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BUILDING ENGINEERING
SERVICES ASSOCIATION

AC systems and
Covid-19

Risk assessment
and decision
making



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Technical Bulletin

COVID-19 and Air Conditioning Systems



μ CORONAVIRUS COVID-19

The current coronavirus (COVID-19) outbreak is developing rapidly with Government and medical professional advice changing rapidly. This statement is based on the best advice currently available at the time of writing. European National Governments and National Health Systems websites should be consulted for any rapidly developing changes to the situation. This guidance addresses the safe management of common ventilation systems.



The following information is a summary of the COVID-19 guidance developed by REHVA - the Federation of European Heating, Ventilation and Air Conditioning Associations with additional content from CIBSE - the Chartered Institution of Building Services Engineers and BESA - the Building Engineering Services Association.

FURTHER READING

- [BESA COVID 19 Guidance](#) - Guidance and support for members regarding COVID-19 / Coronavirus
- [REHVA COVID 19 Guidance](#) - How to operate and use building services in areas with a coronavirus outbreak
- [CIBSE COVID 19 Guidance](#) - Guidance for staff, members and visitors

IMPORTANT

- Preventing contamination and protecting public health is more important than thermal comfort.
- All works shall be undertaken with common protective measures including respiratory protection
- The maintenance personnel should follow standard safety procedures of dusty work, including wearing gloves and respiratory protection.
- Where users can intervene in the control of the ventilation make them aware of the benefit of these for reducing the circulation of infectious material.

FURTHER READING

- [GN 1](#) - COVID-19 and Engineering Services: guidance
- [GN 2](#) - COVID-19 and Engineering Services: guidance

OUTSIDE AIR

- Maximise the supply of outside air as much as reasonably possible while maintaining or increasing the social distancing (min physical distance 2-3 m between persons) among employees in order to foster the ventilation cleaning effect.
- The purpose of maximising fresh air supplies is to dilute the concentration of possible contamination in the indoor air, so any introduction of fresh air is to be encouraged.

WINDOW AIRING

- In buildings without mechanical ventilation the use of openable windows is recommended, even if this causes thermal discomfort.

Dedicated Covid section on the BESA website has regular updates:

<https://www.thebesa.com/covid19/besa-covid19-guidance/>

This specific document can be found here:

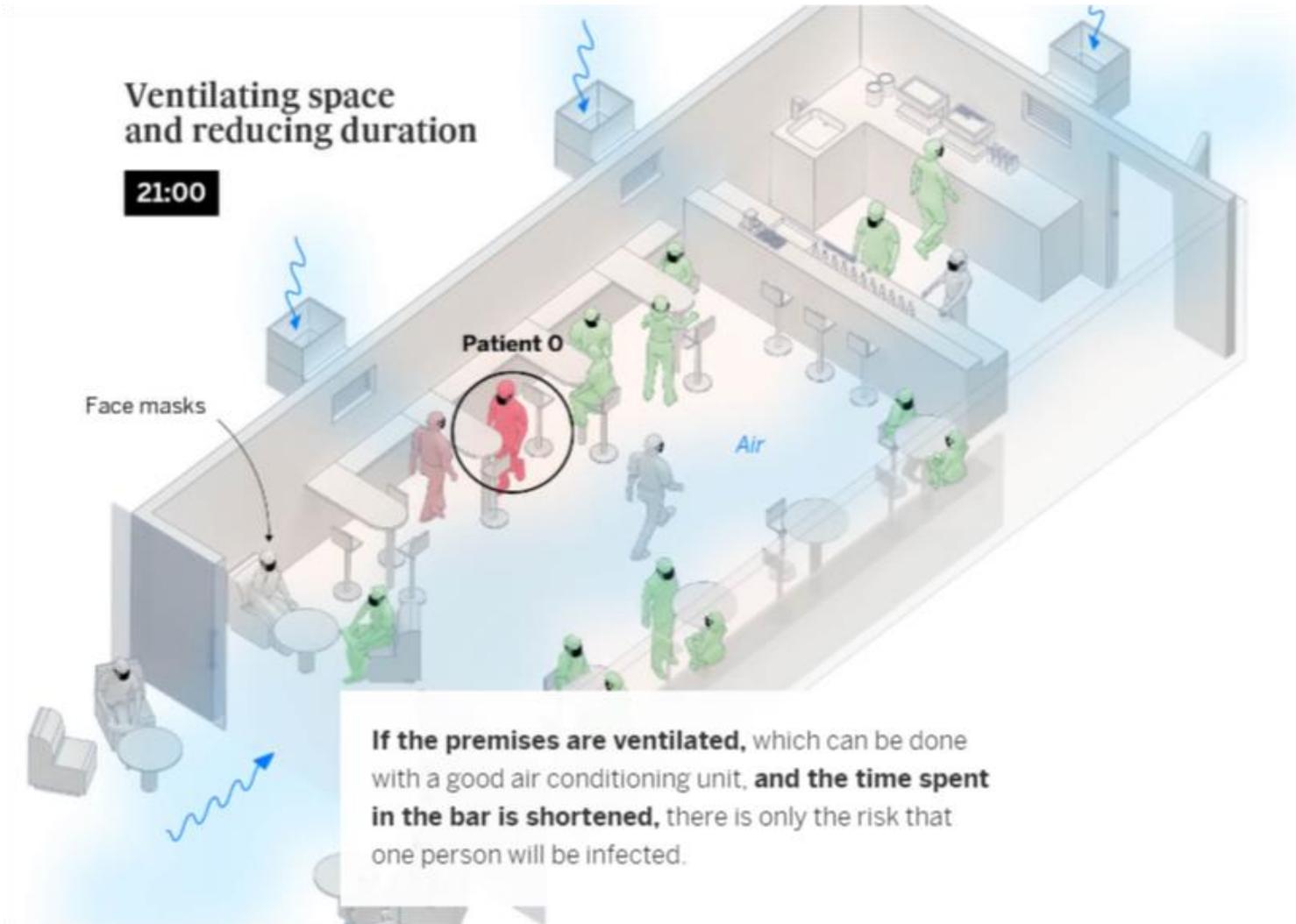
<https://www.thebesa.com/media/1409126/vg002-final-october-2020.pdf>



