COVID Response

September 2021

Ventilation Risk Assessment Tool

(COVID-19 Multi-occupancy space assessment)

Occupational Health and Safety Service

HSD211M (rev 5)

UNIVERSITY OF CAMBRIDGE

Document Control

Version	Reviewed by:	Title	Tracking	Date
	Alison Gower	HSD211M Ventilation Risk Assessment Tool		December 2020
Rev 1	Alison Gower	HSD211M Ventilation Risk Assessment Tool (COVID-19 Multi occupancy spaces)	P 6 Adjusted face visor risk factor in Table 2 - Face	February 2021
Rev 2	Alison Gower Andrea Eccles	HSD211M Ventilation Risk Assessment Tool (COVID-19 Multi occupancy spaces)	Due to decreasing local infection rates; Addition of table 7. Cambridge COVID case rate mitigating factors. Increased individual risk of infection rate from 1% to 6% in Airborne.cam	March 2021
Rev 3	Alison Gower Andrea Eccles	HSD211M Ventilation Risk Assessment Tool (COVID-19 Multi occupancy spaces)	Due to increasing local infection rates but with consideration that there is minimal conversion to hospitalisations; Table 7 has been changed to cap the local infection rate score to +15 for all rates higher than 90 per 100,000 cases Further explanation has been added to describe why more significant changes have not been implemented.	June 21
Rev 4	Alison Gower Andrea Eccles	HSD211M Ventilation Risk Assessment Tool (COVID-19 Multi occupancy spaces)	Following removal of statutory requirements (COVID Regulations 2020) on the 19th July 2021. The document has been revised to include information on how to transition from prescriptive requirements to precautionary behaviours.	July 21
Rev 5	Alison Gower Andrea Eccles	HSD211M Ventilation Risk Assessment Tool (COVID-19 Multi occupancy spaces)	Removal of transmission rates as a risk to consider due to a significant decrease in severity of this risk factor. (including the removal of a second assessment on *airborne.cam* for amber and red Rag rated spaces form the initial calculation. Additional information added on use of C	Sept 21

Ventilation Risk Assessment Tool

This tool should be used to guide your COVID risk assessment. Having good ventilation will not only reduce COVID risk but also the risk of all respiratory communicable diseases such as Flu. From the 19th July 2021 the need to assess ventilation moves from explicit requirements under the Coronavirus Act 2020 legislation to the principles of general risk assessment under the Management of Health and Safety at Work Regulations 1999.

For multi-occupancy spaces this tool (including previous versions) has enabled assessors to risk rate workspaces and identify appropriate controls to reduce transmission of airborne respiratory disease due to ventilation risks.

Results of previous ventilation assessments should be used (either the initial tool or Airborne.cam) as a starting point for the transition from absolute requirements to precautionary principles.
Any adjustment of control measures e.g. increasing occupancy from this base line should be done on an ongoing basis as part of your workplace risk assessment. It is to be expected that some control measures will remain in place, and this may mean some high-risk or poorly ventilated spaces are used minimally for the foreseeable future.

This guidance will give you the information on key factors that can help you assess this aspect of risk management and improve ventilation in your buildings.

COVID-19 and other respiratory communicable diseases are thought to spread by three mechanisms:

1. **Large droplets**- Large droplets fall to the ground quickly. This transmission route can be reduced by social distancing and face coverings.
2. **Fomite transmission** - Occurs when an infected person touches a surface, or aerosol/droplets fall on surfaces, then a susceptible person touches that same surface and then their face. We can reduce this transmission route by washing our hands and surfaces frequently.
3. **By aerosols** - The final transmission route is via aerosols, which are tiny particles that remain suspended in the air, build up over time, and mix throughout a space. This transmission route can be decreased by reducing the length of time of an activity, reducing the number of people in a space, and most importantly by increasing ventilation.

