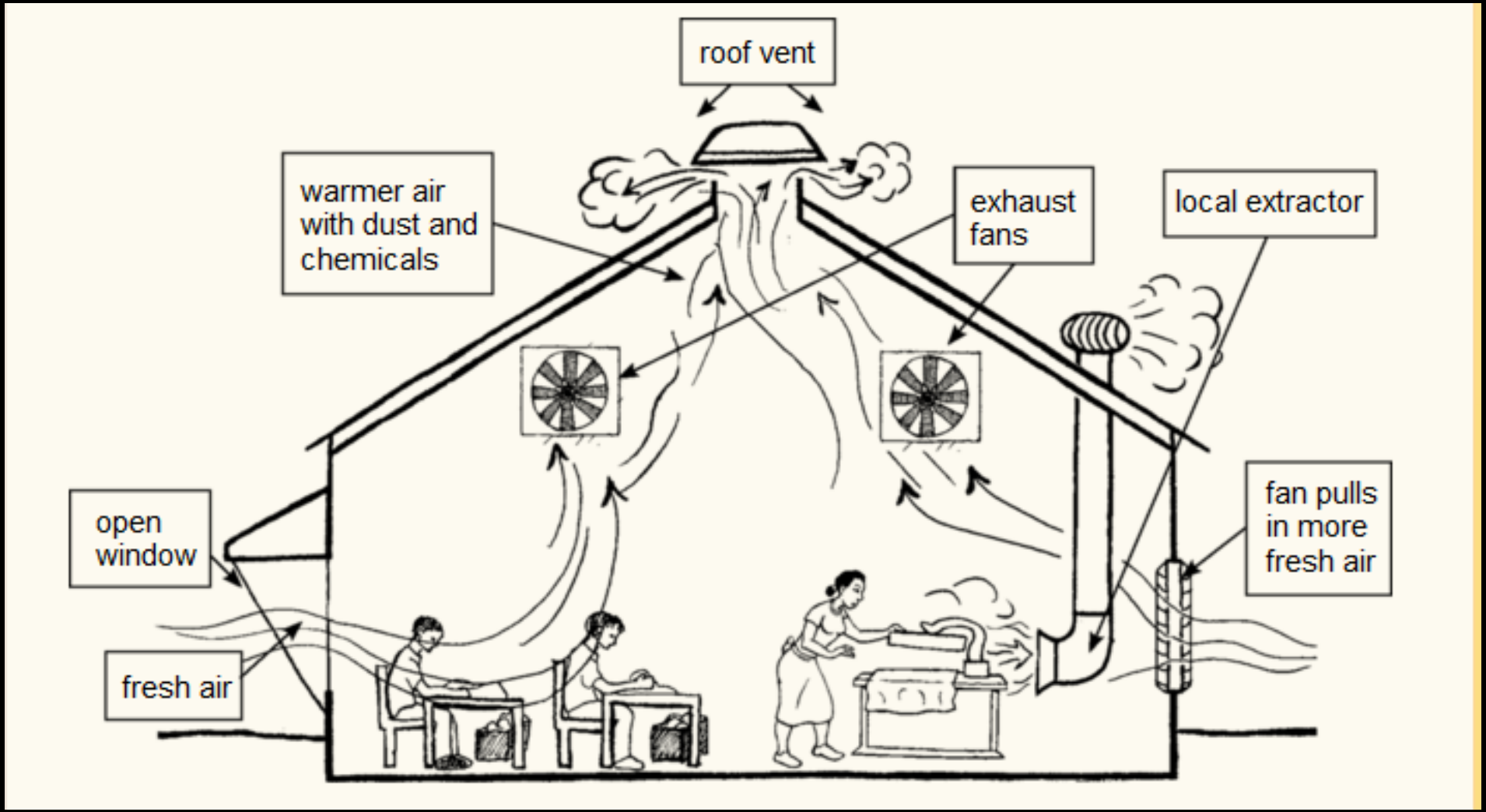
workers united

An SEIU Affiliate

VENTILATION IN A TIME OF PANDEMIC



Ventilation provides workers with clean air

Stack Mitigations by using every feasible control

We are safer when multiple protections are in place

NOT 6 feet OR masks OR ventilation

The best practice is 6 feet + masks + ventilation

How does the virus spread?