A typical public space such as a bar can be shown to expose a high number of fellow patrons if an infected asymptomatic person is present

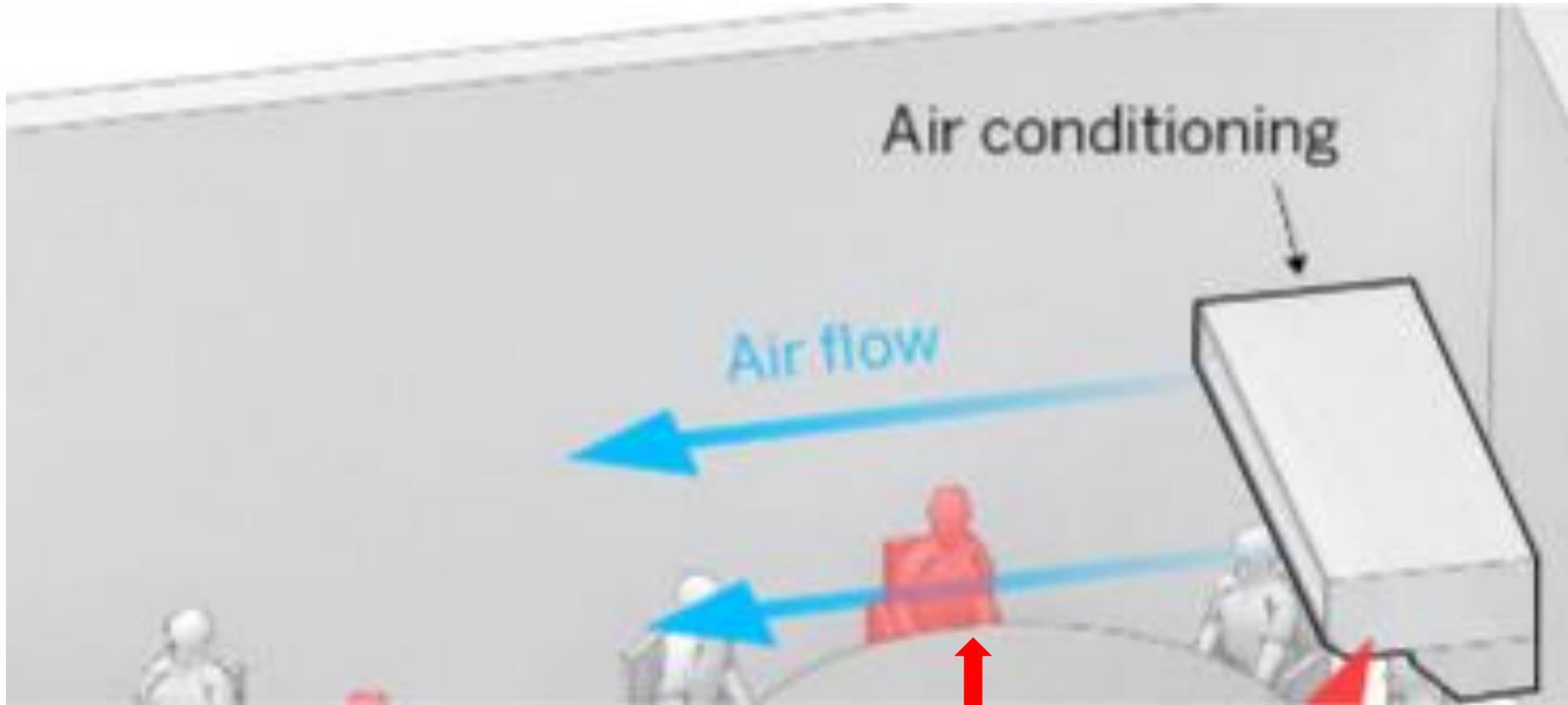
If no mitigating measures are taken.....

