

Commentary

Masks: usage during COVID-19 pandemic

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INTRODUCTION

Overnight, masks have become a symbol of social responsibility. Wearing a face mask is certainly not an iron-clad guarantee that a person won't get sick. Face masks are crucial for health care providers looking after patients and are also recommended for family members who need to care for someone who is ill - ideally both the patient and caregiver should have a mask.

WHY MASKS MATTER MORE FOR THIS CORONA VIRUS?

Corona virus is a new virus, which means that our immune systems have never encountered it before, hence no protection against it. Moreover, corona virus has spread much more rapidly, infecting a concentrated number of patients and resulting in tens of thousands of cases of COVID-19 in a matter of weeks.

During the initial months of the corona virus pandemic, the World Health Organization and the Centers for Disease Control and Prevention advised that use of medical masks should be reserved for patients, health-care workers, and others in close contact with the infected cases. But recently in the light of new evidence, the centers for disease control changed its recommendations, saying that people should wear cloth face coverings in public, while emphasizing that the use of medical masks should still be reserved for front-line workers.

Spread of certain respiratory viral diseases, including COVID-19 can be limited by wearing a medical mask

which is considered to be an important preventive measure. However, the use of a mask alone is insufficient to provide an adequate level of protection, and other measures should also be adopted. Whether or not masks are used, to prevent human-to-human transmission of COVID-19, maximum compliance with hand hygiene and other IPC measures is critical.¹ Various studies regarding influenza, influenza-like illness, and human coronaviruses provide evidence that the medical mask use can prevent infectious droplets spread from an infected person to someone else and potential contamination of the environment by these droplets.²

CHOOSING OR MAKING A MASK

Almost overnight, masks of all shapes, colors and styles have appeared on the faces around us. Here's how to decide what mask works best for you.

TYPES OF MASKS

WHO stresses that it is critical that medical masks and respirators be prioritized for health care workers.

Usage of medical face masks have been recommended as a means of source control for symptomatic persons, so as to prevent the spread of respiratory droplets which are produced while coughing or sneezing. Respiratory etiquette which includes covering of the mouth and nose with a tissue while coughing also targets limiting the spread of infection from an infected individual to others.⁵ There is increasing evidence that persons who suffer from mild or no symptoms during the pre-symptomatic and

early stages of infection can also contribute to the spread of this deadly disease.⁶⁻⁹ The role of asymptomatic infections in transmission of the corona virus is not known yet. However, use of face mask may help in reducing the spread of infection in the community by minimising the excretion of respiratory droplets from infected individuals who may not even know they are infected. So in this regard, mask use by asymptomatic persons can be regarded as an extension of the current practice of face mask use by symptomatic persons.¹⁰

Currently there is no evidence that makes use of non-medical face masks or other face covers an effective means of respiratory protection for the wearer of the mask. Overall, various non-medical face masks showed very low filter efficiency (2% to 38%).¹¹ Another study of same kind showed that usage of cotton surgical masks was associated with a higher risk of penetration of microorganisms and influenza-like illness as compared to no masks.¹²

Table 1: Type of masks.

Respirator or filtering face piece	Medical masks (surgical masks or procedure masks)	Non-medical face masks (or 'community' masks)
<p>It is designed to protect the wearer from exposure to airborne contaminants (e.g. from inhaling infectious agents associated with inhaling small and large particle droplets) and is classified as personal protective equipment (PPE).³</p> <p>Respirators are mainly used by healthcare workers to protect themselves, especially during aerosol-generating procedures.</p> <p>N95 respirator masks fit tightly to the face and have the highest filtration efficiency, blocking 95 percent of particles of 0.3 microns or larger.</p> <p>Valved respirators are not appropriate for use as a means of source control since they do not prevent the release of exhaled respiratory particles from the wearer into the environment.⁴</p>	<p>These masks have rectangular shaped coverings (often pleated) that come with elastic ear loops.</p> <p>These should be used only by medical workers.</p> <p>Compared to the N95 mask, a medical mask filters about 60 to 80 percent of particles and, according to FDA, mostly blocks "large-particle droplets, splashes, sprays or splatter that may contain germs"³.</p>	<p>These include various forms of self-made or commercial masks or face covers made of cloth, other textiles or other materials such as cotton fabric, old T- shirt etc.</p> <p>They are not standardized and are not intended for use in healthcare settings or by healthcare professionals.</p> <p>There is no current evidence to make a recommendation for or against their use in this setting. [COVID]</p>

Table 2: Pros and cons of face mask use in the community.

