



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Letter to the Editor

COVID-19 and importance of air filtration



Reporting Value-13 (MERV-13) to filter even very small particles [13].

Keywords:

COVID-19
Indoor environment
Infection control
Air filtration
Review

Dear Editor,

The number of COVID-19 confirmed cases as per the WHO report is 170,747,372 and the number of deaths is 3,555,726, as on 2nd June 2021 [1]. Few countries were severely affected by the COVID-19 and the first wave predominantly affected the aged people while the second wave affected younger population significantly [2]. The elderly population and people with comorbidity, particularly diabetes is vulnerable to COVID-19. The diabetes community urgently needs to know more about COVID-19 infection control in indoor space using air filtration to avoid contracting it as the mortality figures are higher with diabetes [3]. It is reported that the vaccinees may be infected [4] and the diabetic patients are at a high risk of contracting COVID-19, if he/she visit the indoor space such as hospital where air purification is not done [5]. The severity of superspreading events such as festivals, marriage etc., depends upon the human behaviours and type of interactions [6].

It is suggested that the effective ventilation, avoidance of recirculation of air, enhanced particle filtration by suitable air filters and air disinfection can control infection transmission. The opening of windows will increase natural ventilation and dilutes the indoor air and reduces infection spread [7]. Few filters are effective in removing respiratory aerosols, however there is a misconception about air filter selection to control COVID-19 in indoor space [8]. The indoor air purifiers with high efficiency particulate air (HEPA) filter can be a used to filter the contaminated indoor air. However, this type of HEPA filters must be replaced at regular intervals [9].

If a single room without air conditioner facility is given to the patient, then the far-UVC light is recommended as it effectively controls pathogens [10], whereas rooms with air conditioning is provided for the patient, then the combination of HEPA filter and UVC light can reduce bacterial and virus load significantly [11] and this arrangement is shown in Fig. 1. The room air can be recirculated if the HEPA filter or disinfection method is used for air filtration. The supply or outdoor air should be filtered by a filter and then it should be mixed with the recirculated air and supplied to the room through the HEPA filters [12]. The ASHRAE recommends HVAC system with minimum efficiency of Minimum Efficiency

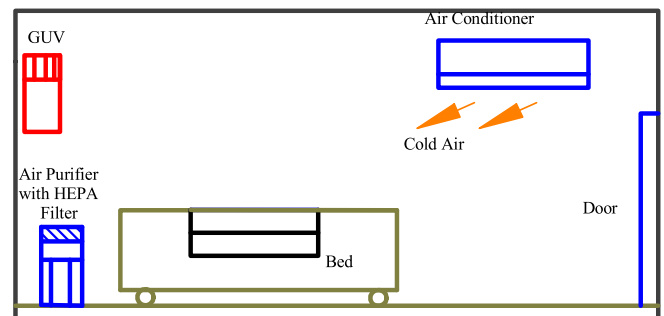


Fig. 1. Air filtration arrangement for airconditioned room.

Declaration of competing interest

Authors declare that, they do not have any conflict of interest.

References

- [1] <https://covid19.who.int/>.
- [2] Iftimie Simona, Ana F, López-Azcona, Vallverdú Immaculada, HernándezFlix Salvador, de Febrer Gabriel, et al. First and second waves of coronavirus disease-19: a comparative study in hospitalized patients in Reus, Spain. PLOS ONE 2021. <https://doi.org/10.1371/journal.pone.0248029>.
- [3] Riddle Matthew C, Buse John B, Franks Paul W, Knowler William C, Ratner Robert E, Selvin Elizabeth, Wexler Deborah J, Kahn Steven E. COVID-19 in people with diabetes: urgently needed lessons from early reports. Diabetes Care 2020;43(7):1378–81.
- [4] Wang Chengdi, Wang Zhoufeng, Wang Guangyu, Johnson Yiu-Nam Lau, Zhang Kang, Li Weimin. COVID-19 in early 2021: current status and looking forward. Signal Transduction and Targeted Therapy 2021;6:114.
- [5] Pal R, Bhadada SK, Misra A. COVID-19 vaccination in patients with diabetes mellitus: current concepts, uncertainties and challenges. Diabetes & metabolic syndrome 2021;15(2):505–8. <https://doi.org/10.1016/j.dsx.2021.02.026>.
- [6] Greenhalgh Trisha, Jimenez Jose L, Prather Kimberly A, Tufekci Zeynep, Fisman David, Schooley Robert. Ten scientific reasons in support of airborne transmission of SARS-CoV-2. Lancet 2021;397. 1603–1065.
- [7] Tang JW, Bahnfleth WP, Bluysen PM, Buonanno G, Jimenez JL, Kurnitski J, Li Y, Miller S, Sekhar C, Morawska L, Marr LC, Melikov AK, Nazaroff WW, Nielsen PV, Tellier R, Wargocki P, Dancer SJ. Dismantling myths on the airborne transmission of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). J Hosp Infect 2021;110:89–96.
- [8] Nazarenko Yevgen. Air filtration and SARS-CoV-2. Epidemiol Health 2020;42:e2020049.
- [9] Zhao Bin, Liu Yumeng, Chen Chen. Air purifiers: a supplementary measure to remove airborne SARS-CoV-2. Build Environ 2020;177:106918.
- [10] Mackenzie Dana. Ultraviolet light Fights New virus, Engineering (Beijing), 6; 2020. p. 851–3. PMID: 32837746, 8.
- [11] Ehsan S, Mousavi, Krystal J, Pollitt Godri, Sherman Jodi, Martinello Richard A. Performance analysis of portable HEPA filters and temporary plastic

anterooms on the spread of surrogate coronavirus. *Build Environ* 2020;183:107186.

- [12] Mousavi Ehsan S, Kananizadeh Negin, Martinello Richard A, Sherman Jodi D. COVID-19 outbreak and hospital air quality: a systematic review of evidence on air filtration and recirculation. *ES T (Environ Sci Technol)* 2021. <https://doi.org/10.1021/acs.est.0c03247>.
- [13] https://www.ashrae.org/file_library/technical_resources/ashrae_journal/2020journaldocuments/72-74_ieq_schoen.pdf. [Accessed 20 May 2021].

Lakshmi Nidhi Rao
A B Shetty Memorial Institute of Dental Science, Nitte Deemed to be
University, Mangalore, India

* Corresponding author.

E-mail address: kapil_krecmech@yahoo.com (N. Kapilan).

N. Kapilan*
Nitte Meenakshi Institute of Technology, Bangalore, India

3 June 2021