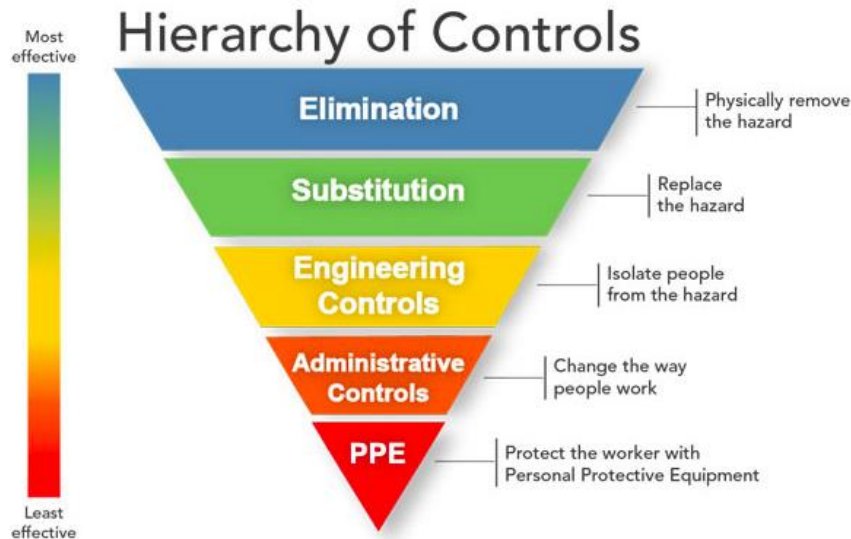




## THE ROLE OF HVAC IN PREVENTING COVID-19 TRANSMISSION



Heating, ventilation, and air conditioning (HVAC) plays a critical role in minimizing the risk of COVID-19 transmission. This should be done as an engineering control together with administrative controls and personal protective equipment (PPE) for controlling existing human exposures in the workplace. HVAC are designed with capability to reduce COVID-19 transmission at the source, before coming into contact with people.

Changes to building operations, including the operation of HVAC systems can reduce airborne exposures. Ventilation and filtration provided by HVAC systems can reduce the airborne concentration of COVID-19 and thus decrease the risk of transmission through the air. Unconditioned spaces cause thermal stress to people that may be directly life threatening and lower the resistance to infection. In general, disabling of HVAC systems is not a recommended measure to reduce the transmission of the virus.

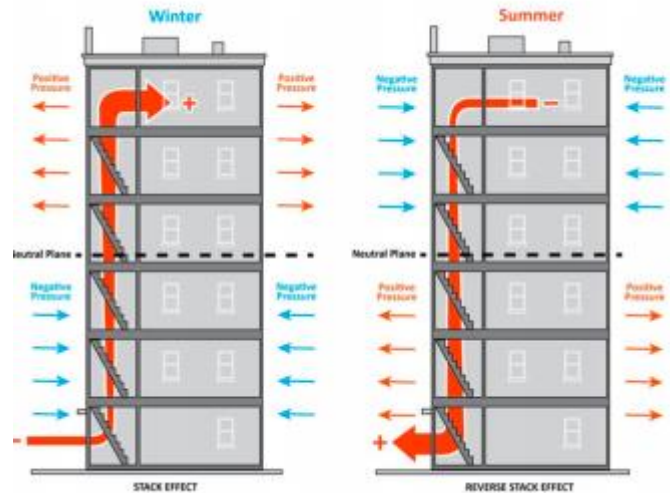
### HOW CAN INDOOR AIR QUALITY BE IMPROVED?

1. **Ventilation:** Bringing outdoor air inside to dilute indoor pollutants. There is typically a ratio of outdoor air to indoor air determined by equipment size, energy consumption, and building codes.

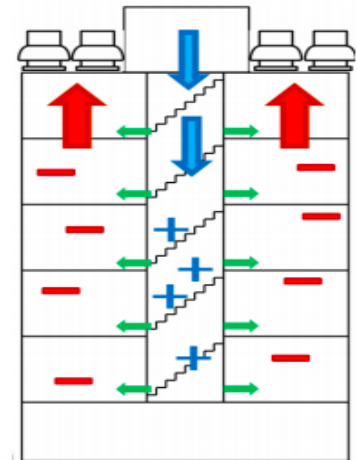


2. **Filtration:** Trapping particles of different sizes depending on the filter efficiency. Filters with higher Minimum Efficiency Reporting Value (MERV) tend to remove finer particles. Reducing particles reduces the risk of cross infections.
3. **Air Distribution:** A major factor in spreading contaminants or limiting their spread within a building. Through properly designed pressure controls minimizing the stack effect and venting, the spread of pathogens from one room to another can be reduced.

- a. **Building Stack Effects:** the movement of air in and out of buildings from air buoyancy. In the winter warmer air rises through the floors of the building and forces cold air to enter from the bottom floors. In the summer, the reverse occurs where cooler air in the building precipitates, dropping to the bottom floors and causes suction of hot air from the top floors.



- b. **Building Stack Effect Solution:** pressurization in the lobby to reduce the stack effect. An exhaust system is recommended to keep the home below the pressure in the corridor or hallway, this ensures that a contaminant from one apartment would never enter another. Open windows should also be minimized to meet minimum ventilation requirements.



4. **Disinfection:** Potential to reduce indoor micro-organisms by installing UVGI lighting. Ultraviolet energy inactivates viral, bacterial, and fungal organisms. UV-C or UVGI are the most effective in inactivating germs.
5. **Temperature and Humidity Controls:** Ideally set to 24°C and 40-60% relative humidity. This will limit the growth of molds and decrease the lifespan of micro-organisms.



## **RECOMMENDATIONS FOR COMMERCIAL AND RESIDENTIAL BUILDINGS**

- Maintain normal thermal comfort conditions of 68-78°F (20-25°C) and 40-60% relative humidity (RH)
- Increase ventilation rates as per the corresponding ASHRAE standards
- Increase the filtration to a MERV 13 filter and wear personal protective equipment (PPE) during filter replacements.
- Operate restroom exhausts continuously.
- UVGI systems should be maximally operated according to manufacturer instructions.
- Pressurization in the lobby of buildings to reduce the stack effect should be maintained.
- Operate stand-alone air cleansers in the area where most people in the household spend their time.