

## EDITORIAL

# “Masking the evidence”: Perspectives of the COVID-19 pandemic

The COVID-19 pandemic presents a severe and acute public health emergency around the world. The event of the pandemic has seen an upsurge in the general public wearing of disposable surgical masks (DSM) and other types of face masks. The issue of mask wearing has been widely debated in the press and the World Health Organization (WHO) have recently changed their advice, to now recommend the routine wearing of face masks by the general public as a means of preventing the spread of COVID-19 (WHO, 2020a). The topic has been discussed across the world, for example in *The Conversation* (Brainard & Hunter, 2020), and on the BBC (Anonymous, 2020; Shukman, 2020; Wong, 2020).

This editorial will focus on the use of medical and nonmedical (fabric) masks by the general public. There are rigorous standards for evaluating masks used by healthcare professionals, which emphasise the ability of the mask to protect the wearer from infectious particles (Phua et al., 2020). In general, DSMs and fabric masks worn by the general public are less effective than respirators, such as N95 (the American standard; the equivalent in Europe is FFP2) respirators, which provide a greater degree of protection due to their shape, material and tighter seal (Howard et al., 2020). As such, the term “mask” will be used to include DSMs and homemade or improvised masks. It should be emphasised that we are concerned principally with DSMs and fabric masks and not those face masks which form an effective and testable seal between the wearer's face and mask and are fitted with a filter which allows the wearer to breathe. Strictly speaking, these are respirators akin to those worn for military use in nuclear, chemical and biological warfare. These masks are known to be highly effective, and we do not question the evidence for N95 type masks.

## 1 | BACKGROUND

The first use of surgical masks, and their subsequent development, goes back to 1899 among doctors working with tuberculosis patients, and the realisation that diseases such as tuberculosis and scarlet fever could be transmitted by droplets (Rockwood & O'Donoghue, 1960). Among the general public, wearing facemasks during periods of epidemics remains rare across the world and mostly confined to South-East Asia and the Far East where it first arose in Japan in the early 20th century during an influenza pandemic (Yang, 2014). People wore face masks as a source of protection during the great influenza pandemic between 1918–1920. In Hong Kong, during the SARS epidemic in 2003 the wearing of DSM by the general public

became more common (Cowling, Ali, & Ng, 2020). Many persist in the routine wearing of DSMs and this has also spread across South-East Asia and the Far East. With the exception of visitors from these regions, this habit has not spread significantly to other parts of the world. However, in the wake of the COVID-19 pandemic, the wearing of face masks by the general public is becoming more common across the world. This is not without controversy. Some major international organisations are divided over the issue with the CDC (USA) coming to the conclusion that they should be worn, and the WHO initially recommended that their use should be restricted to health personnel. However, that position has now changed with the publication of the WHO updated interim guidance “*Coronavirus disease (COVID-19) advice for the public: When and how to use masks*” (WHO, 2020a). For the first time, they make recommendations for the general public to wear face masks in crowded public places.

Regardless of geographic location, the use of DSMs by the general public exacerbates the global supply shortage, potentially affects those with the greatest need, front-line healthcare workers and those in society who are the most susceptible to infection (WHO, 2020b). However, face masks should not be seen as a failsafe mode of protection for this population or for healthy people. With global shortages of medical masks, one emerging trend has been to use of homemade makeshift cloth alternatives to DSMs. Fabric (nonmedical) masks may provide a pragmatic temporary alternative to DSMs, and their use has been supported in the United States by the CDC (CDC, 2020; Wu, Huang, Zhang, He, & Ming, 2020). They can be readily designed from tightly woven cotton fabric household items at a relatively low cost. The Center for Disease Control provides straightforward instructions on how to make a viable fabric face mask, using either a disposable coffee filter or vacuum cleaner bag with a cotton T-shirt (CDC, 2020b). Individuals are encouraged to own at least two fabric masks, so that one can be washed and dried after daily use.

The sewing together of cloth pieces to create a reusable face mask that allows for the insertion of a disposable filter into a pocket has also become a popular alternative to the use of DSM. In countries like Australia, where COVID-19 infection has been successfully contained through measures like contact tracing and social distancing, there has been limited use of DSM by the general public. Fabric masks provide a compromise position on personal protection, as they no impact on the availability of DSM for front-line clinical workers.

