

9 Types of Masks and How Effective They Are



The U.S. CDC (Centers for Disease Control and Prevention), WHO (World Health Organization), and public health officials recommend wearing face masks to control the spread of the novel coronavirus, which causes COVID-19. People are now wearing many different types of face coverings, including bandanas, hand-sewn masks, and disposable medical masks. In many cases, mask choice is dependent on availability; people use what they have. But how effective are each of these face coverings?

Learn more about the different types of face masks and their effectiveness in containing droplet spread from coughs, sneezes, and conversation.

1 Bandana

A bandana is a triangular or square piece of cloth that's often worn as a head or neck covering. Tying a bandana over your mouth and nose is a time-honored way to keep dust and other particles out of the respiratory system. (That's why cowboys used them during roundups.)

Bandanas provide some protection against droplets and cough- or sneeze-related "spray." Without any kind of nose or mouth covering, droplets can spray more than 8 feet, according to research from Florida Atlantic University. Wearing a bandana can decrease that to about 4 feet.

2 Homemade cloth mask

According to an article published in The Journal of Family Practice, single-layer masks may only provide 1% particle filtration. A two-layer cotton mask filters out about 35% of small particles. Cotton face masks can decrease droplet spray from 8 feet to 2 ½ inches.

The effectiveness of a homemade cloth face mask largely depends upon its construction. According to Johns Hopkins Medicine, densely woven cotton fabrics, such as quilting cotton, are best. Single-layer fabric masks are less effective than double-layer masks, which may be less effective than triple-layer masks.

3 T-shirt mask

Numerous online tutorials show how to craft a face mask from an old T-shirt. T-shirt masks are cheap and easy to make, but they're not the most effective. According to a 2013 study published in Disaster Medicine and Public Health Preparedness, T-shirt masks are one-third as effective as disposable surgical masks.

The upside of T-shirt masks: they're comfortable, as the slightly stretchy material conforms to the face. You may be able to increase the effectiveness of a T-shirt mask by using more than one layer of material.

4 Store-bought cloth mask

The effectiveness of a store-bought cloth mask will depend on its construction. According to Johns Hopkins Medicine, you should look for a mask with at least three layers of fabric; ideally, you want a mask constructed from tight-weave 100% cotton cloth.

A typical cloth face mask "is probably at least 50 percent" protective, while "high quality masks could be 80-95 percent protective, and even low-quality masks made of very thin materials could still be 10-20 percent protective," according to Steffen Eikenberry, a postdoctoral scholar at Arizona State University who's studied the effectiveness of masks.

5 Cloth masks with filter

Some store-bought masks come with filter pockets; you can also make cloth masks with a pocket for a filter. You can use folded facial tissues as a filter; simply slip the folded tissue into the filter pocket. Change the tissue filter daily.

In an NPR report, May Chu, an epidemiologist at the Colorado School of Public Health, recommends using a filter of polypropylene material, a durable synthetic fabric often used in upholstery that can hold an electrostatic charge (which helps it trap small particles). Adding a polypropylene filter to a two-layer cloth mask can increase filtration efficiency from 35% to nearly 70%.

Caution about vented masks: Masks with exhalation valves or vents should not be worn to help prevent the person wearing the mask from spreading COVID-19 to others. That is because the vent allows unfiltered air to escape.

6 Neck gaiters and balaclavas

Outdoors enthusiasts often have neck gaiters (essentially, a tube of fabric that's worn around the neck and can be pulled up or down, as needed, to protect the face and neck) or balaclavas (tight-fitting garments that cover the head and neck) on hand. These can be used as mouth and nose coverings and may provide some protection against spread of the novel coronavirus.

Note: many gaiters are made of synthetic fabric, and synthetic fabric doesn't seem to be as effective in preventing the spread of small particles as natural fibers, such as cotton. What's more, a recent study found that neck gaiters made of synthetic fleece may do more harm than good because they essentially aerosolize the wearer's respiratory droplets.

7 Disposable surgical mask

These flat, thin, paper-like masks are usually white and light blue. According to a 2013 study published in *Aerosol Science and Technology*, surgical face masks can filter out about 60% of smaller, inhaled particles. They are primarily intended to stop droplets, sprays and splatters, and studies have shown that diligently wearing surgical masks in public spaces can significantly reduce the spread of respiratory infection.

Surgical masks are not designed to be used more than once. Ideally, you should dispose of a mask after wearing it.

8 Cone-style masks

Manufactured cone-style face masks are molded masks that fit over the mouth and nose; usually, there's also a strip of metal at the top, so the wearer can secure the mask at the bridge of the nose. According to a study by Arizona State University researchers, cone-style face masks are less effective at containing droplets and spray than cloth face masks constructed of quilting cotton. The cone-style masks are more effective than a bandana.

9 N95 and other respirators

N95 face respirators offer the most protection against novel coronavirus and other respiratory diseases. N95s protect the person wearing the mask because they filter out 95% of particles from the air breathed in. Wearing any of the other masks in the list (cotton and disposable) are intended to protect others around you from your own respiratory droplets and "spray."

However, N95 masks are in short supply and should be reserved for healthcare providers. The CDC does not recommend the general public wear N95 masks. In fact, if you have any N95 respirators, you should consider donating them to your local hospital for first responders.

Even more effective than N95 respirators are the N99 (99% filtration), N100 (99.97% filtration), R95 (95% filtration, and partially resistant to oil), and P95, P99 and P100 (95%, 99% and 99.97% filtration, respectively, and strongly oil resistant). Refer to the CDC for more information on respirators.