

# HVAC and COVID-19

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## COMMENT



**H**VAC systems are “suddenly sexy in our COVID reality”, I read on a recent weekly eNewsletter from CBInsights. It links to a business report that found “deals involving HVAC startups have more than doubled since 2015” – that would be way before COVID-19 – but, it continues, “with a new high deal count in 2020”.

According to the WHO, the primary transmission mode of the SARS-CoV-2 virus that causes COVID-19 is through infected secretions in saliva or respiratory droplets that are expelled into the air when a person coughs, sneezes, talks or sings. If enough infected droplets are inhaled by a person nearby, they too can become infected leading to their saliva and respiratory droplets advancing the disease’s spread.

Hence the advice to wear a mask, which limits the distance droplets will spread from an infected person’s mouth or nose.

The WHO advice lists two size ranges for droplets. Respiratory droplets are between 5.0 and 10 µm in diameter. These will not generally remain airborne though, hence the advice that close contact (within one metre, according to the WHO) with an infected person who is coughing, sneezing, speaking loudly or singing, poses a significant risk of their droplets being breathed in and infecting others nearby.

Also, when falling from the air and onto nearby surfaces, infected respiratory droplets can be transferred to uninfected people via touch, hence the need to sanitise surfaces, wash hands and avoid touching the mouth and nose. This is known as fomite transmission.

Respiratory droplets of less than 5.0 µm in diameter, according to the WHO, are referred to as droplet nuclei or aerosols. These smaller droplets can remain suspended in air, making it possible for people to become infected without being in close contact with a ‘spreader’, “if the aerosols contain the virus in sufficient quantity to cause infection within the recipient”. Citing several studies in health care settings, however, the WHO scientific brief of July 9 reported that “no studies have found viable virus in air samples”.

Since confined spaces with crowds of people have been the focus of avoiding infection, I have always been surprised that travelling in an aeroplane is deemed relatively safe. WHO special envoy for COVID-19, David Nabarro, says this is directly due to “modern aircrafts’ air filtration systems” and that “the ventilation system includes really powerful filters, which means that, in our view, they are relatively safe.” He goes on to add that travellers should respect social distancing

rules, particularly in confined settings, “especially when there’s singing or shouting”.

In Chapter 8 on air travel in a report titled *Travelers’ Health* put out by the USA’s CDC (Centres for Disease Control and Prevention), the authors note that modern and modified aircraft recirculate between 10 and 50% of the air in the cabin, mixed with outside air. The recirculated air passes through a series of filters 20 to 30 times per hour and in newer-model planes, “through high-efficiency particulate air (HEPA) filters, which capture 99.9% of particles (bacteria, fungi, and larger viruses or virus clumps) down to 0.1 to 0.3 µm in diameter.

The report suggests that “air generally circulates in defined areas within the aircraft, thus limiting the radius of distribution of pathogens spread by small-particle aerosols. As a result, the cabin air environment is not conducive to the spread of most infectious diseases”.

As a caveat however, it notes that some diseases may be spread by contact with infected secretions, such as when an ill person sneezes or coughs – and the secretions or droplets land on another person’s face, mouth, nose or eyes.

The Health and Safety Executive for the UK (HSE), in its guidance for general ventilation states that employers must, by law, ensure an adequate supply of fresh air in the workplace to help reduce the risk of spreading coronavirus. So, the advice reads, “focus on improving general ventilation, preferably through fresh air or mechanical systems” and, where possible, employers should “consider ways to maintain and increase the supply of fresh air, for example, by opening windows and doors”.

Also suggested is to improve the circulation of outside air and prevent pockets of stagnant air in occupied spaces, by using ceiling or desk fans, for example. “The risk of transmission through the use of ceiling and desk fans is extremely low providing there is good ventilation in the area it is being used, preferably provided by fresh air”.

Similarly, it continues, “the risk of air conditioning spreading coronavirus (COVID-19) in the workplace is extremely low as long as there is an adequate supply of fresh air and ventilation”.

While I am unconvinced of the sudden transition to the sexiness of HVAC systems due to the COVID-19 pandemic, it has focused our minds on the need for fresh and clean air. It’s good to be reminded that air conditioning is not only about making us feel more comfortable inside than we feel outside. □

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