Testimony of Benjamin Holt, Deputy Commissioner for the New York City Department of Consumer and Worker Protection before the Committee on Civil Service & Labor

Remote Oversight Hearing on Workplace Safety in the COVID-19 Era and Introductions 1797 and 2161

November 20, 2020

Good morning Chair Miller, and members of the Committee. I am Benjamin Holt, Deputy Commissioner for the Department of Consumer and Worker Protection's Office of Labor Policy and Standards, or OLPS. I am joined today by Steven Ettannani, Executive Director of External Affairs and our colleagues from the Department of Citywide Administrative Services.

On behalf of Commissioner Salas, I want to share our thanks and appreciation to the Council for their ongoing cooperation and dialogue with our Department throughout these difficult times. It is my hope that you all are doing well and staying safe as we head into the holiday season.

Workplace Safety in the COVID-19 Era

COVID-19 remains an existential threat to New York City' working individuals and families. Our friends, family and neighbors face challenges of unprecedented scope and scale. Financial fragility, truncated work schedules and retaliation at the workplace are just some of the factors that are contributing to job insecurity across the city. Further complicating the matter is that these pressures are not from a static event, but rather an ongoing threat. I say all this to underscore that the City's response to COVID-19 is neither one-dimensional, nor housed at a singular agency. At DCWP, for example, we work with our with partners in government and sister agencies to leverage interdisciplinary expertise that furthers the City's goals for a safe and healthy reopening.

Broadly speaking, DCWP contributes to workplace safety during the reopening in three discrete ways:

1. it continues to enforce private sector worker protections citywide,
2. it issues and disseminates information and public guidance on local, state and federal worker protection laws; and
3. it coordinates with the City's Health Department and Small Business Services to aggregate and disseminate New York State public health guidance.

Enforcing Worker Protections Citywide

New York City benefits from having strong worker protections enshrined in statute, particularly in a pandemic.

The Paid Safe and Sick Leave Law (PSSL), for example, continues to be a resource for New Yorkers to stop the spread and stay home from work if they feel symptomatic with COVID-19,

have been exposed and need to get tested, need to remain in quarantine, need to care for a family member or loved, or need to care for a child whose school has been closed. NYC's PSSL is a very broad protection that is of critical importance during the pandemic.

Second, the Fair Workweek Law (FWW), provides security and predictability to essential workers staffing local grocery stores, pharmacies, and fast food restaurants by requiring employers to give workers advance schedules and to compensate workers for last minute and other changes to their schedules.

And finally, the Freelance Isn't Free Act gives those working as independent contractors the right to timely and full payment free from retaliation.

Critically, these City worker protection laws were never suspended and thus contribute to mitigation efforts citywide to help thwart the spread of COVID-19 and provide some measure economic stability to workers.

I'd be remiss not to mention that efforts to further worker protections have not ceased during this crisis. In September, DCWP was heartened to work with the Council to pass Introduction 2032, legislation which expands and modernizes protections for workers under PSSL. Notably, the legislation ensures that workers can use their leave as they earn it without any waiting periods and gives domestic workers the same rights of accrual and use as other private sector workers in our city. We appreciate your work on this and look forward to continuing to work on worker protection issues in the months ahead.

Issuing and Disseminating Public Guidance on Workplace Laws

DCWP regularly issues and disseminates guidance on municipal workplace laws it enforces. "NYC.GOV/DCWPALERTS" is a dedicated landing page for the public to view updated Department information and guidance during the COVID-19 crisis. On that webpage, guidance and information is translated in, at least, the ten designated citywide languages.[1]

For example, as it relates to PSSL, current guidance covers recent amendments to the law and gives an overview of City, State and federal sick leave laws relating to COVID-19.

In addition to the reference documents on our website, DCWP holds biweekly informational briefings staffed by legal and External Affairs team members. These briefings offer a conversational venue for stakeholders to ask DCWP experts about workplace laws. The Department also disseminates weekly informational e-mails to the same universe of stakeholders.

In June, DCWP launched another resource to the public, the Worker Protection Hotline, to answer worker questions about workplace reopenings and health and safety standards. The Hotline is available five days a week during regular business hours. The public is encouraged to call and may do so anonymously either by dialing 311 or 212-436-0381.

[1] Arabic, Bengali, Chinese-Simplified, Chinese-Traditional, French, Haitian Creole, Korean, Polish, Russian, Urdu

Most recently, DCWP embarked on a series of 10 virtual roundtables to promote PSSL. The roundtables, equally divided to address employer and worker-facing needs leverage longstanding relationships with borough chambers of commerce and community partners alike to address recent amendments to the law and compliance during COIVD-19.

Amplifying and Disseminating Public Health Guidance

The same landing page referenced earlier, "NYC.GOV/DCWPALERTS" also contains reopening guidance. Documents found on the landing page include those collaborated on by the NYC Small Business Services and Department of Health and Mental Hygiene.

Each phase of the reopening has a dedicated guidance document, and more broadly, there is information for what employers must do before they reopen, what workers should expect, and resources to call if there are questions.

Last week, we issued reopening guidance for domestic workers on our landing page. As the home of a dedicated Paid Care Division, this guidance which incorporates public health and safety guidelines, fills an important gap for this vulnerable workforce trying to navigate safety in a unique work environment.

DCWP has conducted over 334 in-person and virtual outreach events since March. This includes over 30 business education days with sister agencies, where we visited more than 2,100 business disseminating guidance on safe reopening standards and helping merchant associations and business improvement districts to distribute personal protective equipment.

In the coming weeks, we will be training New York City Test and Trace Corps staff on PSSL and state and federal emergency sick leave so that they are equipped to give real time feedback to those they connect with. We'll also be collaborating on informational materials highlighting the right to paid sick leave in the context of exposure and quarantine.

In all, this collaborative outreach has been, and continues to be, emblematic of the Administration's comprehensive and multijurisdictional approach to informing the public about COVID-19.

<u>Legislation</u>

Introduction 1797

Introduction 1797 requires DCWP to engage in ongoing public information efforts to amplify the rights and responsibilities of employers and employees under PSSL. The bill requires the development and distribution of posters, flyers and other written materials to pharmacies, doctors' offices and hospitals in coordination with the Department of Health and Mental Hygiene.

DCWP supports the intent of this legislation and its focus on the health of all New Yorkers. Particularly, considering the current pandemic, we need the public to know that if they feel

unwell, they should stay home, and that they have access to PSSL to do so. Reaching people at the moments they are seeking care is a strategically savvy approach to improving public awareness.

That said, there is a fiscal impact associated with the bill. As we know, the City is in the midst of an economic downturn, so we would like to work with Council to ensure those resource concerns are taken into account during our discussions of this bill.

Introduction 2161

I want to briefly mention Introduction 2161, which seeks to establish a board to review workplace health and safety guidance during the COVID-19 pandemic. While this legislation does not solely fall under DCWP's jurisdiction, it does implicate our agency to review health and safety guidance issued by both the City and private employers, assess its content and distribution, and make recommendations for future public health emergencies. Further review of the bill is needed, but I note that the City Restart Taskforce, established earlier this year, has worked directly with each agency to review City agency health and safety guidance. We look forward to further conversations about this bill with Council.

To conclude, I want to reiterate that DCWP, and this Administration, is committed to helping our City reopen safely and stay open safely. I look forward to your questions and thank you for the opportunity to testify.

Good morning Chair Miller and members of the Committee. I am Quintin Haynes, Executive Deputy Commissioner of the Department of Citywide Administrative Services (DCAS). Today, I am joined by Jacqueline Terlonge, Director of the Citywide Office of Occupational Safety and Health (COSH). DCAS, in partnership with DOHMH, OLR, LAW, and City Hall, have provided guidance to city agencies on managing the office in the age of COVID-19.

The COVID-19 pandemic has taken an enormous toll on New York City residents, including our city employees, who have been on the front line responding to this unprecedented challenge. In support of their efforts, the city has implemented teleworking policies, facilitated the widespread use of face coverings, promoted healthy hand hygiene, and instituted social distancing requirements and other health and safety precautions to keep the city government functioning while protecting our workforce.

We intend to maintain the steady-state – teleworking for those who do not need to be at a worksite – and reevaluating, as necessary, based on the virus's trajectory. In coordination with other city agencies, we review mandates and recommendations from New York State and the Centers for Disease Control and Prevention to ensure workplaces are grounded in a health and safety approach. Based on this work, the administration has developed formal guidance and protocols issued to all city agencies in August.

The administration has approached this guidance with four categories in mind:

- Preparing buildings;
- Preparing workspaces;
- Preparing the workforce; and
- Communication.

Preparing buildings includes inspecting and preparing building systems, entrances, and common areas. It includes establishing and implementing new building policies and practices to control access, promoting social distancing, and maintaining building health.

Preparing the workspace is a closely related category that includes establishing and implementing policies and protocols for promoting social distancing through a strategic approach to the configuration and use of workspaces.

Preparing the workforce means developing and implementing policies and practices related to the staff – which staff will be onsite, procedures for working remotely, and steps to protect employee health and well-being.

Also, communication is critical in tying all of these categories together. City employees need to understand their agencies' steps to protect their safety and ensure an orderly process for returning to work. It is important that agencies are transparent, accessible, and make extra efforts to answer questions and address challenges through two-way communication.

These four fundamental practices guide the city's plan to provide a healthy and safe workplace for city employees. The city has also implemented mandatory daily health screenings and posted signage to reinforce habits designed to help keep ourselves and others safe. This administration is working across city agencies to examine and share best practices. We will continue to review new guidance from the CDC, NY State Department of Health, the City Department of Health and Mental Hygiene, and other industry leaders and experts to update our policies accordingly.

At this time, I would like to address Intro. 2162. The Citywide Office of Occupational Safety and Health, commonly called COSH, coordinates employee safety and health activities for all City agencies and provides technical assistance in implementing safety and health programs to reduce workplace hazards.

COSH supports the goals announced in the bill related to monitoring federal, state, and local agencies that provide information about occupational safety and health during a public health emergency and disseminating related material to City agencies' safety and health coordinators. Since the pandemic, COSH distributes COVID-19 related guidance documents to agency safety and health coordinators as information is presented. These guidance documents direct agency safety and health coordinators to design customized employee safety protocols based on work function and potential exposure to hazards, such as COVID-19. These actions are consistent with the intent of this bill.

We look forward to working with the city council on this important matter. I am happy to take questions about the categories included in the city's guidance to agencies.

Thank you.

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Gale A. Brewer, Borough President

November 20, 2020

Gale A. Brewer, Manhattan Borough President
Testimony before the NYC Council Committee on Civil Service and Labor
On Intro 1797-2019 – Information Campaign of Earned Safe and Sick Time Act

My name is Gale A. Brewer and I am the Manhattan Borough President. Thank you to Chair Miller and members of the Civil Service and Labor Committee for the opportunity to testify on Intro 1797-2019, which would establish an information campaign to inform the public about their rights under the Earned Safe and Sick Time Act, also known as the Paid Sick Leave Act.

I co-sponsored Intro 1797-2019 with Councilmember Mark Levine to increase public awareness about paid sick leave (PSL), so that employees who are sick can know to use the paid sick time to which they are entitled. I would be remiss not to credit Nancy Rankin, who until September 2020 was the Vice President for Policy Research and Advocacy at Community Service Society of New York, for her tireless advocacy to make PSL information available at common-sense locations, such as pharmacies and health clinics.

I was a strong supporter of PSL in the City Council. Along with a supermajority of my then-colleagues, I and other City Councilmembers overrode Mayor Bloomberg's veto to pass the New York City Earned Sick Time Act in 2013. The Act would have required private businesses with 20 or more employees to provide 40 hours of PSL to employees effective April 1, 2014.

When I became Borough President, I joined Mayor de Blasio, then-Speaker Melissa Mark-Viverito, and primary sponsor Councilmember Margaret Chin to expand PSL coverage to those who work for companies with five to 19 employees via Intro 0001-2014. The bill secured support from 39 Councilmembers along with myself and the Mayor, and it was swiftly passed and enacted as Local Law 7 of 2014, the Earned Safe and Sick Time Act.

I remain proud of achieving PSL for most New York workers with these two Acts. Yet PSL is only as good as when an employee knows to use their accrued leave when sick. According to the *Unheard Third* survey conducted in 2019 by the Community Service Society of New York:

- Only 10% of immigrant workers had heard a lot about PSL, down from 31% in 2014 when the city conducted a lot of PSL outreach at its launch;
- Only 9% of low-income workers in firms with under 50 employees had heard a lot about PSL, down from 28% in 2014;
- Only 20% of black New Yorkers had heard a lot about PSL, down from 38% in 2014; and
- Less than 50% of employed low-income New Yorkers knew about PSL, down from 78% in 2014.[1]

The premise of Intro 1797 is simple: provide information about PSL at locations where people experiencing illness are likely to visit, such as pharmacies, hospitals, and health centers.