Pictures from El Pais 28th October 2020



That same bar with good ventilation being introduced that will dilute the viral load and massively reduce the exposure of the patrons will see a huge reduction on passive infection rates.

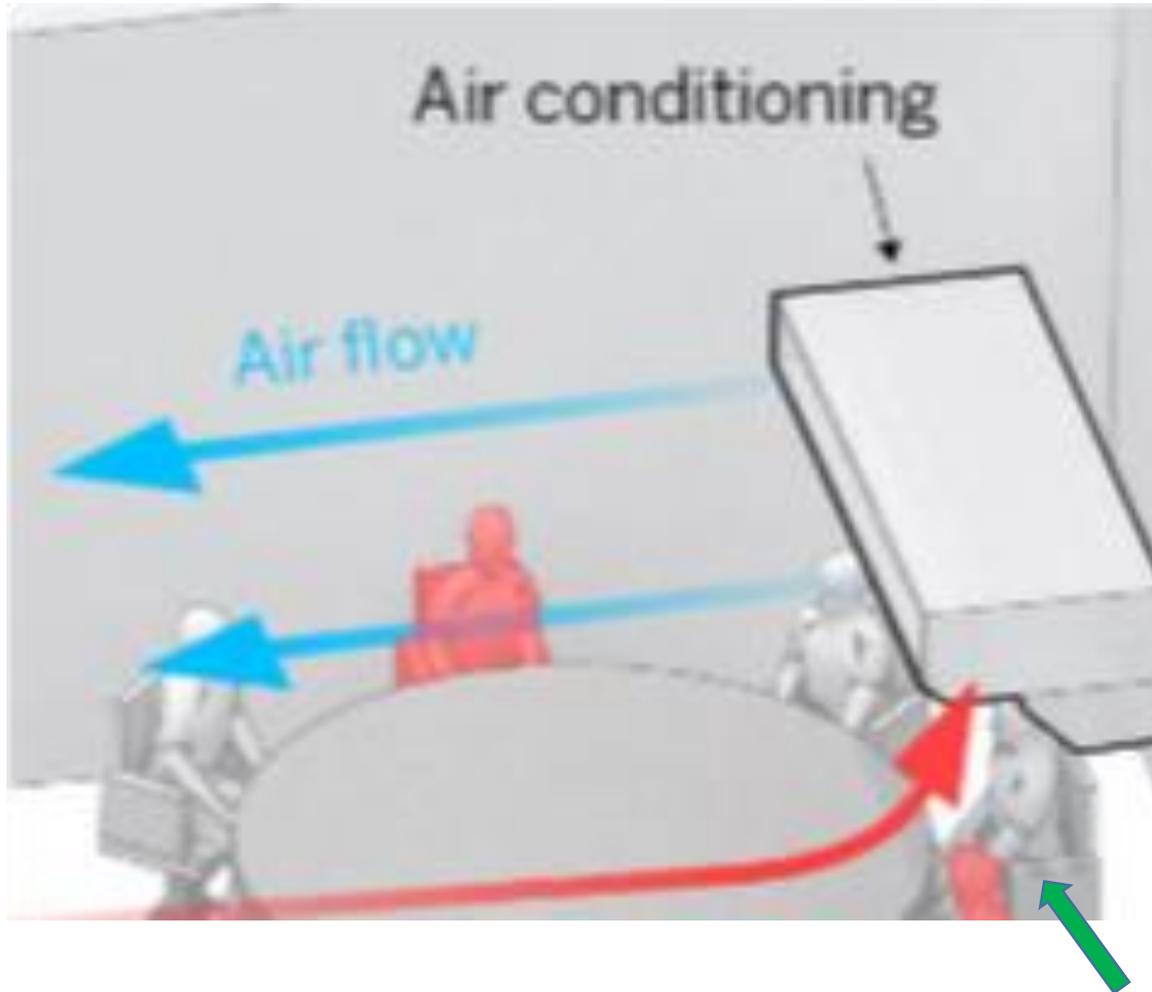
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When we look at the discharge air flow direction of a typical AC or ventilation system we can see it is critical that we do not seat people in a direct line from the air throw pattern to remove risk of direct viral exposure from an infected, and possibly asymptomatic, person.

