

All about wearing face masks during the COVID-19 pandemic

Eileen Senn, MS

August 13, 2020

Disclaimer: *Do not rely only on this factsheet in making decisions about wearing a face mask for protection against Covid-19.*

Why wear a face mask?

The coronavirus is extremely contagious and causes COVID-19. Serious complications include damage to the lungs, liver, and heart; permanent loss of taste and smell; mental and neurological problems; blood clots, stroke, and death. While the world waits for vaccines, we need to protect others and, in turn, be protected -- at home, work, and in our communities.

At least 40 percent of people with the virus are quite contagious without showing COVID-19 symptoms. The virus spreads through the air when anyone with it just talks or breathes, releasing tiny free-floating particles with the virus - called “aerosols” by some – which linger for hours. Coughing or sneezing releases larger droplets into the air. The virus can enter a new person’s body when these particles or droplets are breathed in or land in the eyes or nose.

By wearing a mask, we can stop some particles and droplets from getting into the air. If we have the virus and don’t know it, that reduces the risk of spreading it to others.

There is some evidence that cloth masks also protect the wearer from infection, though this is less certain.

To be clear: masks are **not** a substitute for measures like good ventilation, physical distancing, barriers, staying home when ill, rapid testing, contact tracing, and hand-washing. But masks are helpful when combined with these other interventions.

Face masks are not as good as respirators. They are **not** personal protective equipment (PPE). Respirators, such as N95s, have an airtight face seal when used properly and excellent filtration. There is a shortage of N95s and supplying healthcare workers and other workers with risk of high exposure should be the priority. Wearing them is difficult and requires training.

It comes down to taking precautions in the face of uncertainty, and being a good community member by modeling protective measures. Public mask wearing has the best chance of stopping the spread of the virus when many people do it.

Where should it be worn?

A mask should be worn indoors or in a car or other vehicle if you’re within 6 feet of someone for more than a few minutes. If other people indoors are not wearing masks, you are at risk and should leave the space. This doesn’t apply to people you live with **if** they have been able to avoid the virus.

Risk depends on exposure time plus virus dose. Even a few minutes in an indoor space with poor ventilation may be too risky. Poor ventilation indoors means the air doesn't move or mix much, and there is little or no clean outdoor air coming from windows or a mechanical system. If present, virus particles build up quickly in these kinds of spaces.

If people stay 8 to 10 feet apart outdoors, the risk is very low, and masks usually wouldn't be needed.

Which one?

To work, a mask must fit snugly on the face. It needs to fully cover the nose and mouth and extend under the chin as an anchor. It also should have a wire that pinches at the nose to help reduce leaks.

Fit really matters. Even a one percent gap in the fit of the mask reduces its filtering efficiency by at least 60 percent. To see if there are leaks at the edges of your mask, exhale strongly and watch to see if your hair or a small piece of tissue dangling loosely near your ear, eyes or neck vibrates. If so, there is a leak.

Facial hair can also cause leaks. To avoid this, the skin needs to be clean-shaven where the edges of the mask contact the skin. Facial hair that fits entirely inside the mask is okay.



Materials matter too. Catching the particles and droplets improves with multiple layers and specific combinations of different fabrics. This is likely due to the combined effect of mechanical and electrostatic-based filtration. Cotton is better at higher weave densities.

To choose a face mask or material for one, hold it up to a light. See how much light comes through; the less the better. The filtration improves by using a layer of ultrafine synthetic fibers with hard-to-penetrate gaps with an electrostatic charge (melt-blown cloth). Note that inserting an extra filter into a mask may make it too hard to breathe through.

Online reviews can help you choose what will work best for you. Ultimately you must try wearing a mask and see if it is comfortable, which will increase the likelihood you will actually wear it.

What else matters?

Masks are quite safe with only minor and uncommon side effects including skin irritation and general discomfort. However, some individuals should not wear masks such as those with severely compromised respiratory systems and those who cannot remove or adjust their own mask, including children under the age of 2.

One significant risk of wearing a mask is that it can give a false sense of security, leading to risky behaviors and disregard of other protective measures. So, continue to use a mixture of protective measures including physical distancing.