Close contact

- Droplets passed from one person to another at close range

Long range

- Smaller droplets that can stay in the air

Fomites

- Contaminated surfaces that we touch


Drops fall continuously, depending on weight and other factors.
The most **visible** drops would fall within **6 feet.**
Turbulent gas cloud
The study suggests that droplets of various sizes are trapped in a turbulent gas cloud, allowing them to travel up to **27 feet.**

When are the most people infected at one time?

Venue

- Indoors
- Lots of people

Vocalization

- Talking, singing, chanting

Not enough Ventilation

- Contaminated air is not replaced with clean air

After choir practice with one symptomatic person, 87% of group developed COVID-19

index case | 32 confirmed and 20 probable cases | unaffected person

COVID-19 spreads easily

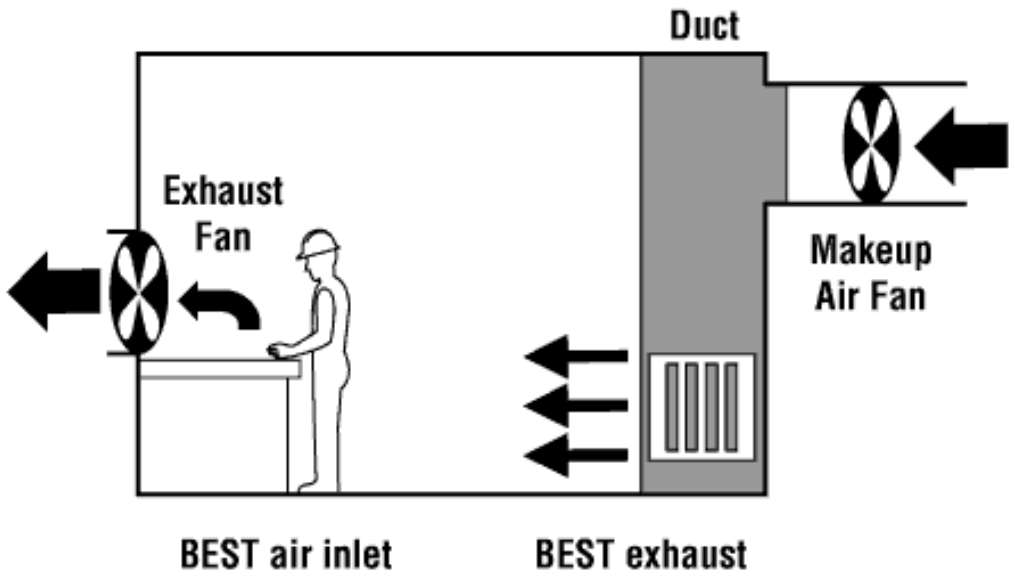
- Avoid groups
- Stay at least 6 feet apart
- Wear face coverings

