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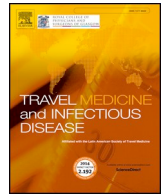
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## Travel Medicine and Infectious Disease

journal homepage: [www.elsevier.com/locate/tmaid](http://www.elsevier.com/locate/tmaid)**COVID-19: Facemask use prevalence in international airports in Asia, Europe and the Americas, March 2020***Dear Editor,*

Since the onset of COVID-19, the demand for facemasks have exceeded supplies leading to a global shortage created by extensive use by the community. Facemask is among the tools for travelers and health professionals highlighted by Chiodinie et al. on February 7, 2020 in the *Travel Medicine and Infectious Disease* journal [1]. However, the effectiveness of facemask use in community settings for the prevention of COVID-19 has been controversial [1–4]. Because of lack of evidence, the World Health Organization recommend against wearing masks in community settings for the prevention of COVID-19. Although disposable surgical masks were designed for the protection of health-care workers during occupational exposures, face masks became popular among non-health professionals during the SARS epidemic of 2003 and the 2009 *pdm H1N1*.

The role of droplet nuclei transmission of airborne infections was first proposed by Wells in the 1930s [5]. When an individual in contagious period coughs or sneezes, numerous droplets containing infectious particles are released to the atmosphere requiring the need for barriers such as facemasks and social distancing for prevention of their spread to other individuals. Studies have indicated that facemasks reduce the risk of contracting influenza-like illnesses in households, especially when combined with proper wearing, handwashing and social distance [4]. In many Asian countries, facemasks are routinely used by the general public to reduce exposure to airborne pathogens. In China, since the emergence of COVID-19, all people in all seriously affected areas are required to use faces masks and is enforced by the Chinese authorities [3].

To our knowledge, there have not been any published reports on the prevalence of face mask use since the emergence of the ongoing COVID-19 pandemic. The only reported method of assessing the prevalence mask use at the population level was the use of photo-epidemiology at mass gatherings during the 2009 *pdm H1N1* and the 2013 MERS outbreak [6]. We applied this method and assessed the prevalence of fa-

cemask use among persons seen in four international airports in Asia, Europe, and the Americas. We obtained consecutive photographs at one-minute intervals at entrance to check-in areas and arrival exit areas of airports. In these photographs, we counted the total number of persons with full face views and those with fully covered facemasks.

We found that, facemask use rate measured in airport settings was the highest in Asia (Bangkok Airport, about one half), followed by South America (Lima Peru), and the lowest in the USA (Atlanta Airport, 2%) (Table 1, Photo). Though the situation is not comparable, facemask use rate in Bangkok and Peru are 2-3-fold higher than observed in previous report of facemask use during 2009 *pdm H1N1* and MERS outbreaks among people who attended mass gatherings. [7] Our results may not be representative of the prevalence rates of facemask in these geographic locations. Given that the population seen in airports are transient, facemask use rate observed in international airports may vary by the geographic area of origin of persons seen at ariports. Other factors are variation in exposure to facemask relevant advisories, the availability of facemasks in their respective home communities, and in perceived threat of COVID-19 transmission at the time of travel. Photo-epidemiologic method of assessing facemask is inadequate to verify the type of facemask used such as loosely fit surgical masks or fit-tested N95 masks. Also, this method is unable to distinguish airport staff from non-staff, and travelers from non-travelers, whose habits with respect to facemask use may vary. Finally, this method is unable to ascertain the continuity of mask use while at airport or during travel.

Some public health experts have advocated for the continued use of facemasks as a tool to reduce the spread of COVID-19 until definitive evidence emerges against its use [2]. Our findings of double-digit variation in facemask use rates between regions significantly affected by COVID-19 underscores the need for research to provide evidence for or against the utility of facemask use in COVID-19 transmission and also to provide uniform recommendations to all people. We believe these preliminary findings will help policy makers assess supply chain dynamics, and the need for relevant public health advisories.(See Photo)



**Photo.** Passengers exiting Lima airport, Peru. Photo by co-author, Ernesto Gozzer.

**Table 1**

Presence of facemask among persons seen at select international airports, March 2020.

Airport, Country	Date	Number of Photo Frames	Number of Faces identified	Presence of facemask
Bangkok, Thailand	March 6, 2020	38	279	46%
Paris, France	March 7, 2020	36	356	4%
Boston, USA	March 7, 2020	30	371	3%
Atlanta, USA	March 7, 2020	48	554	2%
March 11, 2020 Declaration of Pandemic by W.H.O.				
Lima, Peru	March 12, 2020	21	237	27%

## References

- [1] Chiodini J. Maps, masks and media- Traveller and preactioner resources for 2019 novel coronavirus (2019 nCoV) acute respiratory virus. *Trav Med Infect Dis* 2020:101574 <https://doi.org/10.1016/j.tmaid.2020.101574>. (in press).
- [2] World Health Organization. Advice on the use of masks in the community, during home care and in health care settings in the context of the novel coronavirus (2019-nCoV) outbreak: interim guidance. <https://apps.who.int/iris/handle/10665/330987> 29 January 2020.
- [3] Leung CC, Lam TH, Cheng KK. Mass masking in the COVID-19 epidemic: people need guidance. *Lancet* 2020 Mar 3. [https://doi.org/10.1016/S0140-6736\(20\)30520-1](https://doi.org/10.1016/S0140-6736(20)30520-1).
- [4] van der Sande M, Teunis P, Sabel R. Professional and home-made face masks reduce exposure to respiratory infections among the general population. *PLoS One* 2008;3:e2618 <https://doi.org/10.1371/journal.pone.0002618>. (doi:10.1371/journal.pone.0002618).
- [5] Wells WF. On air-borne infection. Study II. Droplets and droplet nuclei. *Am J Hyg* 1934;20:611–8.

- [6] Elachola H, Assiri AM, Memish ZA. Mass gathering-related mask use during 2009 pandemic influenza A (H1N1) and Middle East respiratory syndrome coronavirus. *Int J Infect Dis* 2014 Mar 1;20:77–8.

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