It is clear that airborne transmission can play a significant role, especially for asymptomatic and pre-symptomatic cases. Because the risk of airborne transmission is widely recognised, it is particularly important that ventilation in buildings is assessed.
Ventilation is key in helping to avoid super spreading events, as existing evidence shows these are more likely to occur when a group of people gather in a poorly ventilated space, for a significant length of time.

Adjustments, modification or improvements to building ventilation infrastructure are only one aspect of the mitigation measures that can be used, and should not be relied on alone when managing the use of spaces. In addition, any mechanical work will take time to undertake and will be subject to a programme of ongoing improvements. A large number of rooms in university and college buildings are naturally ventilated through openable windows. People should aim to better understand the importance of ventilation, and open windows whenever possible. Good ventilation is essential for reducing transmission risk.

Key control measures

1. Open windows

Airborne communicable diseases can be spread by small particles emanating from an infected person's airway that can remain suspended in the air for a long time, get mixed throughout a room and build up over time. This means it is very important to enhance ventilation whenever possible.

- Open windows before meetings start and leave them open afterwards (being mindful of security aspects when the building is not occupied).

- Do not have meetings or work with others in a room that has no obvious source of outdoor air or where experience has shown the room can become ‘stuffy’ or uncomfortable when in use.
- To maximise air flow when draughts are not a concern, both high and low level windows should be opened together (when available).
- Where windows are available on multiple room facades these should be opened together to increase air flow.
- Ask staff/students to dress in preparation for the reduced temperatures.
- In winter months or inclement weather when draughts are a concern, open high level windows only as incoming air will be warmed as it flows into the room.
- In cooler months windows only need to be opened slightly to deliver the same air flow as wide open windows in warmer weather.
- Furniture should be moved away from open windows and draughts if possible.
- Display posters to remind room users to open windows.

2. Reduce room density

Denser room occupancy increases sources of aerosol

- Consider using larger spaces for meetings that are currently not being used e.g. seminar rooms, lecture theatres. Always select the biggest room available.
- Ensure that where in-person meetings/working take place only those required for the work are present.
- Ensure that when work/meetings take place with those you do not regularly work/mix with, that only essential closer contact time is allowed. Encourage people to arrive promptly/move on quickly so that rooms can be well ventilated (purged) before the next use.
- Gradually increase the number of room occupants over time and review on an ongoing basis to allow for assessment of the impact of the increased density on workplace transmission. Note: Occupancy numbers should also ensure that a degree of social distancing can be maintained.
- In high risk areas occupancy will be limited e.g. unventilated/poorly ventilated spaces.
- Display signs in each space to communicate maximum occupancy levels to users, these will need to be adjusted as changes occur.
- All larger gatherings should be planned with a degree of social distancing (greater than pre-pandemic). In lecture theatres/meeting rooms this may have a severe impact on capacity, especially where seating is fixed (50% - as the only option will be to use alternative seats) It is advised that lecture theatres with bench seating are selected for larger gatherings, allowing a smaller gap than a full seat space, whilst still increasing social distancing. (75% occupancy should then be achievable).

3. Reduce occupancy time in rooms

Over the course of a day’s use, aerosol builds in a room.

- Ensure that rooms are not put into continuous use (without any gaps in occupation) and time table sessions with ventilation gaps where occupancy is minimal, to allow a fresh air supply into the space (purging).
- Gradually increase occupancy times, to allow for assessment of the impact of increased duration.
- Encourage staff/students to leave work areas for break times and lunch to allow for purging of the workspace.

4. Face coverings

Face coverings dramatically reduce the amount of aerosol in a space.

1. Strongly advise and encourage we wear a face covering when inside University buildings.
    - The use of face coverings is strongly recommended in all internal multi occupancy buildings; they can be removed, but with an ongoing consideration for others who may prefer to use them; this includes if you meet with others in close proximity, and/or in smaller rooms, where it would be courteous to ask if others are comfortable for you not to wear a face covering.
    - In addition, you should consider continuing to wear face coverings if:
        a) Other mitigating factors such as a degree of social distancing (high density areas/crowds) or adequate ventilation is compromised.
        b) When moving around buildings/rooms in multiple occupation.
        c) Where your own risk assessment identifies you should wear appropriate PPE (providing additional personal protection to you as well as to others)

2. Notices displayed to encourage continued use of face coverings
3. If face coverings are removed surfaces such as desks will have increased surface contamination. Ensure that cleaning materials are provided and encouragement/instruction is given to all room users to have responsibility to clean surfaces and contact points after use. This will minimise the risk of transmission of disease via surfaces and touchpoints.

