



WELCOME

MARK DROZDOV

IICRC Board Member, MS, SSM, FSM,
BSI, RSO, CAI, CMA, GPRO

**“HOW TO MANAGE INDOOR
AIR QUALITY AMID COVID-19”**

**LATEST DEVELOPMENTS IN THE VENTILATION AND
FILTRATION ENGINEERING CONTROLS**



WELCOME



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COURSE OBJECTIVE: With the ever-changing nature of the COVID-19 Pandemic, this virtual technical seminar gives a clear insight into the latest updates, industry best-practices, and health and safety preventive measures.



Top (5) Architecture School of 2019 Rated by ARCHITECTURAL RECORD

<https://www.architecturalrecord.com/articles/13611-top-architecture-schools-of-2019>

The Foundation Building @ 7 East 7th Street
Abraham Lincoln spoke here! The Great Hall
opened in 1858.



Mark Drozdov MS,SSM,FSM,BSI,RSO,CAI,CMA,GPRO

The Academic Building @ 41 Cooper SQ. – first
institutional building in New York City to achieve
LEED -Platinum rating in 2010!

GLOBAL HARMONIZATION SYSTEM (GHS) CLASSIFICATION and LABELLING of CHEMICALS

adopted by US OSHA and EU from UN
Multi-Language (25+) Translation
Provided by Mark Drozdov's Students

GREEN BUILDING GUIDELINES/ ENVIRONMENTAL HEALTH & SAFETY (EHS) & OSHA STANDARDS PROGRAM

On average, each person consumes this every day:

1 lb Food **5 lb Water** **36 lb Air**

	Exploding bomb (for explosion or reactivity hazards)		Flame (for fire hazards)		Flame over circle (for oxidizing hazards)
	Gas cylinder (for gases under pressure)		Corrosion (for corrosive damage to metals, as well as skin, eyes)		Skull and Crossbones (can cause death or toxicity with short exposure to small amounts)
	Health hazard (may cause or suspected of causing serious health effects)		Exclamation mark (may cause less serious health effects or damage the ozone layer*)		Environment* (may cause damage to the aquatic environment)
	Biohazardous Infectious Materials (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

PALMS - acronym/mnemonic device to help remember the environmental health & safety (EHS) concerns faced on most jobs:

- **P**andemic/**P**CBs
- **A**sbestos
- **L**ead/**L**egionella
- **M**old/**M**etals
- **S**ilica/**S**afety/**S**ustainability

In the **PALMS** of your hands:



Pandemic/PCBs
Asbestos
Lead/Legionella
Mold/Metals
Silica/Safety/Sustainability

Translate This

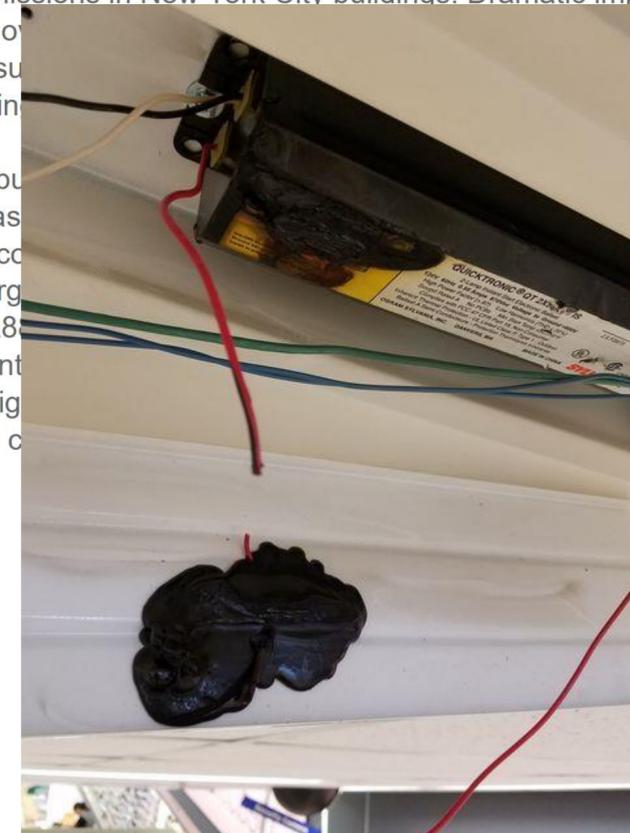
- Home
- About OneNYC Green Buildings & Energy Efficiency
- One City: Built to Last
- Greener, Greater Buildings Plan
 - LL84: Benchmarking
 - LL85: NYC Energy Conservation Code (NYCECC)
 - LL87: Energy Audits & Retro-commissioning
 - [LL88: Lighting Upgrades & Sub-metering](#)
 - Outreach & Training
 - NYC Benchmarking Help Center
- Greening the City's Codes & Regulations
- NYC Carbon Challenge
- Financing & Incentives
- Greening Public Buildings
- Other Initiatives



LL88: Lighting Upgrades & Sub-metering

Lighting in non-residential buildings accounts for almost 18 percent of energy use and greenhouse gas emissions in New York City buildings. Dramatic improvements in lighting technology offer the potential to significantly reduce energy consumption and greenhouse gas emissions that can yield significant cost savings.

Additionally, many buildings have not been able to accurately measure electricity consumption, and as a result, have not been able to reduce their energy consumption if energy audits are not conducted regularly. Local Law 88 of 2009 (LL88) requires buildings to install sub-meters that will help buildings achieve significant energy savings. For more information on to learn more about LL88, how to



In the **PALMS** of your hands:



BIOHAZARD



- When it comes to worker safety, we should be driven by the **precautionary principle** that reasonable steps to reduce risk should not await scientific certainty about the nature of the hazard or risk.
- There is still much that is not known about **COVID-19**. What is known today has been changing rapidly. However, that does not mean that reasonable and effective steps cannot or should not be taken to prepare and to protect workers. Erring on the side of caution will prevent illnesses and deaths. The **precautionary principle** should guide our planning and actions.

In the **PALMS** of your hands:



*In the **PALMS** of your hands:*



- Best Practices from ASSP Z16, AIHA, ANSI and ISO for Site-Level Scorecards



Master Environmental Hazard Remediation Technician

Voluntary Registration

<https://www1.nyc.gov/assets/dep/downloads/pdf/air/asbestos/master-environmental-hazard-remediation-technician-attachment-a.pdf>

<https://www1.nyc.gov/assets/dep/downloads/pdf/air/asbestos/master-environmental-hazard-remediation-technician-attachment-b.pdf>

1. **IICRC Water Damage Restoration Technician (WRT) 20 hours**
2. **IICRC Applied Microbial Remediation Technician (AMRT) 28 hours**
3. **IICRC Fire and Smoke Restoration Technician (FSRT) 16 hours**
4. **NYS Asbestos Handler 32 hours**
5. **EPA Lead Worker 16 hours**
6. **HAZWOPER 40 hours**
7. **OSHA 10 Construction or Gen. Industry**
8. **PCB 4 hours**
9. **Bloodborne Pathogens 4 hours**
10. **ICRA 4 hours**

TOTAL: 174 hours

***Must also comply with NY Mold Law**



NYS - Environmental Hazard Remediation Provider & Technician License

Became Law September 25, 2014 - Chapter 21 New Title D-22

Training requirements by Jan. 1, 2020

<https://www.nassaucountyny.gov/DocumentCenter/View/17633/Enviommental-Hazard-Remediation-Provider-License-and-instruction---Updated?bidId=>

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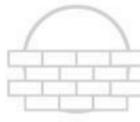
CURRENT & PROPOSED IICRC STANDARDS

Unmatched in technical excellence, the IICRC Standards cover an array of industry related information.

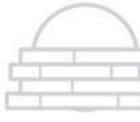
iicrc.org/IICRCStandards



ANSI/IICRC S100
Standard and IICRC R100 Reference Guide for Professional Cleaning of Textile Floor Coverings



BSR/IICRC S210
Standard for Dimension Stone Maintenance and Restoration



BSR/IICRC S220
Standard for Hard Surface Floor Covering Inspection



BSR/IICRC S230
Standard for Professional Inspection of Flooring Subfloors and Substrates



BSR/IICRC S300
Standard for Professional Upholstery Cleaning



BSR/IICRC S340
Standard for Professional Cleaning and Maintenance of Leather Furnishings



BSR/IICRC S400
Standard for Professional Cleaning, Maintenance and Restoration of the Commercial Built Environment



BSR/IICRC S410
Standard for Infection Control During Professional Cleaning and Maintenance of the Commercial Built Environment



ANSI/IICRC S500
Standard and Reference Guide for Professional Water Damage Restoration (2015)



ANSI/IICRC S520
Standard and IICRC R520 Reference Guide for Professional Mold Remediation

VOLUNTEERS WANTED



BSR/IICRC S530
Standard for Indoor Environmental Assessment for Suspected Mold Contaminated Structures



ANSI/IICRC S540
Standard for Trauma and Crime Scene Cleanup



BSR/IICRC S550
Standard for Professional Water Damage Restoration of Commercial Structures



BSR/IICRC S590
Standard for HVAC Cleaning and Decontamination in a Water Damaged Environment



BSR/IICRC S700
Standard for Professional Fire and Smoke Damage Restoration



BSR/IICRC S710
Standard for the Development of a Scope of Work in a Fire and Smoke Damaged Environment



BSR/IICRC S740
Standard for Professional Restoration of Fire and Smoke Damaged Personal Items



BSR/IICRC S760
Standard for Professional Restoration of Structures and Items Damaged by Wildfire Smoke



ANSI/IICRC S800
Standard and Reference Guide for Professional Inspection of Textile Floorcovering



BSR/IICRC S900
Standard for Professional Remediation of Illicit Drugs, Cannabis, and Nicotine Residue



FIELD GUIDE
Safety and Health for Disaster Restoration Professionals



FIELD GUIDE
Safety and Health for Professional Cleaners



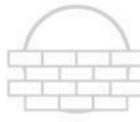
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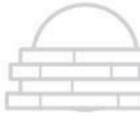
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Standard and Reference Guide for Professional Inspection of Textile Floorcovering



BSR/IICRC S900
Standard for Professional Remediation of Illicit Drugs, Cannabis, and Nicotine Residue

If you're going through hell, keep going. Winston Churchill

THE RELATIVE SIZE OF PARTICLES

From the COVID-19 pandemic to the U.S. West Coast wildfires, some of the biggest threats now are also the most microscopic.

A particle needs to be 10 microns (μm) or less before it can be inhaled into your respiratory tract. But just how small are these specks?

Here's a look at the relative sizes of some familiar particles \blacktriangleright



Pollen can trigger allergic reactions and hay fever—which 1 in 5 Americans experience every year.
Source: Harvard Health

The visibility limits for what the naked eye can see hovers around 10-40 μm .

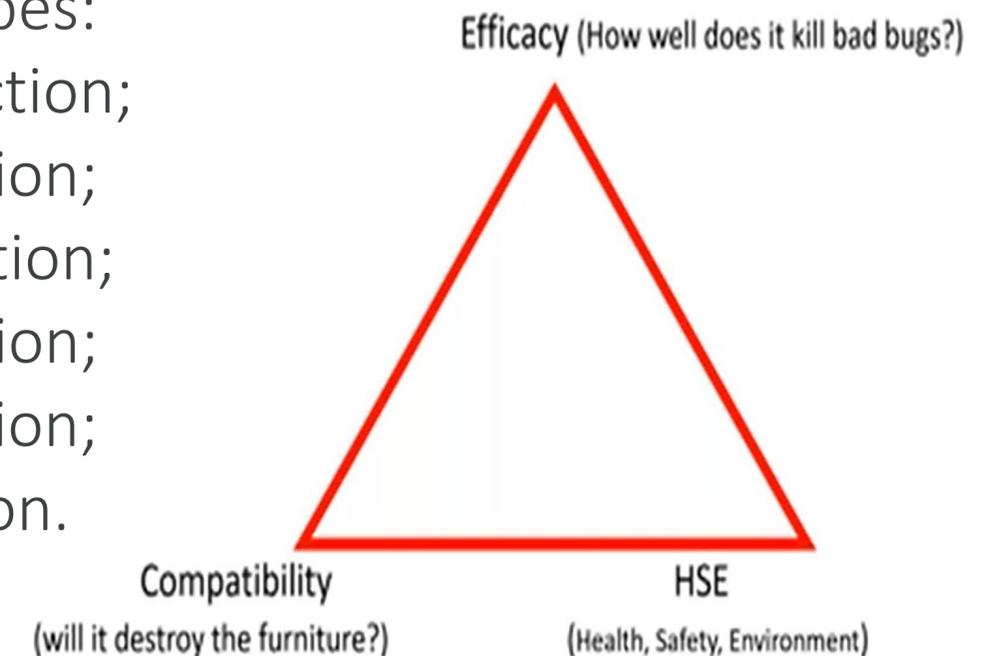
Respiratory droplets have the potential to carry smaller particles within them, such as dust or coronavirus.

Wildfire smoke can persist in the air for several days, and even months.

- **Cleaning** = removes microbial contamination along with organic substances (can achieve 99% if done correctly)
- **Sanitizing = 99.9% (3-Log)** reduces the bacteria population by significant numbers
- **Disinfecting = 99.99-99.999% (4 to 5-Log)** destroys residual microbes that still remain after cleaning*
- **Sterilizing = 99.9999% (6-Log)** eliminates all forms of microbial life

(*) as per EPA, can not claim disinfection unless analytical data is provided to support at least a 2-Log reduction in an indicator organism or another indicator.

Scientists use a **logarithmic** scale. Log reduction stands for a 10-fold (or one decimal point) reduction in microbes, meaning the disinfectant reduces the number of microbes by 90 percent for every step – for an example a colony of a million 1,000,000 microbes:
 A 1-log kill reduces the colony to 100,000 microbes after a 90% reduction;
 A 2-log kill reduces the colony to 10,000 microbes after a 99% reduction;
 A 3-log kill reduces the colony to 1,000 microbes after a 99.9% reduction;
 A 4-log kill reduces the colony to 100 microbes after a 99.99% reduction;
 A 5-log kill reduces the colony to 10 microbes after a 99.999% reduction;
 A 6-log kill reduces the colony to 1 microbe after a 99.9999% reduction.



