

Five great things community spaces can do right now (or any time) to improve indoor air quality and reduce airborne transmission of COVID-19

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Improving indoor air quality can help reduce transmission of COVID-19 and other respiratory illnesses. Measures like ventilation and filtration should always be part of infection prevention and control. Knowledge Translation specialist Amy Katz asked indoor air quality experts Dr. Jeff Siegel and Dr. Amy (Tianyuan) Li what community spaces can do right away to help reduce transmission. Here is what they said. For more information, contact Dr. Li at: tianyuan.li@mail.utoronto.ca.

1. Ask an HVAC expert to inspect and assess your system. If your building has a centralized, forced-air HVAC system, make an appointment with an HVAC professional for a check-up. Sometimes, there are small adjustments you can make to improve indoor air quality right away. Do some research in advance (see resources below), and ask lots of questions. Here are a few questions you can ask about optimizing your system to reduce transmission of airborne respiratory illness:

- Is there any part of your HVAC system that requires immediate repair or replacement? Even a small improvement can make a big difference.
- How much air is your HVAC system bringing in from the outside? Can it be set to bring in more outdoor air? It can be a balancing act to bring in lots of fresh air while maintaining comfortable temperatures, but it's worth it. Fresh air makes a real difference when it comes to reducing transmission of COVID-19 and other respiratory diseases. Bringing in more outdoor air through your HVAC system may use more energy (particularly during extreme weather). So investigate options like heat or energy exchange systems—they allow you to bring in lots of fresh air without using as much energy.

- Is your HVAC filter well-sealed? If not, air can escape around it, and will be released into the room without the benefit of filtration.
- Can your HVAC system be set to run all the time, even when the desired temperature has been reached? You want to make sure your HVAC system is providing the benefits of ventilation and filtration all the time through continuous operation. Depending on the age and type of HVAC fan, this can increase your electricity bills. Investing in a more efficient fan can be a way to minimize these extra costs.
- How many times an hour does your HVAC system replace all the stale air in the room with fresh and/or filtered air? The goal in congregate settings and community spaces should be six or more air exchanges per hour. If your system is not able to meet this target, ask the HVAC expert about options to improve the system performance, and how much this might cost. Even if you don't have the budget right now, it's a good opportunity to start planning.
- Can you upgrade your HVAC filter? All centralized, forced-air HVAC systems use filters. It's best to choose filters rated MERV-13 or higher, as they remove the fine particles that carry viruses out of the air. But not all HVAC systems will be able to function with very high-efficiency filters. Ask the HVAC expert to help identify the filter with the highest efficiency rating that's compatible with your system, and make sure that you change it according to the manufacturer's instructions (see more on how often to change your filter below).

2. Work with an HVAC expert to ensure you have excellent bathroom fans that exhaust to the outside. Bathrooms are a high-risk setting for COVID-19 transmission. One of the best things you can do in bathrooms is clear the air between uses. An HVAC expert can help you make sure your bathroom fans exhaust to the outside, are well-maintained, and are working properly. You may also choose to install higher-powered bathroom fans, and run them continuously or as often as possible—just ask an HVAC expert to help you make sure this doesn't interfere with the way air flows in the building.

3. Stock up on high-efficiency HVAC filters. Once the HVAC expert helps you identify the filter with the highest efficiency rating that's compatible with your system, stock up. Most filter manufacturers recommend you change the filter every three months, although some more expensive filters may last longer and can represent better value. Manufacturer's recommendations are based on the assumption that you are running your system 20 per cent of the time. In this scenario, each year you'll need four

filters for each HVAC filter slot (some HVAC systems use two or more filters). If you are planning to run your system continuously (which we recommend), buy 20 filters for each HVAC filter slot, and change each filter every three weeks. When changing HVAC filters, wear a well-fitted N95 mask, goggles and gloves, and dispose of the filter in a well-sealed bag.

4. Buy or make high-quality portable air filters to help filter particles that carry viruses out of the air.

These are a great idea in almost every room, with the exception of bathrooms. Avoid fancy, un-proven technologies like ionization, plasma, photocatalytic oxidation and hydroxyl radical. You don't need them, and some can release harmful by-products into the air. Focus on quality of the filter, and the "clean air delivery rate" (CADR), which will help you decide what size portable air filter to use in a specific room. Higher CADR means better removal performance. You can even make effective, low-cost portable air filters yourself. For tips on choosing, making, placing and safely-maintaining portable air cleaners, see the resources at the end of this article. When changing portable air filters, wear a well-fitted N95 mask, goggles and gloves, and dispose of the filter in a well-sealed bag.

5. Stock up on N95 masks. The best way to protect workers, residents, clients and visitors from an airborne virus is through the use of respirator-grade masks. As mentioned earlier, they should also be used when changing HVAC and portable air filters. Use this opportunity to make N95s available to everyone who uses your facility. It's also a good idea to do mask-fit testing for workers and residents if possible. But remember—even an N95 that hasn't been professionally fitted is better than a medical mask. Just try and get the best fit you can by choosing one that is the right size for your face, and adjusting the nosepiece and the straps or ear loops. Some masks work better for some face shapes than others—having a few options available at your facility can ensure that an appropriate mask is available for all individuals in a space.

Resources

For information about choosing, making, positioning and maintaining portable air filters, please see:

- [Air cleaner fact sheets](#) from the Clean Air Crew;
- [Best practices for choosing portable air filters](#) from CBC Marketplace.

For more comprehensive information about improving indoor air quality, please see:

- Guidance on [COVID-19 risk reduction in residential buildings](#) from the American Society of Heating, Refrigerating and Air-Conditioning Engineers;
- [Indoor air quality fact sheets](#) from the Clean Air Crew;
- Guidance [on ventilation and COVID-19](#) from the Public Health Agency of Canada;
- [Specific guidance for community spaces](#) from Dr. Jeffrey Siegel.