With the COVID-19 test positivity rate increasing in New York City, it is more important than ever to inform anyone who may be experiencing symptoms that they are entitled to PSL and should refrain from going to work.

It is also important to put out accurate information to the public in light of recent changes to the city's Earned Safe and Sick Time Act, amended last month in order to align the city's law with New York State's PSL legislation that was passed in April 2020 and took effect on September 30. Under the State law, workers of employers with fewer than five employees now qualify to accrue earned sick leave, a welcome expansion of PSL to ensure more workers are covered.

I believe that as New Yorkers are exposed to PSL information across pharmacies, doctor's offices, hospitals, and other health facilities, awareness and knowledge about PSL will increase and more employees will make use of the sick leave that is legally due to them.

I look forward to working with you on the swift passage of this important bill.

[1] https://www.cssny.org/news/entry/public-outreach-to-raise-awareness-paid-sick-time-new-york-city

Testimony of
Gloria Middleton, President
New York Administrative Employees
Local 1180
Communications Workers of America, AFL-CIO

Committee on Civil Service & Labor
Virtual Hearing on Workplace Safety in the COVID-19 Era

Friday, November 20, 2020

Good afternoon Committee Chair Miller, committee members, and City Council members.

My name is Gloria Middleton, President of Communications Workers of America, Local 1180. My union represents 9,000 active City administrative and private sector workers, and almost 6,000 retirees. I am here today to address the topic of Workplace Safety during the COVID pandemic, especially as we enter what appears to be a second wave of the virus that just seems to keep on giving.

This has been a difficult year for all of us as we have learned how to navigate through pandemic life and incorporate the “new norm” into every aspect of day-to-day living. As political leaders, as government agency leaders, and as union leaders, we have the responsibility to make sure those we represent are taken care of and protected while on the job, providing the essential services that New Yorkers have come to count on.

If COVID-19 has taught us anything these past 10 months, it's that no **ONE** single person can fight this invisible battle alone – it takes a team … a group effort.

And that's why I am in favor of legislation that will establish a board to review workplace health and safety guidance during the COVID-19 pandemic … provide recommendations on health and safety protocols for future public health emergencies … and make sure that workers receive relevant information about occupational safety and health related to any public health emergency.

Like most unions, I lost far too many members during the peak of the pandemic, including a most well-loved and respected Shop Steward named Priscilla Carrow. Priscilla was a Coordinating Manager who worked at Elmhurst Hospital in Queens, the epicenter of New York City's pandemic. Part of her job was to distribute PPE … to make sure everyone working with patients, with the public, at Elmhurst had face masks. Everyone but herself … because there wasn't enough to go around.

IF the City had stricter guidelines on health and safety protocols earlier this year, Priscilla Carrow – and hundreds of others just like her – might still be with us today.

But what does concern me about this proposed legislation is the **LACK OF LABOR REPRESENTATION** on the board. With nine available seats, certainly **ONE** could be set aside for a union leader. After all, we are the voice of the 350,000 plus municipal workers who need the health and safety protocols in order to remain protected on the job.

I do realize that the Mayor, the Speaker of the Council, and the Public Advocate have a combined total of five seats that they can fill at their discretion, but that does not **GUARANTEE** that they will fill any of them with a labor leader. Inviting quote relevant experts and stakeholders, including but not limited to those representing uniformed and non-uniformed municipal employees, is not good enough.

I respectfully request that the legislation be amended to include a **GUARANTEED LABOR SEAT** on the board. This would go a long way toward ensuring that workers do not have to worry again about having enough face masks … enough gloves … enough hand sanitizer … or enough disinfecting wipes as Priscilla Carrow did earlier this year.

If this City administration learned nothing else from the initial wave of the coronavirus pandemic, I hope they learned that they need to be better prepared. than a **proactive** one.

# # #

Testimony of Elizabeth Hovey, Adjunct Assistant Professor of History, John Jay College of Criminal Justice, Co-Chair John Jay Chapter, PSC; 11/12/20 "Oversight - Adjunct Faculty Employment at the City University of New York" Committee on Higher Education jointly with Civil Service and Labor.

Dear Distinguished Chairs and Members,

For 20 years I have been an adjunct professor at a college that particularly attracts students and faculty who seek to serve the common good. It's an environment that brings out an extra-ordinary level of dedication in its faculty. I'm very fortunate to teach at John Jay College.

But what I have seen in 7 years of PSC involvement, representing faculty, weighs heavily on me, because of our deep underfunding. Our students, "our most precious resource" as Chair Daneek Miller notes, do not seem to matter to the state of New York. Only if the wealthiest are taxed more--as their fathers and great grandfathers were--will everyone truly have a chance to gain the skills and knowledge to succeed in this economy.

Accepting inadequate funding, the CUNY administrators don't challenge Albany's decisions. Instead they prey upon the long hours and low wages of adjunct instructors. Adjunct dedication is the actual fuel of a system that has, year in and year out, actually provided less funding on a per-student basis--even as student needs grow. Adjuncts now greatly outnumber full-time faculty at John Jay College.

The photographs here show long strings of green "budget complaint slips". Several hundred students, staff and faculty indicated on slips of paper ways in which CUNY's inadequate funding undermines student success at John Jay. Before our college was closed on Wednesday, March 11th, we planned to protest the drastic underfunding of CUNY by releasing these streams of complaints on March 12th. Here you see them sitting in an empty campus.

The decrease of 21% of our funding on a per student basis meant that countless positions have gone unfilled, depleting vital services like writing centers and counseling. Staff, knowing what students need feel constant pressure to compensate. In their dedication, some work beyond their legal hours for no additional pay. Meanwhile, administrators overrule academic priorities with dictates about "efficiencies,"

favoring classes that are at capacity, discouraging enrichment over requirements. All of this was true before the pandemic hit.

In March, when we were first barred from campus, educators were suddenly forced to navigate an unfamiliar teaching universe. Transitioning to online instruction took twice as long as developing material for the traditional classroom. Then, after 8 weeks of starts, restarts, and heroic adjustments to support our students, adjunct faculty faced betrayal. Our provost announced that *none* of the 437 adjuncts having less than 3 consecutive years in their departments would receive the typical rehire notice. This proposed abandonment came even though Congress had earmarked for John Jay College many millions in CARES money--- "to support employment to the greatest extent practicable."

A friend's analogy of being held up by gunpoint seems apt. Giving up your money is one thing; having to contemplate eternity for a dreadful moment is another. Having to endure the stress of one's job and health insurance vanishing during a raging pandemic cannot be easily excused or forgotten. Mercifully, PSC negotiated notice extensions that allowed for a reprieve, department chairs skillfully manipulated their schedules, and many fewer adjuncts were laid off.

But the magnitude of the deprivations that have been inflicted can only be guessed at, despite Chancellor Matos agreeing on May 29 to terms of financial and personnel transparency that have only been breached. We leaders of the John Jay Chapter of the PSC can only learn the fate of laid-off adjuncts who volunteer the information. Our provost will not reveal how many of our erstwhile colleagues were non-reappointed or lost their gigs in myriad other ways, citing directions from CUNY central.

Several adjuncts had classes taken away from them in August, due to new minimum class sizes (which hurt students) and the prioritizing the filling of full-timers' schedules. Multiple "reappointed" adjunct faculty were not even assigned classes, told later that those notices were meaningless. And although national standards have been established that 12 is the ideal enrollment of an online class, at John Jay the *de jure* protections of a 28-person cap for online

courses were flaunted. Several faculty, including myself, instead have had 36 enrolled in classes where, due to privacy restrictions, we may never see the faces of our cherished students.

Senior Vice Chancellor Matthew Sapienza made a long face, and lamented that "lower enrollment," necessitated job cuts, but at John Jay we have a higher enrollment than originally planned for this semester. Summer school enrollment was its highest ever. Long before the numbers were clear, Brooklyn College* planned to cut 25% of its courses. CUNY has seized on the pandemic as an excuse to wield a hatchet.

No one teaches in the CUNY system for the money. We adjuncts have continued to prioritize the future of our students over our financial well-being and our health†. The promise of a free, high quality education that was true when CUNY's student population was overwhelmingly white sounds increasingly hollow. Some adjuncts question whether our dedication is enough in a system that betrays our students.

* Allison Rapp, "Cut COVID, Not CUNY, Professors Protest 25% Cut, 5/13/2020 http://vanguard.blog.brooklyn.edu/2020/05/13/cut-covid-not-cuny-professors-protest-25-cut/

† See Adam Harris, "Thea Hunter: The Death of an Adjunct," Historians in the News, History News Network, 4/18/19, http://www.hnn.us/article/171687, after *The Atlantic,* 4/8/19.

DRAFT

NYC COUNCIL LABOR and CIVIL SERVICE COMMITTEE 11/20/2020

Testimony -DRAFT NOTES
Joel R Kupferman
EJI, Covid-19 Accountability Working Group, National Lawyers Guild - Environmental Justice Committee

"However, as many workplaces tend to be sites of regular, frequent interactions at close quarters, they could serve as **incubators** for viral spread.[1] "

following federal, state, and local guidance as they reopen their businesses and continue to stay open.[1]

1. SCIENCE HAS SHOWN THAT THE VIRUS IS tougher, more persistent and more dispersed than originally thought.[2]
2. VENTILATION is the **KEY** .
   a. Ensuring adequate ventilation throughout the work environment can help to maintain a safe and healthy workplace.
   b. see Understanding 'aerosol transmission' could be key to controlling coronavirus | Julian Tang | Opinion | The Guardian

      https://www.theguardian.com/commentisfree/2020/oct/28/understanding-aerosol-transmission-key-controlling-coronavirus-wash-hands?CMP=Share_AndroidApp_Add_to_Lite&fbclid=IwAR3ckxovS4Ubsm5pQkRVLV0k3BuM6El7qbmCGyEZK2d33eJBgM5rpZphfrs

   c. three factors are recognized as vital to safe operation
      i. Air Exchange ACH There are 6 Air Exchanges per hour **ACH**
      ii. Filitration — of at least MERV 13 Minimum Efficiency Reporting Value
      iii. The percentage of unfiltered outside air that composes this replacement air (% OA) maximize fresh air intake even to 100 percent if possible
   d. three factors are recognized as vital to safe operation by organizations of experts in ventilation including the American Society of Heating, Refrigerating and Air-

Understanding 'aerosol transmission' could be key to controlling coronavirus

Julian Tang

We should still wash our hands, but growing evidence suggests one of the main ways Covid-19 spreads is through the air

Coronavirus - latest updates

See all our coronavirus coverage

▲ South-east Asian countries were far quicker to adopt face masks, which are shown to reduce the spread of aerosols, than many western countries including the UK.' Seoul Station, South Korea. Photograph: Xinhua/Rex /Shutterstock

Imagine you think there are mice in your house. You can see the evidence - mouse droppings; gnawed or damaged skirting boards; holes left in food packaging. You call a local pest control team who confirm that you have mice and advise you on what is needed to remove them. Neither of you have actually had to see a mouse to reach this conclusion.

[1] Lu-Hai Liang. *Covid-19: The Ways Viruses Spread In Offices*. BBC. Mar. 25, 2020. Available at: https://www.bbc.com/worklife/article/20200324-covid-19-the-ways-viruses-can-spread-in-offices

[2] https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html

conditioning Engineers (ASHRAE), the American Conference of Governmental Industrial Hygienists (ACGIH), and the American Industrial Hygiene Association (AIHA) are in agreement that these three factors should be maximized and generally recommend (attached)

e. OSHA's "COVID-19 Guidance on Ventilation in the Workplace," which is consistent (attached)

f. A fan or faulty widows do not cut it.