Industry Reports and Standards Highlights

- **ISO 45005**: Occupational Health and Safety Management - Safe working during the COVID-19 Pandemic general guidelines for organizations, International Organization for Standardization (ISO) Technical Committee TC 283/ WG5 (member)
- **Report for Professional Cleaning and Restoration Contractors** - COVID-19 Pandemic: by IICRC/ RIA/ AIHA Joint Task Force (co-authored, now in 5th edition)
- **AIHA Back-to-Work Safely Guides** (co-authored)
- Virginia's **first-in-the-nation Emergency Temporary Standard** on Occupational Exposure to COVID-19 (co-hosted AIHA info session)
- **Guidance to Protect Volunteers from COVID-19 During Natural Disaster Response & Recovery** (AIHA+NIH committee member)



The COVID-19 Pandemic¹

A Report for Professional Cleaning and Restoration Contractors,

Fifth Edition,

October 26th 2020

¹ Formerly titled "Assisting Clients with COVID-19 Concerns, Second Edition" and "Managing Emergency Services Operations, Second Edition"



Brandon Burton MWR, WLS
Chair, ANSI/IICRC Standards
VP Technical Application, Next Gear Solutions



Mark Drozdov MS, SSM, FSM, BSI, RSO, CAI, CMA, GPRO
IICRC BOD & Infection Control Standard VC,
Cooper U. Professor, OSHA Instructor,
AIHA Gov. Relations Chair



Norris Gearhart CR, FLS, CLS
Gearhart and Associates



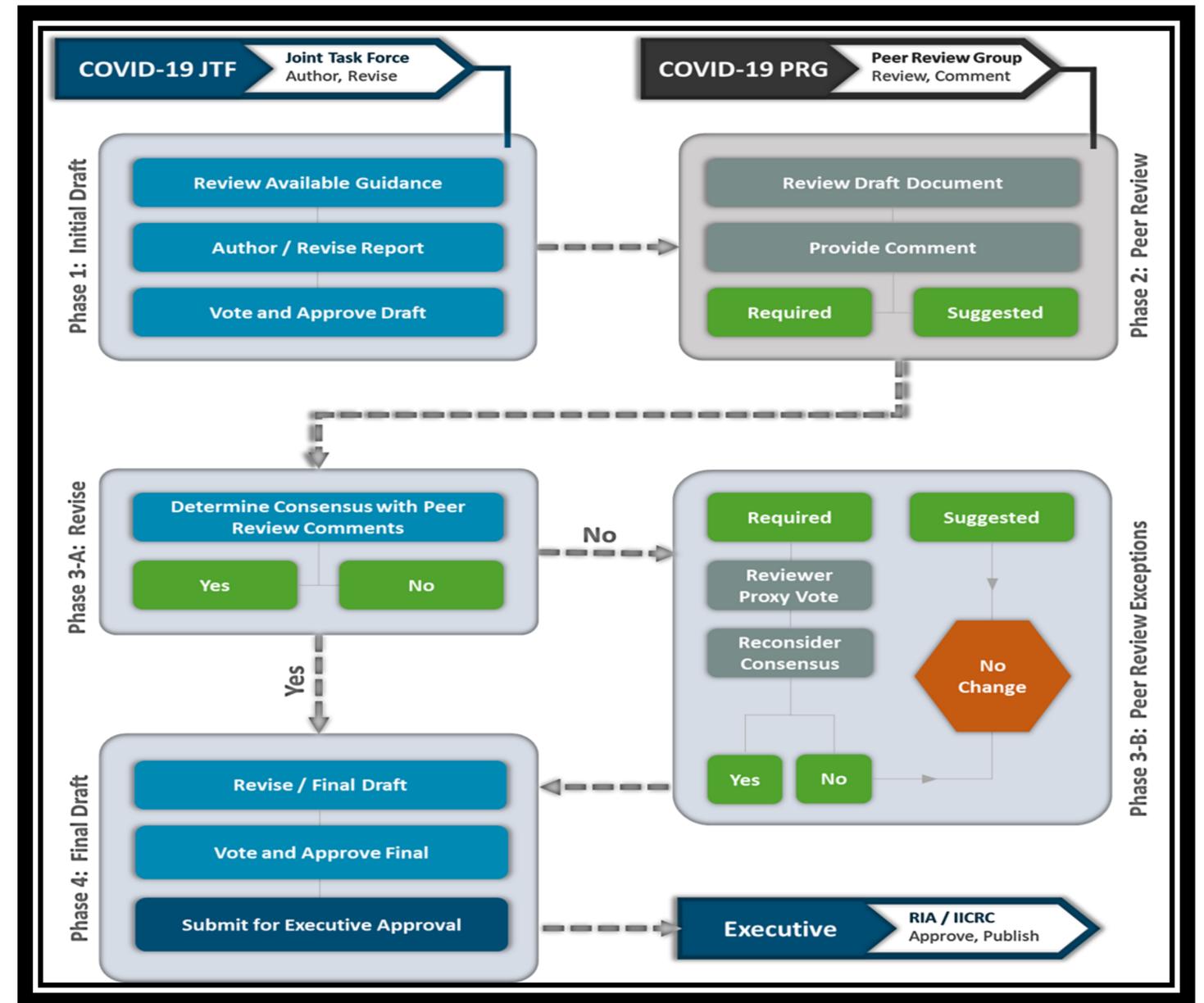
Michael Pinto FLS, CSP, CMP
Wonder Makers Environmental



Joe Spurgeon Ph. D.

AIHA/RIA/IICRC Crisis Response Joint Task Force (JTF)

The screenshot shows the IICRC Disaster Resource Center website. At the top, there is a navigation bar with the IICRC logo and menu items: HOME, STANDARDS, LOCATE A CERTIFIED PRO, TOOLS, RENEWALS, CERTIFICATIONS, EDUCATION, and DISASTER RESOURCE CENTER. The main heading is "DISASTER RESOURCE CENTER". A prominent banner reads "HAPPENING NOW COVID-19 UPDATES" with a "CLICK HERE" button. Below this, "Featured Articles" are listed, including "FIFTH EDITION NOW AVAILABLE THE COVID-19 PANDEMIC" with a sub-headline "THE LATEST REPORT FOR PROFESSIONAL CLEANING AND RESTORATION CONTRACTORS". Logos for RIA, IICRC, and AIHA are displayed. Two buttons at the bottom of the article section are "READ THE LATEST REPORT HERE" and "READ TASK FORCE PROCESS & PROCEDURES HERE". At the very bottom, there is a "Thank you to our Contributors" section with a quote from Mark Springer, CR, President of the Restoration Industry Association (RIA).



AIHA/RIA/IICRC Crisis Response Joint Task Force (JTF)



North American Winter Storms Shirley, Tabitha, Uri then Viola left more than 80% of the United States covered in snow and freezing temperatures from February 11th through the 19th. This resulted in widespread power outages, frozen water supply systems, and crippled transportation infrastructure. There are a tremendous number of complications associated with CAT response, many of which simply do not occur when working typical projects.

*In the **PALMS** of your hands:*

COVID-19 Hierarchy of Controls

Workplace hazard assessment by infection control coordinator

Hazard Elimination

- Prevent viral entry by symptom/temp screening and testing
- Encourage symptom reporting within workplace
- Telework if feasible
- Contact tracing within workplace
- Co-ordinate with local health authorities for community contact tracing

Engineering Controls

- Restructuring physical spaces to ensure physical distancing
- Use partitions or barriers if workers cannot physical distance
- Improve ventilation through dilution ventilation, filtration, and air-cleaning

Administrative Controls

- De-densify by reorganizing workflow
- Use staggered shifts
- Infection control practices including face coverings
- Perform cleaning and disinfection
- Flexible sick leave
- Train employees in hazards and controls

PPE

- Use N95s, gloves, face shields, gowns as per hazard assessment
- Consider alternatives to N95s
- Fit-testing and respirator maintenance procedures

COVID-19 Ready: Updates



[#DailyShow](#) [#TrevorNoah](#) [#DrFauci](#)

Dr. Anthony Fauci - Getting Politics Out of Public Health | The Daily Social Distancing Show



COVID-19 Ready: Updates

POLL REPORT:								
1	Question	ASSP- Hudson River Valley Chapter	ASSP- Hudson River Valley Chapter; Safety & Health Council of the Hudson Valley	ASSP- NYC Chapter	ASSP- NYC Chapter; ASSP- Hudson River Valley Chapter	Safety & Health Council of the Hudson Valley	Yes	No
2	Please indicate if you are a member of (check all that apply):	12%	5%	33%	2%	49%		
3	Are you comfortable with an in-person social event to be held in the near-future @ outdoor-tent?						56%	44%
4	Can you take your mask off when people do not understand or hear you?						4%	94%
5	Is it OK to put your hand on the outside of your mask when wearing it?						20%	80%
6	Should you keep the mask on, even if there are very few moviegoers at a Cinema for the new Christopher Nolan's TENET?						95%	5%
7	Should you put your mask on between courses while eating at a restaurant?						59%	41%
8	Should you wear a mask when riding a bike?						37%	63%
9	Should you wear your mask while alone in the elevator?						94%	6%



Industry Reports and Standards Highlights

ISO OH&S Management in Times of a Pandemic

- Urgent need and opportunity for international (ISO) guidance for “safe work” during the pandemic
- International Committees approved by 62 yes, 2 no, 11 abstain. Ballot to develop passed 9/11/20
- Including the U.S. Delegates - one of our own, Mark Drozdov:)



A new normal



Industry Reports and Standards Highlights



Our Mission

Promote the benefits of a systematic approach to OH&S management

Receive feedback and advance the discipline of OH&S management

Align and develop new products to improve and expand the understanding of OH&S management.

Who are we ?

We are the ISO Technical Committee (TC) that is responsible for the on-going development of the new ISO standard ISO 45001 *Occupational health and safety management systems - Requirements with guidance for use*, and the development of supporting guidance and standards. ISO 45001 defines good practices in OH&S management and specifies requirements for a management system. The standard applies to all forms and sizes of organization, performing any types of activities. [Click for country contacts and Task Group conveners](#) , [Task Group and Working Group members and activities](#) (Dallas Communique)

COVID 19 Message

The developing Coronavirus pandemic is a time of uncertainty and challenge for workers, and for the organizations in which they work. [read more](#)

**What Is Your Experience of ISO 45001?
Participate in Our Survey.....**



Welcome



Welcome everyone to this virtual meeting of TC283 ...

.... a meeting we planned to hold face to face in San Salvador.



Suzette Merille-...	Mark Drozdov
Martin Cottam Cha...	Sally Swingewood ...
Kåre Sørensen ...	Uwe Marx, Ger...
Elisee Gashugi (...)	Alister Dalrympl...
Trevor Dodd UK	Leanie Du Toit UK



Projects in ISO/TC 283

ISO 45001 OH&S management systems – Requirements with guidance for use

Published 2018. Preliminary work in preparation for revision begins November 2020. Systematic review to consider revision likely to begin 2021.

ISO 45002 OH&S management – General guidelines for the implementation of ISO 45001:2018

Comments on WD2 to be considered at October meetings. CD ballot due by November 2020. Publication due 2022. WG3

ISO 45003 OH&S management – Psychological health and safety in the workplace – Guidelines

Currently at DIS stage. Ballot closes November 2020. Publication due 2021. WG2

ISO 45004 OH&S management – Performance Evaluation

Proposed

Work beginning October 2020, new work item proposal ballot by November 2020. WG4

ISO 45005 OH&S management – Safe working during a pandemic

PAS development took place in September. PAS planned for publication end of 2020. Work to develop full ISO standard planned. WG5



Sally Swingewood UK



Unmute



Start Video



Participants 48



Chat



Share Screen



Record



Reactions

Leave



11:40 AM
10/8/2020



Industry Reports and Standards Highlights



ISO Survey 2020

2019	Total valid certificates 2019	Total number of sites 2019	2018	Total valid certificates	Total number of sites	% difference certificates	% difference sites
ISO 9001	883,521	1,217,972	ISO 9001:2015	878,664	1,180,965	0.55%	3.04%
ISO 14001	312,580	487,950	ISO 14001:2015	307,059	447,547	1.77%	8.28%
ISO/IEC 27001	36,362	68,765	ISO IEC 27001:2013	31,910	59,934	12.24%	12.84%
ISO 22000	33,502	39,651	ISO 22000:2005&2018	32,120	36,105	4.13%	8.94%
ISO 45001	38,654	62,889	ISO 45001:2018	11,952	14,607	69.08%	76.77%
ISO 13485	23,045	31,508	ISO 13485:2003&2016	19,472	24,123	15.50%	23.44%
ISO 50001	18,227	42,215	ISO 50001:2011	18,059	46,770	0.92%	-10.79%
ISO 22301	1,693	6,231	ISO 22301:2012	1,506	5,282	11.05%	15.23%
ISO 20000-1	6,047	7,778	ISO 20000-1:2011	5,308	7,225	12.22%	7.11%
ISO 28000	1,874	2,403	ISO 28000:2007	617	666	67.08%	72.28%
ISO 37001	872	4,096	ISO 37001:2016	389	1,541	55.39%	62.38%
ISO 39001	864	1,852	ISO 39001:2012	547	1,422	36.69%	23.22%

ISO PAS 45005

Occupational Health and Safety Management – Safe Working During the COVID-19

In the new standard ISO 45001 there is a stronger focus on the “organization’s context”. Within the ISO 45001, organizations will have to look beyond their own health and safety issues and consider what society expects from them with regard to health and safety.



TECHNICAL COMMITTEES

ISO/TC 283

Occupational health and safety management

ABOUT

SECRETARIAT: [BSI](#)

Committee Manager: [Ms Sally Swingewood](#)

Chairman (until end 2022): [Mr Martin Cotton](#)

ISO PAS 45005

Occupational Health and Safety Management – Safe Working During the COVID-19

"Do you approve publication of this document as an ISO PAS?"