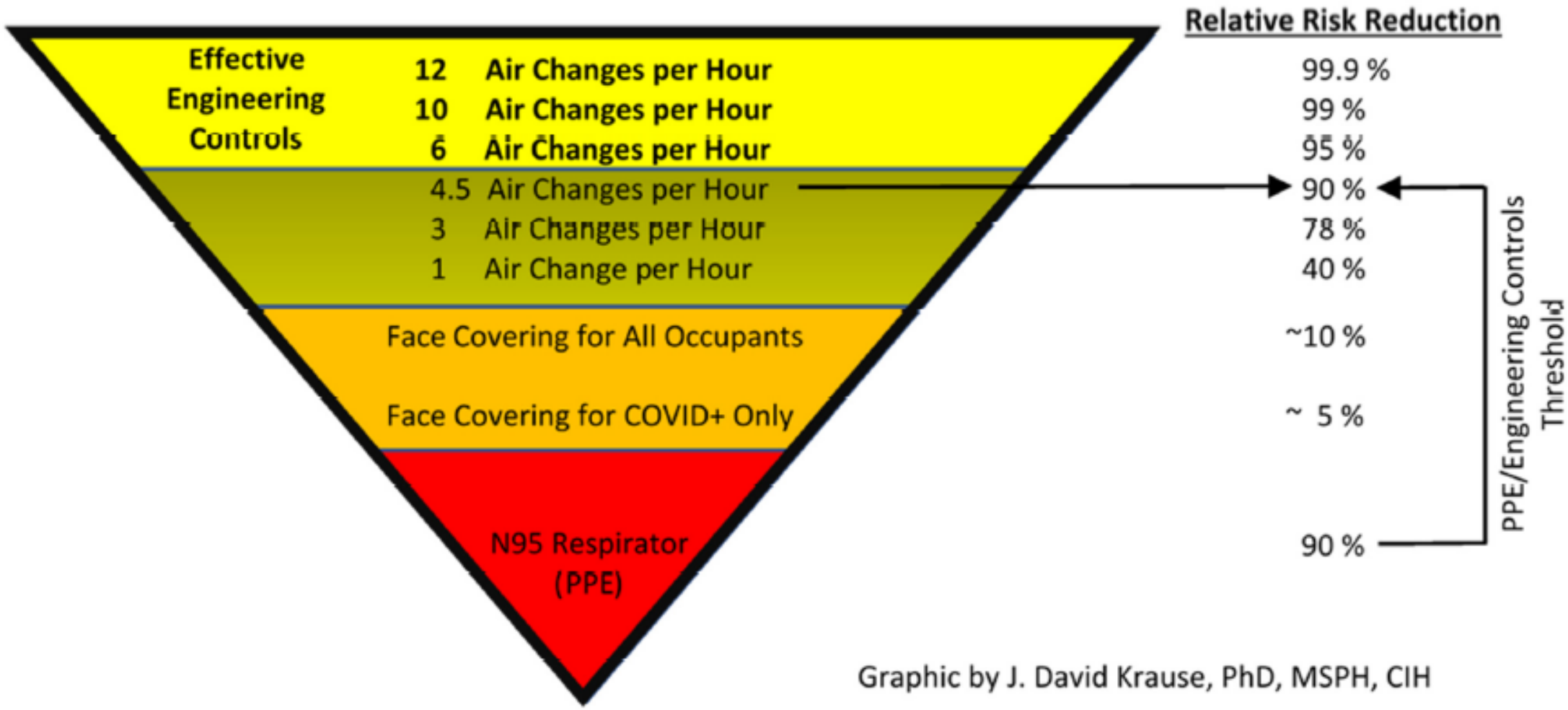
The air in a building must be

- Exchanged
- Diluted
- Filtered

Air Exchange

- Ventilation involves moving air into and out of work areas.
- This is more effective than just moving air around with floor fans.




Relative Risk Reduction
Effective Engineering Controls
12 Air Changes per Hour
10 Air Changes per Hour
6 Air Changes per Hour
4.5 Air Changes per Hour
3 Air Changes per Hour
1 Air Change per Hour
Face Covering for All Occupants
Face Covering for COVID+ Only
N95 Respirator (PPE)
99.9 %
99 %
95 %
90 %
78 %
40 %
~10 %
~ 5 %
90 %
PPE/Engineering Controls Threshold
Graphic by J. David Krause, PhD, MSPH, CIH

