

Importance of Ventilation in the COVID-19 Era

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ABSTRACT

Importance of ventilation in the coronavirus disease-2019 (COVID-19) era: The SARS-CoV-2 virus can be transmitted easily indoors than outdoors. In indoors, good ventilation decreases the concentration of virus particles in the air. Good ventilation can also reduce many other air-borne infections like tuberculosis and influenza.

Challenges faced during the pandemic with regards to ventilation: The improvement of ventilation has not received adequate importance in Information, Education, and Communication (IEC) material for the public, nor in government measures.

Recommendations to overcome the challenges: Ventilation in homes can be improved by opening doors and windows, proper placement of fans, and exhaust fans. At workplaces keep windows and doors slightly open while the ACs are running, add gable/exhaust fan in offices, etc. At centralized air management systems like auditoriums and shopping malls, roof ventilators and high-efficiency particulate air filters/regular filters are recommended. Hospitals and health centers must ensure that vaccinations are carried out in well-ventilated and directional airflow controlled areas wherever possible. Ventilation improvement has huge scope and along with other measures, it can reduce the transmission of SARS-CoV-2. Air-conditioned (AC) buses, metro trains, malls, and healthcare systems should improve their ventilation system. Improving ventilation should be focused on IEC and government measures with a practically feasible and holistic approach.

Keywords: COVID-19 pandemic, SARS-CoV-2, Ventilation.

SBV Journal of Basic, Clinical and Applied Health Science (2022): 10.5005/jp-journals-10082-03163

INTRODUCTION

There have been 4.3 crore cases of COVID-19 in India and the mortality rate is 1.22% (as on April 27, 2022).¹ Adequate ventilation along with physical distancing, wearing face masks, hand hygiene, and vaccination is very important for preventing COVID-19 infection.² The SARS-CoV-2 virus can be transmitted easily indoors than outdoors.³ In indoors, good ventilation decreases the concentration of virus particles in the air. Good ventilation can also reduce many other air-borne infections like tuberculosis and influenza.

CHALLENGES FACED DURING THE PANDEMIC WITH REGARDS TO VENTILATION

The improvement of ventilation has not received adequate importance in IEC material for the public, nor in government measures. Regarding public transport, no differentiation is made between AC transport and well-ventilated modes of transport like AC and non-AC buses, local and metro trains. Also, there are measures to reduce transmission in AC which should be given more attention.²⁻⁴ Maintaining social distancing is very difficult especially in cities as they are having limited space, more population, and limited modes of transport. Governments have judiciously applied lockdowns taking into consideration the local scenarios, balancing lives, and livelihood. Applying restrictions is tricky, for example, (1) If the number of passengers are restricted in bus, the passengers have to wait for hours in a long queue without social distancing; and (2) Some shops were keeping shutters closed due to restrictions of government but were allowing customers to enter from backdoor due to which ventilation is compromised and risk of transmission further increases.

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How to cite this article: Chavhan SS, Dhikale PT, Adsul B. Importance of Ventilation in the COVID-19 Era. *J Basic Clin Appl Health Sci* 2022;5(3):84-85.

Source of support: Nil

Conflict of interest: None

RECOMMENDATIONS TO OVERCOME THE CHALLENGES

Residential Settings

Ventilation in homes can be improved by opening doors and windows, proper placement of fans, and exhaust fans.^{2,4} It is advised that jali/air outlets with exhaust fans should be installed by gram panchayats in homes where there is no cross-ventilation.⁴

Non-residential Settings

At workplaces keep windows and doors slightly open while the ACs are running, add gable/exhaust fan in offices, etc.⁴ At Centralized Air Management Systems like auditoriums and shopping malls, roof ventilators and high-efficiency particulate air filters/regular filters are recommended.⁴ These filters must be regularly cleaned or replaced.⁴ Upper-room ultraviolet germicidal irradiation (UVGI) systems can be used to provide air cleaning within occupied spaces, and in-duct UVGI systems can help enhance air cleaning

inside central ventilation systems.² To ensure cross-flow of air in public transport vehicles by keeping windows open where possible, AC vehicles use exhaust system to improve airflow and use high-efficiency particulate air filters/regular filters which are regularly cleaned or replaced.

Healthcare Settings

Hospitals and health centers must ensure that vaccinations are carried out in well-ventilated and directional airflow controlled areas wherever possible.⁴ The World Health Organization in its "road map to improve and ensure good indoor ventilation in the context of COVID-19" gives detailed guidance to improve ventilation in three settings—health care, nonresidential, and residential spaces.³ For example in healthcare settings, the airflow direction should be from clean to less clean area.³

Ventilation improvement has huge scope and along with other measures, it can reduce the transmission of SARS-CoV-2. AC buses, metro trains, malls, and healthcare systems should improve their ventilation system. Improving ventilation should

be focused on IEC and government measures with a practically feasible and holistic approach.

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