FALL 2020 FORUM & TRADE SHOW

Exploring the Intersection of Health & Energy Efficiency

November 10, 2020

Sponsored by veic

VAEEC
VIRGINIA ENERGY EFFICIENCY COUNCIL

SPEAKERS

- Jody Lesko, *VEIC*
- Michele Mitch Peterson, *Siemens*
- John Morrill, *Arlington County*
- Bill Eger, *City of Alexandria* (moderator)

EXPLORING THE INTERSECTION OF HEALTH & ENERGY EFFICIENCY

John Morrill
Arlington County

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EXPLORING THE INTERSECTION OF HEALTH & ENERGY EFFICIENCY

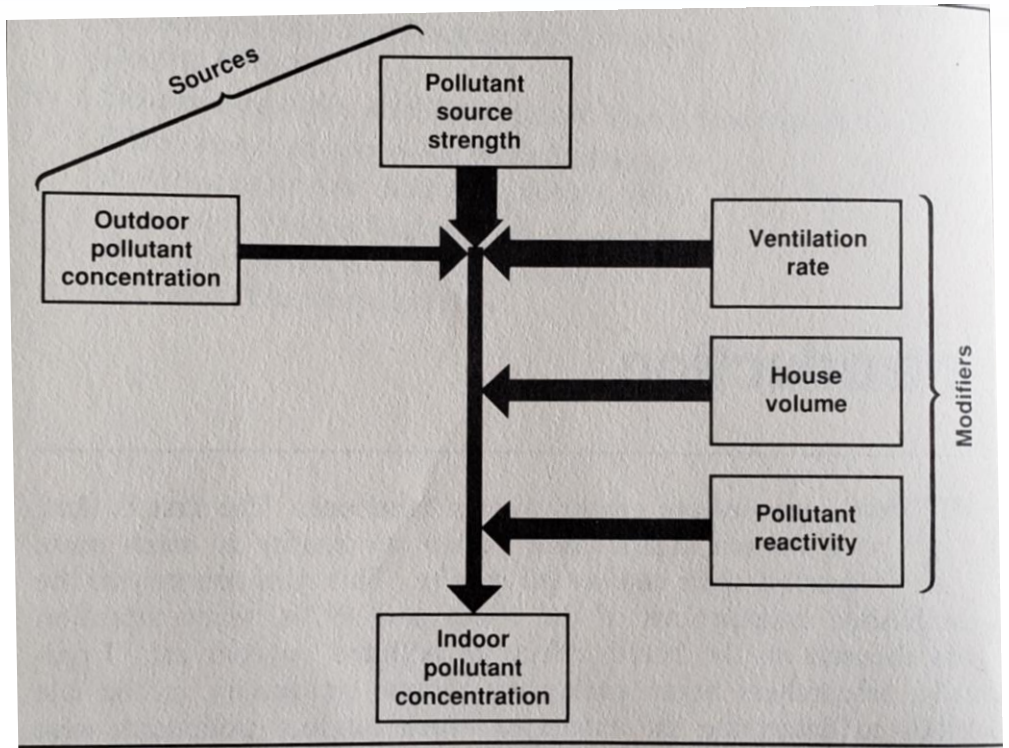

Figure I.1. A simplified model for indoor air pollution (arrow width represents relative importance of each source or modifier).

Illustration from *Residential Indoor Air Quality and Energy Efficiency*, P. duPont & J. Morrill, ACEEE, Washington DC 1989