3. We,filed a **PESH complaint** on October 5 ,2020.

a. Many New York City schools lack sufficient ventilation to stem the spread of COVID-19 making them unsafe to reoccupy -

b. Department of Education's Inadequate Response to COVID-19 :

c. Inadequate ventilation has been an ongoing problem in New York City public schools, one which pre-exists COVID-19. The United Federation of Teachers (UFT) has long received more complaints about Indoor Air Quality (IAQ) in NYC schools than for any other health or safety-related issue.[5] At the core of these complaints is the lack of IAQ/good ventilation with lack of outside air circulating through many classrooms.[6] Teachers in New York have long had to deal with IAQ respiratory illnesses, such as severe headache, hypersensitivity pneumonitis, nausea, dizziness, fatigue, itchy eyes, irritated throats and noses.[7]

d. In the wake of COVID-19, the issue of inadequate ventilation in public schools is now of more dire concern since all three national organizations that provide ventilation and indoor air quality standards for public buildings and workplaces have released official statements recommending increases in previously recommended ventilation requirements. These statements are from the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) [x], the American Industrial Hygiene Association (AIHA)[x], and the American Conference of Governmental Industrial Hygienists (ACGIH)[x].

e. Yet DOE utterly failed to take action to address the problem. First, rather than test public schools for adequate ventilation before deeming them safe for re-opening, DOE erroneously relied on the "2020 Interagency School Walkthrough Checklists," a simple survey of yes/no questions to ascertain the presence or absence of windows that open, air supply or exhaust fans or unit "ventilators"[8] For example, classrooms were considered adequately ventilated as long as they contained at least one open window.[9] This is in stark contrast to the three guidance documents published ASHRAE, AIHA, and ACGHI which demonstrate that building ventilation systems must be modified to provide even more outside or filtered air than was previously required so as to protect against COVID-19.[10] In fact, solely using windows as natural ventilation is specifically address by ASHRAE as an "variable and unpredictable, as are the resulting air distribution patterns, so the ability to actively manage risk in such buildings is much reduced."[11] Moreover, common sense school practice restricts the

opening of windows to a few inches due to child safety issues and opening windows in the winter months would expose teachers and students to nocuous cold temperatures.

f. The complaint to the state Labor Department seeks inspections to determine whether schools are ventilated and filtrated to adequately protect teachers, students, and staff from exposure to airborne SARS-CoV-2, the virus that causes COVID-19.

g. State punted - claiming that PESH dismissed the complaint on October 30, 2020, in a short paragraph claiming that it had no jurisdiction over the complaint because it pertained to compliance to certain COVID-related Executive Orders.

h. We filed these complaints to procure protection against retaliation.

4. RECOMMENDATIONS:

a. We need City Council to ensure that protection to workers who are willing to speak out. I applaud 2612- 2020. But INFORMATION ALONE IS NOT SUFFICE , most workers know that conditions are NOT SAFE, that more has to be done, more cleaning, more PPE , more non-toxic air.

b. what CC has to ensure is **accurate assessment and evaluation or work place facilities -**

i. **not the one page assessment** such as was used to survey 1700 schools- a form that was made shorter since the Covid outbreak began -using a tissue on a stick does not cut the grade.

5. **DUE DILIGENCE and ACCOUNTABILITY,** not apologists that espouse the minimumal requirements ----

6. and **redress —**

7. and **whistle blower protection** —

a. I have spoken to scores of city workers that have legitimate concerns are fearful of speaking out. - TOO much pressure to remain SILENT out of fear of losing job.

b. There is need for these voices to be heard ---- on a timely matter.

8. Intro 2161 and ^^ are aspirational –

a. And can give a false sense of security to the workers.

9. RECOMMENDATIONS

a. Add section - All tests of the related to their health and safety in the workplace be made available to the workers and their representatives and their consultants.29 CFR 1910.1020. Require any testing or surveys be available before one works in a reported venue (hot spot) or as soon after testing as the report is generated. Data

to be entered into City's Building Information System. Each department or agency to provide workers with a written covid program that details all of the precautions that will be used on site. This includes providing the ventilation details including ACH, MERV filter rating, and % outdoor air.

b. Bad Actor policy city should not hore/cancel contracts with firms that violate Covid- Protection regualtions - notification of city workers of such contractors working at their location

c. Increase utilization of the NYC Occupational-Environmental Clinics,

d. Establish a Worker Registry based on WTC-Registry

   i. To register locate Covid and other related ailements based on location and job function.

   ii. Worker Comp complaints and decisions by building and geographical location.

e. Increase Department of Buildings oversight of city owned/controlled buildings.

f. create a postion of NYC worker ombudsperson -

   i. Pro-active, independent, on going investigations

      (1) trusted by workers

g. utilize **citizen science** —

   i. make every worker into a monitor – that can make proma facia cases for further investigation and action - everyone has a cell phone with many new applicable apps.

h. change the laws that allow outside experts (Industrial Hygienists and more) to come in and monitor/inspect.

i. Request OSHA and PESH advisory inspections

Documents attached :

1. Rossol, Monona Nov.20 report on ventilation
2. Pesh Complaint (redacted) 46 school teachers and staff
   a. Monona Rossol ACTS survey
3. AILA
4. AHIA
5. ASHRAE

6. OSHA
7. AILA
8. ACGHI
9. OSHA newest -

Submitted by Joel R Kupferman. Esq
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OSHA: This guidance is intended for planning purposes. Employers and workers should use this planning guidance to help identify risk levels in workplace settings and to determine any appropriate control measures to implement. Additional guidance may be needed as COVID-19 outbreak conditions change, including as new information about the virus, its transmission, and impacts, becomes available.

https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_3.html OSHA TECHNICAL MANUAL

OSHA ALERT

COVID-19 Guidance on Ventilation in the Workplace

OSHA is committed to protecting the health and safety of America's workers and workplaces during these unprecedented times. The agency will be issuing a series of alerts designed to keep workers safe.

Ensuring adequate ventilation throughout the work environment can help to maintain a safe and healthy workplace. Employers should work with a heating, ventilation, and air conditioning (HVAC) professional to consider steps to optimize building ventilation. An HVAC professional can ensure that the ventilation system is operating as intended. The following tips can help reduce the risk of exposure to the coronavirus:

- Encourage workers to stay home if they are sick.
- Ensure all HVAC systems are fully functional, especially those shut down or operating at reduced capacity during the pandemic.
- Remove or redirect personal fans to prevent blowing air from one worker to another.
- Use HVAC system filters with a Minimum Efficiency Reporting Value (MERV) rating of 13 or higher, where feasible.
- Increase the HVAC system's outdoor air intake. Open windows or other sources of fresh air where possible.
- Be sure exhaust air is not pulled back into the building from HVAC air intakes or open windows.
- Consider using portable high-efficiency particulate air (HEPA) fan/filtration systems to increase clean air, especially in higher-risk areas.
- When changing filters, wear appropriate personal protective equipment. ASHRAE recommends N95 respirators, eye protection (safety glasses, goggles, or face shields), and disposable gloves.
- Make sure exhaust fans in restrooms are fully functional, operating at maximum capacity, and are set to remain on.
- Encourage workers to report any safety and health concerns.

For more information, visit www.osha.gov/coronavirus or call 1-800-321-OSHA (6742).

OSHA issues alerts to draw attention to worker safety and health issues and solutions.

OSHA 4103-11 2020 | DOL-OSHA-OOC-2020-106

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OSHA 4103-11 2020 | DOL-OSHA-OOC-2020-106

ARTS, CRAFTS & THEATER SAFETY, INC
181 Thompson St., New York, NY 10012

VENTILATION FOR THEATERS AND FILM LOCATIONS

One day there was no COVID-19, and the next day it was everywhere. And the world was not prepared for it in many ways. For example, the virus is primarily transmitted through the air and marginal ventilation has been common in theaters and locations for decades. Even when the ventilation conforms perfectly to codes and standards, ordinary heating and air-condition (HVAC) systems cannot handle infection control without significant adjustments.

ASHRAE. This acronym stands for the American Society for Heating, Refrigerating and Air-conditioning Engineers (ASHRAE). They set standards for design, maintenance, and testing building ventilation systems. The most relevant standard for this discussion is ASHRAE 62.1, *Ventilation for Acceptable Indoor Air Quality*.

THE PURPOSE. The ASHRAE 62.1 standard's purpose is stated as follows:

> 1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimizes adverse health effects.

"Acceptable to human occupants" means providing air that does not result in a significant number of complaints, and "minimizes adverse health effects" means measurable adverse effects in occupants that are related to the poor quality of the air. Unstated in this purpose, but equally important in practice, is saving energy. This puts the emphasis on "minimum" fresh (outside) air to reduce heating and cooling costs and save the building owner or operator money as well.

ASHRAE 62.1 heating and air-conditioning (HVAC) systems accomplishes these goals by drawing a small amount of air from outside of a building into the system and adding it to a much larger amount of recirculated air. Recirculated air is air that has been removed from rooms throughout the building through ducts and returned to the HVAC air handler to be mixed with that small amount of outdoor air. The amount of fresh air is usually under 20 %.

Next this air mixture is adjusted for temperature and humidity, and run through a particulate filter and returned to those same rooms in the building. This cycle is constantly repeated. The speed at which these cycles occur is usually quantified in air changes per hour (ACH)

AIR CHANGES PER HOUR (ACH). The ceilings of most rooms with these ventilation systems have circular or square "diffusers" where this mixture of recirculated air and fresh air comes into the room. And in other locations, usually also in the ceiling, there are grilles or slots through which the room air is returned to the air handler to go through another recirculating cycle.

When the volume of air coming through the diffuser equals the volume of air in the room, one air exchange has been achieved. This does not mean all the air in the room has been replaced because the air flows slowly into the room through the diffuser and mixes with the air in the room.

ATTACHMENT A

In other words, it takes many air changes in order to completely replace the air in a room. And the rate at which these air changes are delivered is measured in air changes per hour (ACH). If you do the math you will also see that the closer you approach 100 % replacement, the longer it takes to remove those last amounts of remaining air. And theoretically, you never remove every last molecule. This phenomena is reflected in Table 1 which shows the time it takes to get from 99% to 99.9 % complete replacement. For this reason, is it easier to use the 99 % figure for replacement.

Diffuser

TABLE 1 - ACH EFFICIENCY

ACH	Time (mins.) required for 99 % replacement	Time (mins.) required for 99.9 % efficiency
2	138	207
4	69	104
6	46	69
8	35	52
10	28	41
12	23	35
15	18	28
20	14	21
50	6	8

THE FILTERS. The ASHRAE rating for filters is the Minimum Efficiency Reporting Value, or MERV. And while they were originally developed to control what ASHRAE deemed as ordinary dust, today we have empirical data on the capture efficiency of these filters at various particle sizes.

Only 16 MERV filters categories were developed originally by the ASHRAE. But since even better filters were needed, the standards for high efficiency particulate filters (HEPA) were adopted by ASHRAE for the MERV 17 to MERV 20 filters. These capture essentially all very small particles such as those from some manufacturers' "clean rooms" or the COVID-19 particles.

THE VIRUS. The COVID-19 virus particles are emitted with the liquid droplets created when we sneeze, cough, sing, talk, and even just breath through our noses. The large visible mist and droplets settle to surfaces quickly and are unlikely be drawn up into the ventilation system. But the smaller ones, especially those under 10 microns in diameter can float in the air for long periods of time.

The longer these tiny droplets remain in the air, the more of the water in them evaporates leaving only mucous and other secretions from our lungs plus the virus itself (which is 0.125 microns in diameter). These dehydrated particles of virus and dry secretions can be in the range of 0.3 to 1.0 microns. Some of these particles have been documented to have remained airborne for many hours. One study's tests showed the particles were are still capable of infecting people after 16 hours.*

FILTERS FOR COVID-19. There is evidence from a study in which the virus has been detected on the through-side of a MERV 15 in both air handlers in a hospital** plus a number of cases of viral transmission that can only be easily explained by ventilation system transmission.

That evidence of ventilation system transmission is in the process of being confirmed. And it should be no surprise since COVID-19 is easily made airborne, it survives many hours in the air, and it is small enough to go through many types of filters and HVAC systems.

TABLE 2 - MERV FILTER PARAMETERS

MERV #	0.1 - 0.3µ*	1.0 - 3.0µ*
9	n/a	35 %
10	n/a	50 %
11	20 %	65 %
12	35 %	80 %
13	50 %	85 %
14	75 %	90 %
15	85 %	90 %
16	95 %	95 %
17 (HEPA)	99.97 %	~100 %

*µ = micron

Commonly, MERV 7 to 10 filters that aren't rated for the fine particles are used and only about 10 to 20 % fresh air is usually provided.

If this is true, the following are both facts:

1. The system meets ASHRAE 62.1 and is compliant with the standards.

2. The system cannot protect occupants from exposure to the virus, even if they all wear masks and keep six feet apart.

HOW VIRUS EXPOSURE OCCURS. The reason an ASHRAE-compliant ventilation system can no longer be considered safe for occupants is that the ASHRAE standard is totally inappropriate for controlling a tiny particle generated inside the rooms by the occupants. This tiny airborne particle can travel on air currents all through the room. If the HVAC system provides the typical two ACH, then the air in the room is only replaced 99 % after over two hours. And if the filter is not a MERV 17, the virus can be recirculated back into rooms in the building.

