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Safety

Preventing airborne infection

Good ventilation is essential in indoor spaces including planes

Michael Le Page

VENTILATION must be improved in buildings and aeroplanes to reduce the risk of covid-19 spreading via the air, according to recommendations from several organisations, including the European Union Aviation Safety Agency. It is unclear if this advice is being followed.

We know the coronavirus can spread via droplets in air, but there is still debate about the details and how much this form of transmission contributes to the virus’s spread. What is clear is that the risk is greatest if you spend a long time in a confined, poorly ventilated space with others who might be infected – something that many workers cannot avoid.

For this reason, scientists and safety experts think there should be more emphasis on improving ventilation, in addition to measures such as handwashing and social distancing. “The most significant measure is to increase ventilation to remove the virus-laden droplets from the indoor environment where they were exhaled,” says Lidia Morawska at the Queensland University of Technology in Australia.

When infected people cough, sneeze, sing, talk or even breathe, they emit droplets containing the coronavirus into the air. The closer you are to them, the more likely these droplets are to end up in your eyes, nose or mouth. This much everyone agrees on.

In January, 10 people from three different groups became infected after eating at a restaurant in Guangzhou, China. It is thought that the air flow from an air conditioner blew droplets from an infected person to nearby tables.

And in March, one member of a choir infected at least 32 of the 61 people at a practice in a small church in Washington state, according to a report by the US Centers for Disease Control and Prevention. The choristers say they used hand sanitiser and tried to maintain social distancing.

The World Health Organization says airborne transmission via small droplets is possible, but only when medical procedures generate aerosols, such as intubating a person to put them on a ventilator. Linsey Marr at Virginia Tech says the virus-carrying droplets emitted by infected people range from microscopic ones to those large enough to be visible. But people emit thousands of times more smaller droplets than large ones, and she thinks these smaller droplets are what infect people.

Although microscopic droplets can travel further in the air than larger droplets, says Marr, their concentration falls off rapidly with distance. Outdoors, people are unlikely to breathe in enough virus to infect them unless they remain close to an infected person for an extended period. Indoors, the risk is much higher.

There is plenty of evidence that confined spaces pose a higher risk. For instance, one person in South Korea infected 94 of the 216 people working on the same office floor. However, to what extent airborne spread contributes to such clusters remains unclear.

A report from China attributes coronavirus infections among bus passengers in Hunan province to airborne spread, with one person sitting 4.5 metres from someone who infected them. It suggests the virus can remain airborne for at least 30 minutes.

The UK’s Chartered Institution of Building Services Engineers recommends using only outside air if possible, rather than recirculating air within buildings, and says HEPA filters or ultraviolet sterilisers could eliminate any airborne virus. The European Union Aviation Safety Agency issued similar recommendations for aircraft operators.

But many of the reports that find lower rates of smoking among covid-19 patients also suggest that smoking is more common among people who get sickest and die (Qeios, doi.org/dv8j). This is hard to explain if nicotine really protects against the coronavirus.

Questions have also been raised about the accuracy of the initial reports. Some people recorded as non-smokers may have recently stopped due to the pandemic, says Nick Hopkinson at Imperial College London. There has been speculation that in places like Italy where there weren’t always enough intensive care beds to go round, some may have lied about smoking, he says.

Perhaps the biggest concern is that it isn’t valid to compare smoking rates among coronavirus patients with the general population, says Eleanor Murray at Boston University. Most people who have severe covid-19 infections to end up in hospital are older, and older people have lower smoking rates.

Rather than looking at smoking rates in hospital patients, Hopkinson is using an app downloaded by 1.5 million people in the UK to track their cases. His findings aren’t yet published, but suggest that smokers are about 25 per cent more likely to develop covid-19 symptoms – although this is judged by users’ self-reports, not medical tests.

A recent study looked at the health records of 1.7 million people in England to establish risk factors linked with dying from covid-19 among (medRxiv, doi.org/dt9z).

The results for smoking change depending on which other risk factors are included. But the most logical analysis according to Hopkinson, adjusting for age and sex only, finds smokers at a somewhat higher risk of dying from covid-19. “The claim that smoking is protective is interesting and perplexing, but it doesn’t stand up to scrutiny,” he says.

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