remove the straps from behind the ears without touching the front of the mask.
- c. As you remove the mask, lean forward and pull the mask away from your face.
- d. Discard the mask immediately into a closed bin or into a laundry bag if a reusable one.
- e. Clean your hands after disposing of the mask.

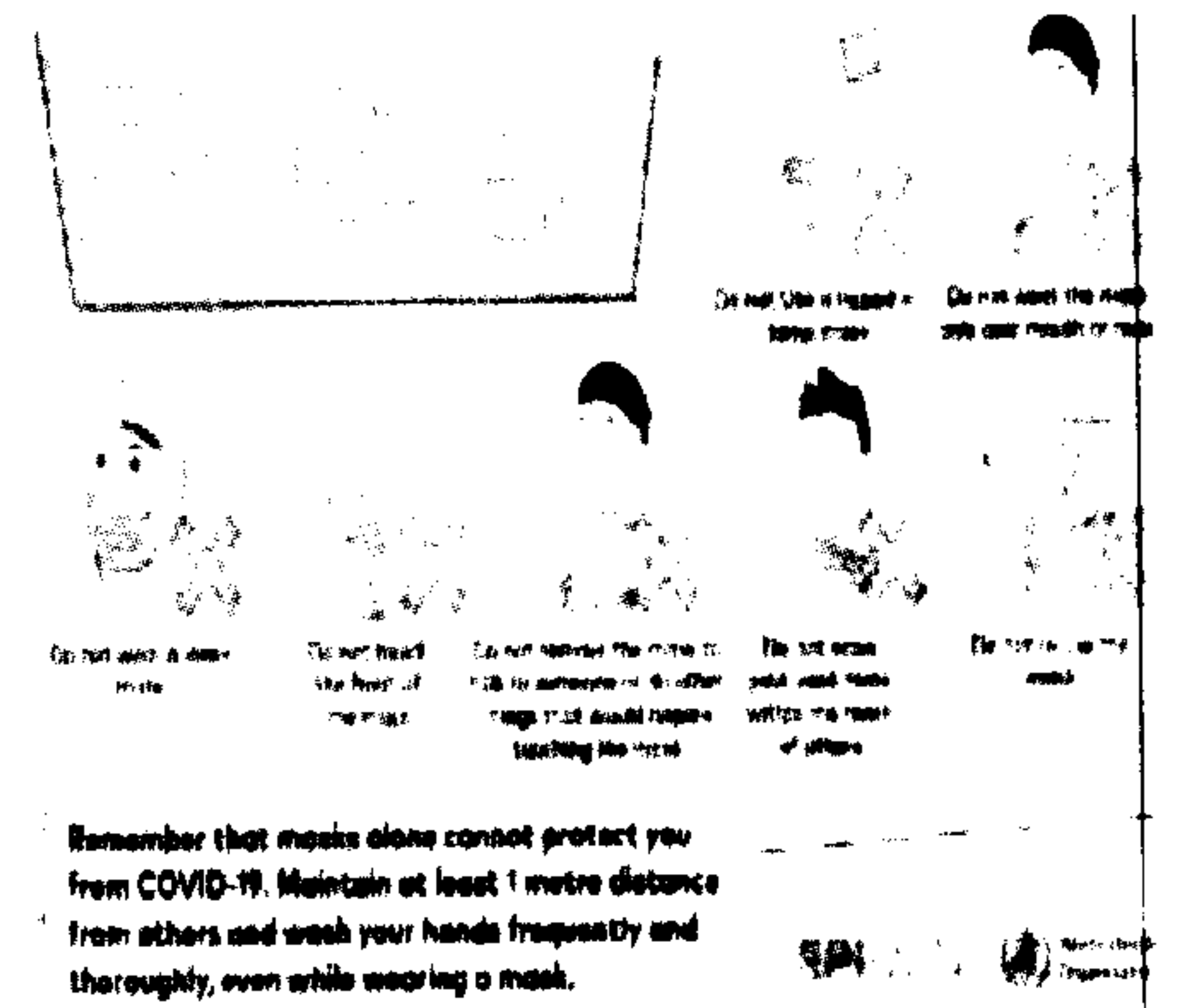
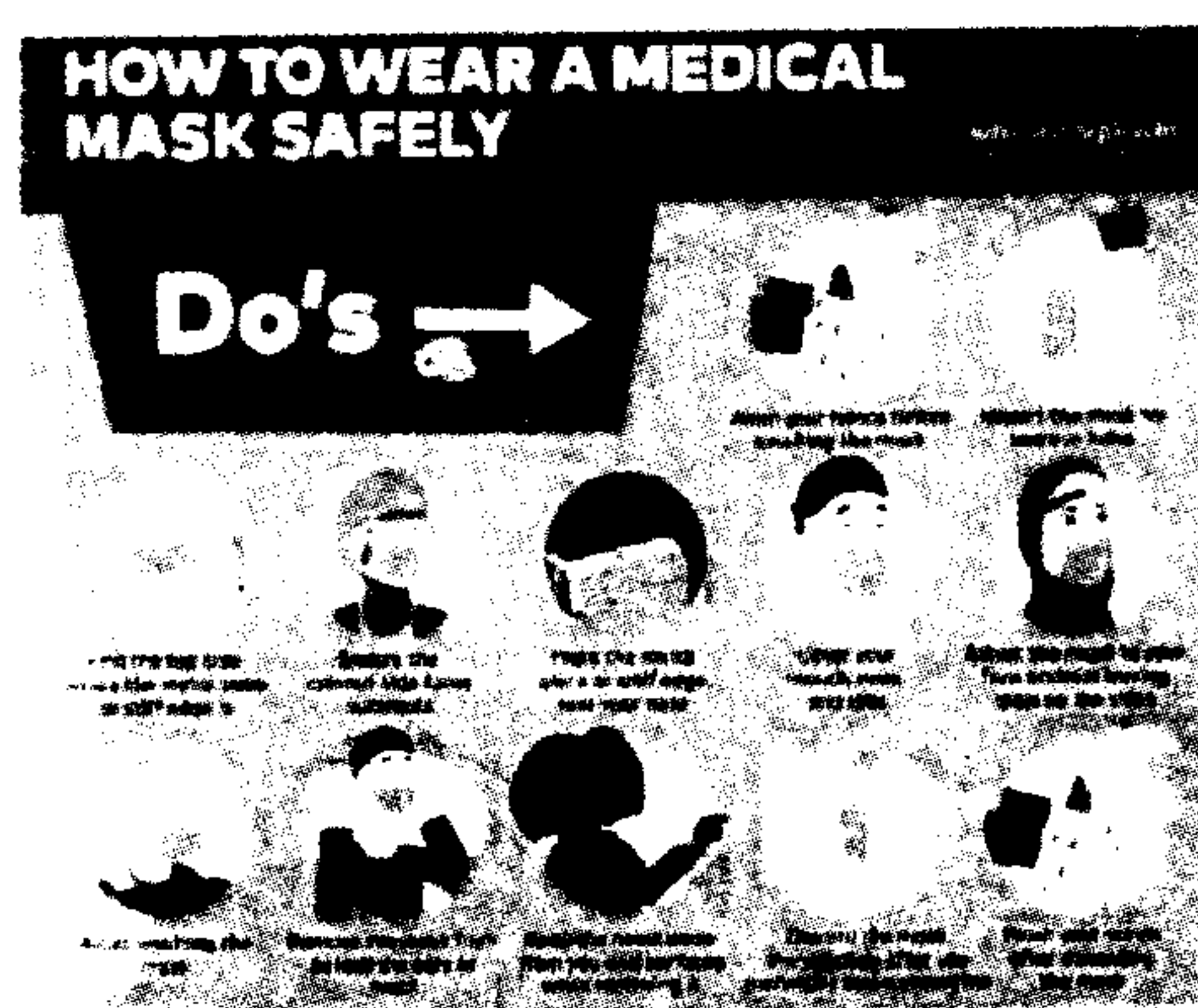


Fig. 4: WHO Infographics on wearing and removing medical face masks. Wearing and removing masks should be carefully done to avoid contaminating the masks and/or your hands

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