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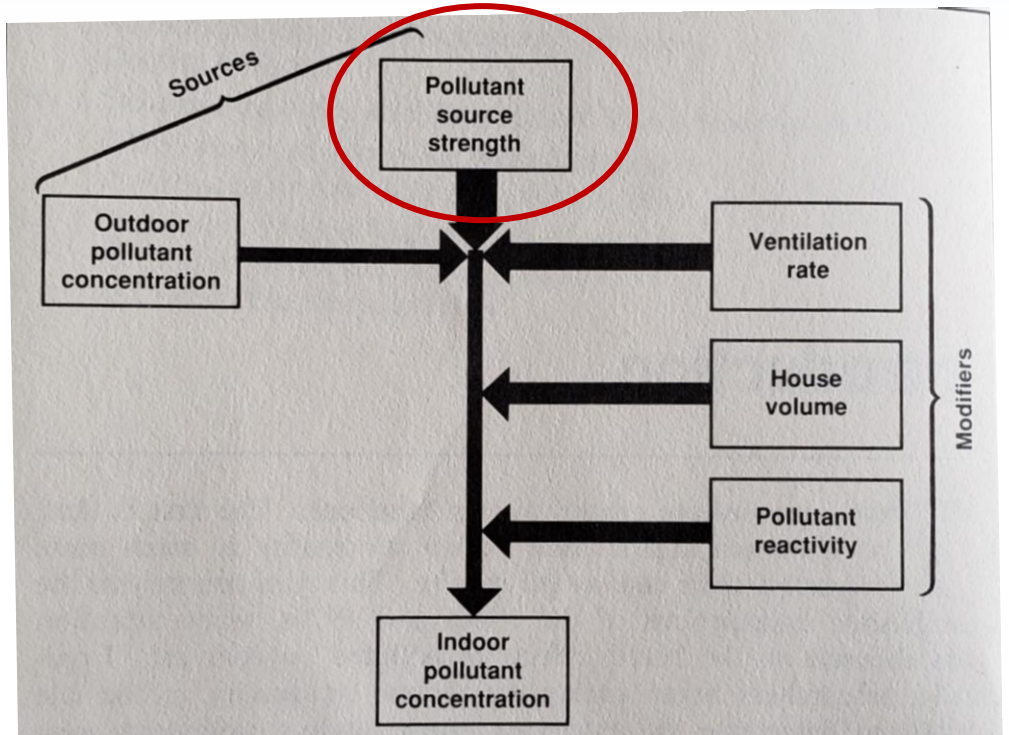

Figure I.1. A simplified model for indoor air pollution (arrow width represents relative importance of each source or modifier).

Simple message:

Pollutant sources are key.

No SARS-COV-2 source, no SARS-COV-2 danger.

Ventilation and filtration are vitally important, yet they are blunt instruments to address multiple aspects of indoor air quality and comfort at the same time.

Illustration from *Residential Indoor Air Quality and Energy Efficiency*, P. duPont & J. Morrill, ACEEE, Washington DC 1989

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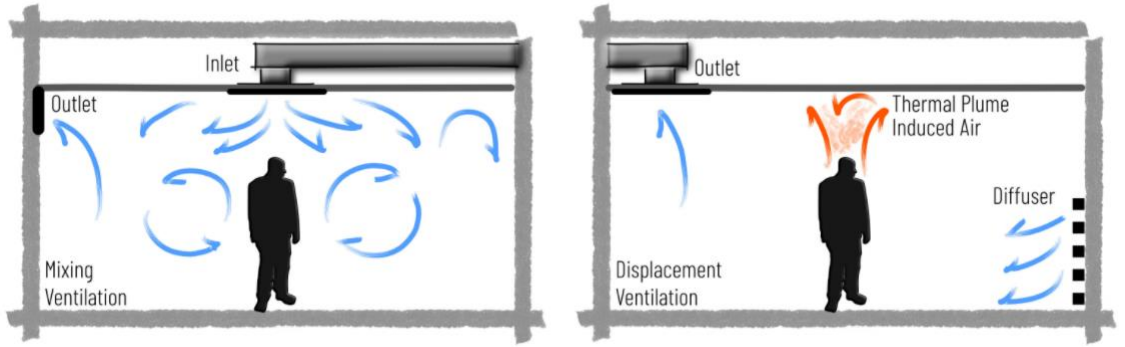

