

# Air quality approaches to minimize spread of COVID-19 (and other viruses) in public and shared spaces

Improved air quality is a cornerstone to lowering viral spread in public and semi-public spaces like workplaces, schools, restaurants, parties, dorms, etc. Measures to “clean the air” prevent super-spreaders and have the advantage of operating in the background. Instead of putting the preventive burden on everyone who comes into a space, hosts can plan and implement good air quality.

*Note: An alternative or complementary approach to cleaning the air is creating a COVID-free “bubble.” Everyone must test negative right before (e.g., <1 hr before) entering a space. The NBA and movie and television productions have used this strategy. Adding a “bubble” strategy may make sense for contexts where people will have close, sustained unmasked contact, as in some sports.*

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LESS COST /UPKEEP/EXPERTISE

MORE COST /UPKEEP/EXPERTISE

## VENTILATION

“Add outdoor air to dilute virus in inside air”

- Open cross-facing windows and doors to outside  
*Tip: Box fans in open windows add effectiveness*
- Hold gatherings outdoors
- Set HVAC or furnace fan to “ON” instead of “Auto” before, during, and after people are in space  
*Tip: Running kitchen and bathroom exhaust fans also improves ventilation*
- “De-densify” the space: Use much larger spaces than needed  
*Tip: High ceilings also reduce risk*
- Change HVAC settings [to bring in more outside air](#) (e.g., open outside air intakes)
- Professional HVAC evaluation and updates, e.g., increase air exchanges per hour, “economizer” settings, heat recovery ventilation. Many options: tailor to local climate, needs, and budget - see page 6 [here](#)

## TO DETERMINE EFFECTIVENESS

- “NDIS” CO2 monitors (~\$150-\$300). [Portable](#) & stationary options available. A common target is <800 ppm CO2 for low risk of COVID spread
- Use ventilation strategies with caution in high-pollution areas. Consider combining with filtration strategies to reduce pollution

## FILTRATION

“Capture & remove virus in inside air”

- DIY [Corsi-Rosenthal box](#) (supplies ~\$100 each)  
*Tip: Change filters at least every 6 months.*
- [Portable air cleaners](#) (~\$100-\$500 each, [plus costs of replacement “HEPA only” filters](#) ~\$25-80 each)  
*Tip: Multiple cleaners at lower fan setting may be less noisy and as effective as one cleaner at highest setting*
- Ask HVAC professional: Can your HVAC system handle upgrading filters to [\(a\) MERV-13 or greater or \(b\) HEPA \(~MERV-17+\)](#)?
- Universal masking (good-fitting, high-filtration masks) filters virus as people breathe  
*Tip: Strategy allows closer face-to-face contact. May require enforcement.*

## TO DETERMINE EFFECTIVENESS

- No direct way to monitor
- For Corsi-Rosenthal boxes and [portable air cleaners](#), use [online](#) or [published](#) calculators to determine how many needed for the space. Key info: 1) size of space; 2) Air Cleaner’s Clean Air Delivery Rate aka CADR ([Corsi-Rosenthal box CADR~165-239](#)); 3) Air Change per Hour target: 5 ACH is common

## UV GERMICIDAL IRRADIATION

“Kill virus in inside air”

- [In-duct/HVAC UVC or Upper room UVC](#) best for high risk settings where ventilation & filtration strategies not implemented.  
*NOTE: [EPA-registered professional needed for installation and maintenance \(every 1-2 years\)](#)*

## TO DETERMINE EFFECTIVENESS

- UV strategies require professional assessment: to evaluate not just efficacy, but also safety. UV only recommended when [adequate ventilation or filtration are not possible](#)