



LETTERS

COVID-19: SHOULD THE PUBLIC WEAR FACE MASKS?

Social distancing for covid-19: is 2 metres far enough?

Robert C Schroter *emeritus professor*

Department of Bioengineering, Royal School of Mines Building, Imperial College, London SW7 2AZ, UK

Introducing blanket policies for the public to wear face masks has major problems, many of which have been pointed out.¹⁻³ “In theory, wearing masks could instil a false sense of security,”¹ but “given the gravity of the pandemic, indirect evidence of benefit combined with the low risk of harm should outweigh the absence of direct evidence supporting mask wearing by the general public.”²

There is another important, yet not widely debated, risk regarding distancing and masks that must be carefully considered because it could have serious repercussions. We have shown how an exhalation behaves, including how far it can travel,⁴ and described the underlying transport mechanisms involved. Small and larger droplets, even in short small breaths, are transported far beyond 1 metre. For larger volume, more energetic breaths, the exhalation and droplet burden travel well beyond 2 metres.

A safe separation of 1 metre cannot be relied on in any circumstances. Although limited scientific evidence supports 2 metres in the present context, we have clear scientific evidence, based on direct experimentation in humans in real life, that a simple 2 metre distance rule might be inappropriate for preventing droplet transmission between people in many situations.

Airborne outdoor tobacco smoke is a reasonable surrogate for small droplets suspended in the air and can help inform the present debate. In some countries, public health legislation already exists for outdoor tobacco smoke, requiring smokers congregating in building entrances, for example, to remain

variably 2-10 metres from the public.⁵ An experimental study found that exhaled outdoor tobacco smoke was detectable over 9 metres from its source.⁶

This known behaviour of exhaled air is vitally important when considering social distancing advice particularly regarding exercise, such as running, which is associated with large volume exhalations and forces. In such circumstances a 2 metre separation is most unlikely to be an effective barrier. Its use should be urgently reviewed.

Competing interests: None declared.

Full response at: <https://www.bmj.com/content/369/bmj.m1442/rr-8>.

- 1 Javid B, Weekes MP, Matheson NJ. Covid-19: should the public wear face masks? *BMJ* 2020;369:m1442. 10.1136/bmj.m1442 32273278
- 2 Greenhalgh T, Schmid MB, Czypionka T, Bassler D, Gruer L. Face masks for the public during the covid-19 crisis. *BMJ* 2020;369:m1435. 10.1136/bmj.m1435 32273267
- 3 Martin GP, Hanna E, Dingwall R. Face masks, the precautionary principle, and evidence-informed policy [electronic response to Greenhalgh et al. Face masks for the public during the covid-19 crisis]. *BMJ* 2020. <https://www.bmj.com/content/369/bmj.m1435/rr-43>
- 4 Denison D, Porter A, Mills M, Schroter RC. Forensic implications of respiratory derived blood spatter distributions. *Forensic Sci Int* 2011;204:144-55. 10.1016/j.forsciint.2010.05.017. 21216361
- 5 Kaufman P, Griffin K, Cohen J, Perkins N, Ferrence R. Smoking in urban outdoor public places: behaviour, experiences, and implications for public health. *Health Place* 2010;16:961-8. 10.1016/j.healthplace.2010.05.012. 20576460
- 6 Hwang J, Lee K. Determination of outdoor tobacco smoke exposure by distance from a smoking source. *Nicotine Tob Res* 2014;16:478-84. 10.1093/ntr/ntt178. 24218368

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>