Algeria (IANOR) Argentina (IRAM) Australia (SA) Austria (ASI) Bahrain (BSMD) Belgium (NBN) Bolivia, Plurinational State of (IBNORCA) Botswana (BOBS) Canada (SCC) China (SAC) Colombia (ICONTEC) Congo, The Democratic Republic of the (OCC) Costa Rica (INTECO) Ecuador (INEN) Egypt (EOS) El Salvador (OSN) Ethiopia (ESA) Gabon (AGANOR) Ghana (GSA) Hungary (MSZT) Indonesia (BSN) Iran, Islamic Republic of (ISIRI) Ireland (NSAI) Italy (UNI) Jamaica (BSJ) Japan (JISC) Jordan (JSMO) Kenya (KEBS) Korea, Republic of (KATS) Malaysia (DSM) Mali (AMANORM) Mauritius (MSB) Mexico (DGN) Morocco (IMANOR) Namibia (NSI) Nigeria (SON) Pakistan (PSQCA) Panama (COPANIT) Peru (INACAL) Qatar (QS) Russian Federation (GOST R) Rwanda (RSB) Saint Lucia (SLBS) Saudi Arabia (SASO) Serbia (ISS) South Africa (SABS) Spain (UNE) Sudan (SSMO) Sweden (SIS) Switzerland (SNV) Thailand (TISI) Trinidad and Tobago (TTBS) Turkey (TSE) Uganda (UNBS) United Kingdom (BSI) United States (ANSI) Zimbabwe (SAZ)

APPROVE (57)

Industry Reports and Standards Highlights

ISO PAS 45005 - Occupational Health and Safety Management - Safe Working During the COVID-19

Reference: ISO Draft PAS 45005		
Committee: ISO/TC 283		
Status: Closed		
Start date: 2020-10-02		
End date: 2020-11-27		

ISO 45001 Timeline



Industry Reports and Standards Highlights

ISO PAS 45005 - Occupational Health and Safety Management - Safe Working During the COVID-19

Disapprove (3)	Denmark (DS) France (AFNOR) Germany (DIN)
Abstain (15)	Barbados (BNSI) Chile (INN) Cyprus (CYS) Côte d'Ivoire (CODINORM) Finland (SFS) India (BIS) Iraq (COSQC) Israel (SII) Netherlands (NEN) New Zealand (NZSO) Norway (SN) Portugal (IPQ) Romania (ASRO) Singapore (SSC) Sri Lanka (SLSI)

ISO PAS 45005 –

Occupational Health and Safety Management – Safe Working During the COVID-19

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ISO PAS 45005 – Occupational Health and Safety Management – Safe Working During the COVID-19

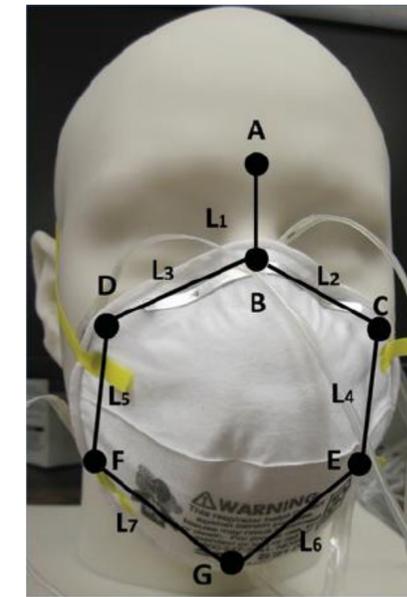
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ISO PAS 45005 –
Occupational Health and Safety Management –
Safe Working During the COVID-19

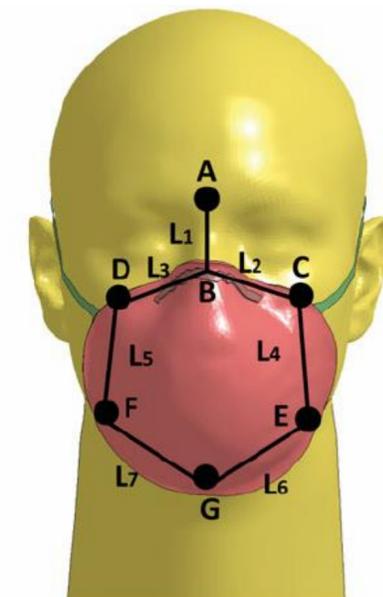
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Filtering Facepiece Respirators (FFR)

- N95 (United States NIOSH-42CFR84)
- FFP2 (Europe EN 149-2001)
- KN95 (China GB2626-2006)
- P2 (Australia/New Zealand AS/NZA 1716:2012)
- DS2 (Japan JMHLW-Notification 214, 2018)
- PFF2 (ABNT/NBR 13.698-2011 – Brazil)
- Korea 1st class (Korea KMOEL - 2017-64)

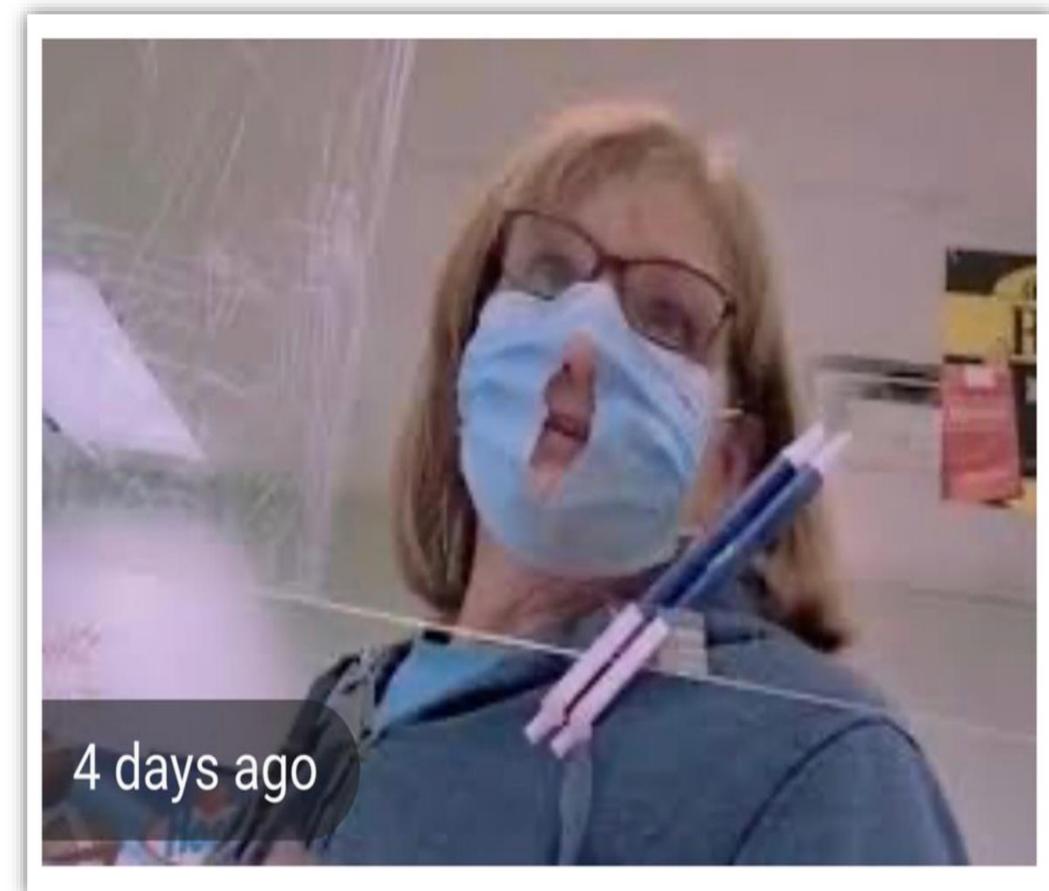


(a)



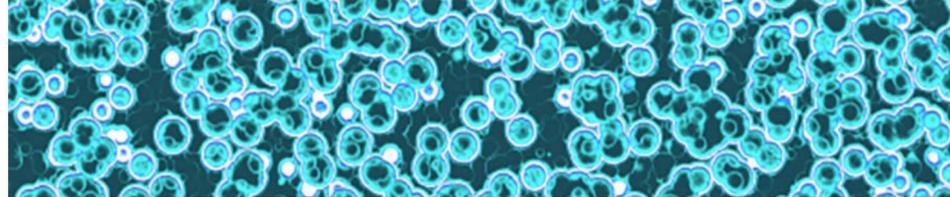
(b)

Respirators (tight-fitting filtering dust masks, such as N95, not to be confused with face covering) are an effective method of protection against hazards when properly selected and worn.





Biological Agents



Hantavirus. Hantaviruses are transmitted to humans from the dried droppings, urine, or saliva of mice and rats. Animal laboratory workers and persons working in infested buildings are at increased risk to this disease.

Legionnaires' Disease. Legionnaires' disease is a bacterial disease commonly associated with water-based aerosols. It is often the result of poorly maintained air conditioning cooling towers and potable water systems.

Measles. Measles is a vaccine-preventable but highly contagious and potentially serious bacterial disease that was previously eliminated in the United States. Unvaccinated travelers often bring the disease back from abroad, spreading it to other susceptible people and causing periodic outbreaks.

Workers' Rights

DOL/OSHA

RIN: 1218-AC46

Publication ID: Spring 2016

Title: Infectious Diseases

Abstract:

Employees in health care and other high-risk environments face long-standing infectious disease hazards such as tuberculosis (TB), varicella disease (chickenpox, shingles), and measles (rubeola), as well as new and emerging infectious disease threats, such as Severe Acute Respiratory Syndrome (SARS) and pandemic influenza. Health care workers and workers in related occupations, or who are exposed in other high-risk environments, are at increased risk of contracting TB, SARS, Methicillin-resistant Staphylococcus aureus (MRSA), and other infectious diseases that can be transmitted through a variety of exposure routes. OSHA is concerned about the ability of employees to continue to provide health care and other critical services without unreasonably jeopardizing their health. **OSHA is developing a standard to ensure that employers establish a comprehensive infection control program and control measures to protect employees from infectious disease exposures to pathogens that can cause significant disease.** Workplaces where such control measures might be necessary include: health care, emergency response, correctional facilities, homeless shelters, drug treatment programs, and other occupational settings where employees can be at increased risk of exposure to potentially infectious people. A standard could also apply to laboratories, which handle materials that may be a source of pathogens, and to pathologists, coroners' offices, medical examiners, and mortuaries.

Agency: Department of Labor(DOL)

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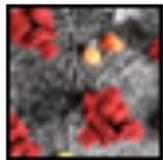
CFR Citation: [29 CFR 1910](#)

Legal Authority: [5 U.S.C. 533](#) [29 U.S.C. 657 and 658](#) [29 U.S.C. 660](#) [29 U.S.C. 666](#) [29 U.S.C. 669](#) [29 U.S.C. 673](#)

Priority: Economically Significant

Agenda Stage of Rulemaking: Proposed Rule Stage

Unfunded Mandates: No

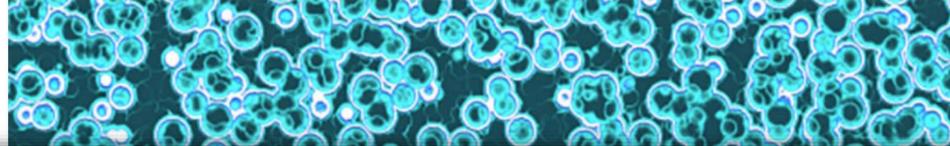


COVID-19

A new coronavirus that emerged from China in 2019 can cause pneumonia-like illnesses, with signs and symptoms including fever, cough, and shortness of breath.



Biological Agents



 **Hantavirus.** Hantaviruses are transmitted to humans from the dried droppings, urine, or saliva of mice and rats. Animal laboratory workers and persons working in infested buildings are at increased risk to this disease.

 **Legionnaires' Disease.** Legionnaires' disease is a bacterial disease commonly associated with water-based aerosols. It is often the result of poorly maintained air conditioning cooling towers and potable water systems.

Universal precautions (UP), originally recommended by the CDC in the 1980s, was introduced as an approach to infection control to protect workers from HIV, HBV, and other bloodborne pathogens in human blood and certain other body fluids, regardless of a patients' infection status.² UP is an approach to infection control in which all human blood and certain human body fluids are treated as if they are known to be infectious. Although the BBP standard incorporates UP, the infection control community no longer uses UP on its own.

 **Cytomegalovirus (CMV).** Workers in childcare and healthcare facilities are among those at greatest risk for exposure to CMV, a common virus that affects tens of thousands of adults every year in the United States and is readily spread through contact with saliva and other body fluids from infected individuals.

 **Ebola.** Ebola hemorrhagic fever (EHF) (sometimes called Ebola Virus Disease, or EVD) is the disease caused by infection with an Ebola virus. It is a type of viral hemorrhagic fever (VHF) brought on by any of several strains of viruses in the Ebolavirus genus. Ebola viruses are capable of causing severe, life-threatening disease.

 **Foodborne Disease.** Foodborne illnesses are caused by viruses, bacteria, parasites, toxins, metals, and prions (microscopic protein particles). Symptoms range from mild gastroenteritis to life-threatening neurologic, hepatic, and renal syndromes.

 **Viral Hemorrhagic Fevers (VHFs).** Along with smallpox, anthrax, plague, botulism, and tularemia, hemorrhagic fever viruses are among six agents identified by the Centers for Disease Control and Prevention (CDC) as the most likely to be used as biological weapons. Many VHFs can cause severe, life-threatening disease with high fatality rates.

 **Zika Virus.** Zika virus is most commonly spread through the bites of infected mosquitoes in areas with ongoing viral transmission. However, it can also be passed from person to person through sharps injuries (e.g., needlesticks) and other exposures to infectious blood, body fluids, and materials. Outdoor workers in areas with active transmission, along with those in laboratories handling samples of Zika virus, remain at the greatest risk of infection.



Biological Agents



Hantavirus. Hantaviruses are transmitted to humans from the dried droppings, urine, or saliva of mice and rats. Animal laboratory workers and persons working in infested buildings are at increased risk to this disease.

Standard precautions (SP), introduced in 1996 in the CDC/Healthcare Infection Control and Prevention Advisory Committee's "1996 Guideline for Isolation Precautions in Hospitals," added additional infection prevention elements to UP in order to protect healthcare workers not only from pathogens in human blood and certain other body fluids, but also pathogens present in body fluids to which UP does not apply. SP includes hand hygiene; the use of certain types of PPE based on anticipated exposure; safe injection practices; and safe management of contaminated equipment and other items in the patient environment. SP is applied to all patients even when they are not known or suspected to be infectious.



EVD is the disease caused by infection with an Ebola virus. It is a type of viral hemorrhagic fever (VHF) brought on by any of several strains of viruses in the Ebolavirus genus. Ebola viruses are capable of causing severe, life-threatening disease.



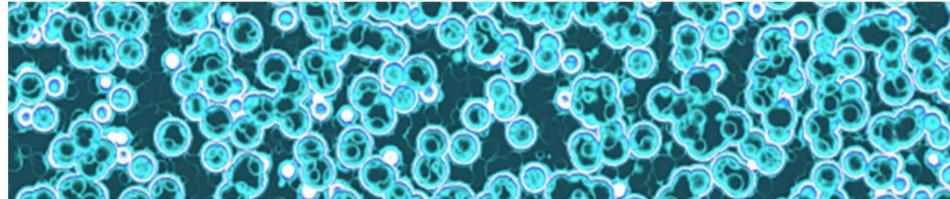
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Biological Agents



Overview
Biological agents include bacteria, viruses, fungi, other microorganisms and their associated

- Hantavirus.** Hantaviruses are transmitted to humans from the dried droppings, urine, or saliva of mice and rats. Animal laboratory workers and persons working in infested buildings are at increased risk to this disease.
- Legionnaires' Disease.** Legionnaires' disease is a bacterial disease commonly associated with water-based aerosols. It is often the result of poorly maintained air conditioning cooling towers and potable water systems.
- Measles.** Measles is a vaccine-preventable but highly contagious and potentially serious bacterial disease that was previously eliminated in the United States. Unvaccinated travelers often bring the disease back from abroad, spreading it to other susceptible people and causing periodic outbreaks.
- Measles.** Measles is a vaccine-preventable but highly contagious and potentially

Transmission-based precautions (TBP) for contact-, droplet-, and airborne-transmissible diseases augment SP with additional controls to interrupt the route(s) of transmission that may not be completely interrupted using SP alone.³ The different types of TBP are applied based on what is known or suspected about a patient's infection.

