

# Face masks are an essential tool to mitigate the ongoing SARS-CoV-2 pandemic: a call to action\*

# P. Dehgani-Mobaraki<sup>1</sup>, A. Kamber Zaidi<sup>2</sup>, J.M. Levy<sup>3</sup> on behalf of the Association Naso Sano

Rhinology

<sup>1</sup> Department of Otorhinolaryngology and Head Neck Surgery, Centro Regionale di Fibrosi Cistica, Gubbio-Gualdo Tadino Hospital, Usl Umbria 1, Italy

<sup>2</sup> Department of Otorhinolaryngology and Head Neck surgery, Mahatma Gandhi Memorial Medical College, Indore, M.P. India <sup>3</sup> Department of Otolaryngology-Head and Neck Surgery, Emory University School of Medicine, Atlanta, GA, United States Rhinology Online, Vol 3: 157 - 159, 2020 http://doi.org/10.4193/RHINOL/20.065

\*Received for publication: September 6, 2020

Accepted: October 19, 2020 Published: October 24, 2020

# To the Editor,

Over the past several months, an increasing volume of information has expanded awareness regarding the transmission of SARS-CoV-2, the novel coronavirus associated with COVID-19. Following the pandemic declaration by the World Health Organization (WHO), global authorities immediately took measures to reduce the transmission and subsequent morbidity associated with this highly contagious disease. However, despite initial success in "flattening the curve" of viral transmission, many areas of the world are currently experiencing an increase in community transmission, threatening to replicate the early public health emergencies experienced by Italy<sup>(1,2)</sup>. In addition, the possibility of contact tracing through geosocial applications and public service platforms have been met with variable interest <sup>(3)</sup>. Given current spread and the upcoming influenza season, it is essential that we use our voices as experts in upper airway health and disease to educate and encourage all communities to adopt appropriate protective measures, including the routine use of facemasks.

Recent studies have identified the sinonasal epithelium as a clinically important site for SARS-Cov-2 infection. In addition to the first mucosal tissue exposed to many airborne viral illnesses, several cellular components of the sinonasal epithelium highly express the ACE-2 receptors bound by SARS-Cov-2. This may explain the unique olfactory symptoms experienced by many patients with COVID-19 <sup>(4,5)</sup>. A simple physical barrier could effectively impact this route of transmission by both minimizing the spread of viral production, as well as one's exposure.

While social distancing is an important aspect of prevention, it is not universally protective. On passive exhalation, respiratory droplets >0.1 mm, depending on particulate size, humidity and temperature will either evaporate or fall upon a surface within

a 2-meter (6.56 foot) range. However, coughing or sneezing propels droplets with a "muzzle velocity" of up to 50 meters/second, traveling distances as far as 6 meters (19.69 feet)<sup>(6)</sup>. In such cases, "safe social distancing" of 6 feet may not protect from viral transmission. The partial filtering offered by masks needs to be promoted as an essential component of standard preventative practice.

While the protection provided by facemasks varies by design, there is a benefit offered by all. In an experimental simulation comparing the filtering capacity of homemade (DIY) cloth, procedural and FFP2 certified, or N95, masks, Van der Sande et al. found that all types of masks reduced aerosol exposure and remained relatively efficacious over time <sup>(7)</sup>. FFP2 masks filtered out more than 99% of particles, leading to a reduction of inhaled aerosol load by 100-fold, while surgical and DIY masks lowered aerosol load by 2-4-fold, offering significant protection from inhaled aerosols. Further, significant reductions in exhaled particulates were associated with FFP2 and procedural masks, but not DIY.

There are countries like South Korea, Japan, Singapore, and even the epicenter of the pandemic - China - that seem to have controlled the spread of COVID-19. It is essential to highlight that one of the major guidelines these countries followed to contain the spread of the disease was the mandatory use of protective masks/covers in public. In Beijing, a study of community transmission found that consistent public mask use was associated with a 70% reduction in the risk of spreading SARS <sup>(B)</sup>. Countries around the world are therefore implementing face mask distribution strategies to accompany requirements for public use. Examples include Singapore, which has installed facemask vending machines to distribute over 5 million to its residents for free, and Hong Kong, which is currently distributing close to 8