Image: https://www.buildwind.net/research-and-development/displacement-ventilation/

EXPLORING THE INTERSECTION OF HEALTH & ENERGY EFFICIENCY

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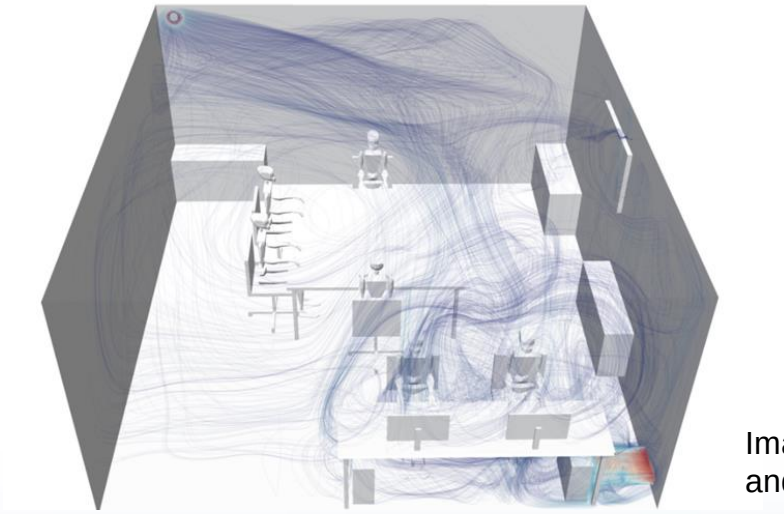

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But they are the last line of defense.

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Safe indoor environments are most effectively ensured by good behavior and limiting sources of contamination.

Lessons From Vermont

Jody Lesko

K12 Indoor Air Quality

How Vermont Delivered

- Why VEIC? What's the connection between IAQ and energy efficiency?
- How has Vermont approached K12 IAQ over time? How did that change in 2020?
- What had to get done? What were the obstacles? What opportunities were uncovered?
- What are the key takeaways? How might this be replicated in other localities?

Why VEIC?

"It was imperative that the administrators of this program really understood the technical and financial priorities in both the short and long term."

Eveline Killian, CEM

Associate Principle at Cx Associates

veic

Approach to K12 IAQ

Historically

- Inconsistent
- Reflected resources available, both in terms of funding and staff skill level
- Focused on temperature management

And in 2020

- Prioritized in policy and funding
- Quick cross-organizational teaming based on trust
- Centralized turn-key program state-wide
- Focused on ventilation and filtration

What had to get done?

Design and Deploy

- Critical design criteria: ensure equity and ease
- Assess needs
- Build customized scopes
- Order equipment; procure contractors
- Complete installations

Obstacles

- Time
- Competing priorities
- Supply chain constraints
- Contractor availability
- Sensitivity around building conditions being known

Opportunities

- Public-private partnerships
- Current and future efficiency gains
- Literacy about HVAC systems and IAQ
- Momentum for additional investment

Key takeaways

And might this be replicated?

- Leverage relationships
- Trust expertise of others
- Identify a central hub
- Maximize all available resources
- Teamwork, teamwork, teamwork