- million workers in the health care industry and related occupations are at risk of occupational exposure to bloodborne pathogens, including human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV), and others.
- Botulism.** Cases of botulism are usually associated with consumption of preserved foods. However, botulinum toxins are currently among the most common compounds explored by terrorists for use as biological weapons.
- COVID-19.** A new coronavirus that emerged from China in 2019 can cause pneumonia-like illnesses, with signs and symptoms including fever, cough, and shortness of breath.
- Cytomegalovirus (CMV).** Workers in childcare and healthcare facilities are among those at greatest risk for exposure to CMV, a common virus that affects tens of thousands of adults every year in the United States and is readily spread through contact with saliva and other body fluids from infected individuals.
- Ebola.** Ebola hemorrhagic fever (EHF) (sometimes called Ebola Virus Disease, or EVD) is the disease caused by infection with an Ebola virus. It is a type of viral hemorrhagic fever (VHF) brought on by any of several strains of viruses in the Ebolavirus genus. Ebola viruses are capable of causing severe, life-threatening disease.
- Foodborne Disease.** Foodborne illnesses are caused by viruses, bacteria, parasites, toxins, metals, and prions (microscopic protein particles). Symptoms range from mild gastroenteritis to life-threatening neurologic, hepatic, and renal syndromes.
- Disease Control and Prevention (CDC),** there have not been any known cases of SARS reported anywhere in the world.
- Smallpox.** Smallpox is a highly contagious disease unique to humans. It is estimated that no more than 20 percent of the population has any immunity from previous vaccination.
- Tularemia.** Tularemia is also known as "rabbit fever" or "deer fly fever" and is extremely infectious. Relatively few bacteria are required to cause the disease, which is why it is an attractive weapon for use in bioterrorism.
- Viral Hemorrhagic Fevers (VHFs).** Along with smallpox, anthrax, plague, botulism, and tularemia, hemorrhagic fever viruses are among six agents identified by the Centers for Disease Control and Prevention (CDC) as the most likely to be used as biological weapons. Many VHFs can cause severe, life-threatening disease with high fatality rates.
- Zika Virus.** Zika virus is most commonly spread through the bites of infected mosquitoes in areas with ongoing viral transmission. However, it can also be passed from person to person through sharps injuries (e.g., needlesticks) and other exposures to infectious blood, body fluids, and materials. Outdoor workers in areas with active transmission, along with those in laboratories handling samples of Zika virus, remain at the greatest risk of infection.

Table 2. Selected elements of infection prevention and control under BBP, SP, and TBP

Control, action or other measure	To protect workers against exposure to...	
	Blood and OPIM ¹	Material that is not blood or OPIM, including body fluids not covered under OPIM (e.g., urine ⁶ and feces)
Blood and body fluid precautions for all patients, regardless of infection status	BBP, SP	SP
Exposure control plan and required elements thereof ¹²	BBP	
Patient isolation/placement	TBP	TBP
Hand hygiene	BBP, SP	SP
Safe injection practices	BBP, SP	SP
Safe sharps management/disposal	BBP, SP	SP
Prohibiting eating, drinking, smoking, or application of cosmetics or lip balm and handling of contact lenses in areas where there is a reasonable likelihood of occupational exposure ¹³	BBP	
Separating food and drink from areas where blood and OPIM are present ¹³	BBP	
Prohibiting mouth pipetting and suctioning of blood or OPIM ¹³	BBP	
Safe specimen storage, packaging, shipment ¹³	BBP	
PPE – Gloves, gowns, masks, eye protection (e.g., goggles), face shields	BBP, ¹⁴ SP, TBP	SP, TBP
PPE – Aprons and other protective body clothing	BBP, TBP	TBP
PPE – Surgical caps	BBP, TBP	TBP
PPE – Shoe/boot covers	BBP, TBP	TBP
PPE – N95 or higher respirators for aerosol-generating procedures on patients with suspected or proven infections transmitted by respiratory aerosols	SP, TBP	SP, TBP
PPE – Any additional appropriate equipment to prevent blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used. See 29 CFR 1910.1030(d)(3)(i).	BBP	
PPE – Any additional appropriate equipment (i.e., not specifically listed already) to protect workers against transmission of infectious agents	TBP	TBP
Housekeeping and environmental control procedures	BBP, SP	SP
▪ Safe waste management ¹³	BBP	
▪ Safe laundry management	BBP, SP	SP
▪ Soiled patient-care equipment management	BBP, SP	SP
Post exposure evaluation and follow-up after occupational exposure to a bloodborne pathogen(s) ¹⁵	BBP	

Table 2 compares selected controls, actions and other measures for the protection of workers against exposure to blood and other potentially infectious materials (OPIM) and for the protection of workers against exposure to material that is not blood or OPIM.

The General Duty Clause of the Occupational Safety and Health Act and additional OSHA standards, including those for personal protective equipment in 29 CFR 1910 Subpart I, also may apply.

COMPARING SYMPTOMS: COVID-19 VS. OTHERS

Symptoms related to indoor conditions may be resolved by opening windows or going outdoors. Symptoms related to COVID-19/flu/cold may require medical attention.

	Illnesses / Allergy ¹				Indoor Conditions at Home ²		
	COVID-19	Seasonal Flu	Cold	Allergies	High CO2 ("Stuffy" House)	Mold/Dampness	VOCs ³ (Household Chemicals)
Cough	●	●	●	●	●	●	●
Fever	●	●	●	●	—	●	—
Breathlessness	●	●	●	●	●	●	●
Body Aches	●	●	●	—	●	●	—
Headache	●	●	●	●	●	●	●
Fatigue	●	●	●	●	●	●	●
Sore Throat	●	●	●	—	—	●	●
Diarrhea	●	●	—	—	—	—	—
Runny Nose	●	●	●	●	—	●	●
Sneezing	●	●	●	●	—	●	●
Watery Eyes	—	●	●	●	—	●	●
Dizziness	—	●	●	●	●	●	●
Nausea	—	●	●	●	●	●	●

● Frequently ● Sometimes ● Infrequent ● Rarely — Uncertain

Note: All people are impacted differently. Chart is for illustrative purposes only and is not a substitute for a diagnosis by a qualified medical professional.

¹Illness / Allergy Sources: CDC, WHO, Mayo Clinic, Johns Hopkins University Center for Health Security

²Indoor Conditions Sources: CDC, EPA (VOCs), Hayward Score

³VOCs include household cleaners, deodorizers, sanitizers, and, personal care products

FFP3 Mask

NEW ARRIVAL Anti-Flu

- pollen
- cement
- heavy metal
- Bacteria
- soot
- virus
- asbestos
- Mould

LIMITED STOCK

P2/N99 FFP3+ MASK

12 PACK

US STOCK

AA 🔍 🔒 mask with exhalation valve : ↻

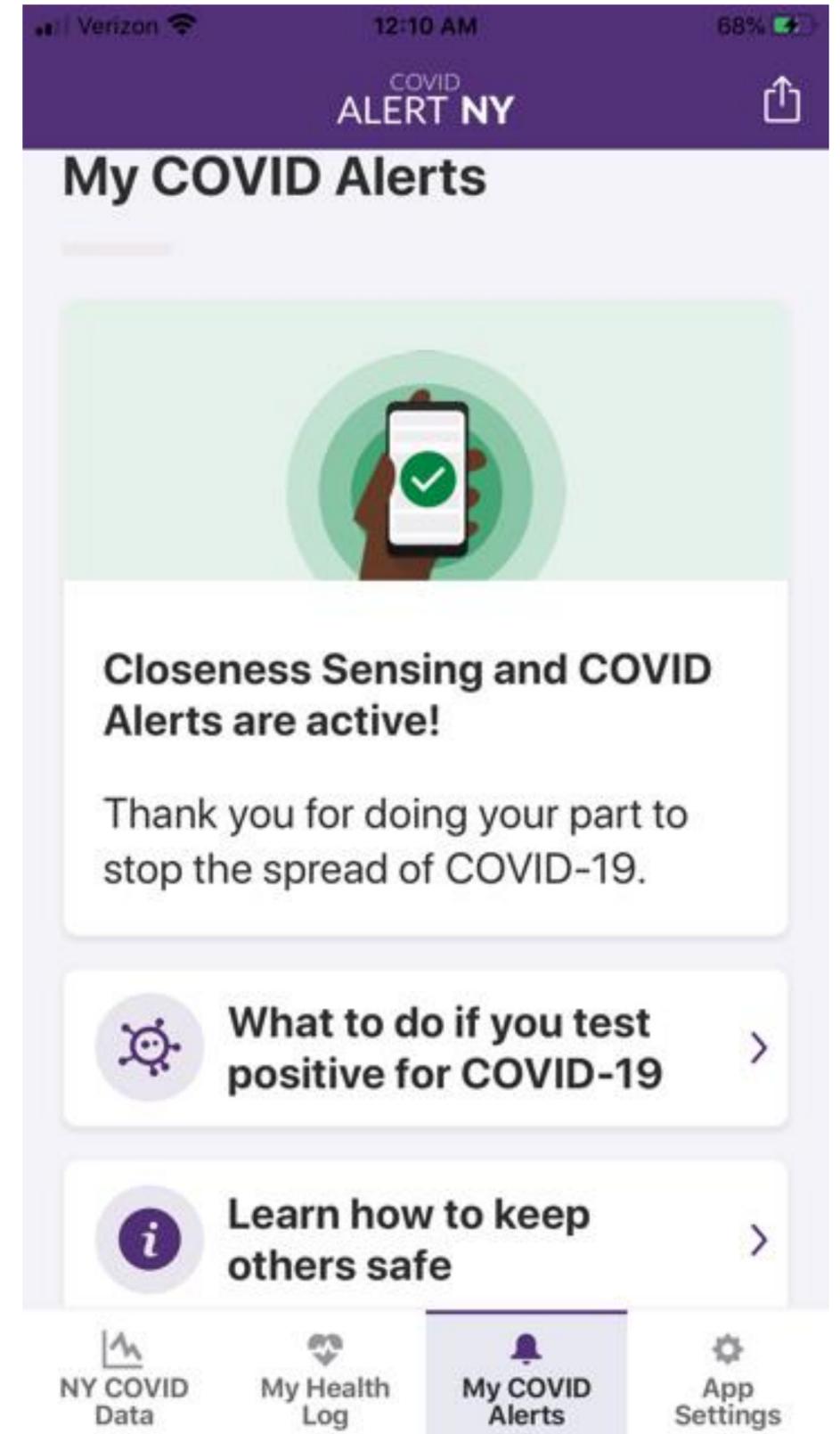
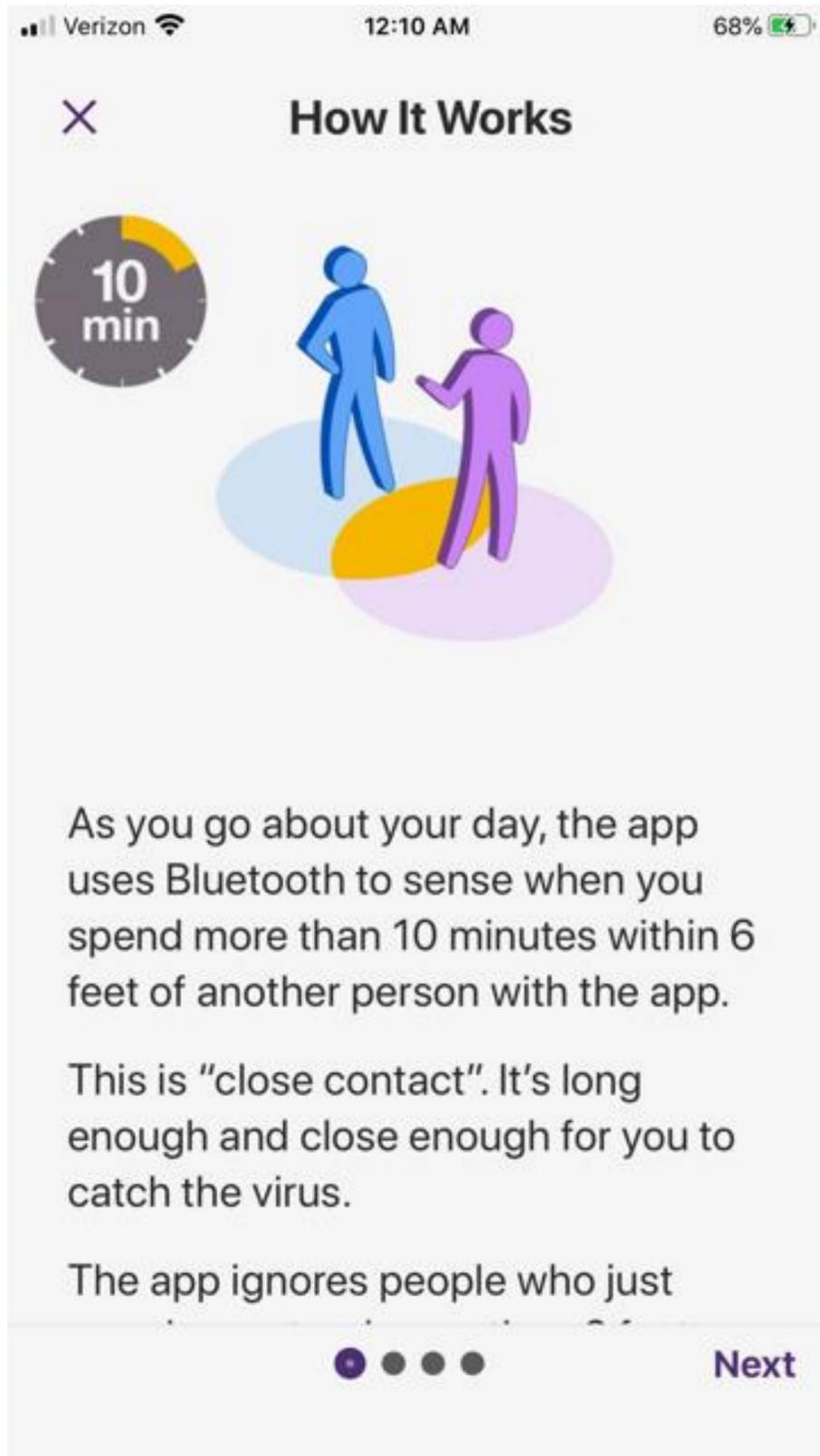
3M 3M

