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NEWS ANALYSIS

Covid-19: Are cloth masks still effective? And other questions answered

In light of new, more transmissible variants of SARS-CoV-2, **Elisabeth Mahase** examines what kinds of mask the public should be wearing, and where they should be worn

Elisabeth Mahase

Are cloth masks still recommended?

Early in the pandemic, major problems in the global supply of medical grade masks meant that the public was asked to avoid using these so that stock could be used to protect healthcare workers. At this point, bodies such as the US Centres of Disease Control and Prevention (CDC) recommended that the public wear cloth masks and even provided information on how to make them out of household items such as T shirts.¹

Many people are still wearing cloth masks, which can now be bought in many shops. But as the worldwide supply of medical grade face masks has expanded, arguments have been made that some members of the public should start wearing more protective masks such as surgical masks. This argument has been strengthened by the emergence of more transmissible variants of SARS-CoV-2, including the UK and South African variants, in response to which some countries have tightened their guidance on what types of masks are allowed.

In France, homemade masks and some shop bought cloth masks have now been banned, after the president of the government's scientific committee, Jean-François Delfraissy, said that the new variants had "completely changed the game."

French health minister Olivier Véran announced on 22 January that people in France should no longer wear homemade masks or certain industrially made fabric masks, listed as category 2. The government specified that category 1 masks filter 95% of 3 µm particles, whereas category 2 devices filter only 70%. Only three types of masks will be recommended: surgical (which filter 95% of 3 µm particles), FFP2 (which filter 94% of 0.6 µm particles), and fabric masks made to category 1 standards.

Austria has gone a step further, making FFP2 masks mandatory in indoor public spaces and sending out free packs of these masks to all residents aged over 65 and to low income households. Like the UK, the country is currently in its third national lockdown.²

Germany has made medical masks mandatory in supermarkets and on public transport. London's mayor, Sadiq Khan, wants to introduce a similar requirement on the UK capital's public transport system. The London newspaper the *Evening Standard* reported that the mayor's office was currently reviewing whether passengers should switch to higher grade masks in light of the new variants.³ The

former health secretary for England, Jeremy Hunt, has also called for FFP2 respirator masks to be made compulsory on public transport and in shops.⁴

On 1 December the World Health Organization updated its advice to recommend medical masks for people at risk of serious covid-19 illness and for people aged over 60.⁵ But this was made before it became clear how new the variants affected transmission. Commenting on the types of cloth mask the public should wear, a WHO spokesperson told *The BMJ*, "For all others, a reusable three layer fabric mask is advised. The filtration, breathability, and fit of the mask are important. If the mask is produced at home, WHO advises an inner absorbent material such as cotton, a non-absorbent fabric such as polyester outside, and a middle filter layer, such as non-woven spunbond polypropylene."

The spokesperson added that respirators and medical masks "continue to be in short supply for health workers."

Fabric masks vary in terms of protection. The consumer website Which? examined this issue and provided a list of the best reusable masks on the market.⁶

Are two masks better than one?

Some medical leaders have suggested that wearing two masks could provide more protection. Anthony Fauci, chief medical adviser to US president Joe Biden, told the US *Today* television programme that "if you have a physical covering with one layer, you put another layer on it, it just makes common sense that it likely would be more effective."⁷

New research from the CDC supports this. It has reported that transmission can be reduced by up to 96.5% if both an infected person and an uninfected person wear tightly fitted surgical masks or a cloth mask together with a surgical mask.⁸

But a WHO spokesperson, commenting in the hours before the new CDC guidance emerged, told *The BMJ* that it was not currently recommending double masking. "Based on the currently available information on the spread of variants of concern, WHO is maintaining its advice on the use of masks. We will continue to review evidence as it becomes available."

Should the public be wearing masks outdoors?

The UK's Scientific Advisory Group for Emergencies (SAGE) is considering this. In a recent paper that focused on physical distancing and face coverings in light of the UK variant B.1.1.7, SAGE said "using face coverings in a wider range of settings where people could be asymptomatic and may be in close proximity (less than 2 m)" should now be considered.⁹

The paper said, "Transmission in outdoor settings where people are distanced is likely to still be very low risk. However, it remains the case that if people are in close proximity for extended periods in an outdoor setting, there is a potential risk of transmission from the higher concentrations of respiratory particles near to an infected person. It is possible that this close range risk is greater with the B.1.1.7 variant (low confidence)."