Non- infected patrons being exposed by direct air throw off an AC unit

Infected patron



The movement of air being drawn into a return or exhaust grille will draw infected particles that are still airborne back past other people in the occupied space, thereby exposing them to contaminated particles and possibly infecting them as well.

The lower humidity levels will allow the lighter particles to remain airborne for longer and increase this risk of passive infection at return or exhaust grilles.

Patrons being exposed to contaminated air being drawn back to a return grille



Risk Assessment of Air Conditioning or Ventilation system fan coil units

(please read BESA VG002 latest version from <https://www.thebesa.com/covid19/besa-covid19-guidance/> in conjunction with this risk assessment)

A risk assessment sheet shall be completed for each fan coil unit or group of units in a common zone to account for local zone issues such as temporary screens which will divert/disrupt air patterns, the use of oscillating louvres, etc. This risk assessment applies to uses where the occupancy is of a sedentary nature only. Higher respiratory occupancy raises the risk of contamination of air in the zone considerably.

Client / Site Location

Before you start

Yes

No

N/A

Are you authorised and qualified to undertake the situation?

Have you read the latest version of BESA VG002 and the accompanying fan coil decision chart?

Have you measured mechanical fresh air volumes into the zone?

Are the fresh air volumes into the zone recorded anywhere? (logbooks, O&M Manuals, etc., for example)

Does the fresh air volume meet or exceed the minimum requirements of CIBSE Guides A and B? (see below for guidance on this)

CIBSE Guide A suggests a minimum supply air rate of 10 litres per second per person for office applications. To reduce risk of occupants in a building it is essential that the viral load is reduced by maximising the fresh air supply and so any measured fresh air supply needs to be in excess of this figure, or the relevant figure for the application as defined in CIBSE Guide B.

A minimum of double the normal fresh air supply rate is needed at the present time and as much as reasonably practical or possible is recommended with a target of trebling the normal rate. If more than double the normal ventilation rate cannot be achieved then consideration shall be given to using localised air cleaners such as UVC mobile units.

Stop 1 - t

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Client / Site Location

Before you start

Yes No N/A

Are you authorised and qualified to undertake the situation?

Have you read the latest version of BESA VG002 and the accompanying fan coil decision chart?

Have you measured mechanical fresh air volumes into the zone?

Are the fresh air volumes into the zone recorded anywhere? (logbooks, O&M Manuals, etc., for example)

Does the fresh air volume meet or exceed the minimum requirements of CIBSE Guides A and B? (see below for guidance on this)

CIBSE Guide A suggests a minimum supply air rate of 10 litres per second per person for office applications. To reduce risk of occupants in a building it is essential that the viral load is reduced by maximising the fresh air supply and so any measured fresh air supply needs to be in excess of this figure, or the relevant figure for the application as defined in CIBSE Guide B.

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Part 1	Consideration shall be given to using localised air cleaners such as UV-C mobile units.			
	If the zone is single person occupied, are there control measures in place to prevent other people entering the zone?			
	If the zone is occupied by more than one person, is it essential to operate the fan coil unit(s)?			
	Has the zone had any risk assessment carried out by you or other parties resulting in seating plans or occupancy level control measures?			
	Has any seating plan taken into account air flow or discharge from fan coil units?			
	If a zone occupant may be seated or present in a direct line between the fan coil outlet and another person, are they beyond the air throw of the fan coil?			
	Is the fan coil needed to assist the distribution of the fresh air being introduced to the zone?			
Is there a register of person(s) who are in the zone to assist future tracing requirements?				
If answer is 'No' to any of the above, take required action or report to your supervisor. If in doubt ask!				
Part 2	Safety and Health Assessment (if the hazard is present tick the box)			
	Occupants in close proximity to others			
	Insufficient fresh air available			
	Insufficient air movement or distribution of the fresh air within the zone			
	Cleanliness of the fan coil heat exchanger			

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	Name		Signature of employer or self employed person	
	Date			
Part 4 - Review	End of Job Review			
	Are there any lessons for next time?	Yes	No	
	Has the work created any new hazards	Yes	No	
	If you have answered 'Yes' to either of these questions, make a brief note below and tell your supervisor.			
	If you have identified significant hazards in section 2 and been unable to fully address or mitigate them in section 3 then fan coil units should be left switched off until such time as the risks can be mitigated.			

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Thank you
Any questions?



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