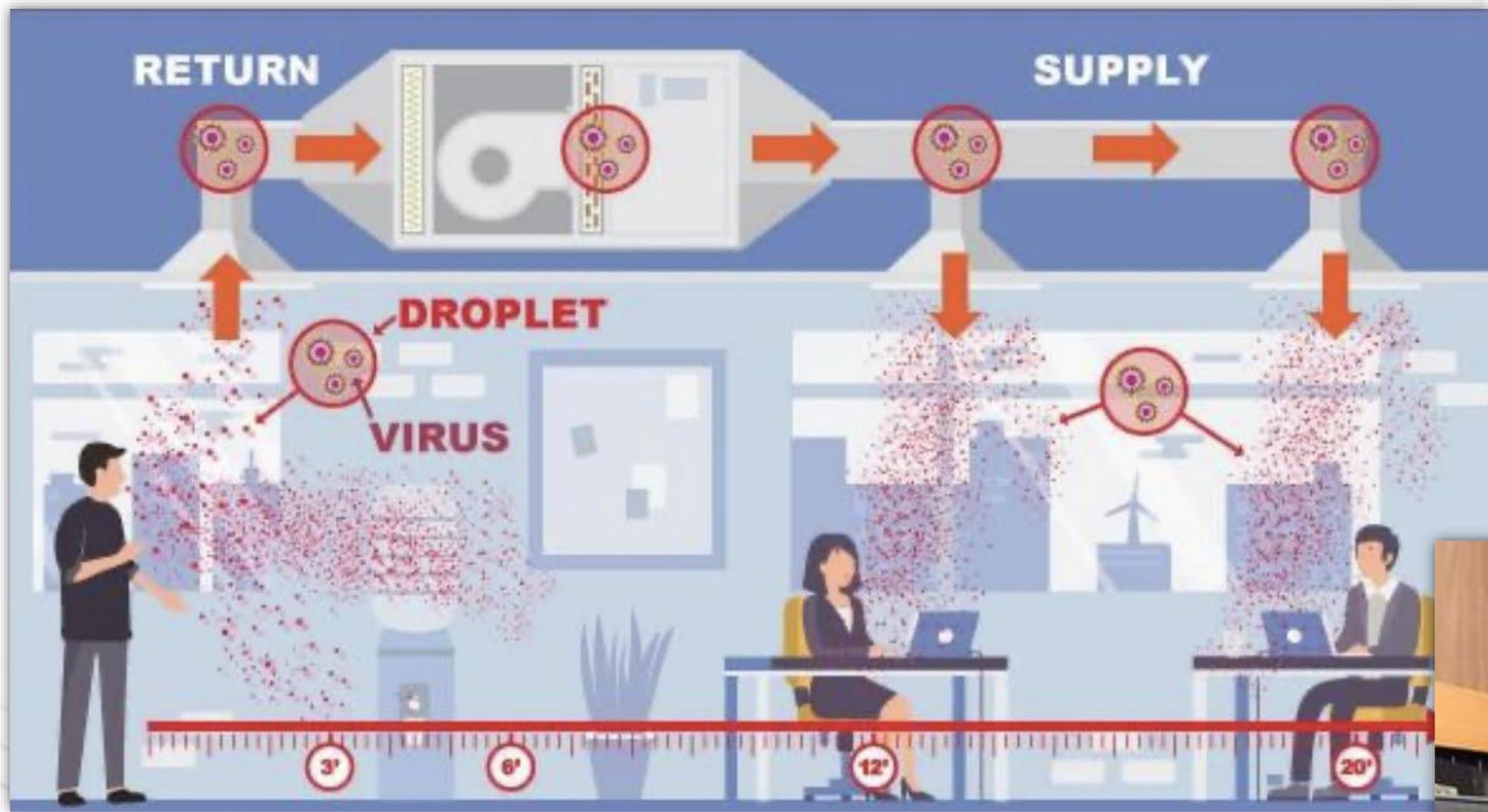
Disposable Respirators | PPE | 3M Worker Health & Safety | 3M ...

[Visit](#)

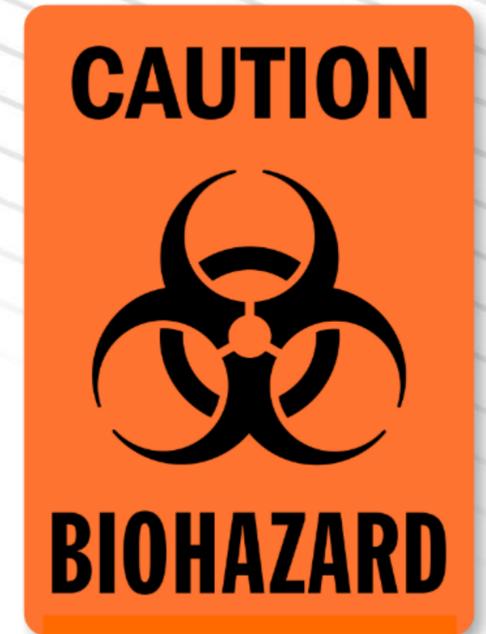
Person	Exposure to
<ul style="list-style-type: none">Individual who has had close contact (< 6 feet)** for ≥15 minutes***	<ul style="list-style-type: none">Person with COVID-19 who has symptoms (in the period from 2 days before symptom onset until they meet criteria for discontinuing home isolation; can be laboratory-confirmed or a clinically compatible illness)Person who has tested positive for COVID-19 (laboratory confirmed) but has not had any symptoms (in the 2 days before the date of specimen collection until they meet criteria for discontinuing home isolation)

***Data are insufficient to precisely define the duration of time that constitutes a prolonged exposure. Recommendations vary on the length of time of exposure, but 15 minutes of close exposure can be used as an operational definition. Brief interactions are less likely to result in transmission; however, symptoms and the type of interaction (e.g., did the infected person cough directly into the face of the exposed individual) remain important.





COVID-19 Remediation Ventilation and Airborne Infection



- Site & Risk Assessment
- Customized Protocol
- HVAC Concerns and Operation
- Trained Cleaners with PPE
- Hard Surface Cleaning Products
- Disinfectants with EPA-Approved Claims
- Validation of Cleaning Effectiveness
- Decontamination of Equipment
- Air Circulation & HEPA Scrubbing

What We Know

- Ventilation matters for “long range” airborne infection for some diseases
- Ventilation may become an effective public health intervention method

What We DO NOT Know

- The minimum ventilation flow rate for infection control
- Relative importance of transmission routes
- Effective control methods for short-range airborne route

[AirScrub.org](https://airscrub.org)

<https://airscrub.webflow.io/>

NADCA POSITION PAPER On Chemical Product Applications in HVAC

Systems EPA requirements: All antimicrobial pesticides for use in HVAC systems are required to be registered by the EPA. Products without specific HVAC directions are not to be used on these surfaces. A product has only been evaluated based on the directions for use listed on the label. The product is likely not to be effective if used in incorrect amounts or for different dwell time.

ASHRAE response to inquiry:

“Your view on if and when HVAC systems should be shut down when spraying disinfectants”

- USE EPA List N
- Follow Label
- Contact Manufacturer

Is sanitizing ductwork legal? NO. The EPA has not registered any products for sanitizing or disinfecting ductwork. Further, no fungicides are registered for use in the ductwork. As noted earlier in this document, **IT IS A VIOLATION OF FEDERAL LAW TO USE A PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.** For antimicrobials, this law is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Therefore, any claims of sanitizing or disinfecting ductwork would require the use of a product in a manner inconsistent with its labeling, which is a violation of FIFRA. Violations of FIFRA can result in fines and criminal penalties from the EPA.

Dear Mr. Mark Drozdov:

The ASHRAE Epidemic Task force (ETF) received an inquiry from you last week:

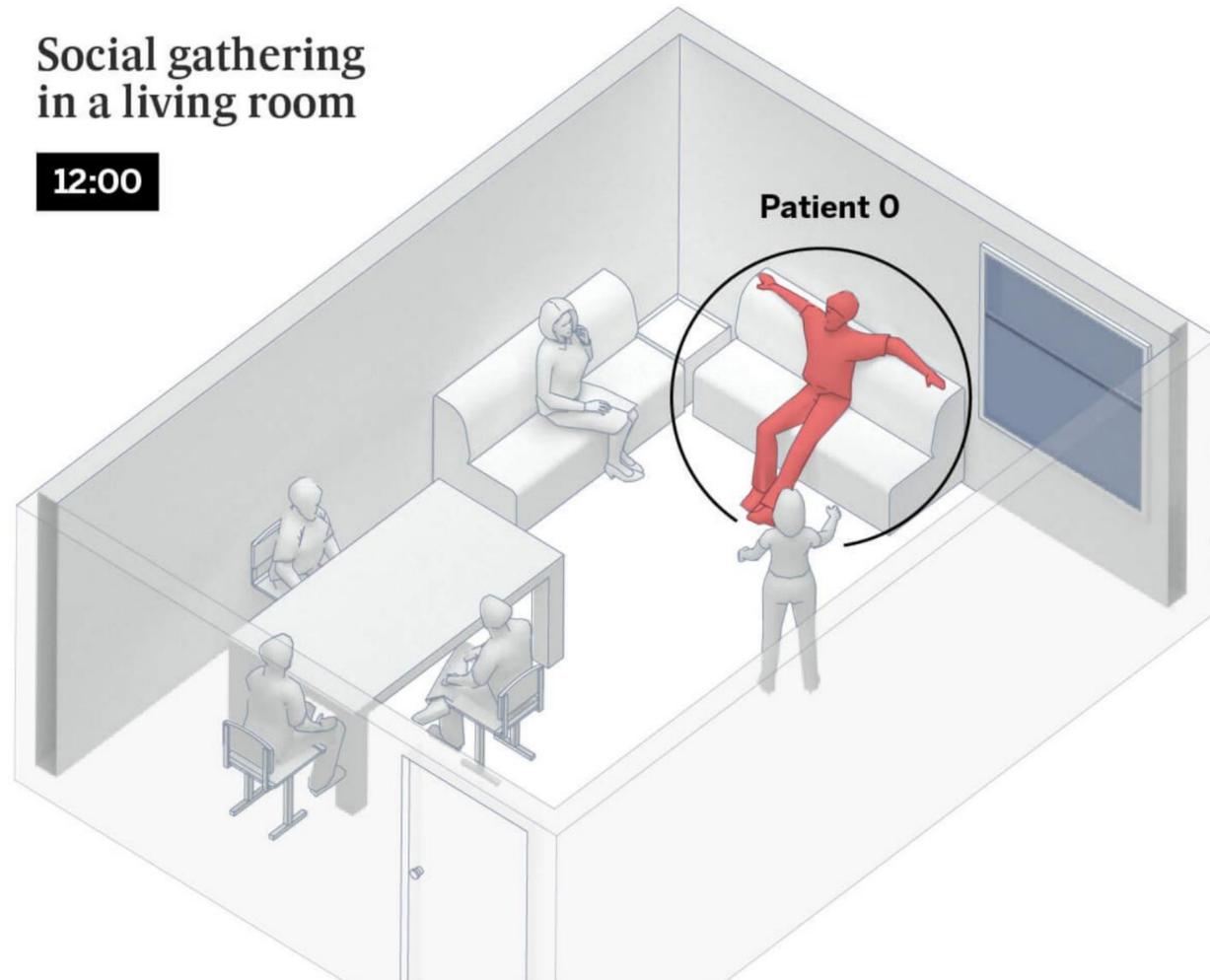
Your view on if and when HVAC systems should be shut down when surface spraying of disinfectants? Is there a room volume for which it would be advisable?

That inquiry was forwarded to various groups for further assistance. It would be appropriate for the ASHRAE ETF to provide specific guidance on the use of disinfectants. Strictly speaking, disinfectants are part of the larger classification of “antimicrobial pesticides”, and as such are regulated by, and must be registered with, the U.S. EPA. Please see: <https://www.epa.gov/pesticide-registration/what-are-antimicrobial-pesticides> In this light, the ETF would recommend the following:

1. Use only EPA-registered disinfectants. If the intent is to treat surfaces for the virus that causes COVID-19, refer to the EPA’s Pesticide Registration List N: Disinfectants for Use Against SARS-CoV-2 <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>
2. As part of the registration process each product’s “labeling” will have been reviewed by the EPA. Said labeling will include a description of suitable applications and directions for use. Specifically, the EPA states the following: “Pesticide product labels provide critical information about how to safely and legally handle and use pesticide products. Unlike most other types of product labels, pesticide labels are legally enforceable, and all of them carry the statement: ‘It is a violation of Federal law to use this product in a manner inconsistent with its labeling.’ In other words, the label is the law.” <https://www.epa.gov/pesticide-labels/introduction-pesticide-labels>
3. In the absence of clear or sufficient directions for use, you should contact the distributor or manufacturer for additional information.

