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Face masks help control transmission of COVID-19

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In their paper on self-reported face mask wearing and control of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission in the US, Rader and colleagues[1] showed an elegant ecological analysis of data from across the US, estimating the effect of face mask use on the transmission of COVID-19 infection. The authors made use of online survey responses of mask usage from thousands of individuals across the country over time to measure the relationship between mask wearing and community transmission control, as characterised by the instantaneous reproductive number. Based on 378 207 responses, an increase in community transmission control with increasing face mask usage was found, which remains after accounting for other differences across the country, such as mobility, and control is enhanced when mask wearing is combined with physical distancing. Rader and colleagues support an increasingly convincing body of evidence that speaks to the importance of mask wearing to mitigate ongoing waves of transmission as vaccines begin to be rolled out.

Face mask mandates have been divisive in many countries. The face mask debate has been complicated by the two modes by which wearing a mask affects transmission: masks might protect the wearer from infection or masks might prevent the wearer transmitting the virus, if infected. For preventing transmission, non-targeted interventions, such as face masks, are especially important given the high proportion of asymptomatic and paucisymptomatic cases and the risk of transmission from these individuals, and from the presymptomatic period.[2] An ecological analysis, such as that of Rader and colleagues, measures the overall effect of face mask wearing on transmission, and thus obviates the need to disentangle the two modes of effect. The findings support laboratory evidence[3] and other ecological studies[4] that have shown that face masks do indeed reduce the overall transmission of SARS-CoV-2.

Face mask wearing has also been part of the response of many countries that have controlled SARS-CoV-2 well.[5] However, observational and laboratory studies are usually considered to create weak evidence for an intervention than the gold standard of a randomised controlled trial. There has been one randomised controlled trial[6] of face masks that compared infections in participants who were given and asked to wear masks versus those who were not. Of the two modes through which face mask wearing could affect transmission, this trial was designed to measure protection to the wearer. The authors could not discern any such effect on the wearer's risk of infection, although the design of the trial has been criticised for being underpowered.[7] Testing the second mode of effect, whether masks affect the transmission of SARS-CoV-2 from the wearer to others, remains difficult. A hypothetical trial to test the second mode of effect would need masks assigned, or not, to the participants, and to recruit their contacts to compare infection rates between the contacts. Such a trial would be logistically challenging, bordering on infeasible, and potentially unethical. However, well conducted, real-world, observational studies, such as that of Rader and colleagues, probably provide the strongest evidence to inform policy.

In most of the population, mask wearing is a cheap and low-risk form of protection, such that the promotion of masks needs a lower evidence base than other interventions. However, there are two aspects of mask wearing to be concerned about. First, there might be groups, such as young children, in which masks have deleterious effects, such as to childhood development,[8] and guidelines should consider this evidence. Second, care should be taken to avoid risk-compensation among people wearing a mask whereby people feel protected due to wearing a mask and so change their behaviour. The study of Rader and colleagues suggests that, in the US, risk-compensation does not cancel out the positive effect of face masks, but whether the US is representative of other countries is arguable.[1] On a policy level, the possibility of risk compensation, uncertainty about the magnitude of the reduction in transmission due to masks, and the result that the effect of face masks can be even greater when combined with other control measures, means maintaining other measures, such as physical distancing, contact tracing, testing, isolation, and quarantine, is still necessary.

The evidence is clear: masks work. However, their use is a non-targeted control measure, wherein the whole population is involved, rather than just known or suspected cases. Buy-in from society is necessary for the

success of the intervention. Rader and colleagues show a relationship between transmission and reported mask usage but did not see a step change in transmission when statewide mask mandates were introduced.[1] This finding suggests that, in the US, there is a disconnect between rules, messaging, and actions, and that further sociobehavioural research is needed on what motivates people who choose not to wear a mask to protect themselves and those around them.

We declare no competing interests.

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