

# Time to wear a better mask, experts say

February 9 2021, by Issam Ahmed

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A firefighter with Anne Arundel County Fire Department in Maryland tests his N-95 mask

As new, more transmissible variants of the coronavirus spread, experts say it's time to consider using a medical-grade respirator, or wearing a surgical and cloth mask together.

Scientists have agreed for some time the main way the virus is spread is through the air, rather than surfaces, and there's growing evidence that [small droplets](#) from ordinary breathing and speech that can travel many meters (yards) are a common mode of transmission.

Added to this is the greater contagiousness of emerging variants, like B.1.1.7, which takes a smaller viral load to cause symptomatic COVID-19 compared to the more common strain.

## Fit and filtration

Back when authorities first recommended people wear face coverings, proper masks were in extremely short supply and the public was encouraged to fashion makeshift solutions out of T-shirts or bandanas. But these are far from ideal.

Linsey Marr, a professor of civil and [environmental engineering](#) at Virginia Tech, who studies airborne disease transmission, told AFP: "How well a mask works depends on two things: filtration and fit.

"Good filtration removes as many particles as possible, and a good fit means that there are no leaks around the sides of your mask, where air—and viruses—can leak through," she said, adding even a small gap could lead to a 50 percent reduction in performance.

The best materials for blocking [small particles](#) include non-woven polypropylene, which is used to make N95s and many surgical-type masks, and the HEPA filters in planes. Among fabrics, tightly woven cotton works best, she added.

## Doubling up

"If you wear a cloth mask, choose one that has multiple layers, ideally one with a pocket that you can slip a good filter material into," said Marr. "Or you can double mask by wearing a surgical-type mask with a tight-fitting cloth mask over it."

Surgical masks are made of material that filters things out well, but they tend to be loose, so adding a cloth mask on top holds down the edges and reduces leaks.

Adding an additional layer improves filtration—if one layer traps 50 percent of all particles, combining two gets to 75 percent.

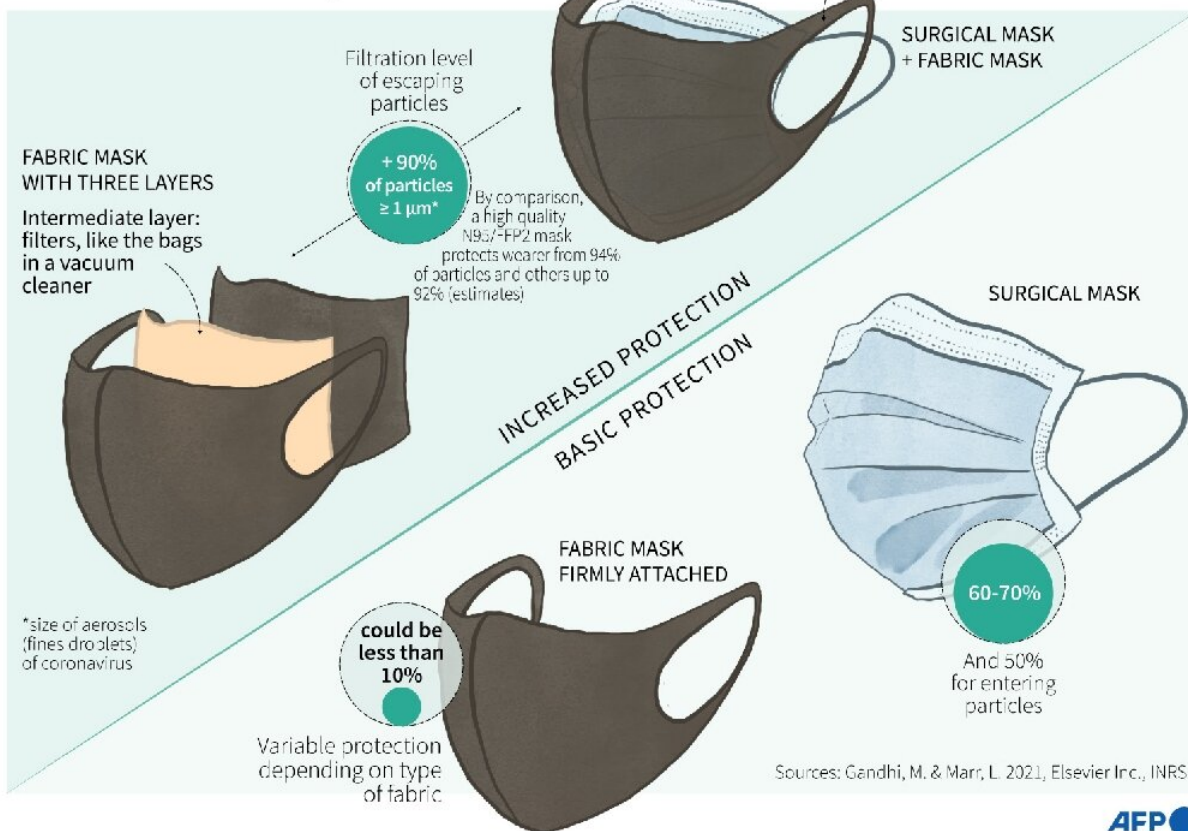
But, she added: "We do not recommend wearing more than two masks. Adding more layers proves diminishing returns and can compromise breathability. It must remain easy to breathe through the layers; otherwise, air is more likely to leak in around the sides of the mask."

Masks that have a metal nose bridge help ensure a snug fit, as do straps that tighten around the head, not just the ears. Braces that improve the fit of surgical masks are now available on the market.

"You should feel the mask sucking inward when you breathe in, and if you hold your hands around the sides of the mask, you should not feel any air leaking out when you breathe out," said Marr.

## Wearing a double mask

Putting a surgical mask under a fabric mask makes it more effective, according to scientific studies



Comparison of different ways of wearing masks to maximise protection against the coronavirus.

## Medical-grade respirators

Another option is getting hold of N95s, or their international equivalents such as KN95, FFP2 etc.

"They all provide a similar level of filtration, meaning protection of particles going in and out," Ranu Dhillon, a global health physician at

Brigham and Women's Hospital and Harvard Medical School.

Dhillon, who has been advocating in favor of better masks since last spring, is frustrated by the lack of clear messaging to the public on the value of better masks.

What's more, "there's not been a concerted push to really mass produce and mass distribute these higher caliber masks."

Health care workers have their masks professionally fit-tested every year to ensure they're making the right seal, but Dhillon doesn't see this as a major obstacle.

"To teach people to fit a mask, even if not 100 percent perfectly, but more effectively, is something that's very doable."

## **Masks in our future?**

The key to conceptualizing the threat is to think of cigarette smoke, said Donald Milton, a professor of environmental health at the University of Maryland.

Ventilation definitely helps, but if you're between a person who is breathing and an exhaust vent, the virus will still reach you—which makes good masks so crucial, he said.

Milton and Dhillon are cautiously optimistic that their pleas could soon become policy under the administration of President Joe Biden, and CNN reported last week the US government was working on the first official mask standards.

Prior to the pandemic, Milton and other aerosol scientists studying the flu concluded it too is transmitted from tiny droplets from ordinary

speaking and breathing, and that the role of sneezing, coughing and transmission from surfaces was smaller than thought.

Their findings stirred controversy at the time, but COVID-19 has renewed interest in the research—meaning [masks](#) could be a common sight during tough flu seasons, long after the pandemic has receded.

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