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Epidemic Task Force Chair Talks Best Practices, FAQs

ATLANTA—Since being established in March, ASHRAE's Epidemic Task Force has developed guidance on mitigating potential health risks in light of the COVID-19 pandemic. From best practices when reopening buildings to filtration and disinfection strategies, the guidance covers various building types. The wide-ranging guidance has helped built environment professionals navigate the pandemic.

To better help ASHRAE members navigate the guidance, *ASHRAE Journal* staff talked with the task force's chair, William Bahnfleth, Ph.D., P.E., Presidential Member/Fellow ASHRAE.

What are the biggest misunderstandings that exist regarding the role of HVAC systems in the transmission of airborne diseases?

Bahnfleth: The biggest misunderstanding is that air conditioning inherently increases the risk of airborne disease transmission and that we are safer with air-conditioning systems off than on. Air conditioning includes heating and cooling, humidification and dehumidification, ventilation and air cleaning and air movement. The main risk factor that may be associated with air conditioning is the spreading of infectious aerosols within a space. This may have been a factor in some of the COVID-19 superspreader incidents; however, inadequate ventilation may have been an even more important contributor.

Ventilation with outside air and particulate filtration both reduce infectious aerosol concentrations in the air and reduce risk of infection. Controlling humidity to within a moderate range from about 40% to 60% relative humidity also seems to be protective. So, on balance, a properly designed, maintained and operated system is likely to reduce risk.

What are a few easy operating strategies building owners and facility managers can implement to help reduce the likelihood of transmission of airborne diseases?

Bahnfleth: Best strategies depend to some extent on what type of systems the owner has. The objectives of

infection risk management are to lower concentrations of infectious aerosols by diluting them with outdoor air, capturing them with filters, disinfecting, and containing them using pressurization. For recirculating systems such as VAV systems, there should be some ability to increase outdoor airflow within the limits of control of the system, so that acceptable temperature and humidity are maintained. Temporarily disabling demand controlled ventilation will also increase the average outside air supply. For once-through ventilation systems such as dedicated outdoor air systems (DOAS), increasing outdoor air may not be an option. Filter upgrades to central systems is another option that may be easy for some systems.

Systems designed to minimum ventilation standards like ANSI/ASHRAE Standard 62.1-2019, *Ventilation for Acceptable Indoor Air Quality*, and ANSI/ASHRAE Standard 62.2-2019, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*, will have MERV-8 or MERV-6 filters, respectively. These do not effectively remove particulate matter of the size produced by respiratory aerosols. Upgrading to at least MERV-13, if possible, will capture a large fraction in this size range.

Owners may also consider adding air disinfection using ultraviolet germicidal irradiation. However, systems must be evaluated to determine their ability to accommodate filters that may be somewhat higher in flow resistance than the filters for which the system was designed. Flushing buildings with outside air for a period of time pre-occupancy will also reduce risk from any residual infectious aerosol that may have been left after the previous occupied period.

As buildings start reopening, what are the top tasks engineers should pay attention to?



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Bahnfleth: As described in the guidance for reopening buildings at [ashrae.org/covid19](https://www.ashrae.org/covid19), a first, critically important, task is to evaluate the condition of systems to determine whether they are functioning as designed. Deficiencies should be addressed, and then epidemic response operating modes and system upgrades can be implemented. To do this properly requires a team that includes the owner; facility staff; commissioning provider; testing, adjusting and balancing company; building automation system company and design engineer and architect.

Although the focus of ASHRAE's guidance is on aerosol/airborne transmission reduction by modifying HVAC system operations, plumbing systems are often within the purview of the same professionals. Water systems that have been idle for extended periods of time may pose a risk of waterborne infection by *Legionella* and other pathogens that can grow in stagnant water in which water treatment effectiveness has dissipated. So, it is also important to flush and verify the safety of domestic water systems.

What are the most frequent questions emailed to the task force's email (covid-19@ashrae.org)?

Bahnfleth: Nearly 500 questions have been received to date. The single-most common category of question is air cleaners. Professionals and the public have many questions about the effectiveness of air cleaners that are being promoted during the pandemic: Do they work? How should they be applied? There have also been many questions from health-care providers who do not practice in hospitals and clinics, such as dentists and optometrists.

A significant number of questions have also been from members of the public who want to know whether they are at risk in their houses or apartments and what measures they should take to increase their safety. Most people don't know very much about their systems, so there has been a great opportunity to educate them.

Some of these truly frequently asked questions have been turned into items in the FAQ section of [ashrae.org/covid19](https://www.ashrae.org/covid19). ■

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