Arguments and evidence supporting the use of face masks	Arguments and evidence against the use of face masks
<p>Due to increasing evidence that persons with mild or no symptoms can contribute to the spread of COVID-19, face masks and other face covers may be considered a means of source control complementary to other measures already in place to reduce the transmission of COVID-19.</p> <p>Evidence is growing that viral shedding of SARS-CoV-2 is higher just before onset of symptoms and for the initial 7-8 days after onset.</p> <p>Face masks have been used extensively in the public in Asian countries and have been linked to a slightly lower risk of SARS among persons without known contact with SARS patients during the 2003 SARS epidemic.</p> <p>Non-medical face masks and other face covers made of textiles have the advantage that they can be produced easily; they are washable and reusable.</p>	<p>Medical face masks are currently in short supply. In view of the current pressure to the health systems, their use by healthcare workers needs to be clearly prioritised and protected.</p> <p>There is only limited indirect evidence that non-medical face masks are effective as a means of source control.</p> <p>Wearing a face mask may create a false feeling of security, leading to relaxing of social distancing and increased frequency of face touching (mask adjustment, etc.)</p> <p>Face masks need to be carefully put on and taken off in order to prevent self contamination. Face masks are not well tolerated by certain population groups (e.g. children) or by persons with chronic respiratory disease.</p> <p>There are no established standards for non-medical face masks used as a means of source control or personal protection.</p>

USE OF FACE MASK BY HEALTHCARE WORKERS

The use of medical face masks by all healthcare workers not providing care to COVID-19 patients may be considered as an additional measure for reducing transmission of COVID-19 within healthcare settings. Optimal strategies have not been defined, but any strategy needs to take into account the availability of medical masks, the extent of community transmission and countermeasures currently in place.

USE OF FACE MASK BY COMMUNITY

The use of face masks in the community may primarily serve as a means of source control. This measure can be particularly relevant in epidemic situations when the number of asymptomatic but infectious persons in the community can be assumed to be high. Wearing a face mask could be considered, especially when visiting busy, closed spaces, such as grocery stores, shopping centres, etc.; when using public transport; and for certain workplaces and professions that involve physical proximity to many other people (such as members of the police force, cashiers - if not behind a glass partition, etc.).

It should be emphasised that use of face masks in the community should be considered only as a complementary measure and not as a replacement of the core preventive measures that are recommended to reduce community transmission including social distancing, staying home when ill, teleworking if possible, respiratory etiquette, meticulous hand hygiene and avoiding touching the face, nose, eyes and mouth.

There are three important caveats related to the use of face masks in the community. It should be ensured that medical face masks (and respirators) are conserved and prioritized for use by healthcare providers, especially given the current shortages of respiratory personal protective equipment reported across the country. The use of face masks may provide a false sense of security leading to suboptimal physical distancing, poor respiratory etiquette and hand hygiene - and even not staying at home when ill. There is a risk that improper removal of the face mask, handling of a contaminated face mask or an increased tendency to touch the face while wearing a face mask by healthy persons might actually increase the risk of transmission.

HOW YOUR MASK COULD PROTECT YOU AND OTHERS?

Even a simple mask is very effective at trapping droplets from coughs and sneezes. A recent study published in *Nature* from the University of Hong Kong and the University of Maryland REF5 revealed that masks were able to stop most virus-laden respiratory droplets and some of the virus-laden aerosols. Experts say there is

more variation in how much protection homemade masks provide against incoming germs, depending on the fit and quality of the material used. But the bottom line is, there is no need of a super-efficient mask as long as use of a mask is practiced in combination with social distancing and frequent hand cleaning with alcohol-based hand rub or soap and water.