Thank you

Jody Lesko

Create safe and healthy indoor environments and come back with confidence

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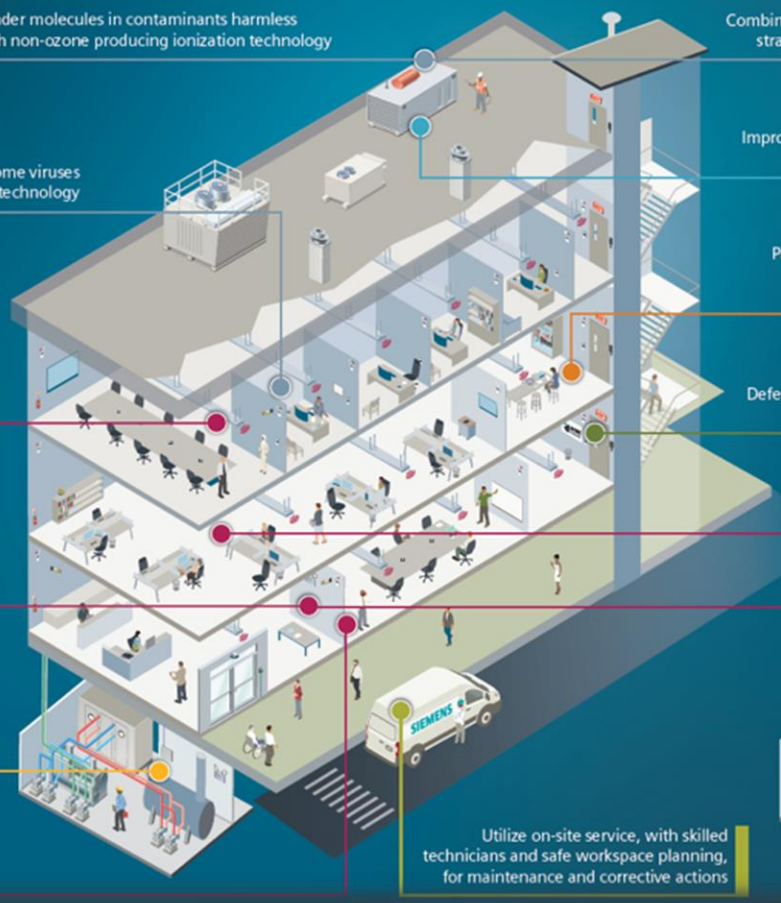
Ingenuity for life



Render molecules in contaminants harmless with non-ozone producing ionization technology

Combine technology and HVAC maintenance strategies to reduce the spread of viruses

Reduce bacteria, fungi and some viruses with fast and safe ultraviolet technology

Improve air quality with new HVAC maintenance strategies and advanced filtration

Provide real-time updates on space utilization and emergency notification of critical events or COVID-19 updates

Create a targeted sanitation and surface disinfection strategy with equipment and IoT sensors

Defer capital budgets to operating budgets through financing options

Monitor office occupancy for density and safe distancing leveraging equipment and IoT sensors and analytics

Control occupancy in buildings by counting people coming in and out of a building leveraging video analytics or access control readers

Screen occupants for evidence of elevated skin temperature using thermal cameras

Manage energy performance by off-setting new HVAC guidelines with energy efficiency strategies and IoT technology

Utilize 24/7 monitoring, remote response and resolution, and maintenance to help onsite teams

Leverage advanced analytics and fault detection to identify issues early and service equipment based on need

Utilize on-site service, with skilled technicians and safe workspace planning, for maintenance and corrective actions

Contact tracing for individuals who tested positive

- Reduce the spread of airborne and surface contaminants
- Improve air quality
- Manage energy performance
- Enable social distancing
- Provide real-time updates
- Sustain healthy & safe environments
- Defer capital budgets

Safe and Healthy Buildings
Responding to Covid-19

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Minimize what comes in…

Technologies to enable social distancing

- FDA-cleared thermal cameras to detect people with EST
- Video Analytics + Access Control – people counting to control occupancy
- Enlighted + Where – enable contact tracing
- Enlighted + Space – identify high-traffic areas to adapt cleaning and sanitation, monitor occupancy, reconfigure spaces
- Comfy – configurable desk booking, building utilization tracking, occupancy, sanitation between meetings in common rooms

…and minimize impact of what gets in

Technologies to accelerate virus deactivation

- **Violet Defense** – ultraviolet light technology eliminates viruses, etc.
- **O2 Prime** – ionization renders contaminants harmless
- **Smart Building Commissioning** – data-focused strategy to ensure system controls work properly
- **Dynamic VAV Optimization** – efficiently, automatically follow evolving ASHRAE guidelines for temp., humidity, ventilation