DISTANCING AND CLOTH MASKS. Only the large droplets are likely to settle within six feet in still air. The tiny aerosol particles float on air currents all over the room and around barriers and shields. The N95 masks can capture 95 % of these tiny particles, but the more commonly used cloth masks are only meant to stop the large droplets expelled by the person wearing the mask.

PERCENTAGE OF FRESH AIR. The last piece of this puzzle is the percentage of fresh air added on each cycle. Many HVAC systems provide 10 to 20 % fresh air. This is too low to sufficiently dilute the virus particle in the air. Resetting the HVAC system's fresh air intake to 100 % will provide a high level of protection but can raise heating and cooling costs unsustainably. More reasonable strategies involve raising fresh air in tandem with better filters and more ACH.

AIR TESTING. To prove to occupants that the ventilation is providing enough air for good air quality, building owners or engineers often do air testing. They test for the carbon dioxide that is emitted when people breathe which can accumulate to uncomfortable levels when there is insufficient fresh air. ASHRAE 62.1 limits the amount of carbon dioxide (CO_2) to 700 parts per million above outdoor air levels. But since the source of the CO_2 is people's breath, this test is only valid when the building has a normal occupancy load. Obviously, ALL rooms that are either empty or have a low occupancy due to distancing will pass the CO_2 test even if they are getting no outdoor air whatever. The test is useless in this pandemic.

Tests for particulates are equally useless since particulates are mostly from outside air. During this crisis, outdoor air is "good" air even if it contains pollution particles. We are safer outdoors than in.

HOW DO WE FIX THIS? The operators of the HVAC system must report to users and unions, data on three ventilation parameters:

1. **Air exchanges per hour.**
2. **The grade of the filter in the air handling unit.**
3. **The percentage of fresh air introduced.**

With these three items available, it is possible to calculate a risk reduction estimate and provide employees and other building occupants with the period of time it would take replace 99 % of the air in various rooms. The two major national industrial hygiene organizations are in basic agreement on strategies that should be considered.

1. AIHA RECOMMENDATIONS. The American Industrial Hygiene Association (AIHA) published a guidance document called *Reducing the Risk of COVID-19 using Engineering Controls*, Version 1, on August 11, 2020. It includes a graphic on page four that plots relative risk reduction against ACH (see Table 3). But these calculations are for a system using a MERV 17 (HEPA) filter. This means that the percentage of fresh air is only relevant to comfort since both fresh and recirculated air meet the objective of being virus-free.

TABLE 3
EFFECTIVE ENGINEERING CONTROLS
(for HVAC systems with MERV 17 filters)

AIR CHANGES/HOUR and Other Methods	RELATIVE RISK REDUCTION
12 ACH	99.9 % *
10 "	99 % *
6 "	95 % *
4.5 "	90 %
3 "	78 %
1 "	40 %
Face covering for all occupants	10 %
Face covering for CoV positive	5 %
N95 respirators for occupants	90 %

* AIHA rates these levels as highly effective

The "relative risk reduction" is the theoretical reduction of the risk of getting the virus. They show that 99.9% to 95 % risk reduction can be achieved if six ACH and a MERV 17 filter are used. And Table 1 (above) shows that at six ACH, the room is 99 % purged of contaminated air in 46 minutes. And it is these high ACH rates of 6 to 12 that they recommend be used.

The AIHA reports "relative" risk reduction because the absolute risk cannot be known. It is not possible to know if there are no infected people in the room or there are ten. (It is also important to note that face coverings for all occupants only provides an estimated 10 % risk reduction. Distancing also is not very effective against the aerosol.)

This use of the term "relative risk reduction" should serve to remind us that no matter how HVAC systems are run, there are no guarantees. The ventilation reduces that risk by purging the virus from the room in as short a period of time as possible. However, this strategy cannot prevent more virus from being generated by someone who is infected. An occupant working in a room with someone who is infected still may be exposed. Risk can be reduced, but not eliminated.

And the almost 100 % relative risk reduction in Table 3, requires a MERV 17 filter and 12 ACH which can replace (purge) the air in a room in 23 minutes. However, ordinary HVAC systems usually are not able to run with a MERV 17 filter or provide. Some HVAC systems cannot provide 6 ACH and certainly not even higher air changes.

2. ACGIH WHITE PAPER RECOMMENDATIONS. Also in August 2020, the American Conference of Governmental Industrial Hygienists (ACGIH) published their *White Paper on Ventilation for Industrial Settings during the COVID-19 Pandemic.* Their first suggested measure for COVID-19 control (Page 15) is to "Increase outdoor air supply to 100 % if possible, or to the maximum allowed by the capabilities of the ventilation system." If the system is run at 100 %

outdoor air, all of the air coming into the building is outdoor air and virus-free. And if, as suggested in their second bullet point, the ACH are maintained between 6 and 12, then a 99 % purge (replacement) of the air can be achieved in 30 to 60 minutes (see Table 1 above).

The ACGIH's third recommendation is to "Increase the filtration efficiency of the system to MERV 13 or as high as the filter racks and fan pressure drop will allow." But actually, if you are running at 100 % outside air, there is no need to have a filter except for reducing outdoor pollution particulates in the incoming fresh air.

The second recommendation is to maintain the ACH between 6 and 12. The third is to increase the filtration efficiency of the "system to MERV 13 or as high as the filter racks and fan pressure drop will allow." It is clear that the two major industrial hygiene organizations are in agreement. The ACGIH also provides information on the need to modify ventilation systems to meet these needs.

But it is clear that the similarities between the AIHA and the ACGIH recommendations are that:

1. **MERV 13 to 17 filters should be used**
2. **The ACH should be between 6 and 12.**
3. **The more outdoor air the better and even running at 100 % outdoor air when the filter is less than a MERV 17 is recommended**

Unfortunately, most buildings do not have HVAC systems with fans powerful enough to push air through the high resistance of a MERV 17 filter. It may be necessary to operate at the least effective MERV 13 that can only capture 50 % of the particles of 0.3 microns. Then if the ACH are raised to six and as much air as possible is provided, (e.g., 40 % as a minimum) an acceptable relative risk reduction may be achieved. Table 4 provides examples of some minimum outdoor air percentages.

TABLE 4
SUGGESTED MINIMUM OUTDOOR AIR (OA) AT 6 ACH

MERV #	MINIMUM OA
17	20 %*
16	25 %
15	30 %
14	35 %
13	40 %

* Although the efficiency of the MERV 17 essentially removes all small particles rendering the recirculated air virus-free, 20 % outdoor should still be added for comfort and good air quality.

The values in Table 4 are only minimum suggestions. The ACGIH recommends providing as much outside air as possible. It is also clear that increasing the ACH could theoretically allow a decrease in outdoor air. But it would be best practice to add as much as possible.

Buildings whose HVAC systems cannot achieve at least these minimum specifications in the three recommendations above need to be off-limits for theatrical and film workers.

The only other ventilation system that qualifies a building as a usable workplace is the dilution (or displacement) industrial ventilation system.

INDUSTRIAL DILUTION VENTILATION. Occasionally a building will be, or will contain, a shop, studio, or lab that has a 100 % exhaust industrial system. If the air supply for this system is air from the building they are in, this room evaluated based on the quality of the building air's HVAC system plus the number of ACH provided by the exhaust fans. But if the room has a separate air supply from a make up air unit that brings in and conditions air specifically for that room and if the exhaust fans can provide 6 to 12 ACH for that room, it is acceptable – even preferred.

RECLAIMING ROOMS WITH INADEQUATE VENTILATION. Small rooms, such as light booths, recording or broadcasting studios, and similarly sized rooms with very limited numbers of occupants may be made acceptable by using HEPA (equivalent to MERV 17) air purifiers. These units usually have a label or manual that provides the square feet of room they can be expected to clean. However, that square footage is usually based on the assumption that the ceiling height is 8 feet. Recalculation is needed for buildings with higher ceilings. These devices also tend to form circular air currents around them as the air at the exhaust portal which is under positive pressure seeks the negative pressure area at the intake. Careful observation of the operation of these units and attention to changing filters is also needed.

OTHER AIR PURIFIERS. Not recommended are ultraviolet (UV) filter units, air ionizers, negative ion generators, ozone generators, and other devices that are hazardous to occupants. Ionizers and ion and ozone generators cause particles to drop rapidly out of the air by charging them so that they are attracted to walls, floors, tabletops, draperies, and even to occupants. This might be acceptable for outdoor air pollution particles, but not for an infective virus. The virus particles are still in the room on surfaces where they can be touched or resuspended by air currents. Toxic ozone gas is produced by ozone generators, ion generators, UV lights, and some other electronic air cleaners. It is counter intuitive to add a gas known to cause respiratory irritation to the air at even low levels when there is a potential for exposure to a respiratory virus.

NATURAL VENTILATION. Older buildings may rely on open windows for ventilation. This system will provide ASHRAE-compliant ventilation when the weather is good enough to leave the windows open. But open or closed, windows do not make these buildings acceptable workplaces now. Air can blow in or out of windows and there is no internal system for filtering the air. These buildings should not be used as workplaces during the pandemic.

WINDOW AIR-CONDITIONERS. Anyone who has washed the filter on their air conditioner knows this is only to protect the internal mechanism from dust in your house as it draws air in. The unit draws in room air, passes it over the cold half of the condenser coil, and blows that same air out. The extension on the back is where hot half of the condenser coil can release the heat to the outdoors. Window air conditioners provide no ventilation at all.

UNIT VENTILATORS (UNIVENTS). These units, common in schools, draw room air from the bottom, heat or cool it, and blow that same air out a grille on top. Some are connected to the outside and provide some fresh air as well. The filter is usually not even rated, and a few models (e.g., made by Trane) can be upgraded to use a MERV 7. Even if the unit runs at 100 % outdoor air, it usually provides between 750 and 1500 cubic feet/minute (cfm), an amount unlikely to create more than one ACH. And this outside air is expelled into the room under positive pressure which drives it with its potential viral load into the rest of the building. This is not a solution.

MORE: If there is a system or unit not address or if you have questions about ventilation where you work, contact actsnyc@cs.com.

footnotes:

* Fears AC. et. al. Persistence of Severe Acute Respiratory Syndrome Coronavirus 2 in Aerosol Suspensions. EID. Volume 26, Number 9—September 2020. https://wwwnc.cdc.gov/eid/article/26/9/20-1806_article?deliveryName=USCDC_331-DM35835.

** Horve, Patrick F., et al., SARS-CoV-2 in Healthcare HVAC Systems, medRxiv preprint doi: https://doi.org/10.1101/2020.06.26.20141085

ATTACHMENT B

UA Green Careers Room Ventilation					
Room	**Use**	**Operable Windows**	**Mechanical Ventilation**	**Window AC Units**	**Notes**
B7	Remote teacher	No	Yes	No	
B8A	Storage	No	Yes	No	
B8B	Storage	No	Yes	No	
C4	Remote teacher	No	Yes	No	
C5	Remote teacher	No	Yes	No	
C5A	Remote teacher	No	Yes	No	
101B	Classroom	Yes	No	Yes	
101D	Classroom	Yes	No	Yes	
102A	Classroom	Yes	No	Yes	
102	Classroom	Yes	No	Yes	
108	Remote teacher	No	Yes	No	
108T	Remote teacher	Yes	Yes	No	
109	Remote teacher	Yes	Yes	No	
109A	Classroom	Yes	Yes	No	Under construction - temp. closed
111	Classroom	Yes	No	Yes	
216	Remote teacher	Yes	No	Yes	
218	Remote teacher	Yes	Yes	No	
219	Remote teacher	Yes	No	Yes	
221	Remote teacher	Yes	No	Yes	
222	Classroom	Yes	No	Yes	
226	Classroom	Yes	No	Yes	
227	Classroom	Yes	No	Yes	
228	Remote teacher	Yes	No	Yes	
230	Remote teacher	Yes	No	Yes	
231	Remote teacher	Yes	No	Yes	
	Total Ventilation:	**72%**	**44%**		

ATTACHMENT B

NOTICE OF ALLEGED SAFETY OR HEALTH HAZARDS

Pursuant to Section 27-a(5)(a) of the Public Employees Safety and Health (PESH) Act of 1980
Hazard Description and Locations

Introduction. Complainants are 46 public school teachers at nine (9) campuses throughout several boroughs of New York City (NYC), and as such are "public employees" pursuant to §27-a of the Public Employee Safety and Health (PESH) Act.[1] The General Duty Clause of PESH states that "[e]very employer shall: (1) furnish to each of its employees, employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to its employees and which will provide reasonable and adequate protection to the lives, safety or health of its employees."[2] Because the PESH Act is remedial in nature it has been "liberally construed, to spread its beneficial result as widely as possible."[3]

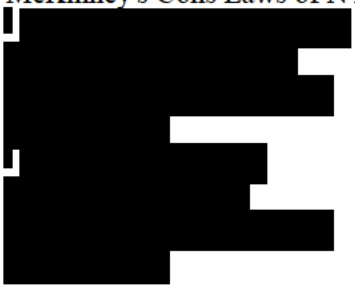
Complainants allege that NYC school buildings, their places of employment, are improperly ventilated and unable to protect them from SARS-CoV-2 (the virus that causes COVID-19), and as such, are recognized hazards which do not adequately protect their lives, safety or health. Complainants' specific concerns are set forth below.

