COVID-19 mythbusting series

What evidence supports the use of face coverings? (part two)

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In this second video in our mythbusting series on face coverings, we will current evidence supporting the use of face coverings to prevent transmission of the virus responsible for COVID-19 from yourself to others. In this area evidence is rapidly developing, with government advice frequently responding to such advances. To gain access to most recent advice, please visit the UK government's guidance page via the link displayed at the bottom of this slide.

Slide 2

It is important to first understand more about the types of clinical evidence available, and how they rank in respect to each other… otherwise known as the 'clinical evidence pyramid'. In terms of quality of evidence to answer a clinical question, pre-clinical research is generally considered to provide the lowest quality, consisting of 'test-tubed based' – in vitro – or animal research. Of clinical research, clinicians reporting individual cases or series of cases, or providing general expert opinion, is considered of lowest quality, rising to case-control studies, cohort studies and randomised controlled trials. Case-control and cohort studies are observational in nature, and attempt to record individuals exposed or not exposed to particular risk factors (i.e. wearing or not wearing masks), and then seek to assess such factors against presence of disease (i.e. becoming infected with COVID-19).

Randomised controlled trials seek to prospectively test the effectiveness of an intervention in preventing disease in a randomly selected group of study participants, compared against a group of participants not given the intervention. Participants and researchers are also frequently 'blinded' to the intervention, so for example in relation to the ongoing COVID-19 vaccine trials, all participants might receive an injection, but only a proportion will receive the trialled COVID-19 vaccine, whereas the remainder will be provided with a vaccine for an existing respiratory disease (i.e. influenza) or a placebo. Researchers and participants will then only know who has received which at the end of the trial. Given these careful safeguards, RCTs are considered to provide the highest individual study quality of evidence and the lowest risk of bias. Finally, systematic reviews or meta-analyses of such RCTs provide further rigour, as they attempt to collate ideally many RCTs to address a particular issue, and then form comparisons of their findings. The goal is to find out if there is a generalised consensus on a clinical question, increasing confidence that an intervention is widely effective across different populations.

With the issue of face coverings, this is where we hit our first roadblock. Unfortunately, to date there is a complete lack of highest quality evidence provided by RCTs, and therefore meta-analyses, for COVID-19. This does NOT mean there is no evidence, but rather no trials have yet been completed. As such, we need to therefore rely on lower quality evidence to address the question of whether widespread use of face coverings is effective at reducing transmission of COVID-19. In the ideal world, such decisions would be delayed until highest quality evidence were available, but the urgency of the current situation does not afford us the time required to complete such studies, unfortunately. So, what of the evidence we do have?

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With regards to 'test tube' or 'in vitro' research, laboratory work has demonstrated that all available face coverings are able to block outward passage of droplets of varying sizes, including those of most relevance for COVID-19. However, whilst surgical masks and N95 respirators approached or achieved 100% blockage for submicron droplets and larger, cloth masks were associated with only up to 50% blockage. While such lower cloth mask efficiencies could still be adequate for general public use, these findings did lead to a recommendation that cloth masks should not be used in high risk environments, such as hospitals. It was also noted that cloth mask are likely to be variable in quality, and whilst the authors of this study did design what they considered to be a 'typical' mask, such variability does increase the difficulty of assessing how effective cloth masks might be when used in 'real life', so to speak.

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Although still relatively low on the clinical evidence pyramid, case reports and series from the current pandemic can provide important context to this debate. In support of social distancing alone not being enough to effectively reduce risk of infection was a recent example of a social distanced choir attended by an unknowingly infected individual. COVID-19 infection was later confirmed in over 30 members of the choir, at least two of which have now sadly died. It should be noted that its thoughts that at least 30% of those infected are 'asymptomatic' – that is they show no recognised symptoms of COVID-19 – while remaining able to infect others. As these people do not feel unwell, they are more likely to continue in their normal routines, potentially infecting others while doing so. These two pieces of evidence combined suggest a need to do more than simply to keep a distance from each other.