Environmental control for COVID, air quality, and energy efficiency all rely on similar technologies

Difference in deployment and operational priorities

ASHRAE Epidemic Task Force

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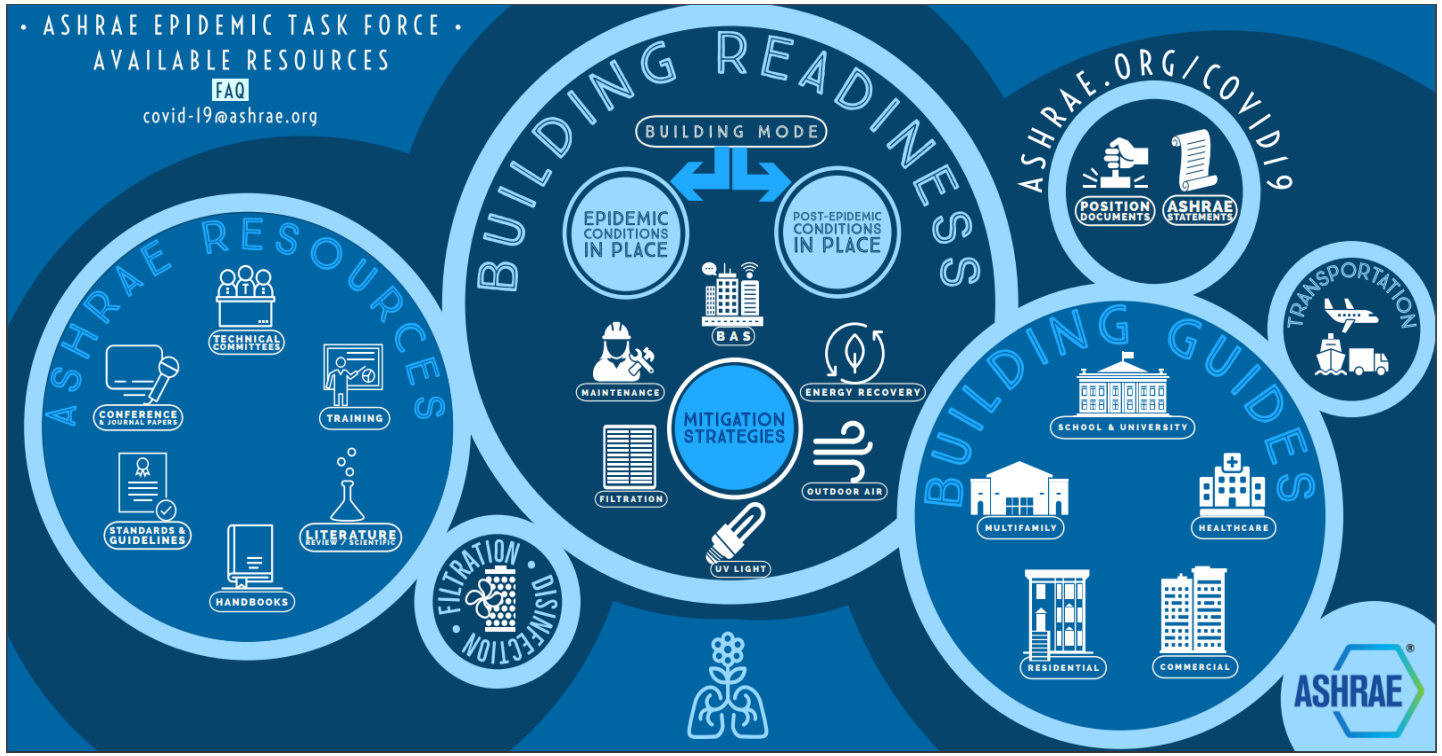

ASHRAE Statement

"Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air"

ASHRAE HVAC & BMS Recommendation Summary

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Step 1
Enable Remote Access

- Provide remote access for both building operators & service providers
- Follow cybersecurity best practices

Step 2
Assess System Capabilities

- Are systems functioning correctly?
- Is system capable of implementing new strategies?

