

The possible impact of mask wearing outside the home on the transmission of COVID-19

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Aim:

To assess the possible impact of mask-wearing outside the home on the transmission of COVID-19

Background and methods

NERVTAG and SPI-M have recently reviewed the evidence on mask-wearing, in addition to other groups such as DELVE. Broadly, the evidence consists of two sorts of studies: mechanistic studies that measure the physical properties of droplets and aerosols as generated by normal or forced respiration and the impact that masks may have on limiting the dispersion of these particles; and epidemiological studies of the effects of masks on risk of acquiring or passing on respiratory infections (mostly based on influenza). The latter evidence base takes account of the use of masks in more realistic settings and includes the effects of adherence and that respiratory viruses can be spread via multiple routes, including fomites. Within the epidemiological evidence, there have been 10 randomised controlled trials which have been reviewed and summarised in a number of meta-analyses. Overall, these trials show a modest, non-significant, effect of mask wearing if both infected individuals and uninfected (presumed susceptible) individuals wear the mask in high risk settings (such as the home) and a lesser impact if just one or other of these groups wears the mask. However, it is difficult to accurately ascertain the level of compliance with mask-wearing in these studies and extrapolation from influenza and other respiratory viruses to COVID-19 is not straightforward. Finally, a recent study of the transmission of COVID-19 in Hong Kong (Cowling *et al.* Lancet Public Health 2020, DOI:[https://doi.org/10.1016/S2468-2667\(20\)30090-6](https://doi.org/10.1016/S2468-2667(20)30090-6)) suggested that in early February the reproduction number was around 2, yet 75% of the population reported wearing masks. If the reproduction number would have been about 2.8-3 without interventions and all of the reduction can be ascribed to mask-wearing then this gives a possible upper-bound on the use of masks to reduce transmission.

We used our model, based on the BBC Pandemic contact survey (previously reviewed by SPI-M and SAGE (Kucharski *et al.*)) to assess the possible impact of mask-wearing outside the home. The results are shown in the table below and suggest that mask-wearing may have a modest impact if compliance is high.

Table: Estimated reduction in transmission from wearing facemasks in school, work and other settings. We assume 70% of cases are eventually symptomatic and asymptomatic individuals are only 50% as infectious.

Scenario	Effective reproduction number	Effective reduction in transmission
No control	2.7	–
Self-isolation (SI)	1.7	37%
SI & HH quarantine	1.6	41%
SI & HH quarantine & 90% wearing masks outside with 5% reduction in transmission per contact	1.5	45%
SI & HH quarantine & 90% wearing masks outside with 10% reduction in transmission per contact	1.4	47%
SI & HH quarantine & 90% wearing masks outside with 20% reduction in transmission per contact	1.3	52%
SI & HH quarantine & 90% wearing masks outside with 30% reduction in transmission per contact	1.2	57%