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# Improving ventilation during COVID-19

## ****Introduction****

Over the past few months we have shared information around improving ventilation as and when new guidance has been issued. As we are now approaching colder, and more inclement weather now is a good time to revisit and update the advice to help you consider potential airborne transmission factors and look to improve ventilation measures where possible. The original guidance was developed jointly with Trade Union Health and Safety Representatives and Cumbria County Council services including Public Health, Health and Safety, and Property Teams. This guidance has been updated to include links to the BOHS ventilation tool and a useful video issued by the HSE.

## Improving ventilation – practical advice

You must continue to focus primarily on those controls which limit **droplet/close contact transmission**. In terms of ventilation our buildings, layouts, occupants, class/group sizes and activities all will differ, and this does make it difficult when you might have concerns over whether your ventilation is adequate. However, evidence from the SARS-COV-2 study suggests that it is more of a risk in **poorly ventilated areas**.

The SARS study also shows that certain activities generate higher levels of aerosol (singing, loud speech (shouting), aerobic activity) and these are likely to pose the greatest risk. In some spaces even enhancing ventilation may not fully mitigate this risk, so the best control measure currently is to avoid these activities, especially in areas that cannot be well ventilated.

## Identifying poorly ventilated areas

Your first step is to identify poorly ventilated areas and look at how you can improve ventilation or reduce the risk by other measures such as avoiding use of these areas where possible.

The British Occupational Hygiene Society (BOHS) has worked in collaboration with the HSE occupational hygienists to develop a simple tool for assessing general ventilation and Covid-19 transmission. It enables you to put in basic information about a workspace, the number of people who use it and the types of ventilation you have. It will then indicate the effect your ventilation arrangements are likely to have on reducing transmission. It also provides recommendations for taking action, where appropriate. The tool can be accessed here: [Ventilation Tool – Breathe Freely](https://breathefreely.org.uk/ventilation-tool/?utm_source=govdelivery&utm_medium=email&utm_campaign=hse-science&utm_term=ventilation-tool&utm_content=science-oct-21)

The Department for Education announced earlier this year that Co2 Monitors would be provided to all state-funded schools including early years, schools and further education providers backed by £25,000,000 in government funding. Roll out of the monitors has proven to be very slow with only special schools, pupil referral units, alternative provision and residential schools along with some secondary schools receiving deliveries so far. The DfE say however that they aim to have all schools supplied by the end of the Autumn term. The instruction leaflet provided with the monitors gives advice on placement and rotation of monitors and measuring along with guidance on understanding the readings and advice on improving ventilation.

**Increasing natural ventilation (fresh air) – the best option!**

The HSE have published a short video giving basic advice on how you can use ventilation to help reduce the risk of Covid-19 in the workplace. [HSE Covid-19 ventilation and air conditioning](https://youtu.be/hkK_LZeUGXM)

* If you can, increase natural ventilation in as many areas as possible, even in mechanically ventilated buildings (without compromising safeguarding/security) and let fresh outdoor air in. This will improve air flow and allow changes of air. Research shows that being in a room with fresh air can reduce the risk of infection from airborne particles by over 70%. You will need to consider balancing this with heating to maintain reasonable temperatures.
* Be proactive and try to ventilate early. Windows and room doors (see fire door advice) should be opened for 10-15 mins before a classroom is occupied and between classes and in breaktimes.
* You can either open windows for short bursts of 10 to 15 minutes every hour or so, regularly throughout the day, or leave windows open a small amount (around 3cm) continuously. Even a small amount will allow air change.
* When temperatures outside are warmer and conditions windier this will also help. Ensure that in windier conditions any external doors which are opened to allow increased, short term ventilation, are securely held to avoid injury.
* **Toilets** – in toilet areas without mechanical extraction, open windows to allow air movement, but doors should remain closed.
* **Where toilet lids are fitted** - instruct building occupants to flush toilets with the lid closed.

## Fire doors

Measures to reduce the potential spread of COVID 19 in schools include improving the ventilation in enclosed spaces. In many instances this has resulted in self-closing fire doors being held open by wedges, etc.

Whilst it is accepted that this practice will improve ventilation by increasing the air flow through the room (assuming windows are also left open), this must be balanced against the need to reduce the risk of fire spread.

The recommendation is for classroom doors (and the doors of any other rooms) to remain open when the room is occupied. The windows of the room should also be opened, if practicable, to create a crossflow of air.

The fire doors of all unoccupied rooms should remain closed. The reasoning is if a fire occurs in an unoccupied room and the door has been held open, a pathway exists for fire and smoke to spread.

The advice to have fire doors held open for the purposes of improved ventilation should not be applied to all fire doors. There are some fire doors that are provided specifically to protect a means of escape, these doors are considered to be safety critical. For example, in schools with more than one storey it is often the case that the upper floors will be served by more than one stair to provide an alternative escape route. If these stairs can be accessed by the same corridor at ground floor, then potentially a fire on the ground floor could compromise both means of escape. Therefore, it is necessary to ensure that suitable separation is provided; this will generally be achieved by providing one or more fire doors within the corridor. Where this is the case, these doors must not be wedged open.

