Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Public Health 183 (2020) 67–68

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Letter to the Editor

The facemask in public and healthcare workers: a need, not a belief

Since the declaration of the COVID-19 pandemic, a lot of data have invaded our lives, and the conflicting findings have caused us to be frantic about the correct course action. Although the application of social distancing has been accepted worldwide, the level of enforcement varies in each country ranging from voluntary to strict legal measures. Some countries are currently verifying the utility of these measures.[1] Despite these steps, the number of infections and deaths is continuing to increase worldwide, posing a responsibility for the most developed countries to step up in this time of crisis to support the most vulnerable layers of our society. The overwhelming stress and level of danger that our frontline health care is subjecting themselves to in this pandemic as they perform their duty to serve the public has triggered astonishing questions of whether they are just a resource that can be exploited, exhausted, and used up.[2] During this pandemic, numerous healthcare workers in the world have died, and many have committed suicide in a tragedy that has touched all continents.[3,4] Our infrastructure is posing a considerable risk to our healthcare workers because numerous hospitals in Canada are old and their ventilation systems are not up to date to handle a pandemic.[5] In numerous hospitals with a lack of window access, the circulation of aerosols may be quite dramatic for both patients and healthcare workers. The 6-feet distancing is not respected inside many hospitals in several provinces because corridors, stairwells, and passages are narrow. Although experts have expressed different opinions on the airborne status of SARS-CoV-2, the virus has been isolated in the ventilation systems of several hospitals, which endangers everyone without proper personal protective equipment (PPE) in the building. The recent proof of aerosolized droplets being able to travel well over 6 feet supports the question of whether our current social distancing guidelines are even adequate.[6] There have been anecdotal reports of hospital administrative bodies not allowing their staff members from wearing their own PPE originating from outside of the hospital's supplies, with the concern of not being able to validate if the quality is not sustainable from both a legal and an ethical point of view. The concept of *primum non nocere* should still be valid for all administrators.[7] The preposterous indication that some PPE may be faulty argues against our charter of freedom. It should not be an excuse to forbid healthcare workers or patients entering hospital facilities to wear their PPE.[5] The number of community transmission is increasing exponentially, and asymptomatic carriers can infect their close contacts.[8] Healthcare workers, patients, and visitors entering the hospital facilities should be allowed to wear their PPE even when they are not interacting with symptomatic patients. In facilities where social distancing is not or cannot be implemented (e.g., laboratories, elevators, and stairwells), wearing any type of PPE may help prevent an airborne infection. A combination of the filtering action of the fabric and the seal between the mask and the face forms the basis of reducing aerosol exposure in people wearing masks.[9] Recently, Bartoszko et al.[10] reported on four randomized clinical trials (RCTs), which were meta-analyzed and adjusted for clustering. The authors conclude that there is some evidence suggesting that medical masks and N95 respirators offer similar protection against viral respiratory infection, including coronavirus in healthcare workers during non–aerosol-generating care. In a submitted manuscript, not yet peer-reviewed, Jefferson et al.[11] report on a meta-analysis of 14 trials on the use of masks vs. no masks showing no effect in either healthcare workers or community settings and no difference between the N95 respirators and other types of masks. However, the trials had not been carried out in aerosol-generating procedures and most of the studies showed poor design and incompleteness. The science would suggest that facemasks are crucial for everyone, not only healthcare workers. It does not make sense to continue to stockpile them and limit their use. Facemasks need to be used more widely and compulsorily. It has been calculated that wearing a simple cotton mask will reduce the amount of virus transmitted to a neighbor by 36 times.[12] The transmission rate (R_0) is a parameter that indicates how contagious an infectious disease is. An R_0 of 1.0 indicates each existing infection causes one new infection. In the case of the 1918 pandemic flu, the R_0 was 1.8. Although initially the R_0 of SARS-CoV-2 was 2.4, more recent and comprehensive data indicate that it was 5.7.[13] In other words, without containment measures, SARS-CoV-2 spreads far and fast. Unfortunately, many countries were slow in implementing strong public health measures, hindered by trying to maintain political correctness instead. This was evidenced by the late decision to ban non-essential air/land/sea travel in many countries. If most people wear a mask in public at any time, the transmission rate can easily decrease beneath 1.0, thus stopping the spread of the disease and limiting the long-standing lockdown measures.[13] The number of COVID-19 cases in South Korea started decreasing in February 2020, when the government supplied facemasks to every citizen. In contrast, the number of cases in Italy continued to climb in the same time period where facemasks were not freely supplied.[14] It is important to emphasize that while a protective mask may reduce the likelihood of infection, it will not eliminate the risk, particularly when a disease has more than one route of transmission, as identified in SARS-Cov-2. Vaccines against COVID-19 take time to develop. In a situation where there is a short supply of PPE, an improvized facemask should be viewed as the last possible alternative if a commercial product is not available. In China, Hong Kong, Taiwan, Japan, South Korea, and Thailand, the broad assumption is that anyone could be a carrier of the virus, even seemingly healthy people, leading to terrific results in these countries with the widespread wearing of facemasks. The