Other circumstantial evidence does include the fact that many countries which were initially more stringent in their response to the pandemic – including mandatory wearing of face coverings – have generally observed smaller outbreaks. Proponents of face coverings argue that this serves as a de facto demonstration of their efficacy. However, as all disease control attempts have involved multiple interventions e.g. social distancing, closed workplaces, restricted travel it is challenging to determine exactly which of these combined interventions might be effective, or most effective.

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Corresponding with our highest quality of evidence currently available, though no meta-analyses of trials have been completed, some have been completed for case-control studies. Considered

together, these do form a consensus of a low to moderate effect of face coverings in reducing virus transmission. Although it is accepted that this evidence is relatively weak, this has led some to suggest that given no clear over-riding harm caused by wearing face coverings, that some evidence of benefit justifies their use – known as the 'precautionary principle'. Incidentally, this review also considered social distancing, which found a moderate reducing risk of virus transmission between 0 and 2m, with the largest decrease in risk seen between 0 and 1m, broadly supporting current social distancing recommendations of between 1 and 2m.

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Although difficult to classify within the clinical evidence pyramid, Eikenberry and others have used current available evidence to try to predict what might happen if face coverings were deployed across whole populations. This study considered both variable proportions of the population that decided to use a face covering (between 20 and 80% of the population) and variable effectiveness of such coverings (again between 20 and 80%). When a simulated outbreak was constructed for New York state, it was found that even with face coverings of 20% effectiveness used by 20% of the population, peak daily deaths were decreased compared to no face coverings being used, with these decreases becoming progressively larger as face coverings became more effective and widely used, arguably justifying their widespread deployment for the current outbreak. The authors also note that face coverings appeared to be more effective when worn early in an outbreak. It is therefore unknown what impact face coverings might have when deployed relatively late in an outbreak, or in the early stages of any 'second wave' of infections.

On a practical level, it should be noted that in countries which did not initially introduce mandatory face coverings, such as the UK and US, use of face coverings only slightly increased during the initial COVID-19 outbreak, comparing with a large proportion of the population using face coverings in countries where mandatory face covering was introduced, such as in China. These findings do seem to suggest that use of legislation is necessary to achieve widespread adoption of face coverings in public spaces.

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As you have probably learnt by now, this issue is complex! Whilst the evidence presented so far does lead me to cautiously support use of face coverings, I would like to leave you with some final considerations. Firstly, there has been much discussion about face coverings being used incorrectly and increased face touching whilst wearing a covering, decreasing the efficacy of these items. I'm sure I am not alone in having noticed face coverings only being worn over the mouth, leaving the nose exposed, for example. However, I feel care needs to be taken over confusing lack of current public knowledge on how to correctly use face coverings with a permanent inability to correctly use face coverings, and would suggest that rather than abandonment, education on correct use appears to be the clear path to take in this case. With regards to face touching, interestingly a small observational video study conducted early in the pandemic suggested that in outdoor public areas, those wearing face coverings touched their face less frequently than those not wearing coverings. This does seem to contradict public perception, and is deserving of a larger study, also including people in enclosed spaces.

Some concern has been raised about communication issues when wearing face coverings, particularly amongst those who depend on lip reading. This is a valid concern, and I support recent attempts to explore mitigating these issues through use of, for example, a clear panel within the face covering. This might also extend to groups of people who are, for medical reasons, unable to use face coverings. And I am aware of signage increasingly being used for individuals to say while they support face coverings, they are not able to use them for medical reasons.

I have already mentioned this earlier, but I would like to again say that there is no clear single 'winning' choice of face covering, and preference is likely to vary by individual. However, regardless of which face covering you choose, it should be remembered that they are not a replacement for social distancing. Several studies are in agreement that a package of interventions, including face coverings and social distancing, is likely to be most effective at reducing risk of virus transmission, rather than a single intervention alone.

Finally, although current evidence does tend to support face covering use, it is still acknowledged that the evidence base is relatively poor. However, there are a number of high-level evidence studies currently in progress that hopefully will provide more definitive answers on this challenging issue!

For more free COVID-19 resources for veterinary professionals, visit
rcvsknowledge.org/covid-19

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