

Homemade Masks

Review comments in brackets are from [Hans Plugge](#) – Masters of Science, Toxicology, Harvard School of Public Health, Multidisciplinary scientist with over 35 years of government and private industry experience performing a broad range of regulatory assessments.

The Study

Testing the Efficacy of Homemade Masks: Would They Protect in an Influenza Pandemic?

Objective: This study examined homemade masks as an alternative to commercial face masks.

Methods: Several household materials were evaluated for the capacity to block bacterial and viral aerosols. Twenty-one healthy volunteers made their own face masks from cotton t-shirts; the masks were then tested for fit. The number of microorganisms isolated from coughs of healthy volunteers wearing their homemade mask, a surgical mask, or no mask was compared using several air-sampling techniques.

Results: The median-fit factor of the homemade masks was one-half that of the surgical masks. [This is actually pretty good most face masks i.e. N95 are worn without fit testing in which case 50% is on the high side for efficiency.] Both masks significantly reduced the number of microorganisms expelled by volunteers, although the surgical mask was 3 times more effective in blocking transmission than the homemade mask [Surgical masks are generally not worn over the ears but high up on the crown of the head and lower just above the neck to provide the right tension].

Conclusion: Our findings suggest that a homemade mask should only be considered as a last resort to prevent droplet transmission from infected individuals, but it would be better than no protection. (*Disaster Med Public Health Preparedness*. 2013; 0:1–6) [Highly overstated ONLY TRUE if and when masks are properly fitted and tested and we all know that is unlikely to be happening right now; let alone most hospitals etc. are not set up for fit testing]

<https://www.cambridge.org/core/journals/disaster-medicine-and-public-health-preparedness/article/testing-the-efficacy-of-homemade-masks-would-they-protect-in-an-influenza-pandemic/0921A05A69A9419C862FA2F35F819D55>

The Lay Article

.... while wrapping a bandana around your face might look pretty badass, it's not the most effective material at blocking virus particles, **according to a 2013 Cambridge University study** on how household materials **hold up against micron-size particles and viruses**. To put that into perspective, a virus particle **is about one-millionth of an inch**, or a thousand times smaller than bacteria, which is already much smaller than most human cells.

Researchers found that surgical face masks, made of a specialized paper that is both strong and breathable, were roughly 89 percent effective at preventing sick individuals from transmitting virus particles that are .02 microns (or micrometers) in size, which is five times smaller than the coronavirus. Meanwhile, particles 1 micron in size, 10 times larger than the coronavirus, were filtered at a rate of 97 percent.

A vacuum cleaner bag was considered the most formidable household material with a rate of nearly 86 percent protection against the smallest particles tested. [If you can find it cutting up vacuum filter bags and incorporating into a homemade masks to improve efficiency will hamper breathing i.e. more difficult].

Falling behind was a standard dish towel at nearly 73 percent; a cotton-blend T-shirt at 70 percent; and an antimicrobial pillowcase at 68 percent. [None of these differences are significant without fit testing]

They also tested how doubling up on the material could help. In the case of dish towels, two layers showed a notable increase in filtration rate — a 14 percent jump for particles of 1 micron in size — although the same level of increased benefits could not be said for cotton shirts or pillowcases.

Nevertheless, the Cambridge researchers still chose pillowcases and T-shirts as their favorite option in a pinch because of their breathability. While two dish towel layers may be formidable against many micro-particles, they found the construction 138 percent more difficult to breathe through than a typical surgical face mask, whereas a double-layer of pillowcases was just 4 percent less breathable.

While medical-grade face masks were found to be, on average, “three times more effective in blocking transmission [of microorganisms]” compared to their homemade counterparts, they also concluded that makeshift masks are still better than none at all.

<https://nypost.com/2020/03/20/doctors-are-now-running-out-of-face-masks-heres-how-to-make-your-own/>

The Numbers

A micron is 1/1,000,000 meters

Human hair diameter – 70-75 microns

White blood cell – 25 microns

Red blood cell – 5-8 microns

Bacteria – .2-3 microns

Coronavirus = .1 micron

The Chart

	.02 microns	1 micron	Greater difficulty breathing
Surgical face masks	89%	97%	
Vacuum cleaner bag	86 %		
Dish towel	73%		
Cotton t-shirt	70%		
Anti-microbial pillow case	68%		
Dish towel doubling		83%	138%