https://doi.org/10.1016/j.puhe.2020.05.009

widespread public acceptance of using facemasks in these countries, even before the onset of COVID-19, may be attributed to their experience of facing several epidemics in the past. To a certain extent, pollution has triggered the use of facemasks for protection in these countries.[15]

In conclusion, all citizens should wear a mask. Although strict isolation and social distancing measures can flatten the infectious curve, the use of facemask needs to be encouraged and facilitated where the 6-feet social distancing cannot be implemented because of physical barriers. Preservation of N95 respirators for high-risk, aerosol-generating procedures in this pandemic should be considered when in short supply, but surgical facemasks should be provided to everybody.

References

1. Sjödin H, Wilder-Smith A, Osman S, Farooq Z, Rocklöv J. Only strict quarantine measures can curb the coronavirus disease (COVID-19) outbreak in Italy, 2020. *Euro Surveill* 2020;**25**(13).
2. DocCheck. *Ich bin es wert, geschützt zu werden*. https://www.doccheck.com/de/detail/articles/26464-ich-bin-es-wert-geschuetzt-zu-werden?utm_source=DC-Newsletter&utm_medium=email&utm_campaign=DocCheck-News-&utm_content=asset&utm_term=article&sc_src=email_323446&sc_lid=19718799&sc_uid=xrOB0Z7pzf&sc_llid=171015&sc_customer-=f68a7adc806cd41162f1a3d19b5d0eb4; 2020.
3. Liu N, Zhang F, Wei C, et al. Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: gender differences matter. *Psychiatr Res* 2020;**287**:112921.
4. Bansal P, Bingemann TA, Greenhawt M, et al. Clinician wellness during the COVID-19 pandemic: extraordinary times and unusual challenges for the allergist/immunologist. *J Allergy Clin Immunol Pract* 2020 (*in press*).
5. Shanafelt T, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA* 2020 (*in press*).
6. Bourouiba L. Turbulent gas clouds and respiratory pathogen emissions: potential implications for reducing transmission of COVID-19. *JAMA* 2020;**323**(18):1837–8.
7. Banna G, Curioni-Fontecedro A, Friedlaender A, Addeo A. How we treat patients with lung cancer during the SARS-CoV-2 pandemic: primum non nocere. *ESMO Open* 2020;**5**(2).
8. Yu X, Yang R. COVID-19 transmission through asymptomatic carriers is a challenge to containment. *Influenza Other Respir Viruses* 2020 (*in press*).
9. Lavoie J, Cloutier Y, J.L., G.M. *Guide on respiratory protection against bioaerosols–recommendations on its selection and use*. Quebec, Canada: IRSST; 2007.
10. Bartoszko JJ, Farooqi MAM, Alhazzani W, Loeb M. Medical masks vs N95 respirators for preventing COVID-19 in health care workers A systematic review and meta-analysis of randomized trials. *Influenza Other Respir Viruses* 2020 (*in press*).
11. Jefferson T, Jones M, Al Ansari LA, et al. Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 1 - face masks, eye protection and person distancing: systematic review and meta-analysis. *medRxiv* 2020. 2020.2003.2030.20047217 (*preprint, under review*).
12. Bae S, Kim MC, Kim JY, et al. Effectiveness of surgical and cotton masks in blocking SARS-CoV-2: a controlled comparison in 4 patients. *Ann Intern Med* 2020. M20-1342.
13. Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. High contagiousness and rapid spread of severe acute respiratory syndrome coronavirus 2. *Emerg Infect Dis* 2020;**26**(7).
14. Greenhalgh T, Howard J. Masks for all? The science says yes. In: *Fast.Ai*; 2020.
15. Carlsten C, Salvi S, Wong GWK, Chung KF. Personal strategies to minimise effects of air pollution on respiratory health: advice for providers, patients and the public. *Eur Respir J* 2020 (*in press*).

C.M. Sergi*
Stollery Children's Hospital, University of Alberta, Edmonton, AB, Canada

A.K.C. Leung
Alberta Children's Hospital, University of Calgary, Calgary, AB, Canada

* Corresponding author.
E-mail address: sergi@ualberta.ca (C.M. Sergi).

21 April 2020
Available online 13 May 2020