The Department of Health and Social Care for England did not respond when *The BMJ* asked it whether the UK government was considering recommending masks outdoors.

Paul Hunter, professor in medicine at Norwich Medical School and one of the reviewers for the WHO mask guidance, said the advice may depend on the situation. "If you're outside in a big queue, and people aren't socially distancing around you, I would put a mask on. But if I'm just walking on a not overly busy high street [or] going for a walk around a village I wouldn't wear a mask," he said.

Hunter added that people should be careful not to get their mask wet, especially if they are then going to go indoors wearing the same mask. He explained, "If that material gets wet, you can't breathe through the material, and the mask then loses much of its effectiveness. So if it rains and you've got a mask on, it becomes pointless because you can't breathe through it. If it's cold outside and your breath wets the mask, as it will do, it becomes much less useful."

WHO has recommended that masks be worn outdoors when there is "known or suspected community or cluster transmission" and when physical distancing cannot be maintained.

Does the UK's mask policy need updating?

Despite the changes in other countries and calls from within the UK to update policy, a spokesperson for the Department of Health and Social Care—which does not consider cloth masks to be personal protective equipment (PPE)—told *The BMJ*, "We have no plans to make it mandatory for the public to wear PPE. The most important and effective actions members of the public can take for protection is to wear a face covering where necessary, staying at home unless leaving is absolutely necessary, and maintaining a 2 m social distance when in public."

"While our PPE supply is stable, we are clear that PPE should be reserved for frontline health and social care workers and is not recommended for use in retail and hospitality settings or by the public."

But Hunter said the government should be reviewing its policy. Speaking to *The BMJ*, he said, "I would disagree with that. I think we would have done a lot better last year if we had actually paid more attention to WHO guidance than if we tried to make it up ourselves."

Many medical bodies, including the BMA and the Doctors' Association UK, have also been calling for PPE guidance for healthcare workers to be reviewed.

A WHO spokesperson told *The BMJ*, "Based on evidence gathered from scientists, public health professionals, and national health

authorities to date, the variants appear to be more transmissible, but there does not appear to be a change in the way that they are transmitted."

"Studies are still ongoing, but available evidence suggests there is a mutation in these variants that result in the virus being able to bind more efficiently to human cells; but the modes of transmission have not changed."

"This is why our advice at the moment is to stress the importance of adherence to a combination of measures that are known to prevent the spread of SARS-CoV-2: practising physical distancing, wearing a mask, practising respiratory hygiene, performing hand hygiene, avoiding crowded spaces, and ensuring adequate ventilation."

Is there any new evidence on mask wearing by the public?

New studies looking at the effects of wearing masks have been published during the pandemic. US researchers recently looked at the impact of state-wide mask requirements on new cases per 100 000 population per day from 1 January 2020 to 24 October 2020.¹⁰ They reported that, after adjusting for interstate differences, states that adopted mask requirements early saw the strongest effects on numbers of new cases when compared with those that did not adopt such measures. The effect was smaller but still "clearly protective" when comparing early adopter states to late adopters. "These analyses advance the scientific evidence showing positive impacts of state-wide mask requirements in the US," the researchers concluded.

Meanwhile, a preprint tested the effectiveness of different face masks and compared this with the perceptions of protection among 710 US residents.¹¹ A TSI 8038+ machine was used to test N95, surgical, and two fabric face masks on an individual 25 times each. The researchers reported that fabric face masks "blocked between 62.6% and 87.1% of fine particles, whereas surgical masks protected against an average of 78.2% of fine particles. N95 masks blocked 99.6% of fine particles." But they said that survey respondents tended to "underestimate the effectiveness of masks, especially fabric masks." The results indicated that "fabric masks may be a useful tool in the battle against the covid-19 pandemic and that increasing public awareness of the effectiveness of fabric masks may help in this endeavour," the authors concluded.

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