

Q: *Since winter is coming, how can we use ventilation and filters to lower the risk of COVID transmission while indoors?*

During the spring and summer, many of our congregations have been worshipping outdoors. It is wonderful to worship in God's creation, and it is so much more COVID-safe than being indoors. But fall and winter will be upon us shortly, and, in many places, outdoor worship may not be practical.

First, before moving indoors, can you tweak/add things to make outdoor worship possible for longer? Here are some ideas, but please share yours in the [GNW Stepping Forward Facebook group](#).

- When locally allowed, add propane heaters or fire pits so that folks can warm up, at least momentarily.
- Add canopies, remembering that [sidewalls are problematic](#), possibly disrupting the airflow and creating pockets of concentrated, potentially virus-laden aerosols
- Suggest that folks bundle up.
- Provide disposable hand warmers.
- Provide blankets or suggest that folks bring their own.
- Encourage folks to bring warm beverages, being mindful of the need for physical distancing when consuming a drink. The viability of this suggestion depends on your site's current risk level, risk tolerance and opening plans.
- Move worship to a later time in the day when it is a bit warmer.

Once it becomes necessary to move inside, or if you already have and are wondering what you can do to increase the safety of your congregation and other groups using your space, consider these thoughts and ideas:

1. Remember that ventilation is just one layer in an excellent multi-layered plan for safety. It works best in conjunction with other strategies such as masking, limiting capacity, and limiting the length of a gathering.
2. Know your ventilation system. If it is a forced-air system, check these things, and if you aren't sure, get a local HVAC expert to check it for you. Based on this knowledge, simply by swapping filters and operating the system a bit differently, you may achieve a much greater level of safety.
 - How many ACH (air changes per hour) can it manage? The design criteria for a modern church would be 4, although older buildings may not have been designed to this standard, and many modern ones may not meet it. [Ideally, you want to be at 5 for COVID safety and to minimize the amount of time you need to leave between usages.](#)
 - What level of filtration does it have? Can it handle more? Experts recommend MERV 13 filters if your system can handle it and sealing around the filter(s) to minimize bypass. Learn more on the [American Society of Heating, Refrigerating and Air-Conditioning Engineers website](#).
 - Can you increase the outside air intake? Ideally, you want as little recirculation as possible unless you have at least a MERV 13 and possibly even a HEPA filtration system.
 - Can you direct indoor return air flow using your system? Ideally, you want it up and away from people. (More on how you can do this without a forced-air system or without modification if your system doesn't support this is below).

- If your system is not forced air, for example, steam heat, or an older system with few options, consider whether this might be the time to make some upgrades. There is emerging thinking and research that suggests that upgrading ventilation systems from their current standard based on human comfort to one that considers infection control could be a good long-term strategy for reducing COVID-19 risk and even the risks associated with seasonal flu and the common cold.
3. If your system isn't adequate and upgrades aren't feasible, consider these strategies:
- Open as many doors and windows as you can but be careful about creating drafts that blow potentially contaminated air across others.
 - Use ceiling fans, running in reverse, so they pull air up from the middle and send it back down the sides.
 - Add other fans positioned to exhaust air from the space to the outdoors via the doors and windows.
 - Add stand-alone HEPA filtration units either by themselves or with a forced-air system to clean the air. In a forced air space, HEPA filtration can effectively make up the difference in air changes for a low-performing system. Once you know the basics of your system and space, [this calculator will help you figure out how big a HEPA filter you need](#), or conversely, whether the one you are considering will do enough.
 - [Add Ultraviolet Germ Irradiation \(UVGI\) units](#). Using ultraviolet light to sanitize air against COVID-19 is not yet widely accepted, but some articles suggest this approach. Depending on price and need, these can be either added into an existing forced-air system or be stand-alone, generally mounted high on the walls.
4. Layer strategies together to get as much safety as you can.
- Require masks and social distancing to prevent the 'near-field' spread. The larger droplets settle out at about 6 feet.
 - Improve indoor ventilation and air quality as described above.
 - Limit the time in the space; for example, can you shorten worship to 30 minutes? The less time in the space, the less risk that contaminated aerosols will build up and the less exposure attendees will have to any that do.
 - [Ensure that there is adequate time between gatherings](#). You want your equipment to have a chance to change out the air and/or clean it entirely. Once you know your air changes and air cleaning timelines, this chart gives you recommended times between gatherings; the left hand, 99% column is considered acceptable for COVID-19.

For a further general overview of these strategies and recommendations, see these links from the CDC and the Journal of the American Medical Association.

- <https://covid.rh.gov/covid-19-prevention/indoor-air-circulation>
- <https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html>
- <https://jamanetwork.com/journals/jama/fullarticle/2779062>