Social gathering in a living room

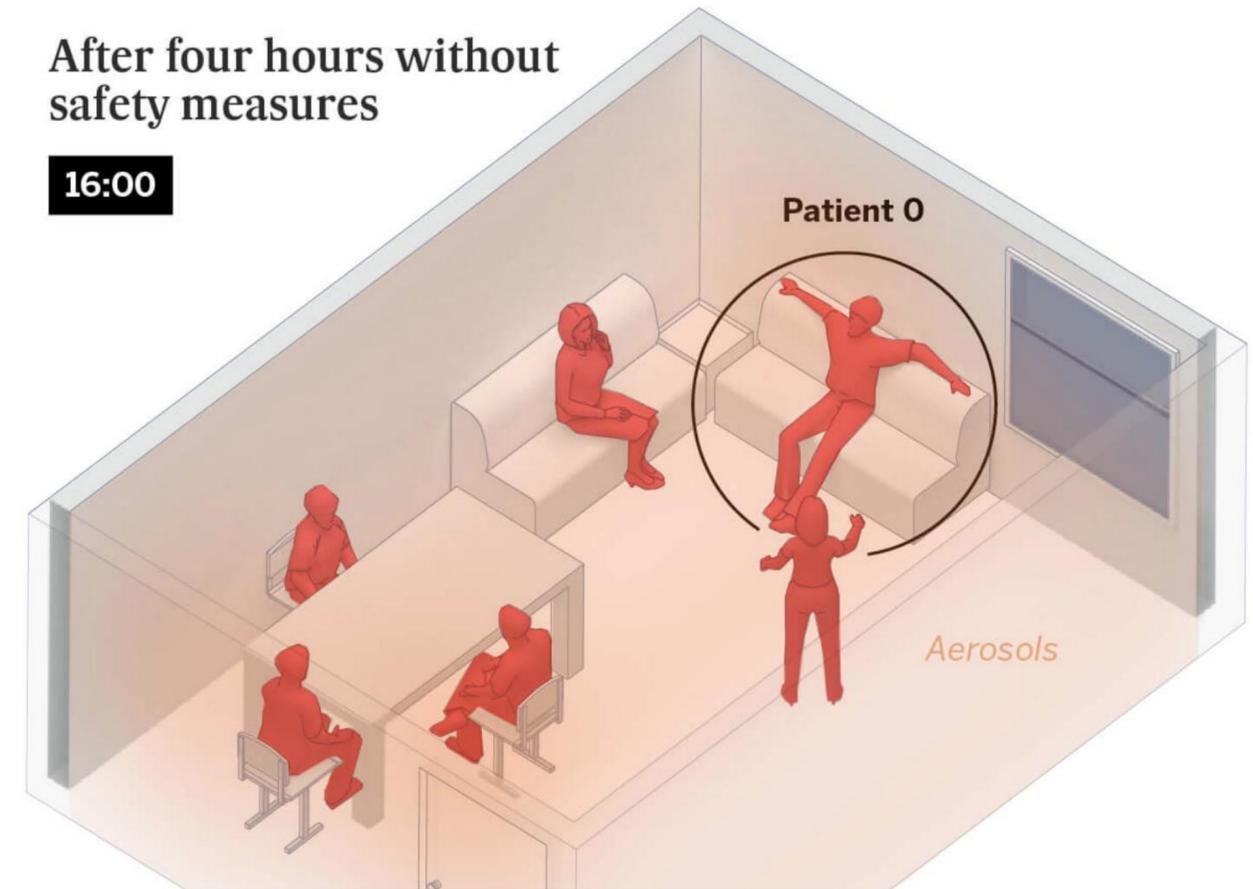
12:00



Six people get together in a private home, one of whom is infected. **Some 31% of coronavirus outbreaks recorded in Spain** are caused by this kind of gathering, mainly between family and friends.

After four hours without safety measures

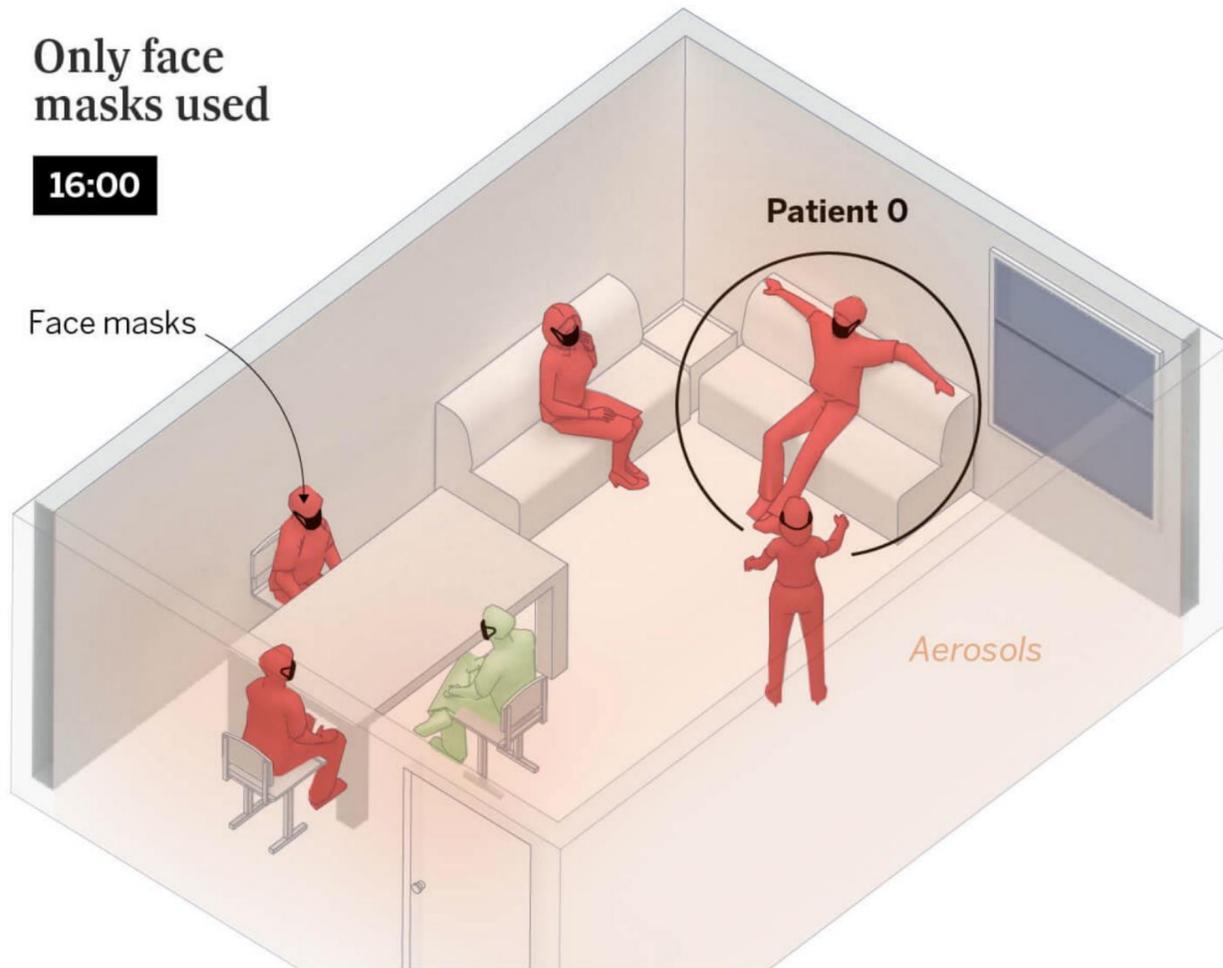
16:00



Irrespective of whether safe distances are maintained, if the six people spend four hours together talking loudly, without wearing a face mask in a room with no ventilation, **five will become infected**, according to the scientific model explained in the methodology.

Only face masks used

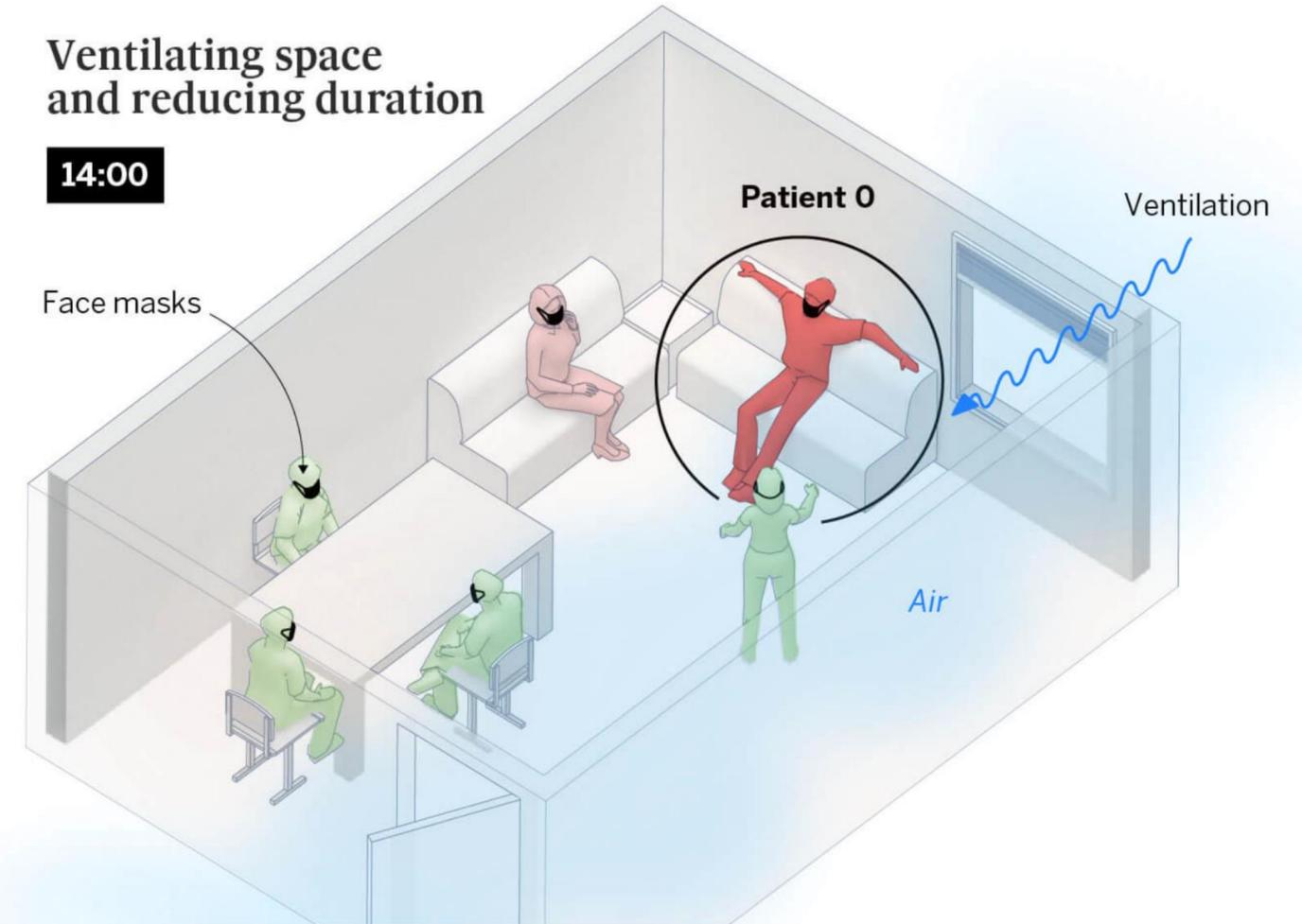
16:00



If face masks are worn, four people are at risk of infection. Masks alone will not prevent infection if the exposure is prolonged.

Ventilating space and reducing duration

14:00



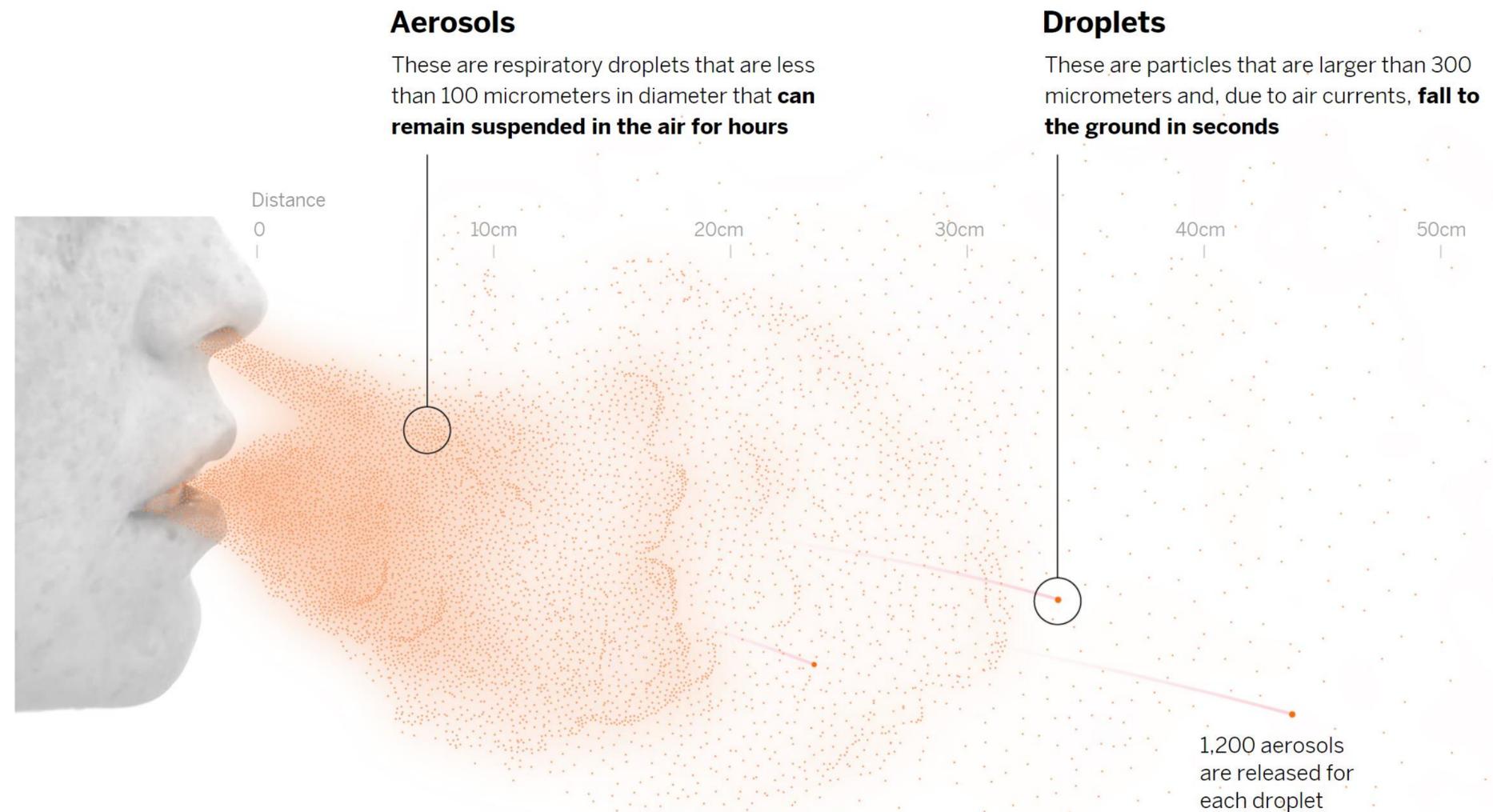
The risk of infection drops to below one when the group uses face masks, shortens the length of the gathering by half and ventilates the space used.

<https://english.elpais.com/society/2020-10-28/a-room-a-bar-and-a-class-how-the-coronavirus-is-spread-through-the-air.html?fbclid=IwAR1S79uyTUzpkqjImEQmxxT7h7q0Nh6Am660BChF-W1z7Aoc94EYN1N2n4>

It is paramount for all occupants and professionals to understand if HVAC systems and engineering controls are actually helping, **or not**, in preventing the spread of COVID-19.