Wearing a face mask beneath the nose renders it worthless. Pulling a mask up and down to make it easier to talk or breathe risks getting virus on the hands and face. “Storing” it on the chin makes it likely that any virus on the mask will be inhaled.

Avoid masks with exhalation valves or vents; they allow your exhaled breath to exit through the valve, defeating the purpose of protecting others. If that is all you have, place nonporous tape over the valve to block it. Questions have been raised about the efficacy of single layer neck gaiters, bandanas and knit masks, so it is safest to avoid them.

How should it be put on and adjusted?

To avoid contaminating the mask, wash your hands with soap and water or use hand sanitizer.

Pick the mask up by the loops or ties and place them around each ear. Put the top part over your nose, then pull the bottom part over your mouth and chin. If the mask has a slider on each ear loop, adjust them so it fits well. If it has ties, re-tie them as needed.



Mold the nose bridge to the shape of the face with both index fingers. Start at the top and push inward as you move down. It should fit snugly.

How should a face mask be removed?

Reach behind your ears and remove the straps to lift the mask off your face, pulling it away from the face. Avoid touching your face or the inside of the mask.

Place the mask in a breathable storage container - a brown paper lunch bag, for example, so it can dry out. An airtight container won't let a mask dry out. Wash your hands with soap and water or use hand sanitizer in case you got virus on them removing the mask.

What kind of care do they need?

The inside of the mask needs to be free of the coronavirus. Since the virus “lives” on surfaces for only 3 days, store masks for three days in a breathable container before re-using. Ultraviolet light -- from the sun -- also can disable the virus. Minimize cross-contamination by making sure masks do not touch each other and not sharing.

If possible, have three or four masks and rotate among them every day. After about eight hours of use, discard disposable masks or launder washable ones. Use unscented detergent

and the warmest water possible, given the materials. Drying in a hot dryer or in the sun can help too.

For more information

As the pandemic continues, we are learning more about the virus, its effects, how it's transmitted, and the usefulness of face masks to deal with it. These resources were some of the best available when this factsheet was prepared.

A User's Guide to Masks: What's Best at Protecting Other (And Yourself), Maria Goday, 7/1/20, www.npr.org/sections/goatsandsoda/2020/07/01/880621610/a-users-guide-to-masks-what-s-best-at-protecting-others-and-yourself

All About Masks and Coronavirus, University of Maryland Medical System
www.umms.org/coronavirus/what-to-know/masks

Use of Masks to Slow the Spread of Covid-19, Centers for Disease Control and Prevention
www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

Covid-19, Personal Readiness and Response, Center for Infectious Disease Research and Policy (CIDRAP)
www.cidrap.umn.edu/covid-19/preparedness-and-response/personal

Technical references

Making sense of the research on COVID-19 and masks. Abbott BW. Et al., Brigham Young University, 7/19/20. <https://pws.byu.edu/covid-19-and-masks>
<https://brightspotcdn.byu.edu/7b/e7/75df64714f30a59c1ba7766a1c00/byu-covid-masks-abbott.pdf>.

Osterholm Update: COVID-19, Special Episode: Masks and Science, Michael T. Osterholm, PhD, MPH, Director, Center for Infectious Disease Research and Policy (CIDRAP), 6/3/20 Podcast, www.cidrap.umn.edu/covid-19/podcasts-webinars/special-ep-masks
Transcript
www.cidrap.umn.edu/sites/default/files/public/downloads/special_episode_masks_6.2.20_0.pdf

Aerosol Filtration Efficiency of Common Fabrics Used in Respiratory Cloth Masks, Abhiteja Konda et al., 4/24/20, ACS Nano 2020, 6639-6347.
<https://pubs.acs.org/doi/10.1021/acsnano.0c03252>
<https://pubs.acs.org/doi/10.1021/acsnano.0c04676>, corrections

Masking During the COVID-19 Pandemic, J. O'Keeffe, National Collaborating Center for Environmental Health, Vancouver, BC, 4/16/20
https://ncceh.ca/sites/default/files/Masking%20during%20the%20pandemic_NCCEH%20April%202020.pdf