The air in a building must be

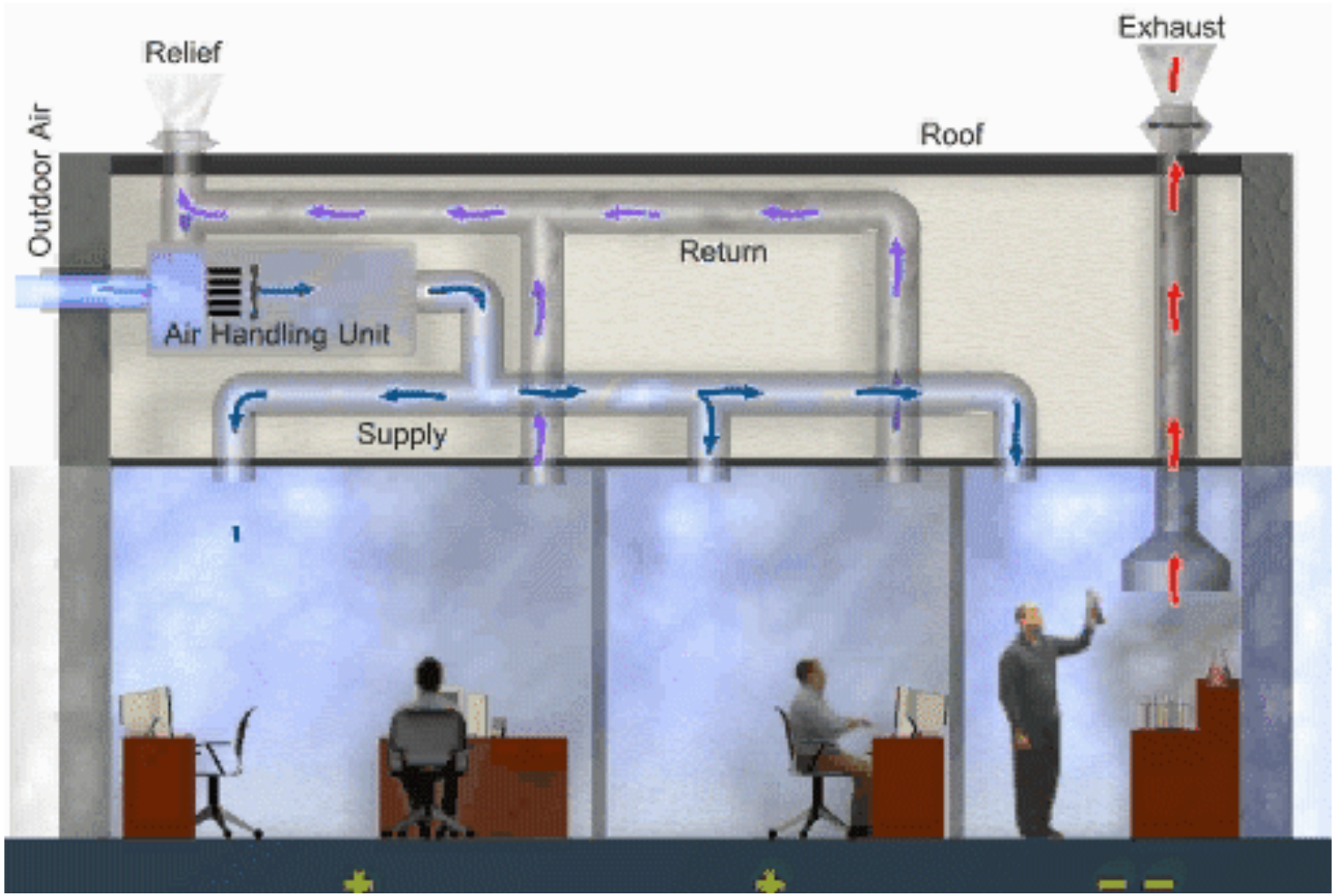
- Exchanged ★
- Diluted
- Filtered

Air Dilution

We need clean air from outside to replace indoor air

It is expensive to heat or cool outside air so most ventilation systems mix outside air with recirculated air. Normally, Outdoor Air can be as low as 20% of the air that is brought in as make-up air.