5. Mechanical ventilation

A large number of University buildings have mechanical ventilation. This can be beneficial due to larger number of air changes compared to a naturally ventilated space. You should know the details of your system before conducting the risk assessment. In some cases mechanical ventilation can create danger zones where contaminated air builds up in an area. These will be found with enhanced modelling/survey.

- Where possible find out the number of air changes per hour for you mechanical ventilation.
- Find out if the ventilation feed is fresh or recirculated air or a combination of the two, if possible set the system to run on 100% fresh air feed, or as high as the unit will allow.
- Ensure that air vents/ducts are free of obstruction and that systems are up to date with regular servicing.
- For purely recirculated systems, if possible isolate and use natural ventilation means instead. Communicate the need to not use the system to building users if it cannot be isolated, reduce occupancy density and duration if these areas need to be used.

6. Identification and monitoring of poorly ventilated spaces

People exhale carbon dioxide (CO_2) when they breathe out. If there is a build-up of CO_2 in an area it can indicate that ventilation needs improving.

Although CO_2 levels are not a direct measure of possible exposure to COVID-19, checking levels using a monitor can help you identify poorly ventilated areas. This link has Health and Safety Executive guidance on use of CO_2 monitors for monitoring: Identifying poorly ventilated areas (hse.gov.uk)

If you identify poorly ventilated spaces, the SafeSpace Team can support you with selecting a suitable CO_2 monitor to evaluate the reality of risk in the space. Please contact them on safe_space@admin.cam.ac.uk for further details

Ensure that all multi-occupancy areas / rooms are risk assessed with the ventilation tool (see next section).

For more details on all aspects of ventilation please see the CIBSE COVID-19 Ventilation Guidance https://www.cibse.org/coronavirus-covid-19/emerging-from-lockdown#1

Monitoring and review process

As staff return we advise a phased reduction of existing COVID-19 control measures over the summer months aiming to lead to a fuller opening of the University for the Michaelmas term. The phased approach is essential to ensure staff returning feel secure and safe and that 'so far as is reasonably practicable' workplace COVID infection risk has been minimised throughout the process.

To enable this transition we advise that you use the following procedure -

1. Control measures identified in your ventilation assessment which provide a low risk/green rating should be implemented at the initial date of return.
2. Continuously monitor workplace COVID transmission rates and local infection rates, increased/decreased demand for return to the workplace and staff anxieties. The University COVID helpdesk will contact Departments as cases occur, you do not have to request this information.

3. Slowly adjust control measures in accordance with monitoring data.

    a. If cases/transmissions/staff anxieties rise, stricter controls should be implemented.
    b. If cases/transmission/staff anxieties reduce control measures can be further relaxed.
    c. Ensure any changes are documented and communicated to staff/students.

4. Identify and keep any key control measures (as outlined above) throughout the pandemic and beyond, if they are reasonable and/or effective at minimising workplace respiratory communicable disease risk.

5. Through this monitoring and review process, you will be able to ensure that you have only adapted control measures (e.g. reintroduced additional staff to the workplace/increased occupancy) when it is safe to do so.

If you require further assistance please contact the Safe Space Team

Ventilation Risk Assessment Tool

Ventilation Risk Assessment Tool – Multi Occupancy Spaces

This tool is an indicator and provides a guide to risk factors. If ventilation has not been assessed at all since the start of the pandemic, this tool should be used to give a base line of control measures for initial safe re-occupancy of workspaces. In previous versions of the tool, where a result was Amber or Red rated, an additional calculation using Airborne.cam was required. Due to the removal of the 'infection risk' factor from the calculations (due to a change in risk severity), this will no longer be necessary. This factor may be re-introduced at a later date should circumstances change. If you now have a red rated space please contact the SafeSpace team who will advise you on monitoring of ventilation.