However, to date there is a paucity of good quality research on the use of homemade fabric facemasks by the general public,

highlighting the need for well-designed clinical trials to test their efficacy. Fabric masks may come in a variety of combinations with different levels of filtration and breathability. In their updated interim guidance, the WHO currently advises fabric masks consist of three layers of fabric. They may act to arrest aerosol droplets from the respiratory tract, which could help to reduce the reproduction number and slow down the epidemic, especially in crowded areas and on public transport. One note of caution related to the use of cloth masks, if they are not used properly there is an increased risk of infection due to inherent issues of moisture retention and poor filtration (Macintyre et al., 2015). It should also be stressed that this form fabric masks are not suitable for use in the clinical environment.

## 2 | DISPOSABLE SURGICAL MASKS

DSMs are usually made from nonwoven fabric, intended to provide a barrier to prevent respiratory droplets entering the nose, mouth or respiratory tract. These are the kind of facial masks that have been used widely in places like Hong Kong since the SARS outbreak in 2003 (Smith, Ng, Li, & W., 2020). These types of mask should only be used once and should be changed immediately if they become moist. Unfortunately, it is common to see people wearing this type of mask around their neck or on top of their head whilst eating or drinking, rendering the mask completely ineffective when they put it back in place. The general belief is that wearing a DSM can help reduce the spread of viral particles not only by protecting the person wearing the mask, but also to prevent them from spreading their respiratory droplets elsewhere. However, as outlined earlier, wearing a DSM does not make someone invincible to viral infections (WHO, 2020a). Importantly, DSMs do not replace good personal hand hygiene and appropriate respiratory etiquette. When coughing or sneezing, individuals need to avoid coughing or sneezing directly into their hands, to avoid subsequent contamination of other surfaces or objects.

In relation to the use of DSMs, one question has divided the nations and scientific experts around the world since the event of the COVID-19 pandemic: Do people who are not infected with the viral infection need to wear masks to limit the spread of the virus? Set against the dwindling global supply of DSMs for front-line healthcare personnel, many scientific experts have openly discouraged the purchasing and wearing of this type of face mask (CDC, 2020a). However, as the spread of COVID-19 global pandemic continues, some public health experts are starting to rethink this message of discouragement of mask wearing. With the acknowledged risk of disease transmission from asymptomatic and pre-symptomatic individuals the Chinese CDC view mask wearing as a crucial measure to prevent droplets carrying the virus escaping and spreading infection (Xiao et al., 2020).

## 3 | EVIDENCE FOR WEARING MASKS

Prior to June 2020, the WHO recommended that people should only wear a face mask if they have symptoms of respiratory illness or if

they are providing care for someone with such symptoms (WHO, 2020c). As stated earlier, this position has changed, and they now provide updated interim guidance and practical advice for the use of medical and nonmedical masks by the general public (WHO, 2020a). However, throughout the pandemic interpretation of the WHO guidance has varied across geographic regions of the world. For example, in Hong Kong which experienced the SARS outbreak in 2003, the first COVID-19 case was reported on 23 January 2020, and the wearing of face masks was strongly encouraged. The Hong Kong Department of Health states that "surgical masks can prevent transmission of respiratory viruses from people who are ill. It is essential for people who are symptomatic (even if they have mild symptoms) to wear a surgical mask. It is now recommended that...everyone wears a face-mask when taking public transport or staying in crowded places. It is important to wear a mask properly and practice good hand hygiene before wearing and after removing a mask" (DoH, 2020). Whereas in the United Kingdom, where the first case of infection was recorded on 31 January 2020, a far more relaxed approach to the wearing of face masks was advocated. The NHS released a statement that "face masks play a very important role in places such as hospitals, but there is very little evidence of widespread benefit for members of the public" (NHS, 2020). So, who, if anyone, has got it right?

There is no shortage of opinion and secondary ideas and it looks as if policy may be moving towards more widespread wearing of face masks. Indeed, countries like Germany, Spain and France have recently introduced laws for mandatory mask wearing in public places. Presently, over 50 countries around the world mandate this type of behaviour. But what about the evidence? In reading newspaper reports and even scientific articles based on empirical work and reviews, caution in interpreting the results and ensuing advice is needed. The words "may," "could," "trend," and "reduce" (as opposed to "prevent") abound (Chu, Duda, Solo, Yaacoub, & Schünemann, 2020). Even the risk of COVID-19 infection is couched in ambiguous language such as "potential" to be transmitted and cause infection. In parts of the world where face masks have been widely worn during the current outbreak, the stem of the spread of the COVID-19 virus would not have been possible without adequate hand washing, avoiding face touching and social distancing. Without these essential measures thousands, if not millions more people would die, regardless of how diligently face masks have been worn.