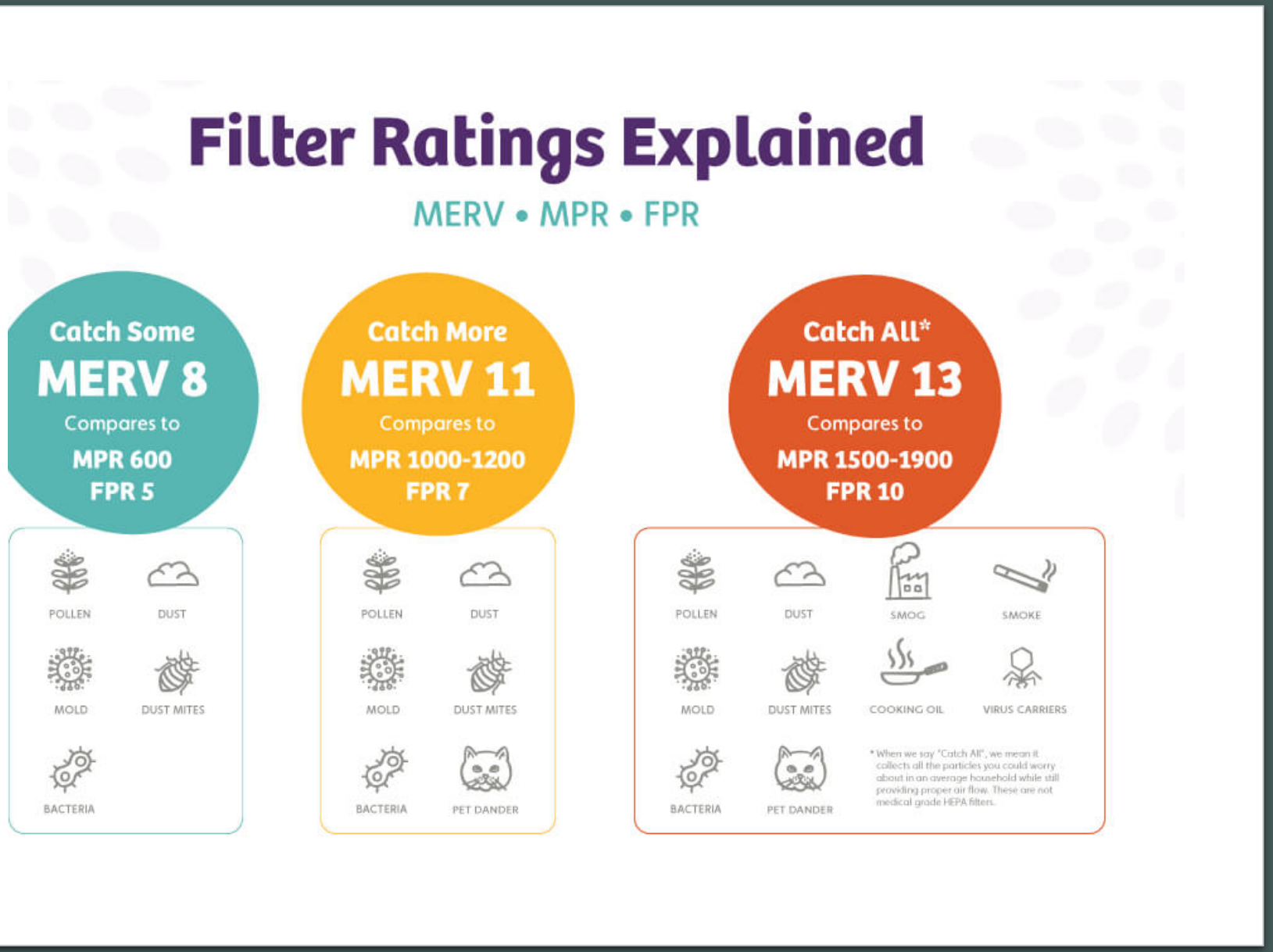
ASHRAE and many Public Health organizations now recommend to increase the percentage of Outside Air as high as the system can handle to reduce the spread of the virus.