HOW TO PUT A MASK ON AND TAKE ONE OFF?

Before putting on a mask, clean hands with alcohol-based hand rub or soap and water. Cover mouth and nose with mask and make sure there are no gaps between your face and the mask. Avoid touching the mask while using it; if you do, clean your hands with alcohol-based hand rub or soap and water. Replace the mask with a new one as soon as it is damp and do not re-use single-use masks. To remove the mask; remove it from behind (do not touch the front of mask); discard immediately in a closed bin; clean hands with alcohol-based hand rub or soap and water.

THE RISK OF WEARING A MASK

Fidgeting with a mask could introduce germs to your face and increase the risk of getting infected with virus. But the real worry about wearing a mask is that the person starts to believe it's protecting him or her more than it really is. Behavioral economists say that when people begin to feel safe, they take more risks. Masks do make us feel safer, but any benefit of wearing a mask will be quickly negated if we lose our resolve about social distancing and hand washing. Moreover, wearing a mask doesn't justify unnecessary lingering in grocery stores or spending time with friends just because you are wearing a mask. A mask alone will not protect a person from the corona virus.

WHEN TO WEAR A MASK AT HOME?

A mask is only needed in the home if someone is sick. The patient should be confined to a separate room with no or minimal contact with the rest of the household (including pets) and should use a separate bathroom if possible. Both patient and caregiver should wear masks when in contact with each other.

CAN A MEDICAL MASK BE REUSED?

Medical masks and N95 masks have been designed for one-time use. However, a number of scientists, led by a group at Stanford University, are studying the best way to sanitize masks to extend the life of the personal protective equipment used by medical workers during the current shortage.

The problem is that washing or sanitizing a medical mask will degrade it, making it less effective. Scientists have found that using UV light, heat and humidity or a hydrogen peroxide vapor could work, but the methods are

developed for use in hospitals with special equipment and are not for home use. For medical workers, one strategy is to keep a set of five masks, so they can wear a new mask every day and return to the first mask on the sixth day as studies have found that viruses usually decay faster on fabric and other porous materials than on hard materials like steel or plastic.

HOW TO CARE FOR A FABRIC MASK?

It's much easier to clean a fabric mask than a medical mask. The centers for disease control says fabric masks should be washed routinely. Experts suggest washing masks daily in a machine or a sink, using regular laundry soap and let it air dry. Although it's not necessary, it can be ironed to ensure all germs have been removed. Use of chemicals like bleach or hydrogen peroxide should be avoided as it will begin to degrade the fabric fibers, making the mask less effective.

CONCLUSION

The use of medical face masks by healthcare workers must be given priority over the use in the community. The use of face masks in public may serve as a means of source control to reduce the spread of the infection in the community by minimising the excretion of respiratory droplets from infected individuals who have not yet developed symptoms or who remain asymptomatic. It is not known how much the use of masks in the community can contribute to a decrease in transmission in addition to the other countermeasures. The use of face masks in the community could be considered, especially when visiting busy, closed spaces, such as grocery stores, shopping centres, or when using public transport, etc. The use of non-medical face masks made of various textiles could be considered, especially if due to supply problems - medical face masks must be prioritised for use as personal protective equipment by healthcare workers. This is based on limited indirect evidence supporting the use of non-medical face masks as a means of source control. The use of face masks in the community should be considered only as a complementary measure and not as a replacement for established preventive measures, for example social distancing, respiratory etiquette, meticulous hand hygiene and avoiding touching the face, nose, eyes and mouth. Appropriate use of face masks is key for the effectiveness of the measure and can be improved through education campaigns.

Recommendations on the use of face masks in the community should carefully take into account evidence gaps, the supply situation, and potential negative side effects.

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