Step 3
Implement New Strategies

Temperature

- Maintain ASHRAE-55 standard comfort temperatures
- Stable temperatures minimize potential condensation

Humidity

- Control 40%-60% if possible

Outside Air

- Dilute indoor contaminants with OA
- Implement OA flush for 2 hours (or 3 air changes) before and after occupancy

During pandemic, treat **comfort cooling** systems as **critical, life-safety** systems

Implement these strategies as a new **Epidemic Mode** of operation

Occupant Environment

Virus Transmission Reduction

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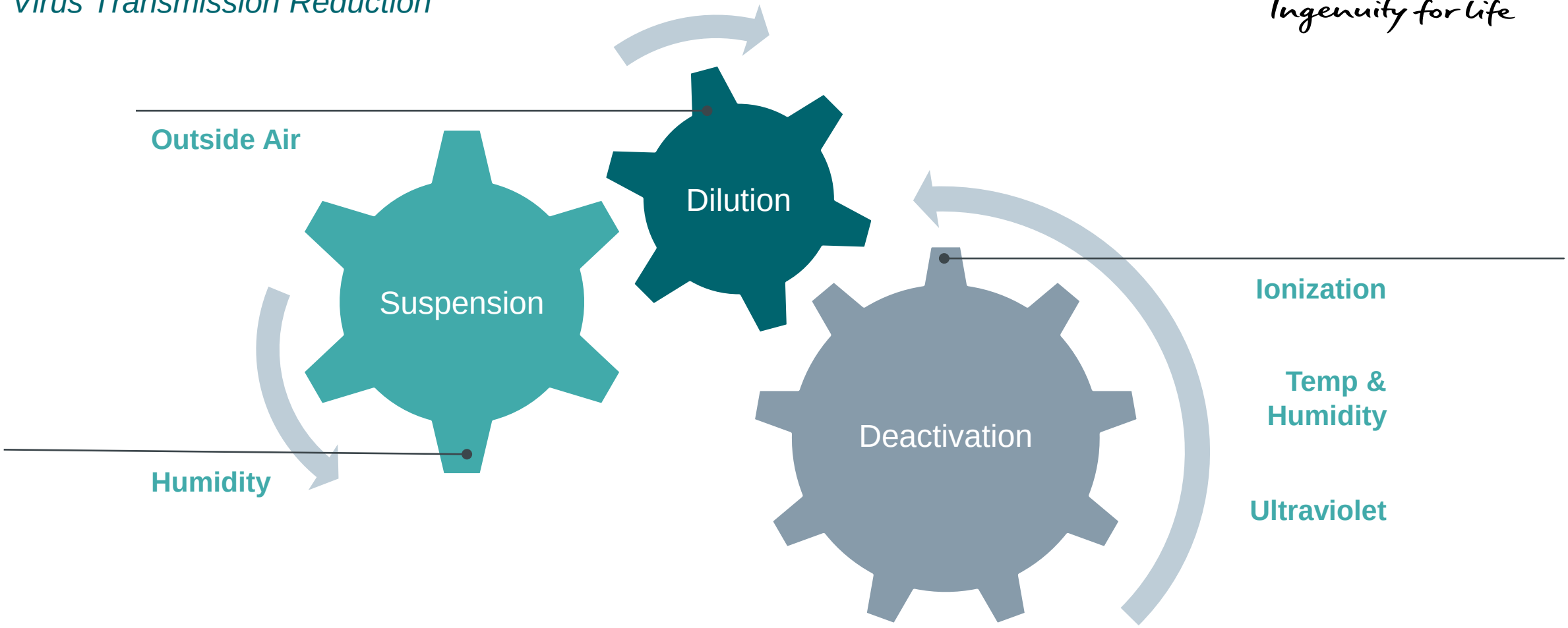