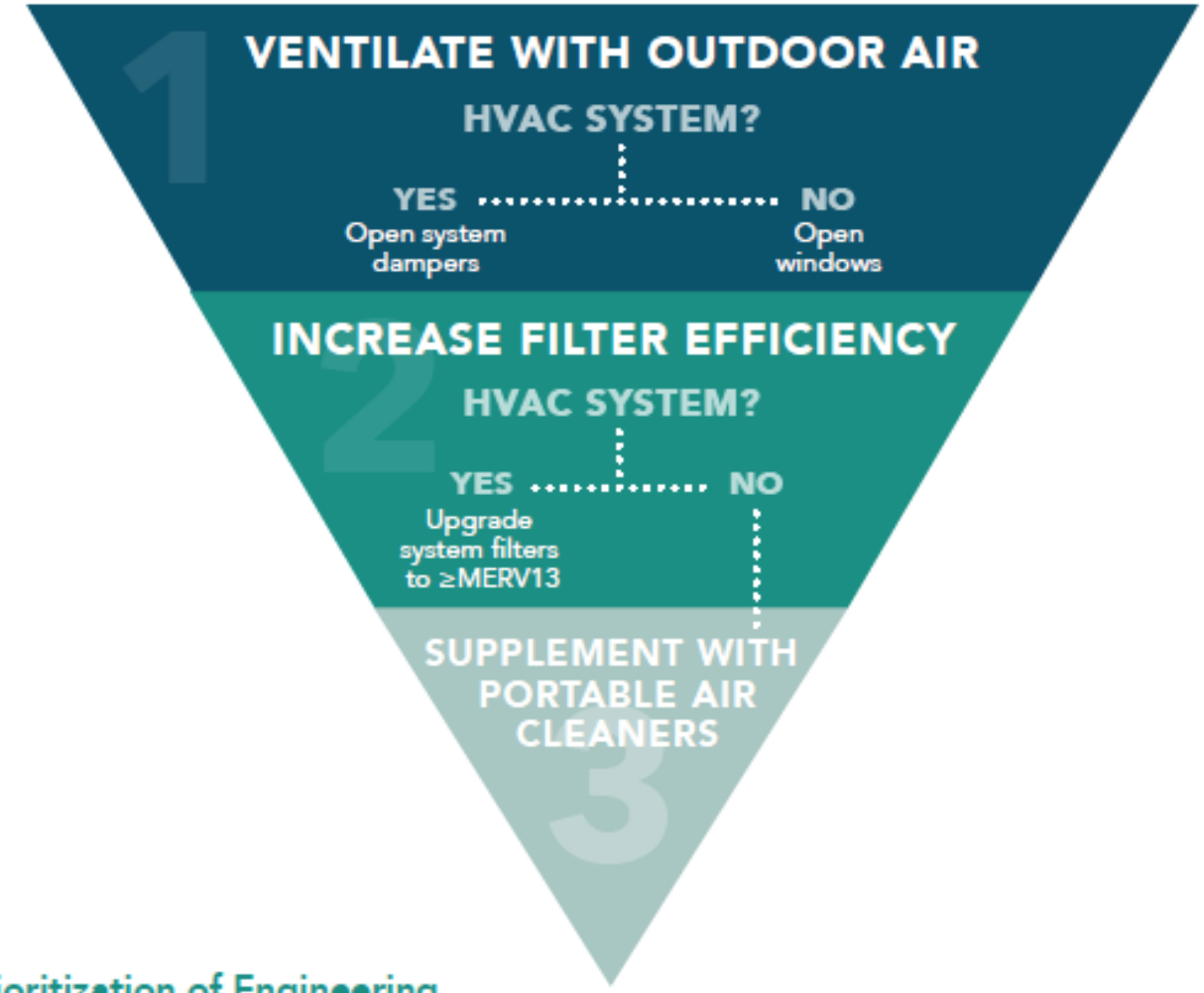
Buildings should eliminate or minimize air recirculation (thus maximizing fresh outdoor air) to the extent possible during this period.

The air in a building must be

- Exchanged ★
- Diluted ★
- Filtered


Filter Ratings Explained
MERV • MPR • FPR
Catch Some
MERV 8
Compares to
MPR 600
FPR 5
POLLEN
DUST
MOLD
DUST MITES
BACTERIA
Catch More
MERV 11
Compares to
MPR 1000-1200
FPR 7
POLLEN
DUST
MOLD
DUST MITES
BACTERIA
PET DANDER
Catch All*
MERV 13
Compares to
MPR 1500-1900
FPR 10
POLLEN
DUST
SMOG
SMOKE
MOLD
DUST MITES
COOKING OIL
VIRUS CARRIERS
BACTERIA
PET DANDER
* When we say "Catch All", we mean it collects all the particles you could worry about in an average household while still providing proper air flow. These are not medical grade HEPA filters.

Filtration



Prioritization of Engineering Controls to Reduce Long-Range Airborne Transmission

Ventilation should operate before and after the building is occupied

Some ventilation systems only operate while people are in the building

New pandemic recommendations call for the ventilation to operate for two hours before people enter the building and two hours after they all leave.