#### Face masks essential in mitigation of SARS-CoV-2

SPECIAL CONSIDERATIONS		
Smoller airways : increased chanc Children < 2 years of age Older children usually not recommended to wear masks Compliance issues (May inadvertently attempt to either remove/adjust it) Advised to stay home Repetitive touching of face favor	es of suffocation * Masks in children Deaf child - Inability to understand facial expression - Masks wearing discomfort (cochlearimplants/soft bands/hearing aids) - Mask induced sound attenuation - Use of <i>clear window masks</i> might help	Instructions for parents         • Educate and train children about safety measures and the correct technique to wear and remove the mask.         • Special instructions should be given in simple terms such as :         (1) Wash hands before putting on a mask;         (2) Cover both the nose and the mouth with no gaps between the face and mask         (3) Avoid constantly touching the mask to readjust it         (4) Avoid touching the outer contaminated surface of the mask         (5) Replace the mask if it becomes damp.         At school: focus on hand hygiene, distancing and mask wearing
Carbon dioxide (CO2) re-breathing                Disposable filtering facepiece respirators (FFR) with exhalation valves (EVS)             classified as M95 FFR masks <sup>1</sup> : designed to avoid the increase in carbon dioxide             (CO2) levels, heat, and humidity inside the mask, with oxygen levels below             and bit workplace standards <sup>-1</sup> leading to symptoms of discomfort, fatigue,             dizziness, headache, muzular weakness, drowsiness or a physiological impact <sup>4</sup> on users. <sup>1</sup> However, it should be highlighted that exhalation valves can also be             a potential dangerous source of infection spread if the wearer is COVID positive             and actively shedding the virus. In such situations, surgical masks would be a             better and safer option.                 Additionality, the FFP2-3 should be reserved just for people expected to be in             contact with COVID positive patients for long periods of time (in the operation             the artif merime and and the staff pre-screened and marked safe.                 The wear time might impact the comfort. A greater mean tolerance time noted             for M95 FFR/Surgical mask (c1 a.1) <sup>and</sup>	Diagnostic and Surgical procedures Assol rigid endoscopies : Patients should be advised to wear a mask covering their mouth, in cases of inadvertent sneezing. Fiexible nasal endoscopy: patients should be advised to wear a mask covering their mouth Laryngelezamination: Tracheostomized patients should have their stoma covered by surgical mask. Microscopic insome patients might elicit a vagal response induced cough and hence the patients should rear amsk. Microscopic surgical procedures: The surgeons might encounter difficulties using the eye piece with the face shield on.	Constraint         Tracheotomized patients *           - Use of closed-circuit ventilation, heat motisture exchanger with a bacterial/viral filter over the stoma and cuffed tracheostomy tables with in-line suction might be useful.           - Irrespective of the tracheostomy status, all COVID suspected patients should wear a surgical mask to cover the nose and the mouth and if tolerable, the stoma should be covered by a simple surgical mask.           - Usual face masks reduce acoustic transmission preventing lip reading.         • PE makes it more uncomfortable for the patients wearing hearing devices           - A clear window also called the set-through musis have been designed         • Severe respiratory illness, cystic fibrosis, asthmatic tendencies, cancer patients, patients on chemo/radio therapy and other immunocomported conditions : wear mask at all times           - Severe respiratory illness, cystic fibrosis, and the cover as mask at all times         • Recovered patients of COVID-19 : A double-edged sword           Masks might offer self-protection. Touching and reusing contaminated masks might be a concern.         • Recovered patients of COVID-19 : A double-degd sword
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Figure 1. Special considerations.

million masks with two each to kindergarten and primary pupils under their free mask scheme: CuMask+<sup>(9)</sup>.

As with hand hygiene and physical distancing, population compliance plays a key role in the success of any epidemiologic intervention. For example, Vietnam has had a commendable response to the outbreak. With a total of 1,007 confirmed cases and a death rate/100,000 population of 0.03 as of August 2020, it has set an example for the world. A habitual mask-wearing population, early intervention, vigorous quarantine policies and complete contact tracing have helped Vietnam in effectively fighting COVID-19.

The WHO has reversed its early position on wearing masks in public, during home care, and in healthcare settings in areas that have reported cases of COVID-19<sup>(10)</sup>. As healthcare providers with expertise in the head and neck area and an ethical obligation to advocate for the health of our patients and communities, we must leverage the voices of our professional societies to support the universal use of protective facemasks as long as community transmission of the novel coronavirus remains a threat. There are some special considerations regarding the use of mask that needs to be discussed with the community (Figure 1). Clear guidelines for universal use of personal protective equipment are essential to limit the infection spread as communities around the world continue to grapple with this evolving pandemic. Wearing a mask is one such simple measure that would help contain the virus. But as the Little Prince said: "The essential is invisible to the eye".

### Acknowledgments

The authors would like to thank the members of the Ethical Committee and the scientific committee members for their valuable feedback.

## Authorship contribution

Conception or design of the work: PDM; Data collection, analysis and interpretation: PDM, AKZ; Drafting the article and final approval of the version to be published: PDM, AKZ, JML.

#### **Conflict of interest**

Association Naso Sano is a non-profit volunteer organization that promotes Otolaryngology research and treatment, focusing mainly on the prevention of diseases involving the nose, sinuses and head neck cancers. Based in Corciano in the Umbria region of Italy. https://www.nasosano.it

# Funding

Non declared.

#### **Consent for publication**

Not applicable.

# Availability of data and materials

Not applicable.

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Puya Dehgani-Mobaraki, MD, MS (ORL) Founder and President, Association Naso Sano Consultant Department of Otorhinolaryngology and Head Neck Surgery Centro Regionale di Fibrosi Cistica-Gubbio-Gualdo Tadino Hospital Usl Umbria 1 Italy

Tel: +39-32-9316 1405 E-mail: dehganipuya@gmail.com

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