Summary

APPENDIX

Deactivation
Temperature and Humidity

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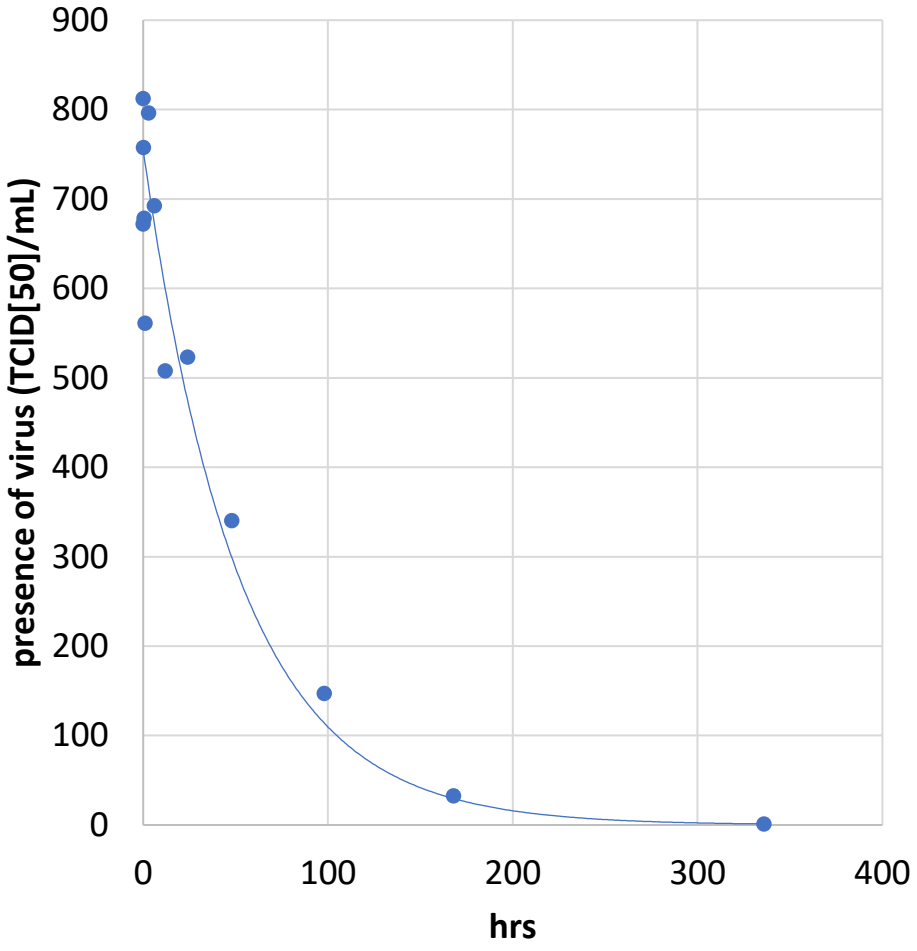
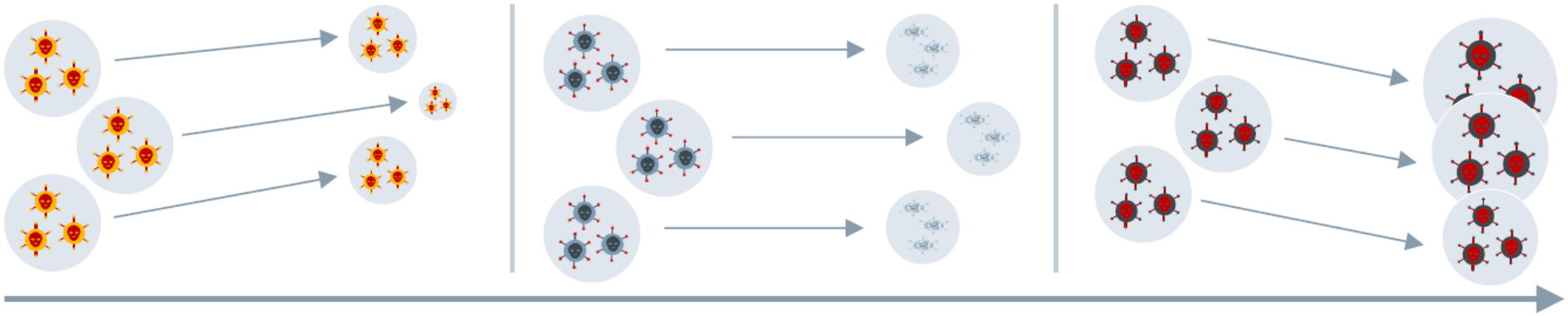
Viruses require specific conditions in order to replicate; in the absence of these conditions, virus becomes “deactivated”