Industry-specific ventilation issues

- School lunchrooms
- Event centers and athletic facilities
- Semi trailers
- Warehouses
- Industrial laundries

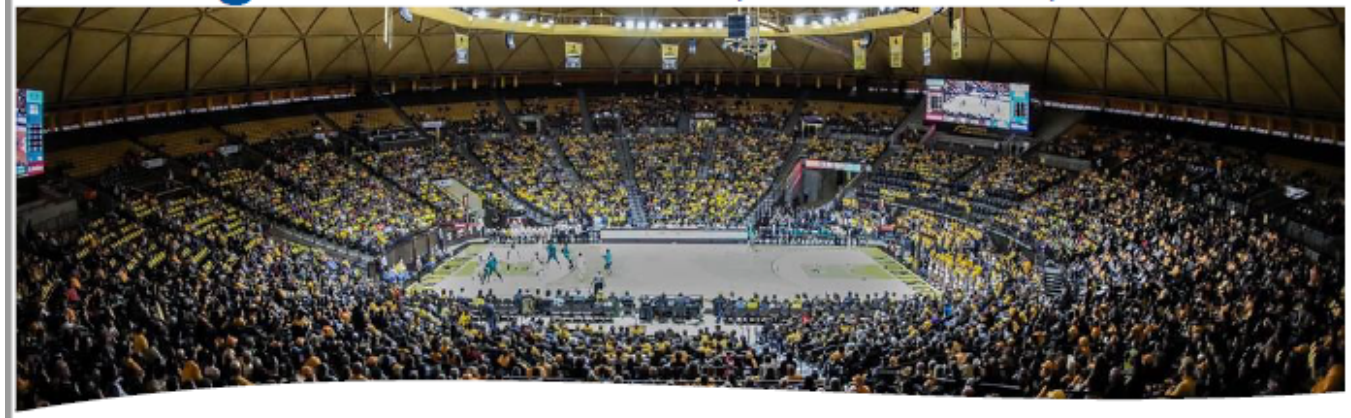
ASHRAE Guidance for Schools

- Standards and checklists for preparing buildings to reopen and for new operating parameters

Athletics Facilities

- Move activities outdoors if possible
- Limit occupancy to maintain social distancing guidelines and avoid unnecessary occupants
  - Increase outdoor air ventilation rates
  - Increase rates as high as possible
- Maintain minimal comfort conditions
- Avoid use of locker rooms but if necessary Increase airflow in locker rooms and keep negative
- Verify all locker room exhaust flows exceed ANSI/ASHRAE Standard 62.1

Large Assemblies, Lecture, Theater



- ❑ Limit occupancy to maintain social distancing guidelines
- ❑ Increase outdoor air ventilation rates
- ❑ Replace all filters with MERV 13 or higher
- ❑ Verify exhaust airflows in all toilets and locker rooms
  - ❑Minimum 1.0 cfm/sf
- ❑ Verify exhaust airflows from all concession stands
  - ❑Minimum 0.7 cfm/sf
- ❑ Provide additional outdoor air and/or HEPA filter units in rehearsal rooms and green rooms
- ❑ Disable demand control ventilation control

