Note 8 – Masks – like initially said are good at blocking droplets, not at catching particles.

As mentioned in Note 6, the viruses causing respiratory tract infections have diverse transmission routes, including airborne routes. Thus, using masks to prevent getting contaminated or spreading viruses to others appears reasonable.

However, data dealing with respiratory viruses on personal protective equipment (PPE), and on masks more particularly, is surprisingly scarce. Intuitively, any barrier would seem better than none, and two better than one, but as it is the case with gas, the important question is the efficacy of the filter/barrier. As viruses are extremely small (usually 80-100 nanometers), protective barriers have to be nearly "air-tight" to be effective, a bit like the military masks used during WW1.

Studies conducted on the efficacy of masks **all** conclude, that using barriers slow down pathogens. However, efficacy depends on the fabrics, the seal of the mask to the face, as well as the route of viral transmission (e.g. droplets are more blocked than airborne particles) (*Davies et al., 2013; Milton et al., 2013*). Evidence also suggests that mask efficacy declines with usage time and the number of ill people (that is producing viral particles) surrounding the user (*Chughtai et al., 2019*).

Most studies test masks with a certain flow of air, or with particles that are not viruses.
2 studies however stand out by their quality:

One is a careful comparative study about cloth facemasks that was done to evaluate their efficacy against particles of small sizes - below 2.5 microns - because those penetrate deeper in the lungs and are more relevant to public health. It showed that 40 to 85% of the particles passed THROUGH the masks. This was not done on virus particles, it also showed that cloth facemasks were better at filtering LARGE particles than surgical ones. (see Shakya et al, 2017).

The other, one of the most careful study ever performed (Mc Intyre et al, in BMJ) actually randomized during a period of 4 weeks, 1600 health care professionals, in 15 hospitals, with either medical masks, cloth masks, or control, and measured **actual infection rates** (including 17 respiratory viruses like RSV, Flus, SARS, Adeno, Bocaviruses… in their PCR). They found higher rates of infection with cloth masks – those allowed particles penetration in 97% of cases, medical masks only in 44%.

The most efficient masks would seem to be "N95 respirator"- type masks, followed by surgical masks, and the least efficient would be (homemade) cloth masks (*Blachere et al., 2018; Davies et al., 2013*). It should be noted that N95 respirators may not provide necessary protection against pathogens (*Lee et al., 2007; Loeb et al., 2009*) and that flu viruses can pass though surgical masks (*Booth et al., 2013*). Remember that the Flu virus is BIGGER than the Corona. Homemade cloth masks are not recommended and should be used only as a last resort (*Davies et al., 2013)*.

A recent opinion article in the Washington Post recently (April 2, 2020) reminded us “Everyone wore masks during the 1918 Flu pandemic. They were useless.”

All of this is known - the question then becomes: Are “optics” and “social blame” useful in such public health crisis? No one doubts that masks are useful for the infected and the professionals – there are however serious doubts that generalizing facemasks will do anything effective except putting social blame on some people by giving a FALSE perception, and feeding a sense of powerlessness. And accusing some of being ‘criminals’ because they refuse to relinquish ***logic***, ***chemistry*** and ***physics*** may be going way to far! Shouldn’t we do better than Medieval reflexes – this is not the plague?

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