Complainants. Of the 46 Complainants, 14 are named, eight are named to PESH only but do not want their names revealed to their employer, and the remaining 24 are anonymous. Public Employees for Environmental Responsibility (PEER) and the Environmental Justice Initiative (EJI) are representing all Complainants in this matter. Seventeen Complainants currently have accommodations allowing them to work remotely; however, these accommodations expire on December 31, 2020, and these Complainants believe they will be asked to return to their unsafe workplaces in three months.

The complainants are employees at the following locations:

1) Newtown High School Queens, 48-01 90 Street, Queens, NY 11373
    a. Complainants whose names may be revealed to the employer
        i. Amanda Vender[4]
        ii. Ariela Rothstein[5]
    b. Complainants whose names may NOT be revealed to the employer

[1] N.Y. Lab. Law § 27-a.
[2] §27-a(3)(a).
[3] Hartnett v. Ballston Spa, 152 A.D.2d 83, 86, 547 N.Y.S.2d 902, 904 (App. Div. 3rd Dept. 1989) (citing McKinney's Cons Laws of NY, Book 1, Statutes §§ 35, 321).



i. [redacted][6]
ii. [redacted][7]

c. Anonymous Employees
   i. John Doe 1
   ii. John Doe 2
   iii. John Doe 3

2) Grace Hoadly Dodge Campus (including Crotona International High School and Bronx Academy for Software Engineering), 2474 Crotona Avenue, Bronx, 10458
   a. Complainants whose names may NOT be revealed to the employer
      i. [redacted][8]
   b. Anonymous Employees
      i. John Doe 4
      ii. John Doe 5
      iii. John Doe 6
      iv. John Doe 7
      v. John Doe 8
      vi. John Doe 9
      vii. John Doe 10
      viii. John Doe 11
      ix. John Doe 12
3) The Urban Assembly School for Green Careers, 145 W. 84th Street New York, NY 10024
   a. Anonymous Employees
      i. John Doe 13
4) Murry Bergtraum Campus (including Urban Assembly Maker Academy), 411 Pearl Street, Manhattan, NY 10038
   a. Anonymous Employees
      i. John Doe 14
      ii. John Doe 15
      iii. John Doe 16
5) Louis Armstrong Middle School, 32-02 Junction Blvd., East Elmhurst, NY 11369
   a. Complainants whose names may NOT be revealed to the employer
      i. [redacted][9]
6) The Flushing International High School, 144-80 Barclay Avenue, Queens, 11355
   a. Complainants whose names may be revealed to the employer

[redacted]

i. Jordan Wolf[10]
ii. Jillian Leedy[11]

b. Complainants whose names may NOT be revealed to the employer
i. [redacted][12]
ii. [redacted][13]
iii. [redacted][14]

c. Anonymous Employees
i. John Doe 17

7) The Earth School, P.S. 364, 600 East 6 Street, NYC, NY 10009
a. Complainants whose names may be revealed to the employer
i. Vanessa Keller[15]
ii. Jessica Smith[16]
iii. Emmy Matias[17]
iv. Jia Lee[18]
v. Suzanne Budesa[19]

[redacted]

vi. Erica Zimetbaum[20]
vii. Nykenna Middlebrooks[21]
viii. Kimberly Fritschy[22]

b. Complainants whose names may NOT be revealed to the employer
i. [redacted][23]

c. Anonymous Employees
i. John Doe 18
ii. John Doe 19
iii. John Doe 20

8) Landmark High School, 351 West 18 Street, Manhattan, NY 10011
a. Anonymous Employees
i. John Doe 21
ii. John Doe 22
iii. John Doe 23
iv. John Doe 24

9) Liberty High School Academy for Newcomers, 250 West 18 Street, Manhattan, NY 10011
a. Complainants whose names may be revealed to the employer
i. Gabrielle Tessler[24]
ii. William Russell[25]

Background. SARS-CoV-2, the virus that causes COVID-19, is roughly 0.1 μm (micron) in diameter, and is spread primarily through the air.[26] Virus particles attach to liquid droplets and are expelled from people's noses and mouths when they cough, sneeze, talk, sing, and breathe. Larger droplets will fall to the ground or on surfaces, but smaller droplets can float in the air for hours. Given the tiny size of the virus, ordinary heating and air-condition (HVAC) systems cannot remove the virus from the air.

[redacted]

Note, however, that virus particles themselves are typically attached to small droplets of liquid, resulting in a size of roughly 0.3 microns, as discussed in more detail below.

Moreover, there is evidence that the virus can be spread throughout a room through an air conditioning system.[27]

Ventilation standards. Despite the fact that the science is clear as to the specifics of protective ventilation and filtration necessary to reduce the risk of SARS-CoV-2 transmission in schools and other buildings, the NYC Department of Education (DOE) is relying on an array of conflicting standards.

Current science on ventilation. Scientists researching ventilation necessary to protect workers in schools and office buildings from SARS-CoV-2 state that in order to reduce risk, proper ventilation can be achieved by:

> 1) supplying a sufficient amount of clean outdoor air and delivering it to the breathing zone, and 2) effectively diluting the concentration of pollutants. In many parts of the world such as the U.S., mechanically ventilated classrooms and offices typically have about 20% of their air supplied from outdoors, and the rest is recirculated air. This is done to save heating and cooling energy while maintaining acceptable levels ofIndoor Air Quality (IAQ). To reduce the risk of the SARS CoV-2 virus infection, the outdoor ventilation rate should be increased to the maximum operational capacity of the building ventilation system, which can be 2 or more times of that under the normal operation mode per the existing standard, Unless it is a 100% outdoor air supply system by design, the recirculated air should be filtered with high efficiency particulate air filters (HEPA) or at least MERV 14 filters to minimize the possible cross contamination between different rooms. For naturally ventilated rooms, an exhaust fan can be placed on one of the windows while keep at least one of the windows on the opposite side or far end of the same side open to increase the ventilation rate, especially under no wind and low indoor-outdoor temperature differential conditions. To be effective, high efficiency filters and sufficient airflow through them are necessary. At the building level, high efficiency particulate (HEPA) filters in the recirculated or mixed air duct can reduce the cross contamination between rooms and increase the total clean air delivery rate (outdoor plus filtered air) for diluting the virus concentration in the ventilated space. HEPA filters have a minimum efficiency of 99.97% for 0.3 to 10 μm particles. MERV 14 or higher rating filters have a minimum efficiency of 75% − 84% for 0.3 − 1.0 μm, and 90% or greater for 1.0 − 3.0 μm particles. Assuming that 80% of the air is recirculated, use of MERV 14 or HEPA filters to treat the recirculated air can further dilute the pollutant concentration by a factor of 4 or 5, respectively.[28]

Therefore, it is abundantly clear that the mere ability of air being able to flow in and out of a room or building does not render that room or building safe. Rather, sufficient airflow and high efficiency filters are necessary to reduce the risk of virus transmission.

Department of Education standards. The NYC Department of Education (DOE) discusses what they believe is adequate ventilation in school buildings in light of SARS-CoV-2.[29] Specifically, they state:

---

[27] See, e.g., Lu J, Gu J, Li K, Xu C, Su W, Lai Z, et al., *COVID-19 Outbreak Associated with Air Conditioning in Restaurant, Guangzhou, China*, 26 EMERG. INFECT DIS. 1628 (2020), https://dx.doi.org/10.3201/eid2607.200764 (also available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7323555/).

[28] Jensen Zhang, *Integrating IAQ control strategies to reduce the risk of asymptomatic SARS CoV-2 infections in classrooms and open plan offices*, 26 SCIENCE AND TECHNOLOGY FOR THE BUILT ENVIRONMENT 1013 (2020), https://www.tandfonline.com/doi/full/10.1080/23744731.2020.1794499.

[29] https://www.schools.nyc.gov/school-year-20-21/return-to-school-2020/health-and-safety.

> According to our city and federal public health experts, ***a room is safe when air is able to flow in and out—whether through natural or mechanical means.*** This flow can be achieved either through use of an HVAC, an open window, or air handlers. All rooms must have adequate ventilation to be used for the school year.
>
> Following public health guidance, we are assessing and making repairs on buildings designed and built to permit air flow through windows. We expect repairs to be completed by the opening of school and rooms without adequate ventilation will not be occupied by students or staff.
>
> Ventilation in school buildings is provided by a combination of the following systems:

- supply and exhaust fans
- windows and exhaust fans
- HVAC Systems: rooftop units, air handling units, and dedicated outside systems in newer buildings, such as Univents

  These systems are installed to meet the Building Code Requirements at the time of design and construction.
- Buildings that have supply and exhaust fans do not need operable windows. Windows can be used for additional air dilution and supplemental ventilation, or if the mechanical system failed.
- ***Buildings that have operable windows and exhaust fans meet the ventilation requirements.***
- Mechanical ventilation can be with both supply and exhaust fans, or only exhaust fans and the use of windows for make-up air.
- Mechanical ventilation is provided by HVAC Units that supply fresh air into inner core rooms of buildings that do not have windows. Outside air dampers should be opened (either manually or using the Building Management System) to between 75%-100% to maximize outside air supply and still maintain building comfort levels.

  All DOE school buildings were surveyed by the NYC School Construction Authority (emphasis added).[30]

This web page provides a hyperlink to the "School Building Ventilation Survey."[31] The Building Ventilation Survey states:

> Properly ventilated classrooms are key to our reopening our schools safely. We have been working around the clock to ensure that every school has been carefully surveyed for ventilation by consulting engineers under the direction of the New York City School Construction Authority…We found that ***the ventilation in more than 95 percent of our classrooms is in good working order.*** Out of the 64,000 classrooms we surveyed, fewer than 3,000 had issues. These results for individual schools are preliminary and are intended

[30] Id.
[31] https://www.schools.nyc.gov/about-us/reports/school-building-ventilation-survey.

> to help focus our repair and maintenance efforts. They do not indicate any space's ability to open, as we are continuing to repair and correct any outstanding ventilation issues.
>
> The DOE will make repairs or improvements with rooms prior to opening, and/or will close any rooms until repairs are made. ***A room requires at least one functioning method of ventilation to be cleared for occupancy.*** This could be a window that opens, a type of mechanical ventilation (exhaust fan, supply fan, unit ventilator) or a combination of the both. Ongoing updates will be provide [sic] as repairs or improvements are made.
>
> Any room that does not meet our stringent safety standards will not be used for instructional purposes unless it is repaired or remediated. We want to remind you that while ventilation is essential to our COVID-19 prevention plan, it is only one part of a comprehensive strategy to keep our students, educators, and staff members safe inside and outside our schools.[32]

Unfortunately, the DOE's statements on what makes a building safe for occupancy is not based on science or current knowledge of the spread of SARS-CoV-2. A room is ***not*** safe simply because some air can flow in and out; buildings that have "operable" windows and exhaust fans do ***not*** render that building safe; ventilation in 95% of the classrooms is not in "good working order" (nor does ventilation being in "good working order" necessarily render that room safe from the spread of the SARS-CoV-2 virus); and "one functioning method of ventilation" is not sufficient to allow it to be "cleared for occupancy."

ASHRAE standards. The American Society for Heating, Refrigerating and Airconditioning Engineers (ASHRAE) has standards for design, maintenance, and testing building ventilation systems. Although ASHRAE developed a task force to "address the challenges of the COVID-19 pandemic and possible future epidemics as it relates to the effects of heating, ventilation, and air-conditioning systems on disease transmission" in schools,[33] their standards are ***not*** sufficiently protective for the novel SARS-CoV-2 virus. ASHRAE states that the "[t]ransmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning [HVAC] systems, can reduce airborne exposures."[34] ASHRAE acknowledges that educational facilities have a wide range of types and ages of HVAC systems, and their guidance stresses the importance of increasing outside air while properly filtering and treating return air in order to minimize the spread of SARS-CoV-2.