Warehouses

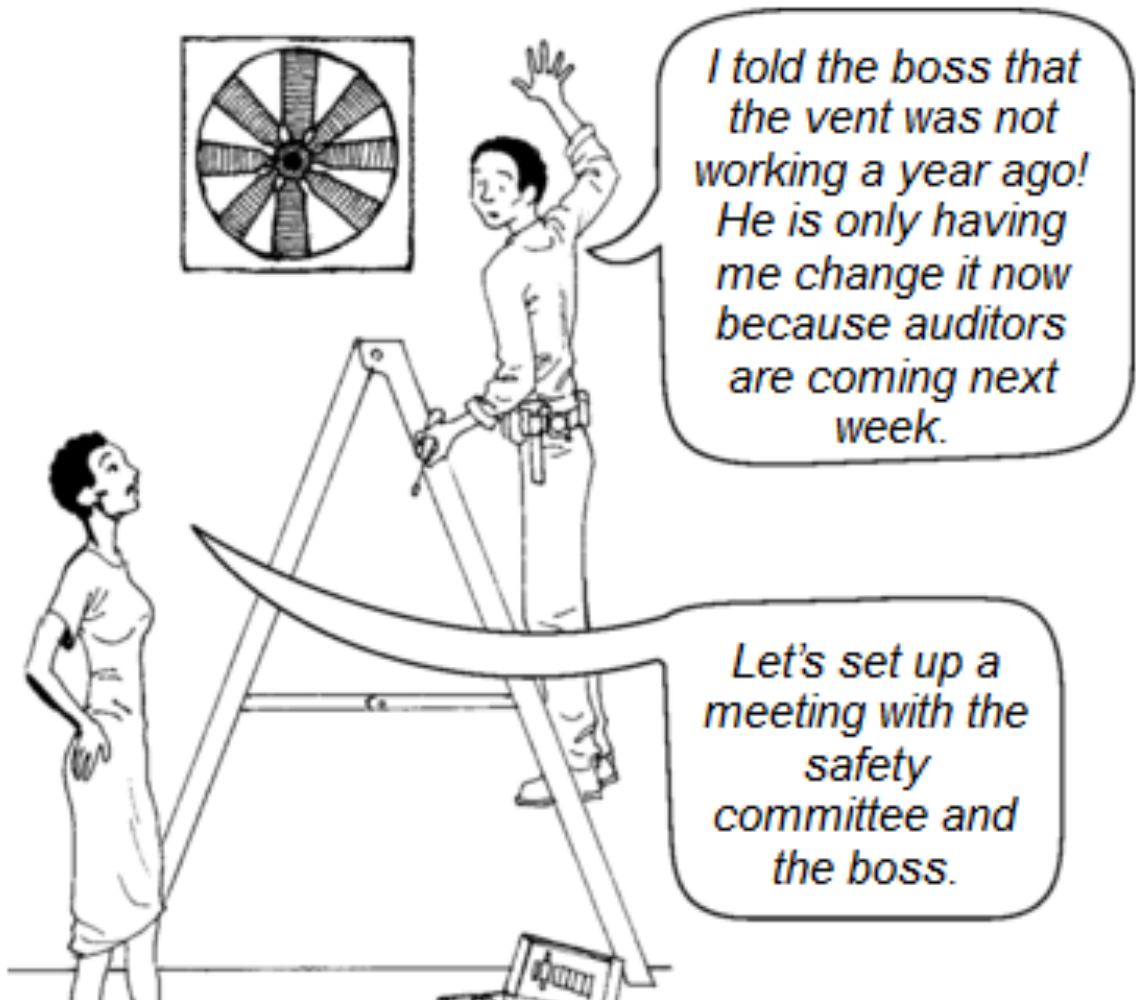
- *ANSI/ASHRAE Standard 62.1-2019, Ventilation for Acceptable Indoor Air Quality*, specifies minimum ventilation rates and other measures for new and existing buildings that are intended to provide IAQ that is acceptable to human occupants and that minimizes adverse health effects.

Vented Vans

Dust and lint control

- The virus can catch a ride on small dust particles like the lint in industrial laundries
- Dust control is an important part of protecting workers.

Ventilation systems must be maintained



Safety Committees can monitor ventilation maintenance

https://www.ashrae.org/technical-resources/resources

Summary

- Ventilation is an important workplace protection from COVID-19
- Talk with employers about
  - Air Exchange
    - Moving air in and out of the work area is more important than just moving air around
  - Dilution
    - Introduce as much clean outdoor air as possible
  - Filtration
    - Increase the filtration efficiency as much as possible
  - Operating the ventilation system for two hours before and two hours after people are in the building
- There are ventilation standards for every type of building. These standards have been modified to protect people during the pandemic
- It is important to control dust and lint. Using compressed air to blow down lint might increase the risk of transmission of the virus.
- Safety committees can gather information about ventilation and make sure systems are cleaned and maintained

Questions? Suggestions?

- We want these briefings to support the work you do!
- Please enter your questions or suggestions in the Chat Box or e-mail Dawn at Dawn.Ang@workers-united.org
- Mark your calendar now for the next COVID briefing on !