

# Cloth face masks can reduce the spread of SARS-CoV-2: new study

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A literature review coordinated by Karolinska Institutet in Sweden and McMaster University in Canada demonstrates that cloth face masks provide clinically useful levels of filtration, which has the potential to reduce the spread of viruses such as SARS-CoV-2. The findings, now published in the journal *Mayo Clinic Proceedings*, support the wearing of cloth masks to reduce the spread of the new coronavirus, according to the researchers.

"We have no direct proof that [face masks](#) reduce the transmission of SARS-CoV-2, as this would require a randomized clinical trial that would be unethical to conduct," says Juan Jesus Carrero, professor of epidemiology at the Department of Medical Epidemiology and Biostatistics and corresponding author of the study. "However, the literature we found clearly shows that face [masks](#) can reduce the spread of viruses and protect the wearer—some of them highly effectively. This evidence should be more than sufficient to recommend their use, particularly given the difficulty in controlling the ongoing pandemic."

The research group identified 25 published articles that studied the filtration properties of cloth or cloth face masks of various designs and materials. The testing behind the articles had been conducted in various ways and using different methods, making them difficult to compare. Few of the studies followed existing medical standards for certifying [personal protective equipment](#) intended for use in healthcare. Despite this, according to the researchers, the results convincingly demonstrate that certain cloth face masks reduce the spread of particles to the wearer's surroundings and reduce the particles inhaled.

## Multiple layers perform better

"It may seem counterintuitive that woven cloth, with space between threads that are visible to the naked eye, can block fine particles in the aerosol size range, but the data show unequivocally that this is the case. Even single layers block some particles and multiple layers perform better," says Juan Jesus Carrero. "In our judgement, the use of face masks should be a key component of reducing the spread of COVID-19, which is in line with current recommendations from the WHO and the CDC in the United States".

The same research group published a commentary in the *Annals of Internal Medicine* in late May,

recommending the use of cloth face masks for the public. At the same time, the researchers emphasize the importance of good hand hygiene, social distancing and disinfecting public areas.

Provided by Karolinska Institutet

### **Cotton and flannel offer the best protection**

The materials demonstrated to offer the best protection were muslin (a type of unfinished cotton), cotton and flannel, preferably in three to four layers and with a thread count of at least 100 threads per inch (TPI). For example, a historic surgical face mask made of 4-layers of muslin reduced contamination of the air to the same extent as disposable medical face masks, even for fine particles in the aerosol size range.

"Although the wearing of face masks is currently mandatory or recommended in large parts of the world, many people either cannot afford or do not have access to disposable face masks or medical face masks," Juan Jesus Carrero says. "Use of disposable medical masks in the community further threatens the supply of personal protective equipment for healthcare and other high-risk workers."

### **Recommendations for manufacturers**

The researchers have compiled recommendations for manufacturers and for those who choose to make their own face masks, including graphics showing hand-sewing patterns and instructions for use and washing. The material is available in English on the website [clothmasks.ca](http://clothmasks.ca) and is currently being translated into other languages.

**More information:** Catherine M. Clase et al. Forgotten Technology in the COVID-19 Pandemic. Filtration Properties of Cloth and Cloth Masks: A Narrative Review, *Mayo Clinic Proceedings* (2020). [DOI: 10.1016/j.mayocp.2020.07.020](https://doi.org/10.1016/j.mayocp.2020.07.020)

Catherine M. Clase et al. Cloth Masks May Prevent Transmission of COVID-19: An Evidence-Based, Risk-Based Approach, *Annals of Internal Medicine* (2020). [DOI: 10.7326/M20-2567](https://doi.org/10.7326/M20-2567)

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