The relevant standard in this case is ASHRAE 62.1, "Ventilation for Acceptable Indoor Air Quality." However, it is critical to note that the purpose of ASHRAE's standard 62.1 is to "specify minimum ventilation rates and other measures intended to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimizes adverse health effects."[35] In other words, these standards were based on designing an energy efficient system that would provide a minimum of outside air to keep carbon dioxide (CO_2) levels down. These standards are ***not*** designed to protect people from an airborne

[32] Id. (emphasis added).
[33] https://www.ashrae.org/file%20library/technical%20resources/covid-19/guidance-for-the-re-opening-of-schools.pdf.
[34] Id. at 2.
[35] https://ashrae.iwrapper.com/ASHRAE_PREVIEW_ONLY_STANDARDS/STD_62.1_2019.

virus like SARS-CoV-2, particularly when the virus can linger in the air for hours and recirculate through traditional HVAC systems.

If a school has an HVAC system in good operating condition meeting ASHRAE's standard 62.1, it *may* be repurposed into a system that can provide decent infection control that can reduce risk to employees and students. Typically, HVAC systems accomplish their goals by drawing small amounts of air from outside and adding that fresh air to a much larger amount of recirculated air. The amount of fresh air is usually less than 20%. This air mixture is then adjusted for temperature and humidity, run through a particulate filter, and returned to rooms throughout the building. This cycle is continuous so as to cleanse the air throughout the day. The speed at which these cycles occur is typically quantified as air changes per hour ("ACH").

The inadequacy of ASHRAE's ventilation standards are eloquently laid out by Monona Rossol, M.S., M.F.A., industrial hygienist and President of Arts, Crafts and Theater Safety (ACTS), Safety Officer for local USA829 of IATSE, and the Safety Consultant for SAG-AFTRA. Ms. Rossol describes the mechanics and the necessary ACH in a paper entitled, "Ventilation for Theaters and Film Locations" dated September 20, 2020:

> The ceilings of most rooms with these ventilation systems have circular or square "diffusers" where this mixture of recirculated air and fresh air comes into the room. And in other locations, usually also in the ceiling, there are grilles or slots through which the room air is returned to the air handler to go through another recirculating cycle. When the volume of air coming through the diffuser equals the volume of air in the room, one air exchange has been achieved. This does not mean all the air in the room has been replaced because the air flows slowly into the room through the diffuser and mixes with the air in the room… it takes many air changes in order to completely replace the air in a room… theoretically, you never remove every last molecule.[36]

As an example, Ms. Rossol explains that if there are six ACH, it will take 46 minutes to replace 99% of the air in a room.

ASHRAE's rating system for filters is called the Minimum Efficiency Reporting Value (MERV). All filters have a MERV rating of one to 20. Filters with higher ratings can remove smaller particles. High efficiency particulate filters (HEPA filters) can remove 99.97% of particles that are 0.3 microns. HEPA filters have a MERV rating of 17 to 20.

Virus particles can be in droplets as small as 0.3 microns in diameter.[37] A table in Ms. Rossol's paper shows the filtration capabilities of different MERV ratings (see Table, below).[38] Therefore, filters should have a MERV rating of 17 or above to minimize risk of SARS-CoV-2 infection.

[36] Attachment A.
[37] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7094991/.
[38] Attachment A.

TABLE 2 - MERV FILTER PARAMETERS

MERV #	0.1 - 0.3µ*	1.0 - 3.0µ*
9	n/a	35 %
10	n/a	50 %
11	20 %	65 %
12	35 %	80 %
13	50 %	85 %
14	75 %	90 %
15	85 %	90 %
16	95 %	95 %
17 (HEPA)	99.97 %	~100 %

*µ = micron

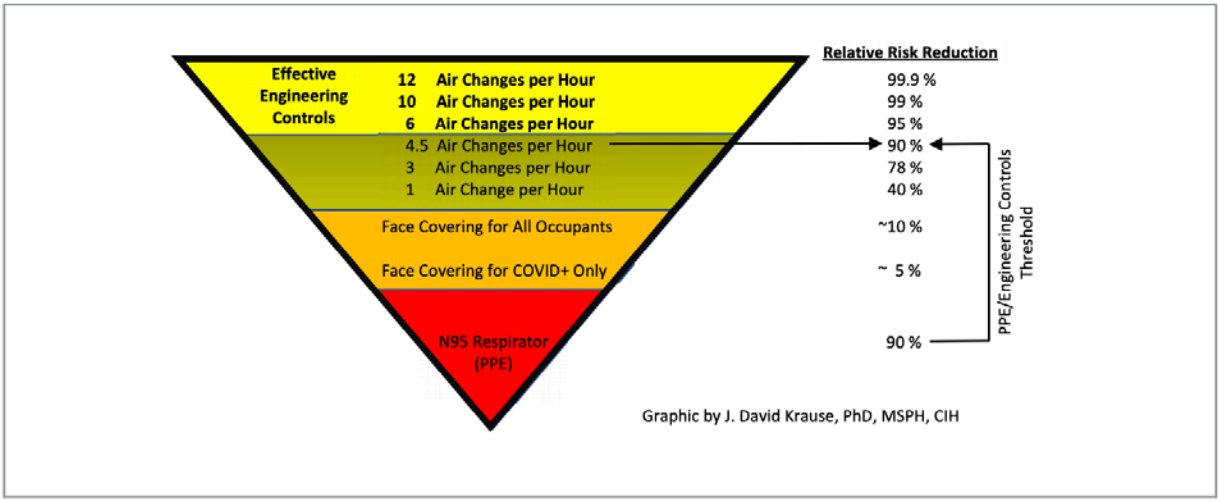
Ms. Rossol concludes:

> The reason an ASHRAE-compliant ventilation system can no longer be considered safe for occupants is that the ASHRAE standard is totally inappropriate for controlling a tiny particle generated inside the rooms by the occupants. This tiny airborne particle can travel on air currents all through the room. If the HVAC system provides the typical two ACH, then the air in the room is only replaced 99 % after over two hours. And if the filter is not a MERV 17, the virus can be recirculated back into rooms in the building.[39]

AIHI and ACGIH guidance. The American Industrial Hygiene Association (AIHA) published a guidance document entitled "Reducing the Risk of COVID-19 using Engineering Controls, Version 1," on August 11, 2020.[40] In this guidance, they state that 6 ACH is necessary to achieve a 95% risk reduction of contracting COVID-19 (see Figure 1):[41]

Figure 1

[39] Id.
[40] https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Guidance-Documents/SUPPLEMENT-to-Reducing-the-Risk-of-COVID-19-Using-Engineering-Controls-Guidance-Document.pdf.
[41] Id. at 2.



However, AIHA states that this relative risk reduction will hold true only with a MERV 17 or above filter.

The American Conference of Governmental Industrial Hygienists (ACGIH) published their White Paper in August of 2020 on "Ventilation for Industrial Settings during the COVID-19 Pandemic."[42] ACGIH is in agreement with AIHA that an ACH of at least 6 is needed, as well as a MERV of 13 or higher, and that the more outdoor air brought in the better.

Distancing and masks. It is important to note that neither masks nor social distancing can substitute for adequate ventilation. These tiny virus particles, some as small as 0.3 microns, will not be stopped by distancing within a room, or by cloth masks. Therefore, requirements for teachers, staff, and students to wear masks (most of which will be cloth, rather than N95s) and distance are not sufficient to protect Complainants.

Requirements necessary to make school buildings safe for employees and students given the risk of SARS-CoV-2 transmission. It is clear that the DOE's ventilation standards do not align with the current state of science, experts such as Ms. Rossol, or the AIHA and ACGIH ventilation guidance. Therefore, in order to make classrooms, staff spaces, hallways, lobbies, stairwells, rest rooms, etc. safe from SARS-CoV-2, NYC schools must include three parameters in any ventilation system:

1. Sufficient ACH (6 or greater);
2. MERV rating of 13 or greater (where a MERV 17 or greater rating gives the greatest risk reduction); and
3. Adequate percentage of outside (i.e., fresh) air.

Please note that these parameters are applicable only in systems with air handling or rooftop units (RTU's) providing ventilation/conditioned air, or, in the case of a "chilled beam" system (present in some of the newer schools), a Direct Outside Air System (DOAS). Buildings whose HVAC systems cannot accommodate these requirements are not safe for Complainants.

[42] https://www.acgih.org/docs/default-source/vent-committee/iv_position-test.pdf?sfvrsn=4b10ba0d_2

Specific locations of workplaces with health hazards. Complainants are submitting details of nine campuses that have inadequate ventilation such that the spread of SARS-CoV-2, and thus the risk of becoming ill with COVID-19, are likely. Data displayed below are from NYC Schools, and are based on inspections that were conducted this year. Specifically, NYC Schools state, "In order to ensure maximum safety for staff and students, all school buildings have been surveyed for ventilation. The DOE will make repairs or improvements prior to Monday, September 21, and/or will close any rooms not repaired by that date."[43] Please note that all Room Assessments, copied in Figures below, were pulled from the NYC Department of Education website on Sunday, October 4, 2020.

1) Newtown High School Queens, 48-01 90 Street, Queens, NY 11373 (Q455).

There are seven Complainants from this school: named Complainants Amanda Vender and Ariela Rothstein; Complainants [redacted] and [redacted] who are willing to be named to PESH only and not to their employer, and three who would like to remain anonymous. In Newtown High School, there are 201 rooms, and of these, 24 (11.9%) have no windows or windows that do not open; 196 (97.5%) do not have operational supply fans; 115 (57.2%) do not have operational exhaust fans; and 186 (92.5%) do not have operational unit ventilators (see Figure 2, below).[44] Of the windows that do open, some only open 7 inches. Only three rooms of the 201 (1.5%) have operation supply fans *and* operational exhaust fans. Exhaust fans are irrelevant without a supply fan. There are no data for ventilation in lobbies, hallways, cafeterias, or elevators. As students and teachers change classrooms, or enter/depart the school buildings, hallways and lobbies will be crowded and potential areas where the virus can be transmitted.

Figure 2

Unit ventilators, although sparsely distributed in Newtown High School, are not adequate for ventilation. Specifically, Ms. Rossol states:

> These units, common in schools, draw room air from the bottom, heat or cool it, and blow that same air out a grille on top. Some are connected to the outside and provide some fresh air as well. The filter is usually not even rated, and a few models (e.g., made by Trane) can be upgraded to use a MERV 7. Even if the unit runs at 100 % outdoor air, it usually provides between 750 and 1500 cubic feet/minute (cfm), an amount unlikely to create more than one ACH. And this outside air is expelled into the room under positive pressure which drives it with its potential viral load into the rest of the building.[45]

[43] See, e.g., https://www.schools.nyc.gov/schools/M402 under "Building Ventilation Information."
[44] https://www.nycenet.edu/roomassessment?code=Q455
[45] Attachment A

Complainant Vender works in rooms 313, 317, 319, 416 to 450. Although all of her rooms have minimally operable windows, none of them have operational supply fans *and* operational exhaust fans, and none have operational unit ventilators. Picture 1, below, shows how the vent in room 416 does not pass the "tissue test" (whereby a tissue on a stick is placed before the vent to determine if there is any airflow).

Picture 1

Room 416 also only has a window that opens 7 inches (see Picture 2, below).

Picture 2

Room 431's exhaust fan is, according to the walkthrough checklist, operational. It is located in a closet (see Picture 3, below). It is unclear how an exhaust fan in a closet would be effective.

Picture 3

Named Complainant Rothstein currently has an accommodation to work remotely, which expires on December 31, 2020. Complainant [redacted] who is willing to be named to PESH for purposes of this complaint, but not to employers and other entities, also has an accommodation to work remotely. Both of these Complainants fear for their health and safety should they be forced to return to work after the accommodation expires on December 31, 2020. Three other anonymous Complainants in this school are in similar situations as these four Complainants. Therefore, Complainants Vender, Rothstein, [redacted] and the anonymous employees are

being asked to work in a workplace that does not comply with ACGIH or AIHA standards, and which, according to scientific data regarding the size of aerosolized SARS-CoV-2 virus particles, and the spread of the disease throughout enclosed spaces, puts her at risk from recognized hazards that are causing or are likely to cause death or serious physical harm. Moreover, Complainant Vender, Rothstein, [redacted], and the anonymous employees' employer is not providing reasonable and adequate protection to the lives, safety or health of its employees, contrary to the General Duty Clause of the PESH Act.

2) Grace Hoadly Dodge Campus (including Crotona International High School and Bronx Academy for Software Engineering), 2474 Crotona Avenue, Bronx, 10458 (X660).

There are ten Complainants from the schools on this campus, nine of whom wish to remain anonymous, and one, Complainant [redacted], who wishes to be named to PESH but not to any employer or the public. Most Complainants do not have accommodations to work remotely. Some of Complainants teach in different schools within the campus.