Departments/Institutions can start to gradually relax some control measures defined in these assessments e.g. increasing occupancy/duration based on evidence of minimal COVID transmission risk.
It may be necessary to increase control measures at any point if workplace transmission is evident.

The University SafeSpace team are available for help and advice with these assessments.
Safe_Space@admin.cam.ac.uk

Risk assessment tool for assessing a physical space– Hands, Face, Space, Ventilation, Duration

Ventilation cannot be assessed without first ensuring that other key control measures are in place.

1. Hands

Control measure		
Hand sanitiser/washing facilities at entrance/visual reminders in place	0	
No hand sanitiser available/no handwashing facilities at all/no visual reminders	+10	

2. Face

Select the option for the majority of occupants in the space

Control measure	**Score**	
FFP3 mask/half mask with filter (un-valved)/air-fed hood	-10	
Any face covering	0	
No face coverings worn	+20	

3. Space

A. This relates to the physical distance between people in the space for the majority of the time

Control measure	Score	
>5m	0	
1-5m	+5	
<1m	+10	

4. Ventilation

Control measure	**Score**	
Mechanical ventilation with HEPA filtration	0	
Mechanical ventilation – supplied from fresh air feed	0	
Openable windows/doors – natural ventilation	+5	
Mechanical ventilation – recirculated air/fresh air mix	+10	
Mechanical ventilation – completely recirculated air (including recirculating air conditioning units)	+15	
No ventilation (internal space or no opening windows)	+15	

5. Duration – In multiple occupation

Control measure	**Score**	
< 15 minutes	0	
30 minutes max	+5	
60 minutes max	+10	
90 minutes max	+15	
>90 minutes	+20	

6. Mitigating factors (please use all that apply)

Air changes per hour above 10 (if known)	-20	
Room left empty for 10 minutes prior to occupation with mechanical ventilation that includes outside air running.	-15	
Room left empty for 10 minutes prior to occupation with only ventilation from open windows	-10	
Static use (minimal movement – people sat at desks i.e. office, lecture etc.)	-5	

7. Additional Risk factors (please use all that apply)

Low aerosol generating activity e.g. lecture/training	+5	
Medium aerosol generating activity e.g. meeting with discussion, eating	+5	
High aerosol generating activity e.g. singing, wind instruments, voice projection, drama, loud speaking (e.g. speaking over loud machinery)	+10	
Aerobic activity i.e. Gym	+15	

RAV1 Form

Essential Use
Reason for room use _____

RA - Calculation

Section	Score
1. Hands	
2. Face	
3. Space	
4. Ventilation	
5. Duration	
6. Mitigating Factors	
7. Additional risk factors	
Total	

Assessor name	Signature	Supervisor name	Signature

Risk rating	Score
Low	**<35**
Medium	**35-50**
High	**50+**

Action needed	
Low risk	1. Record the findings on your risk assessment. Ensure that this is signed by the assessor. 2. Ensure that all control measures are clearly communicated to room users with signage and include in Standard Operating Procedures (SOPs).
Medium risk	1. Record the findings of your risk assessment. Ensure that this is signed off by the assessor. 2. Consider changing control measures in the tool and recalculate. 3. Ensure that all control measures are clearly communicated to room users with signage and include in SOP's.
High risk	1. Record the findings of your risk assessment. Ensure that this is signed off by the assessor. 2. Contact the safe space team for consideration of use of CO_2 monitors to calculate the reality of the risk.

.

UNIVERSITY OF CAMBRIDGE
Safety Office
Greenwich House
Madingley Road
Cambridge CB3 0TX

Tel: 01223 333301
Fax: 01223 330256
safety@admin.cam.ac.uk
www.safety.admin.cam.ac.uk/

HSD211M (rev 5)