As one safety and health expert, who specializes in infection control, put it in an article published in [R&R Magazine on Managing Indoor Air Quality Amid COVID-19](#)

"It is critical to remember that each indoor environment is unique; conditions within each indoor environment are dynamic, and there is not a one-size-fits-all strategy for infection control."



How to Manage Indoor Air Quality Amid COVID-19



October 7, 2020

Mark Drozdov

KEYWORDS COVID-19 /
disinfection services / IAQ /
infectious disease control /
training

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As we seek to return to normalcy without a vaccine, COVID-19 confronts us with a troubling reality. We spend 90% of our time indoors in the U.S. and Europe, and scientific evidence indicates we are nearly 20 times more likely to be infected by the virus indoors than outdoors. COVID-19 has impacted many indoor settings such as schools, offices, churches, restaurants and bars, with prisons, meatpacking plants, and long-term care facilities being most affected due to high occupancy, poor ventilation and vulnerable populations.

Increasingly, scientists believe airborne transmission is a major route for the spread of COVID-19. Viral respiratory droplets released from coughing, sneezing, talking, and breathing can aerosolize into smaller particles, stay suspended in the air for hours, and travel significantly farther than six feet. A key scientific debate has been whether the virus is infectious in

The fundamental question is what can and should we do to mitigate airborne transmission and create “safe” indoor environments amid COVID-19? One critically important and often overlooked area is engineering and Heating, Ventilation, and Air Conditioning (HVAC) controls. The American Industrial Hygiene Association (AIHA) states, “Engineering controls that can keep infectious aerosols at very low levels indoors offer the greatest promise to protect non-healthcare workers and other vulnerable populations as we reopen our businesses and workplace.”

Similarly, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) states, “Changes in building operations, including the operation of heating, ventilating, and air conditioning systems can reduce airborne exposures.” It highlights the following HVAC strategies based on evidence-based literature:

- Enhanced filtration that includes higher Minimum Efficiency Reporting Value(MERV) filters over code minimums in occupant-dense and/or higher-risk spaces
- Upper-room UltraViolet Germicidal Irradiation (UVGI), with possible in-room fans, as a supplement to supply airflow
- Local exhaust ventilation for source control
- Personalized ventilation systems for certain high-risk tasks
- Portable, free-standing High-Efficiency Particulate Air (HEPA) filters
- Temperature and humidity control

ASHRAE is careful to qualify its recommendations with the caveat that the system’s impact will depend on the source location, strength, and distribution of the released aerosol, droplet size, temperature, air distribution, humidity, and filtration. Each indoor environment is unique; conditions within each indoor environment are dynamic, and there is not a one-size-fits-all strategy for infection control.



The complex and evolving nature of the airborne transmission risk has resulted in two broad categories of responses for engineering and HVAC controls. The first is that owners and operators, particularly those responsible for mission-essential businesses, have spent significant financial resources on many of ASHRAE's recommended strategies and beyond. The second category is many other owners and operators have done little due to being overwhelmed, confused, resource-constrained, or merely taking a wait-and-see approach.

Empirical data that allows people to understand the current level of risk and remediation usefulness is absent from most decision-making processes. ASHRAE, AIHA, IICRC and other leading authorities base their recommendations on evidence-based methodologies and peer-reviewed research.

Extrapolating academic studies results to any specific indoor environment has significant challenges and limitations, especially for a novel virus like SARS-CoV-2. ASHRAE and AIHA acknowledge as much, urging the involvement of knowledgeable mechanical engineers and industrial hygienists familiar with a building and, in some cases leveraging computational fluid dynamics (CFD) modeling.

However, mechanical engineers and industrial hygienists have candidly and consistently shared with us their concerns around infectious aerosols. Simply put, existing diagnostic solutions for indoor air quality, including tracer gases, smoke or bubble testing, and monitors or sensors may be insufficient for assessing the risk posed by an airborne pathogen like SARS-CoV-2.

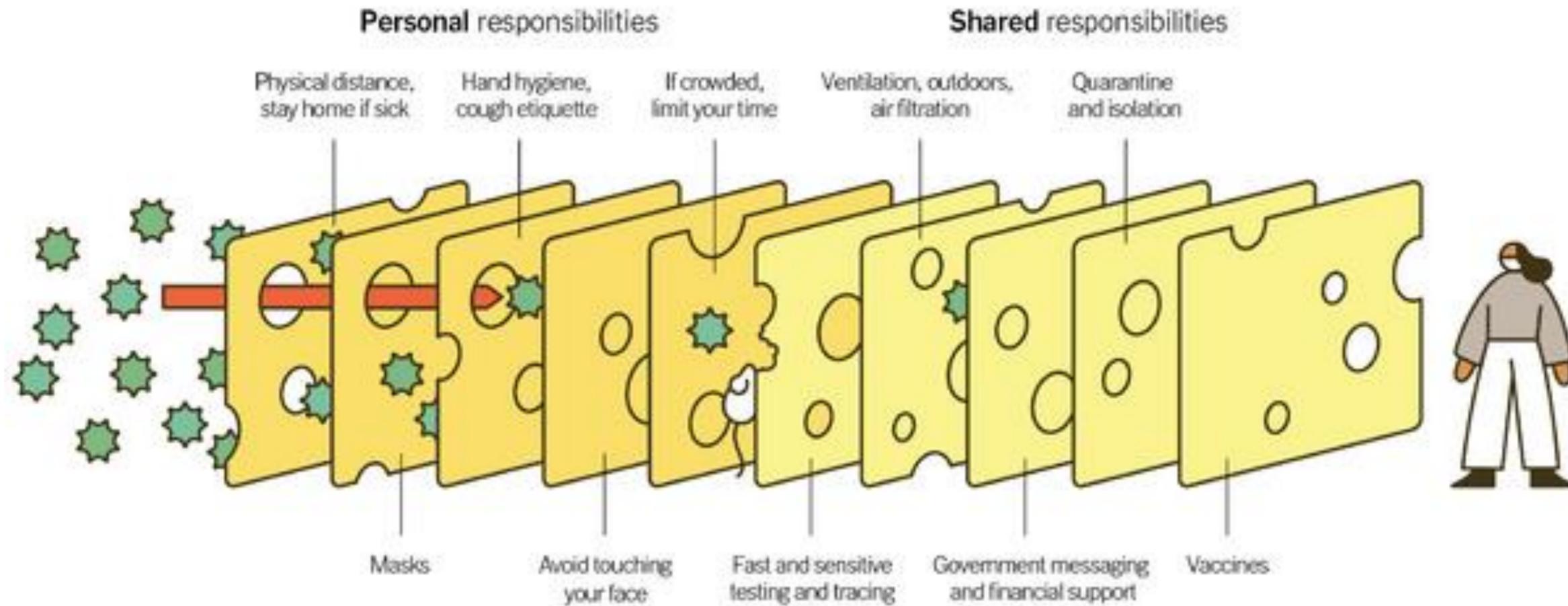
The good news is that emerging technologies at the cutting edge of building, health, and data science are posed to fill this gap. One notable solution is veriDART, developed by the Bay Area-based technology company SafeTraces with the National Institutes of Health (NIH) support. This groundbreaking technology safely mimics the airborne pathogen's mobility with proprietary tracers based on the chemical composition, fluid dynamics, and detection methods of human saliva and aerosols that comply with OSHA, NIOSH, and ACGIH exposure limits. The key is to enable owners and operators to identify hotspots, assess filtration and ventilation, and inform remediations with empirical data, heatmap visualizations, and time-series analyses.

The challenge is how it efficiently support safer office reopening and emergency response at sites, yielding valuable data for what could be very costly engineering and HVAC control decisions. For example, a Fortune 500 company used veriDART for both a survey risk assessment of their 500,000 square foot office building and targeted risk assessments of their restrooms, conference rooms, and other perceived high-risk locations. A major focus area of testing was dilution ventilation, which ASHRAE and AIHA cite as an important engineering control for reducing an occupant's exposure to airborne viruses.

It was established by veriDART data-driven time and condition parameters for tracer dilution to the diagnostic indicator level of low risk. Interestingly, the number of effective air changes per hour had a uniform effect on tracer dilution within a room, but non-uniform across rooms of similar size, HVAC configuration, and test conditions. The customer's implication was clear: they needed to be careful about not over-generalizing their engineering and HVAC controls across the entire building.

Multiple Layers Improve Success

The Swiss Cheese Respiratory Pandemic Defense recognizes that no single intervention is perfect at preventing the spread of the coronavirus. Each intervention (layer) has holes.

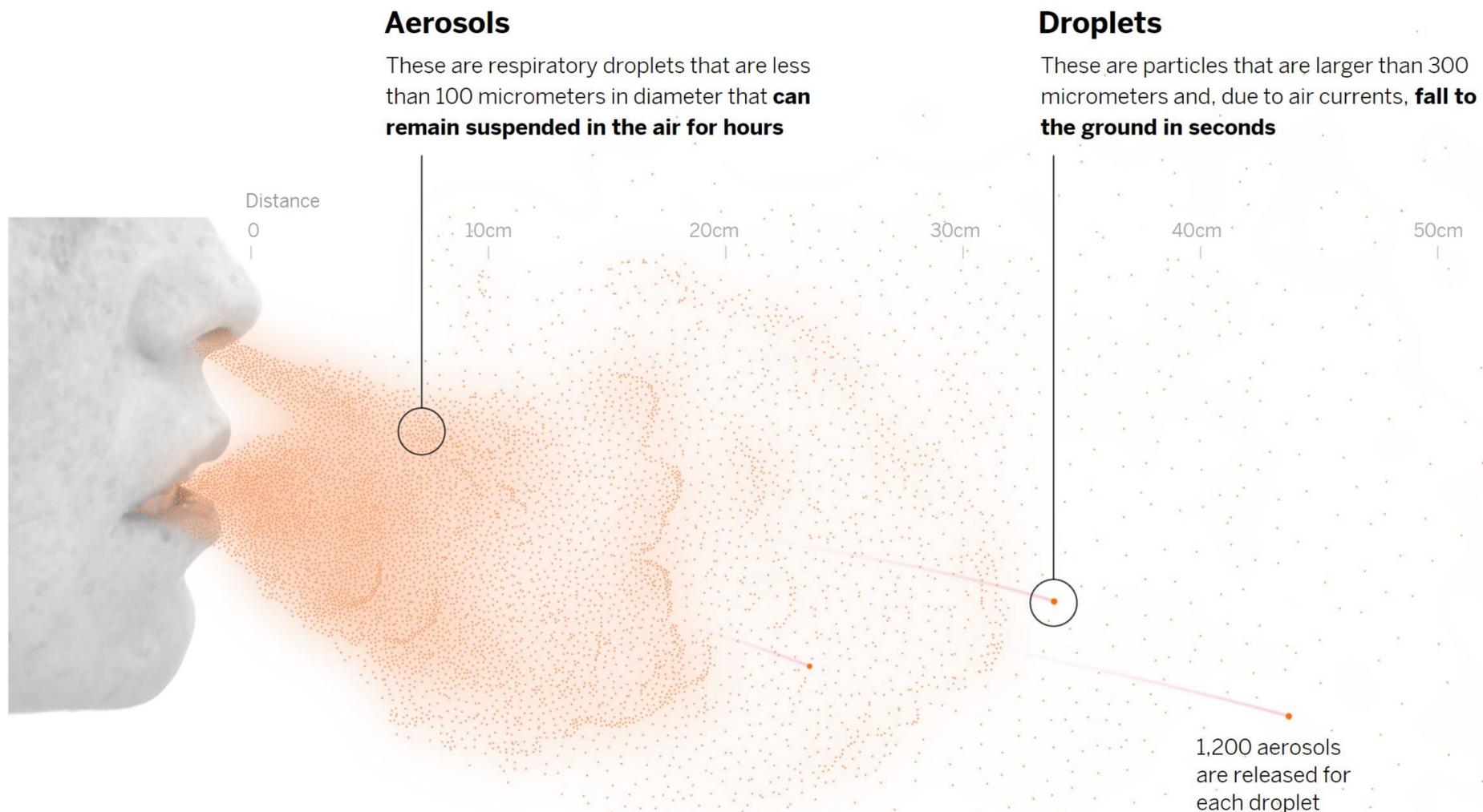


- James Reason, PhD, introduced the **“Swiss Cheese Model”** In 1990.
- **Most of the time inherent risks are never realized because safeguards are in place to prevent them.**
- These safeguards are represented in his model as multiple layers of swiss cheese. **However, every process has “holes” that, under the right circumstances, can line up and lead to an error, accident or “hazard” as Reason described it.**
- **The COVID-19 pandemic requires multiple layers of protection to keep the workplace safe.**
- When used together consistently, **the holes (or weaknesses) in any single layer of protection should be offset by the strengths of another layer of intervention.**

It is paramount for all occupants and professionals to understand if HVAC systems and engineering controls are actually helping, or not, in preventing the spread of COVID-19

"It is critical to remember that each indoor environment is unique; conditions within each indoor environment are dynamic, and there is not a one-size-fits-all strategy for infection control."