Out of 123 spaces designated "student-staff space" in the building, 21 (17%) do not have windows or have windows that do not open; 120 rooms (97.6%) do not have fully operational supply fans; 118 (95.9%) do not have fully operational exhaust fans; and 0 (0%) have operational unit ventilators.[46] No bathrooms, hallways, cafeterias, lobbies, or elevators are listed on the checklist, so status of these areas is unknown. Only two rooms (1.6%) have both operational supply and exhaust fans. Exhaust fans are irrelevant without a supply fan.

Figure 3

3) The Urban Assembly School for Green Careers (located in the Louis D. Brandeis High School), 145 W. 84th Street New York, NY 10024 (M402/M470)[47]:

There is one anonymous Complainant from the Urban Assembly School for Green Careers. Staff at this school were provided with a "UA Green Careers Room Ventilation" chart. Of the 23 rooms to be used for teachers instructing remotely or classrooms with students in the school, 5 (21.7%) do not have operable windows; and 14 (60.9%) have no mechanical ventilation whatsoever.[48] No bathrooms, hallways, cafeterias, lobbies, elevators, or auditoriums are on the chart, so status of these spaces is unknown. The Urban Assembly school is located within the Louis D. Brandeis High School, and that school as a whole has 182 rooms, 48 (26.4%) of which do not have windows; 131 rooms (72%) have no operational supply fans; 60 rooms (33%) do not

[46] https://www.nycenet.edu/roomassessment?code=X660
[47] Note that the "Room Assessment" for this school is listed under Code M470, not M402.
[48] Attachment B

have operational exhaust fans (67%); and there are 0 unit ventilators (0%). One hundred and thirty-one rooms (72%) do not have both an operational supply fan and an operational exhaust fan. Exhaust fans are irrelevant without a supply fan.

Figure 4

4) Murry Bergtraum Campus, Urban Assembly Maker Academy, 411 Pearl Street, Manhattan, NY 10038 (M520):

There are three anonymous Complainants at the Urban Assembly Maker Academy within the Murry Bergtraum Campus. Of the 225 rooms in the school, 223 (99%) do not have windows or do not have windows that open; nine (4%) do not have operational supply fans; 36 (16%) do not have operational exhaust fans; and 190 (84.4%) do not have unit ventilators (see Figure 5, below).[49]

Figure 5

5) Louis Armstrong Middle School, 32-02 Junction Blvd., East Elmhurst, NY 11369 (Q227).

Complainant [redacted], who wishes to be named to PESH only, (name redacted for purposes of the employer and the public), works in the Louis Armstrong Middle School. Of the 184 rooms in this school, only 82 (44.6%) have no windows or windows that cannot be opened; 113 rooms (61.4%) do not have fully operational supply fans; and 58 rooms (31.5%) do not have fully operational exhaust fans. The building does not have any (0%) unit ventilators (see Figure 6, below).[50]

Figure 6

[49] https://www.nycenet.edu/roomassessment?code=M520
[50] https://www.nycenet.edu/roomassessment?code=Q227

6) The Flushing International High School, 144-80 Barclay Avenue, Queens, 11355 (Q189).

Named Complainants Jordan Wolf and Jillian Leedy, plus Complainants [redacted], who wish to be named to PESH only and not their employer or the public, and one anonymous Complainant (six total) work at The Flushing International High School. Complainant Wolf currently has an accommodation to work at home until December 31, 2020. Complainant Leedy works in Rooms 316 and 315A. Of the 122 rooms in this school, nine (7.4%) do not have windows; 105 rooms (86%) do not have operational supply fans; 85 rooms (69.7%) do not have fully operational exhaust fans; and none (0%) have unit ventilators (see Figure 7).[51] Of Complainant Leedy's workspaces, Room 316 has an operable window, but no supply fan or exhaust fan; Room 315A has an operable window, no supply fan, and an inoperable exhaust fan.[52]

Figure 7

7) The Earth School, P.S. 364, 600 East 6 Street, NYC, NY 10009 (M064).

Named Complainants Vanessa Keller, Jessica Smith, Jia Lee, Suzanne Budesa, Erica Zimetbaum, Nykenna Middlebrooks, Kimberly Fritschy, Emmy Matias, plus Complainant [redacted] who would like to be named to PESH only and not their employer or the public, and three anonymous Complainants (total of 12) work at P.S. 64. Of the 114 rooms in this school, 18 (15.8%) have windows that do not open or no windows at all; 106 (93%) do not have supply fans; 30 (26.3%) do not have operational exhaust fans; and zero (0%) have unit ventilators (see Figure 8, below)[53] Complainants Smith and Lee work in Room 114, which has a window and an exhaust fan, but no supply fan. Kimberly Fritschy works in Room 141, which has a window that opens and an operational exhaust fan, but no supply fan. Some of the Complainants have an accommodation allowing them to work remotely until December 31, 2020.

Figure 8

[51] https://www.nycenet.edu/roomassessment?code=Q189
[52] Id.
[53] https://www.nycenet.edu/roomassessment?code=M064

8) Landmark High School, 351 West 18 Street, Manhattan, NY 10011 (M419, but ventilation report is under M440, Bayard Rustin Educational Complex).

Four Complainants have signed onto this complaint anonymously; all believe they will be exposed to recognized hazards should they be made to work from this building. Of the 192 rooms in this school, eight (4.2%) do not have windows, or have windows that do not open; 153 (79.7%) do not have operational supply fans; 137 rooms (71.4%) do not have operational exhaust fans; and 145 (75.5%) do not have operational unit ventilators (see Figure 9, below).[54]

Figure 9

9) Liberty High School Academy for Newcomers, 250 West 18 Street, Manhattan, NY 10011 (M550; but the ventilation report is under M451).

Named Complainants Gabrielle Tessler and William Russell have signed onto this Complaint. Of the 97 rooms in this school, 68 (70.1%) do not have windows or (in one case) the window cannot be opened; 36 do not have fully operational supply fans (37.1%); 35 rooms (36%) do not have fully operational exhaust fans; and there are zero (0%) unit ventilators (see Figure 10).[55] Complainant Tessler is the Staff Nurse, and works in Medical Room 516. Room 516 has no window, but does have a supply fan and exhaust fan.

Figure 10

Requested Remedy. Complainants request inspection reports of NYC schools with more comprehensive metrics than "whether or not" a room has: 1) a window; 2) window that opens; 3) supply (fan/diffuser); 4) exhaust (fan/return); and 5) unit ventilator. The so-called "tissue test," as shown in

[54] https://www.nycenet.edu/roomassessment?code=M440
[55] https://www.nycenet.edu/roomassessment?page=2&code=M451

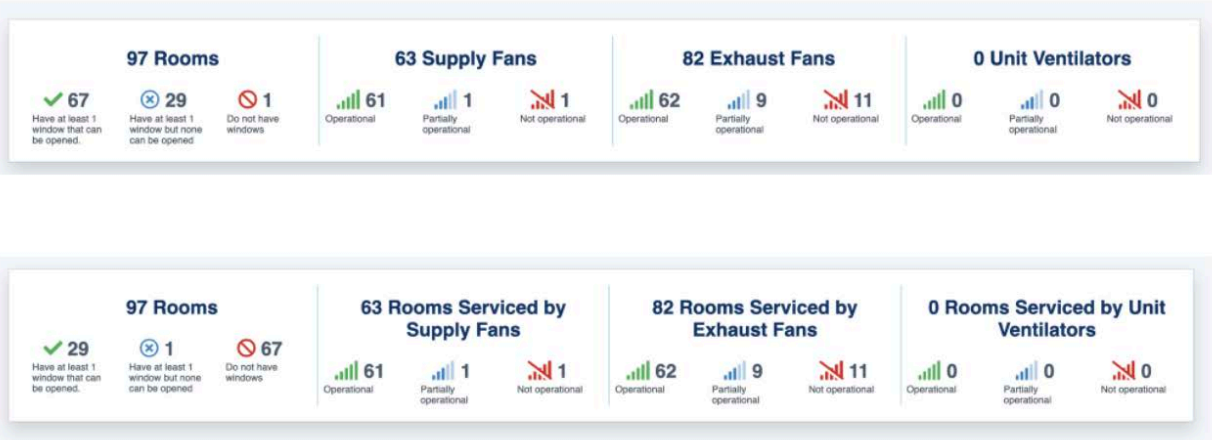
Picture 1, above, is also inadequate to determine either the *quantity* or the *quality* of air moving throughout a room.[56] It is impossible to demonstrate even basic building code compliance for required ventilation without including the actual cubic feet per minute (CFM – the most common way to measure airflow) for both supply and return air for each room.

In order to calculate CFM, the following measurements are needed: 1) square footage of each space; 2) ceiling height of each space; and 3) the CFM that is being pulled through and filtered. This would involve a mechanical plan of each building, and testing every source of air supply and exhaust/return (e.g. vents, diffusers, and registers) for specific air flow, typically done with equipment such as a balometer, by a testing, adjusting, and balancing (TAB) firm that issues a full system balancing report. It is not possible to obtain accurate ACH in a space that is naturally ventilated only.

Until testing is conducted which can determine the safety of these classrooms, the Department of Education cannot be deemed to be meeting its general duty to provide a place of employment free from the recognized hazard presented by SARS-CoV-2 and COVID-19 and alternate provisions should be made for teachers who cannot be provided a safe workplace.

In addition, Complainants note that the changing inspection data on the DOE's website is not only confusing but also does not instill confidence in the accuracy of the data and/or the inspections themselves. For example, Room Assessments done for School M451 had the following two charts, pulled less than one week apart:

Figure 11



The first chart in Figure 11 was captured on September 30, 2020, and shows that only one room in this school does not have a window, 67 have windows that can be opened, and 29 have windows that cannot be opened. However, the same chart captured on October 4, 2020 has the numbers "flipped," showing 67 rooms *without* windows, 29 with windows that can be opened, and one that has a window that cannot be opened.

This change certainly was not made because the school somehow eliminated the windows from 66 classrooms in the last week (not to mention that one would wonder *why* a school would eliminate

[56] See also https://www.ny1.com/nyc/all-boroughs/news/2020/08/27/video-shows-inspectors-using-toilet-paper-on-a-stick-to-measure-classroom-air-flow

windows). While this example appears to *worsen* the case for re-opening, some of the other changes noticed by Complainants did the opposite. Regardless of the impact on re-opening decisions, these drastic after-the-fact changes in inspection reports issued with no public notice or explanation substantially undermine Complainants' already minimal comfort with the quality of the inspections.

Conclusion. While this PESH complaint only involves nine schools within the NYC public school system, it is abundantly clear that there is a systemic underassessment of the ventilation problems in the city's school buildings. Complainants, other teachers, school support staff, janitors, cafeteria workers, and parents of students need to be able to make an informed choice as to whether returning to school in person is safe. Without the comprehensive ventilation tests described above, they will not have the information necessary to make such a choice. Therefore, we are providing a copy of this complaint to the Commissioner requesting such inspections pursuant to PESH §27-a (5), which states:

> Any employee or representative of employees who believes that a violation of a safety or health standard exists, or that an imminent danger exists, may request an inspection by giving notice to the commissioner of such violation or danger. Such notice and request shall be in writing, shall set forth with reasonable particularity the grounds for the notice, shall be signed by such employee or representative of employees, and a copy shall be provided by the commissioner to the employer or the person in charge no later than the time of inspection, except that on the request of the person giving such notice, his name and the names of individual employees or representatives of employees shall be withheld. Such inspections shall be made forthwith.

The risk of contracting COVID-19 in NYC schools is not hypothetical. As reported by the New York Times on September 23, 2020, 100 NYC school buildings have already reported at least one positive case by the first day of in-person instruction.[57] Not all people who tested positive went into the school buildings, but others did, resulting in quarantining of close contacts.[58]

We understand that in the best of all possible worlds, students and teachers would be able to return to schools this fall. There is incredible pressure on administrators, parents, state agencies, and teachers to return to "normal" as soon as possible. However, given that the SARS-CoV-2 virus can be deadly and is highly contagious, we must be cognizant of the health and safety of school employees and the students. SARS-CoV-2 is a recognized hazard that can cause death or serious physical harm to NYC school employees. It is incumbent on the Department of Labor to ensure that Complainants are provided reasonable and adequate protection to the lives, safety and health. Such protection includes comprehensive inspections of all the school buildings and classrooms, hallways, lobbies, stairwells, etc., and adequate ventilation and filtration. Unless and until these inspections are conducted and changes to ventilation and filtration made, we respectfully urge PESH to allow all NYC schoolteachers to work remotely.