The rate of this exponential decay is expressed as either “time constant” or “half life”

https://www.dhs.gov/science-and-technology/sars-calculator



Suspension
Humidity



<40% r.h.

Low humidity

The water in the droplets evaporates; they get smaller and stay longer as an aerosol

40-60% r.h.

Medium humidity

Water droplets have less tendency to evaporate and viruses die quickly

>60% r.h.

High humidity

Continued benefits of medium humidity but higher risk of condensation and attendant issues

Dilution
OA and Temperature

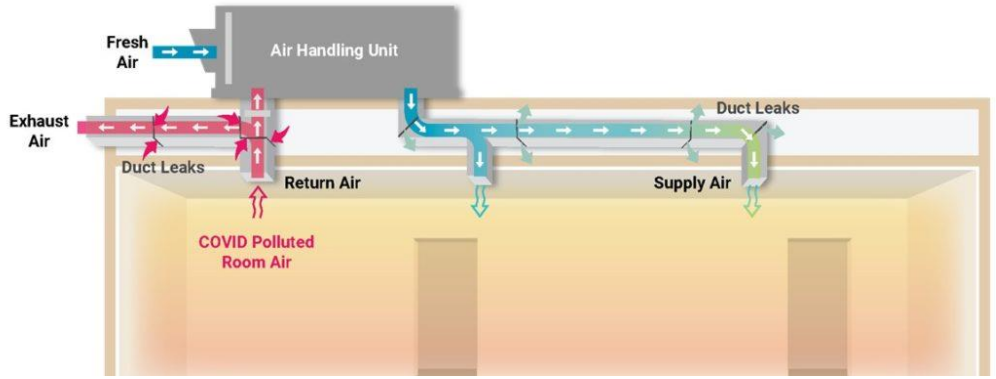


Image credit: I found it on the internet

Elevated discharge temperature increases air flow

- Higher ACH
- Increased introduction of fresh air
- Higher exposure to improved filtration

Increased OA means reduced recirculation air

QUESTIONS & ANSWERS

To submit a question,

- Request to share your audio, or
- Use the session chat-box

Thank You to our Panelists

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Michele Mitch-Peterson
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AGENDA

12:00-12:15 PM	WELCOME & UPDATES
12:15-12:30 PM	EXHIBITOR & NETWORKING SHOWCASE
12:30-1:30 PM	ADVANCING EFFICIENCY WITH EMERGING TECHNOLOGIES
1:30-1:45 PM	EXHIBITOR & NETWORKING SHOWCASE
1:45-2:45 PM	LARGE ENERGY USERS: EFFICIENCY OPPORTUNITIES & CHALLENGES
	ENERGY EFFICIENCY IMPLEMENTATION IN THE TIME OF COVID-19
2:45-3:00 PM	EXHIBITOR & NETWORKING SHOWCASE
3:00-4:00 PM	EXPLORING THE INTERSECTION OF HEALTH & ENERGY EFFICIENCY
4:00-4:30 PM	**NETWORKING RECEPTION**