As one safety and health expert, who specializes in infection control, put it in an article published in [R&R Magazine Managing Indoor Air Quality Amid COVID-19](#)



White Paper

**Solutions developed with
the support of National
Institutes of Health
(NIH)**

Groundbreaking Core Technology

First and Only Aerosol Mobility Indicators (“Tracers”)

Science-Based Methodology



Intent

- Mimic mobility of human saliva/aerosols
- Spraying simulates coughing/sneezing; sampling simulates inhalation

Chemical Composition

- Water-based liquid aerosol
- DNA for robust tracking capability

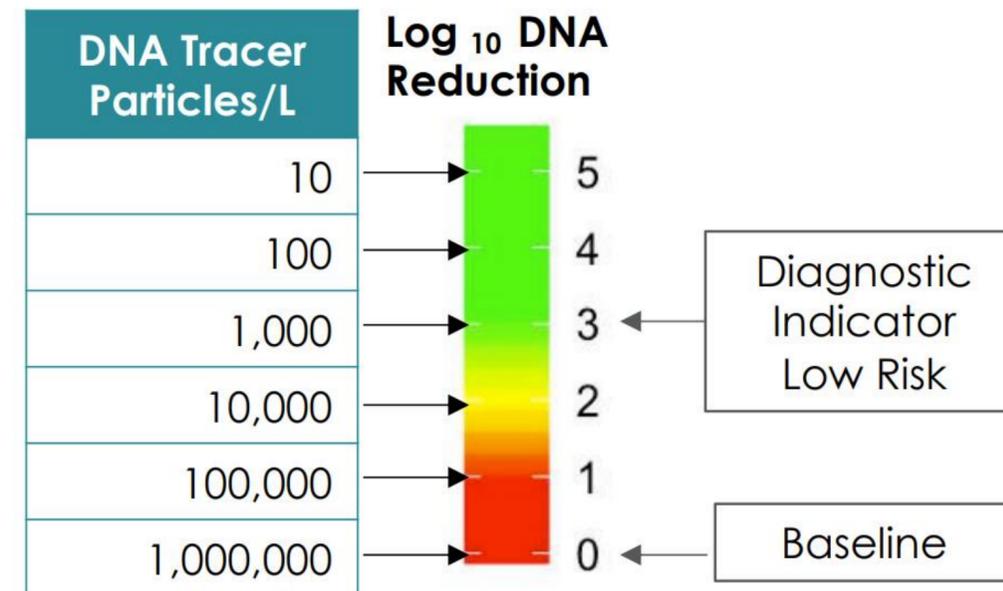
Particle Size

- Informed by respiratory aerosol range

Product Safety

- FDA-GRAS
- OSHA-, NIOSH-compliant

Data-Driven Verification



Intent

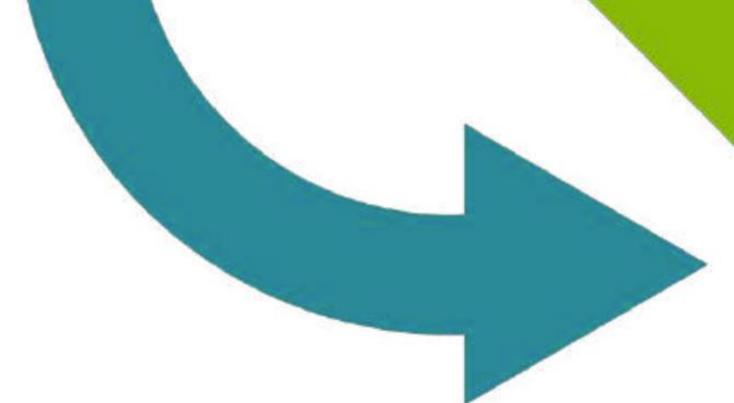
- Measure DNA detection level to assess airborne exposure risk

Approach

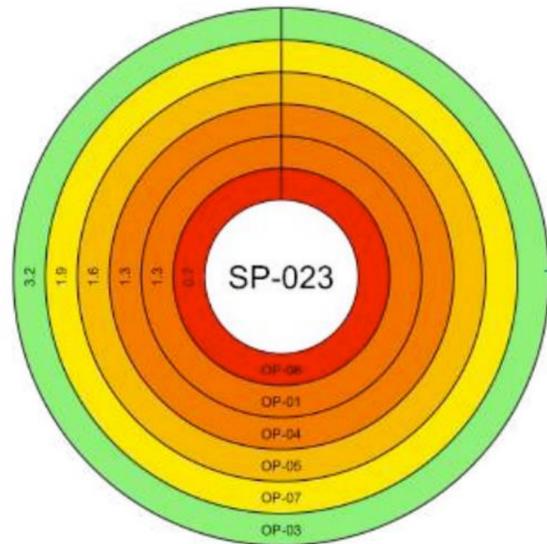
- Risk thresholds based on Log₁₀ reduction of DNA copies from baseline to sampling point
 - *High Risk (Red)*: 0-1 log reduction
 - *Moderate-High Risk (Orange)*: 1-2 log reduction
 - *Moderate-Low Risk (Yellow)*: 2-3 log reduction
 - *Low Risk (Green)*: 3 or greater log reduction

Customer Case Study #4

Survey Test



Stairwell (1st Fl)



High trafficked area with airflow convergence

Key Decision:

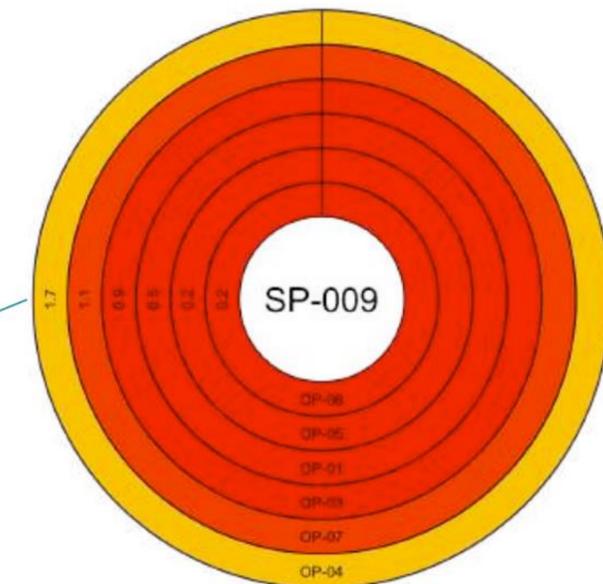
Fortune 50 company determining which office areas to keep open and closed prior to reopening



Key Findings:

Several hotspots identified during testing, sometimes conforming with expectations, sometimes not

Kitchen (1st Fl)



Airflow exacerbates risk associated with kitchen

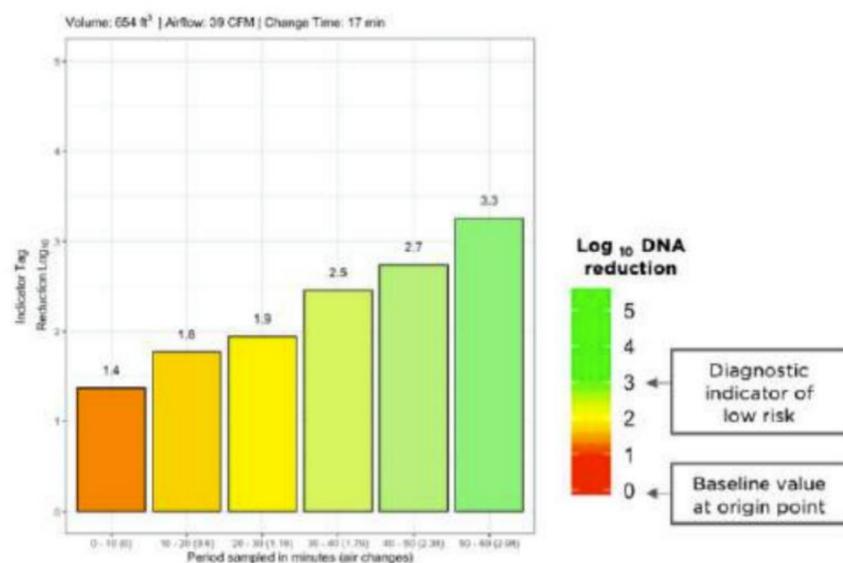
Outcomes:

Space utilization plan and SOP's informed by results, with follow-on testing of hotspots identified

Applications

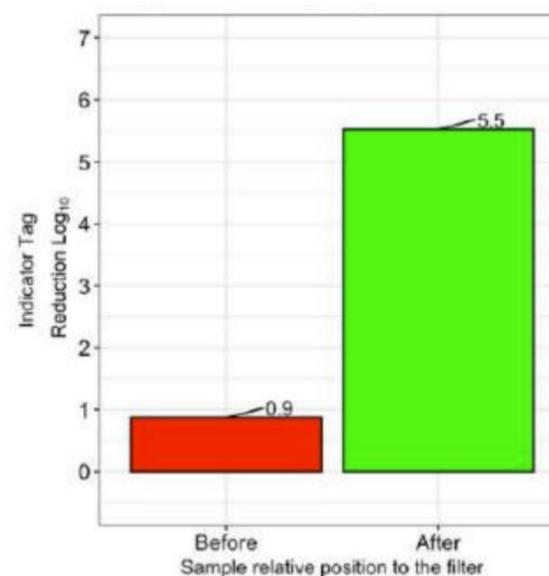
Ventilation, Filtration, and Survey Testing

Dilution Ventilation Test



- Verify time/HVAC settings for aerosol dilution under multiple scenarios
- Informs decisions on ventilation, filtration, and airborne interventions

Filtration Test



- Verify filtration efficacy at different MERV/HEPA levels
- Audits existing systems and informs enhancement decisions

Survey Test



- Verify aerosol mobility and airflow patterns across building/floor
- Identifies hotspots and informs remediations with empirical data

Q 1: True or False

If the vast majority of transmission occurs through the air rather than fomites, and airborne transmission is what is driving superspreading events, **then we should shift our effort toward cleaning shared air, not shared surfaces.**

<https://www.washingtonpost.com/opinions/2020/05/26/key-stopping-covid-19-addressing-airborne-transmission/>

Q 2: True or False

As one safety and health expert who specializes in infection control put it, when explaining how HVAC systems could be helpful in addressing COVID-19: **“It is critical to remember that each indoor environment is unique; conditions within each indoor environment are dynamic, and there is not a one-size-fits-all strategy for infection control.”**

<https://www.randrmagonline.com/articles/89119-how-to-manage-indoor-air-quality-amid-covid-19>

Q 3: True or False

Informed mitigations for hotspots identified in testing is the state-of-the-art practice. **Solutions developed w/support of National Institutes of Health (NIH)**

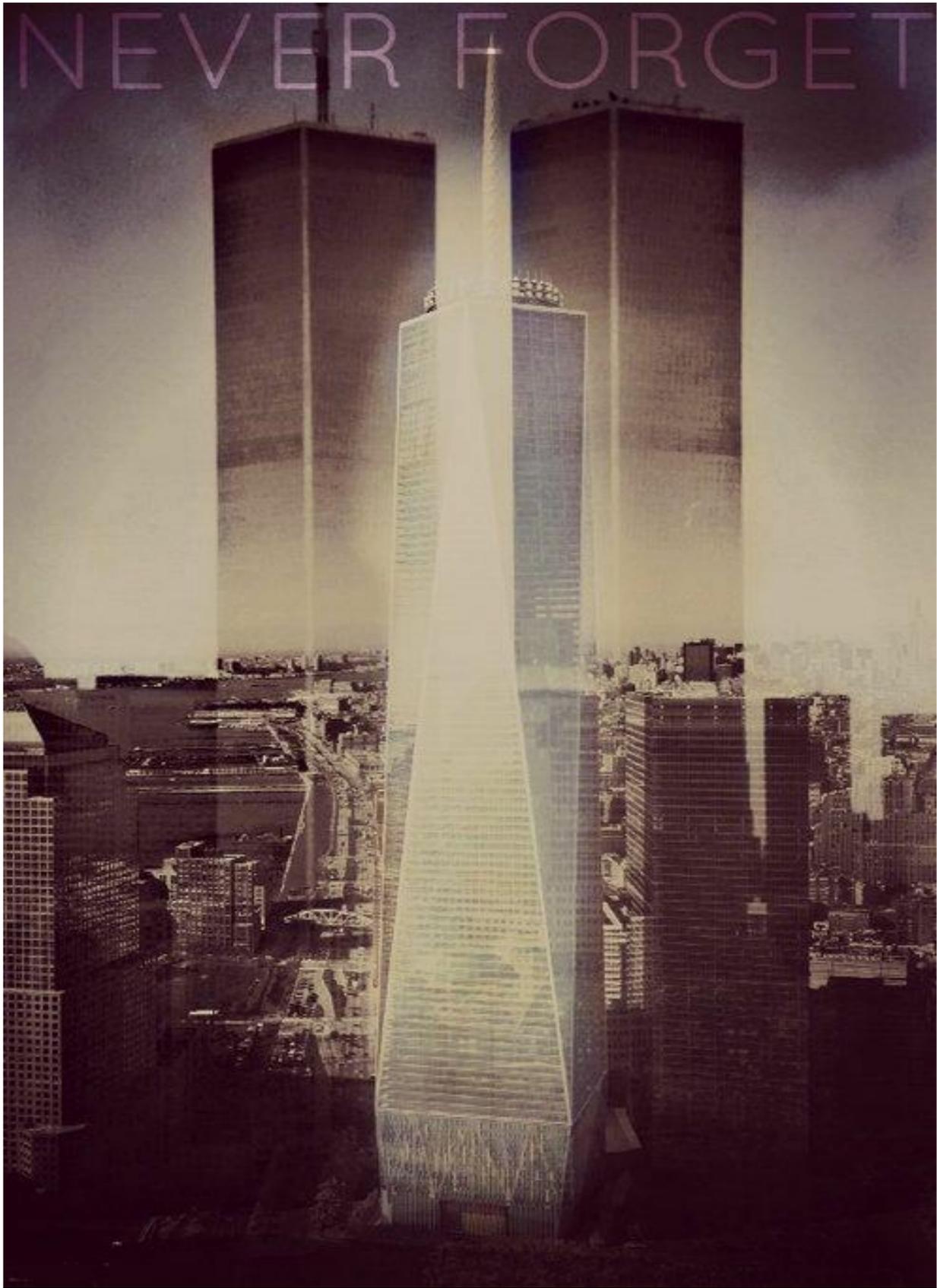
Mark Drozdov MS, SSM, FSM, BSI, RSO, CAI, CMA, GPRO Project Principal/Subject Matter Expert



Mark Drozdov is an Environmental Health & Safety (EHS) industry expert with over 3 decades of experience with major public & private sector clients. He is a trusted advisor on projects in safety, industrial hygiene, risk assessment, hazards identification & compliance. Mark co-founded and successfully built EHS & Sustainability firm CES, acquired by BSI Group.

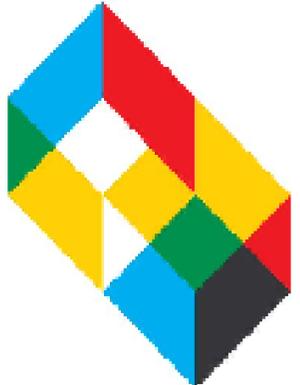
He actively contributes to associations, such as the AIHA/RIA/IICRC Crisis Response Joint Task Force (JTF), Institute of Inspection, Cleaning and Restoration Certification (IICRC) Board of Directors, Infection Control Standards, and the AIHA Government Relations.

Mark also serves as an Adjunct Professor at The Cooper Union, Columbia University, NYU, Vassar, CUNY City & Hunter Colleges and Stevens Institute of Technology. He has presented and been published on topics such as Pandemic/PCBs and Silica/Safety/Sustainability (PALMS). Mark's industry credentials include Certified Lead Auditor for ISO 14001 Environmental Management Systems (EMS) and ISO 45001 Occupational Health and Safety Management System (OHS MS).



Questions & Answers

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Institute for Sustainable Design



NYC 2020 INNOVATION CHALLENGE

Make changes in something established, especially by introducing new methods, ideas, or products:

Selected as
a **FINALISTS** out of
100 submissions!



AEROSPECT
DRONE BASED DATA COLLECTION

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Buildings