Similarly, any doors opening onto the stairwell at each storey level will prevent the effects of smoke prejudicing the means of escape and must therefore remain closed.

If it is absolutely necessary to hold open safety critical fire doors, then it should be done so with an automatic hold-open device that is linked to the fire alarm system. This will allow the door to close on activation of the fire alarm system. Note that the use of acoustically operated hold-open devices is not acceptable for use on safety critical doors.

Similarly, in schools there will be areas classed as dead ends, i.e. a person making their escape in case of fire has only a single direction of escape. In such circumstances any door opening onto the ‘dead end’ will be probably be designed as a self-closing fire door to provide protection to the escape route. These doors may be wedged open BUT only when the room is occupied.

Schools must be aware that the biggest fire risk to the property is that presented by arson. Well-constructed and properly maintained fire doors play a vital role in preventing an uncontrolled fire from spreading and causing extensive damage to a property. Therefore, all doors should be closed at night when the school is unoccupied, irrespective of whether or not they are fire doors

## Balancing ventilation and keeping people warm at work

Providing adequate ventilation does not mean people have to work in an uncomfortably chilly or cold workplace.

There are simple steps you can take to make sure your workplace is adequately ventilated without being too cold:

* Partially opening windows and doors can still provide acceptable ventilation while keeping workplace temperatures comfortable
* Opening higher-level windows will probably create fewer draughts
* In occupied rooms relying on natural ventilation, air the space by opening windows and doors as fully as possible to regularly provide additional fresh air.
* Try not to seat people next to open windows
* If the area is cold, relax dress codes so people can wear extra layers and warmer clothing
* You could set the heating to maintain a comfortable temperature even when windows and doors are open

## Mechanical ventilation and extraction

* **Mechanical ventilation/local exhaust ventilation (LEV) air conditioning systems** - mechanical ventilation brings fresh air into a building and can include air conditioning and/or heating. Systems that provide both heating and air conditioning are known as heating and ventilation air conditioning (HVAC).

**To help reduce the risk:**

* Continue using most types of mechanical ventilation as normal and set them to fresh air intake and switch off recirculating air modes.
* Switch ventilation on at nominal speed at least 2 hours before, and at lower speed 2 hours after people use work areas.
* At nights and weekends do not switch ventilation off but keep systems running at a lower speed.
* Make sure mechanical systems/ducts/heat recovery equipment are inspected, maintained, filters replaced, defects addressed, and regularly cleaned in line with manufacturers' instructions.
* **Toilets with mechanical extraction** – keep doors closed and extraction operating as normal 24/7.

## Recirculating air – turn off recirculation and use fresh air supply

* Mechanical systems supplying individual rooms should be allowed to operate with recirculation modes switched to supply 100% outdoor air where possible.
* If you use a centralised ventilation system that circulates air to different rooms, it is recommended that you turn off recirculation and use a fresh air supply.
* Recirculation units for heating and cooling that do not draw in a supply of fresh air can remain in operation provided there is a supply of outdoor air, for example windows and doors left open.
* Recirculation units (including air conditioning) can mask poor ventilation as they just make an area more comfortable.

## Fans and air cleaning units

* In collective spaces, i.e. when several people are present in the space, the use of fans for air circulation/cooling is not advised, particularly in small volume, closed or partially open spaces with minimal outside air exchange.
* Desk or ceiling fans should only be used provided the area is well ventilated.
* The use of fans is advised where there is only one person in a room.
* If fans are used, you must take steps to minimise air from fans blowing from one person directly at another to reduce the potential spread of any airborne viruses.

## Testing/air cleaning and filtration units

* Local air cleaning and filtration units could be used to reduce airborne transmission where it is not possible to maintain adequate ventilation.
* Filtration systems, high-efficiency HEPA filters, and ultraviolet-based devices are the most suitable types to use. They would have to be the correct size for the area in which they are being used and would require advice from a competent HVAC engineer. See CIBSE guidance publications referenced by SAGE [**https://www.cibse.org/coronavirus-covid-19/emerging-from-lockdown#1**](https://www.cibse.org/coronavirus-covid-19/emerging-from-lockdown#1)

## Don’t forget ventilation in vehicles

* Switch ventilation systems on while people are in the vehicle and set to drawing fresh air in, and not recirculating air.
* To improve ventilation, windows can also be opened (partially if it's cold). Heating should also be left on to keep the vehicle warm.
* For vehicles that carry different passengers, such as taxis, clear the air between different passengers so the vehicle is aired before anyone else gets in.
* Opening doors where it is safe to do so will help to change air quickly. Opening windows fully for a few minutes can also help to clear the air in the vehicle.

The Department for Transport guidance [**Coronavirus (COVID-19): taxis and PHVs**](https://www.gov.uk/guidance/coronavirus-covid-19-taxis-and-phvs#preparing-your-vehicle-for-the-next-passenger) has information on ventilation and making these vehicles COVID-secure. HSE has advice on [**social distancing in vehicles**](https://www.hse.gov.uk/coronavirus/social-distancing/using-vehicles.htm)during the pandemic.