Medical Xpress

Optimal use time for face coverings to mitigate COVID-19 transmission

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In a paper published by the *Journal of Hazardous Materials*, researchers from Surrey's renowned Global Centre for Clean Air Research (GCARE) explore two key questions: how long a mask should be worn;

and when should it be discarded, recycled or washed to optimize its usage time.

The GCARE team conducted a comprehensive laboratory investigation on 11 masks, revealing that over time the filters of a face covering start to become clogged by aerosol particles, while breathing resistance also increases as the masks are worn. The crossover point between particle penetration and breathing resistance estimates an ideal usage duration.

Results suggest that although respirator masks provide the best performance (3.2 to 9.5 hours usage time and around 97 percent effective in protecting against harmful particles), medical and some handmade masks also provide protection but with lower usage time and effectiveness.

The researchers found that medical face masks provide between 2.6 to 7.3 hours of usage time and are around 81 percent effective against virus-laden particles, and handmade masks are effective for 4 to 8.8 hours and are 47 percent effective.

Professor Prashant Kumar, senior author of the paper, Associate Dean (International) and Founding Director of GCAREat the University of Surrey, said: "It is important to reiterate that while vaccination is key to the fight against COVID-19, face coverings are also essential. Donning a face mask is not only about protecting yourself but all those around you.

"While any face mask is better than no face mask, our research aims to give the general public clear and accurate information so they can make informed decisions as we continue in our fight against COVID-19."

More information: Ashish Sharma et al, Efficacy of facemasks in mitigating respiratory exposure to submicron aerosols, *Journal of Hazardous Materials* (2021). DOI: 10.1016/j.jhazmat.2021.126783

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