A Cochrane systematic review (Vincent & Edwards, 2016) of the use of DSMs showed that there was no evidence to support their use, albeit that the quality of studies retrieved was poor. A more systematic study of DSMs was published recently (Leung et al., 2020) shows that DSMs are effective at reducing the transmission of COVID-19 particles by droplet but were ineffective in reducing transmission by aerosol (distinguished from droplets but size). The study only considered normal breathing by participants and not coughing or sneezing and—of particular interest in the climate of fear generated around COVID-19—was that the majority of the participants, all diagnosed with COVID-19, did not shed particles. This study provides clear results, but the applicability to practice remains uncertain. On the one hand, the risk of becoming infected

with COVID-19 may be very low (contrary to the view perpetrated in the media). On the other hand, the viral load required to become infected is unknown and if the threshold for infection is low then reductions in droplet spread may be negligible, rendering the wearing of masks less valuable. However, if there is sufficient viral load being transmitted via the aerosol route, then this renders the face mask of no value in preventing spread of infection to vulnerable people. As advocated by Feng (2020), governments of different countries and their public health agencies must make rational recommendations on appropriate face mask use to complement other preventive measures. Whilst countries around the world continue to evaluate the benefits of universal use of masks, there is urgent need for innovative approach in producing face masks, developing new materials and education to citizens to fight the current and future pandemics. In Hong Kong, a new type of reusable fabric mask "CuMask+" will be issued to all citizens. What is special about this patented 6-layer mask is that it is washable for 60 times and incorporated with copper as a key filtering component capable of immobilising bacteria, common viruses and other harmful substances (QMask, 2020).

In relation to the protocol of wearing a face mask, individuals need to be educated about the importance of not touching the mask and then touching their eyes, nose or mouth. In many countries, a lot of attention has been given to the importance of wearing a mask; however, it appears that limited attention has been given to how a mask should be removed and then disposed. Public health nursing highlights the need for adequate (20 s with soap and water) hand-washing before and after removing a mask. Before removing the mask to avoid getting infective particles onto either the face or mask and after removing to get rid of any infective material the mask may harbour. Individuals should also dispose mask directly into a rubbish bin immediately it is removed.

Feng et al. (2020) advocate a rational approach towards the wearing of face masks by the general public, priority should be given to older adults and those individuals with underlying medical conditions. In addition, to reduce the asymptomatic and pre-symptomatic transmission of infection, anyone under quarantine/self-isolation should be strongly encouraged to wear a mask if they need to go outdoors.


There is very limited research into the effectiveness of DSM use in the general public; as such, most guidance is not fully supported by rigorous research studies. Greenhalgh, Schmid, Cypionka, Bassler, and Gruer (2020) called for more research into the use of facemasks as a tool to combat SARS-CoV-2, the respiratory virus behind COVID-19. In relation to face masks themselves, a greater understanding of the optimal thickness and nature of mask fabric would be valuable to help overcome the current issues of poor filtration and moisture retention.

## 4 | CONCLUSION

The outbreak of the novel coronavirus (COVID-19) continues to pose significant health-related challenges around the world. In this editorial, we have looked at the wearing of DSMs and fabric masks in the

general public during the outbreak from three perspectives; the evidence, the cultural and historical background and examination of issues surrounding mask use by the general public during this outbreak. Despite limited "convincing" evidence, given the serious threat that is posed by COVID-19, nurses should consider advising vulnerable members of the general public to wear some form of facial mask, preferably a DSM. In addition, all members of the general public may benefit from wearing some form of face mask when outside the home in crowded environments, such as on public transport or in shops. In relation to the issue of limited evidence, Greenhalgh et al. (2020) believed that searching for best evidence in the face of a pandemic may be the enemy of best policy. Face masks, DSM and fabric, provide a simple, relatively inexpensive and "potentially" effective way to reduce the transmission of the respiratory droplets that cause COVID-19. Although DSM would appear to be superior to fabric masks in relation to filtration and breathability, cloth masks are likely to be better than no mask at all. Clinical nurses possess valuable public health knowledge, as health educators we have a potential role to provide the general public providing reliable information and adequate resources to ensure the safe use of face masks. However, it is important to send out the message that the wearing of masks may create a false sense of security and we must continue to promote other public health measures, such as hand hygiene and social distancing.

Globally, face masks have the potential to reduce the spread of this life-threatening illness, with a minimal impact on social and economic life. Unfortunately, COVID-19 will most probably not be the last form of the SARS-CoV-2-related virus to cause a global pandemic and anything, no matter how little, that can be done to reduce infection rates and subsequent deaths should be embraced. It may be that wearing face masks becomes the "new normal" in the post-COVID-19 world.

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