

Study reaffirms that masks prevent COVID-19 transmission

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A new study in *The Lancet* demonstrates that face coverings dramatically reduce the load of SARS-CoV-2 in exhaled breath from infected persons. The reductions reached as high as 98 percent, with variations according to the type of face covering worn.

The study is the first to measure viral shedding with and without face coverings in infected humans under real-world circumstances of mask and respirator use. Prior studies looked only at manikins. The volunteers in the study were not trained in, nor did they undergo, fit testing or extensive instruction in mask or respirator use to maximize control of viral spread.

The net result is that the study mimics to a high degree real-world conditions of face covering selection and use. The reductions in viral load measured are thus representative of what could be expected in practice, without extensive efforts to fit, test and train the entire population on proper usage.

An additional key strength of the study was its direct measurements of viral load in exhaled breath, both with and without a face covering in the same individual at the same time. Thus, each study subject served as their own control. In addition, capturing exhaled virus enabled determination of the particular strains of virus with which study subjects were infected.

The study enrolled 106 volunteers between June 2020 and May 2022. Of those, 44 provided 60 pairs of same-day samples, one produced while wearing a face covering and one without, where at least one sample in the pair had detectable levels of SARS-CoV-2 virus.

The face coverings examined by the study were N95 and KN95 respirators and cloth and surgical masks. Study volunteers brought their own cloth masks when randomly assigned to wear a cloth mask. The vast majority of KN95 respirators tested were ones provided by the University of Maryland (where the study was

done) to its students and employees. The surgical masks and N95 respirators tested were also provided to volunteers and thus represented largely one brand of device.

The study evolved over time from comparing cloth vs. surgical masks to comparing KN95 respirators vs. surgical masks to KN95 vs. N95 respirators. Of the 60 paired samples total, eight were produced with a cloth mask, 26 with a surgical mask, 13 with a KN95 respirator, and 13 with an N95 respirator.

The authors had previously published earlier results from the study. However, the current article in *The Lancet* includes for the first time the N95 and nearly all the KN95 results.

The researchers collected each sample over 30 minutes using a human exhaled bioaerosol collector. Volunteers were instructed to speak certain phrases and sing at certain intervals during the 30 minute period to mimic typical aerosols generated through vocalization.

The study found that wearing an N95 respirator resulted in the highest reduction in exhaled viral load at an average 98 percent decrease, significantly outperforming all other masks and respirators. KN95 respirators reduced viral load by 71 percent, cloth masks by 87 percent, and surgical masks by 74 percent. Cloth masks significantly outperformed both KN95 respirators and surgical masks. The difference in reduction between KN95 and surgical masks was not significant.

Overall, the study volunteers were a younger population with mild COVID-19 disease. The Omicron variant of SARS-CoV-2 was by far the most common, detected in 29 samples. The Alpha and Delta variants were detected in 4 samples each.

Based on the viral load measurements and prior studies on the amount of virus typically needed to cause

an infection, the researchers estimated that the wearing of an N95 mask by an infected individual would reduce the likelihood of transmitting the virus by 20 fold.

The researchers explained the poor performance of the KN95 respirators in their study, noting that because they largely studied one brand, the results are not generally representative of all KN95 respirators. They noted that the KN95 respirator brand they studied had an unfortunate combination of stiffness and high resistance to airflow. The stiffness of the masks likely resulted in poor fit, leaving large air gaps for infectious aerosols to travel through relatively unimpeded. The high resistance to airflow meant that air was more likely to flow through the gaps caused by poor fit instead of the mask filters.

The study was limited in that it studied younger individuals with mild disease. It also studied specific manufactures of masks, and thus the results do not necessarily generalize to all N95, KN95, surgical and cloth masks.

Nevertheless, the study demonstrated that all face coverings tested were efficacious in reducing infectious aerosols generated by individuals infected with SARS-CoV-2.

“The research shows that any mask is much better than no mask, and an N95 is significantly better than the other options. That’s the number one message,” said Dr. Donald Milton, the senior author of the study.

The study is robust evidence in favor of policies mandating face coverings as a component of overall measures to control the pandemic. Face coverings are therefore an essential tool in any strategy to eradicate SARS-CoV-2.

The study authors themselves strongly advocate for healthcare workers wearing N95 respirators to protect their patients and their visitors, as well as other healthcare workers.

“Duckbill N95 masks should be the standard of care in high-risk situations, such as nursing homes and health care settings,” said Dr. Jianyu Lai, the first author of the study.

The study once again demonstrates the wholly unscientific nature of Centers for Disease Control and Prevention (CDC) guidelines on masking. The CDC also changed its guidance this past March from 10 days of mask-wearing after ending isolation

due to COVID infection to merely five days. Like the prior changes, this change in guidance was politically motivated and unsupported by science.

The requirements for healthcare providers to wear masks have also been increasingly eliminated nationally, as both health departments and the health systems where they work have dropped mask requirements. The New York State Department of Health dropped masking requirements for healthcare providers in May.

The study came as the North Carolina legislature overrode the governor’s veto of a mask ban there. Mask bans are also at various stages of consideration in New York state, Chicago and Los Angeles. Bills have been introduced in New York and Chicago, and in LA the mayor has proposed banning masks.

These mask bans are meant to suppress the mass anti-genocide protests. Notably, the North Carolina legislation banning masks also imposes liability on protest organizers for injuries that happen during protests and increases penalties for blocking roads during protests.

Only the working class can establish control of COVID-19 and other infectious diseases on a scientific basis, including establishing a sound basis for masking requirements. It must do so by seizing power and implementing its own independent political program, which puts social need in place of private profit as the key economic driver in society.



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