Inspections conducted by the Department of Education have demonstrably failed to adequately inform DOE employees and public stakeholders of the risk of airborne spread of the SARS-CoV-2 virus. The results of those inspections are seemingly subject to change without notice and their methodology, to the extent it is available, is unsound. All nine facilities discussed in this complaint displayed a different set

[57] https://www.nytimes.com/2020/09/23/nyregion/coronavirus-new-york-schools.html
[58] Id.

of data just one week ago, though specific discussion of those changes has been limited to the data set for Liberty High School to avoid unnecessary confusion.

Action on this complaint is urgently needed, as thousands of children and teachers return to hundreds of potentially unsafe classrooms across New York City amid a “third wave” spike. Placing dozens of people in unventilated rooms for seven or more hours a day will guarantee a massive new wave of infections among teachers, staff, students, and all of their families. This is an imminent and unavoidable threat, and the Department of Labor has a legal and moral duty to intervene to protect New York’s public employees.

Sincerely,

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Attorneys for Complainants

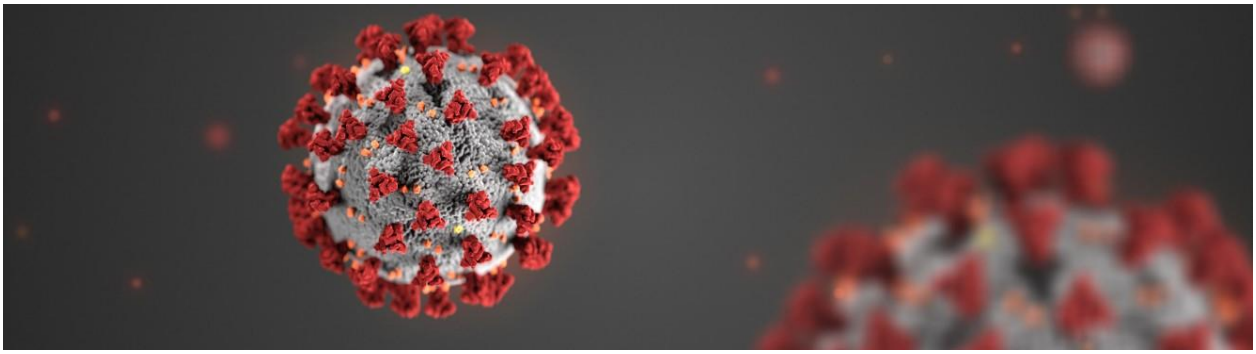
2020 Interagency School Opening Walkthrough Checklist

Bld ID	M131		Visit Date:	8/28/2020
Building Name	I.S. 131 - MANHATTAN			
Geo Dist	2			
Address and Directions	100 HESTER STREET, Manhattan NY- 10002			
		Kitchen AC?	Yes-Partially Operational	

ROOM #	Primary Usage? (Student-Staff Space/ Building Support Space/ Inaccessible/ Room Not Found)	Windows? (Yes/No)	At least one window can be opened? (Yes/No)	Supply Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Exhaust Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Unit Ventilators (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Comments
101AB	Student-Staff Space	Yes	Yes	Operational	Operational	Not Operational	
106	Student-Staff Space	No	No	Partially Operational	Operational	Operational	
113	Student-Staff Space	Yes	Yes	Not Operational	Operational	Operational	
113A	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
119	Student-Staff Space	Yes	Yes	Operational	Operational	Operational	
119A	Student-Staff space	Yes	Yes	Operational	Operational	Operational	
119B	Building Support Space	No	No	Operational	Operational	Doesn't Exist	
119C	Building Support Space	Yes	Yes	Operational	Operational	Doesn't Exist	
121	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
123	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
129	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
131	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
136AB	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
138	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
140	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
140AB	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
141	Student-Staff Space	Yes	Yes	Operational	Partially Operational	Operational	
141A	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
141B	Building Support Space	No	No	Operational	Doesn't Exist	Doesn't Exist	
141C	Building Support Space	No	No	Operational	Operational	Doesn't Exist	
145	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
172	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
1st Fl Toilet	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
204A	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
204B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
204C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
204D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
204E	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
206	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
206A	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
208	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
210	Student-Staff Space	No	No	Operational	Operational	Operational	
211	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
212	Student-Staff Space	Yes	Yes	Operational	Operational	Operational	
213	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
214	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Doesn't Exist	
218	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
219	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
221A	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
221B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
221CD	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
223	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
223A	Building Support Space	Yes	Yes	Doesn't Exist	Operational	Operational	
224	Student-Staff Space	Yes	Yes	Operational	Not Operational	Doesn't Exist	
235	Student-Staff Space	Yes	Yes	Operational	Operational	Doesn't Exist	
236	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
237	Student-Staff Space	Yes	Yes	Operational	Operational	Operational	
237A	Student-Staff Space	Yes	Yes	Operational	Operational	Operational	
239	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
242	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
243	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
244	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
248A	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
248B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
248C	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
248D	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
248E	Student-Staff Space	No	No	Operational	Not Operational	Doesn't Exist	
249	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
300	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
301	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
302	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
303	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
304A	Student-Staff Space	Yes	Yes	Doesn't Exist	Partially Operational	Operational	
304B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
304C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	

ROOM #	Primary Usage? (Student-Staff Space/ Building Support Space/ Inaccessible/ Room Not Found)	Windows? (Yes/No)	At least one window can be opened? (Yes/No)	Supply Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Exhaust Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Unit Ventilators (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Comments
304D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
304S	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
305	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
306	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
308	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
310	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
311	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
312	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
314	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
316	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
317	Student-Staff Space	Yes	Yes	Operational	Not Operational	Doesn't Exist	
318	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
321A	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
321B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
321C	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
321D	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
321S	Student-Staff Space	Yes	Yes	Operational	Operational	Operational	
323	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
324AB	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
325	Student-Staff Space	Yes	Yes	Doesn't Exist	Partially Operational	Operational	
326	Student-Staff Space	No	No	Operational	Not Operational	Doesn't Exist	
327	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
329	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
331	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
332	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
334	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
335	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
336	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
338	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
339	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
342	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
343	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
346	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
348A	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
348B	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
348C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
348D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
348S	Student-Staff Space	No	No	Operational	Not Operational	Operational	
350	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
352	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
400	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
401	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
402	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
403	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
404B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
404C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
404D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
404S	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
405	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
406	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
408	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
409	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
410	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
411	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
414A	Student-Staff Space	Yes	Yes	Doesn't Exist	Partially Operational	Operational	
416	Student-Staff Space	Yes	No	Doesn't Exist	Doesn't Exist	Operational	
417	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
418	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
421A	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
421B	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
421C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
421D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
421S	Student-Staff Space	No	No	Operational	Doesn't Exist	Doesn't Exist	
423	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
424	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
425	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
426	Student-Staff Space	No	No	Doesn't Exist	Not Operational	Doesn't Exist	
429	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
429A	Building Support Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
431	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
433	Student-Staff Space	Yes	Yes	Doesn't Exist	Partially Operational	Operational	
434	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
435	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
440	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	

ROOM #	Primary Usage? (Student-Staff Space/ Building Support Space/ Inaccessible/ Room Not Found)	Windows? (Yes/No)	At least one window can be opened? (Yes/No)	Supply Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Exhaust Fan (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Unit Ventilators (Operational/ Partially Operational/ Not Operational/ Doesn't Exist/ Cannot Access)	Comments
441	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
443	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
444	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
446	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
448A	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Not Operational	
448B	Student-Staff Space	Yes	Yes	Doesn't Exist	Not Operational	Operational	
448C	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
448D	Student-Staff Space	Yes	Yes	Doesn't Exist	Operational	Operational	
448S	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
450	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
452	Student-Staff Space	Yes	Yes	Doesn't Exist	Doesn't Exist	Operational	
AUD	Student-Staff Space	No	No	Cannot Access	Operational	Doesn't Exist	
C30	Student-Staff Space	No	No	Doesn't Exist	Not Operational	Operational	
C34	Student-Staff Space	No	No	Operational	Not Operational	Doesn't Exist	
C36	Student-Staff Space	No	No	Doesn't Exist	Not Operational	Doesn't Exist	
C39	Student-Staff Space	No	No	Operational	Not Operational	Doesn't Exist	
C40	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
C44	Student-Staff Space	No	No	Doesn't Exist	Not Operational	Doesn't Exist	
C52	Building Support Space	No	No	Doesn't Exist	Doesn't Exist	Doesn't Exist	
Cafeteria Toilet-Boys	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
Cafeteria Toilet-Girls	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	
GYM	Student-Staff Space	No	No	Operational	Operational	Doesn't Exist	
KIT	Student-Staff Space	Yes	Yes	Operational	Partially Operational	Operational	
Toilet-Boys	Student-Staff Space	No	No	Operational	Not Operational	Doesn't Exist	
Toilet-Girls	Student-Staff Space	No	No	Doesn't Exist	Operational	Doesn't Exist	



White Paper on

Ventilation for Industrial Settings during the COVID-19 Pandemic

by

American Conference of Governmental Industrial Hygienists (ACGIH®)

Industrial Ventilation Committee

August 2020

Preamble

This White Paper, developed by the Industrial Ventilation Committee of the American Conference of Governmental Industrial Hygienists (ACGIH®), originates from concern about the proper use of ventilation controls in industrial workplaces where SARS-CoV-2 (the Coronavirus responsible for COVID-19) is potentially present. This volunteer committee, with expertise in industrial ventilation, offers guidance on the topic of industrial ventilation to industrial/commercial facilities that are planning operational controls to reduce the impact of the COVID-19 pandemic for employees returning to work around the world. These *recommended practices* are intended as guidance for Occupational and Environmental Health and Safety professionals and others including plant managers as they seek to mitigate exposures for their workforce during the COVID-19 pandemic.

Included within this paper are COVID-19 exposure control strategies that consider all of the traditional industrial hygiene Hierarchy of Controls. It will provide some practical suggestions about the use of ventilation principles and concepts that can help reduce worker exposure to droplets and aerosols that may contain Coronavirus-19. It will also communicate some simple guidelines and principles that can be used to select and design ventilation controls to limit the spread of Coronavirus disease. This White Paper will NOT opine on heating, ventilation and air-conditioning (HVAC) systems and other ventilation systems that are used in office situations, as they have been addressed by ASHRAE in recent documents (ASHRAE, 2020).

The design of an overall exposure control strategy in a facility within the context of Coronavirus-19 will likely require a combination of control strategies. Currently available information characterizes this biological hazard as:

- potentially severe in its effects,
- highly contagious,
- associated with a significant percentage of infectious, although asymptomatic, individuals,
- transmitted person-to-person,
- initiating respiratory infection through inhalation and contact with the eyes, nose, and mouth, and
- having an unknown infectious dose range at the time of this writing.

Therefore, these guidelines address possible courses of action regarding the use of industrial ventilation systems for local exhaust, dilution, and convective cooling purposes within the context of prevention of transmission of Coronavirus-19. The type of industry, worker occupation, exposure profile, climate, facility layout, and indoor environmental conditions will affect how these guidelines should be implemented.

Introduction and Background

Coronavirus Disease 2019 (COVID-19) is associated with a pathogenic novel coronavirus (SARS-CoV-2 or Coronavirus-19 for the purpose of this document) from the same family of viruses responsible for the Severe Acute Respiratory Syndrome (SARS) outbreak experienced between 2002 and 2004. COVID-19 is caused by a single-stranded RNA virus with a lipid envelope that has a diameter of approximately 120 nm (wetted particle size larger) (Zhu, 2020; CDC, 2020).

Symptoms associated with COVID-19 vary by age and health status from mild flu-like symptoms to severe respiratory distress and death. According to the Centers for Disease Control and Prevention (CDC), individuals with increased susceptibility to more severe COVID-19 illness include those over 60 years of age and those with underlying health issues, such as serious cardiovascular conditions, moderate to severe lung disease or asthma, immune system deficiencies, obesity, and underlying medical conditions (such as diabetes, or renal or liver disease) (CDCa, 2020). In addition, a proportion (5%–80%) of infected individuals may not show symptoms (asymptomatic) (Oxford University, 2020; Oran and Topol, 2020).

Disease transmission has been demonstrated to occur person-to-person and is thought to occur through:

- propulsion of large droplets generated from coughing and sneezing directly into the face, nose, eyes, and mouth of someone nearby (droplet transmission),
- inhalation of infectious particles generated by breathing, talking, singing, coughing, and sneezing that remain suspended for lengthy periods or are distributed by indoor air currents (aerosol transmission) (Jones, 2015), and
- contaminated hand-to-mucus membrane contact (contact transmission) (CDCb, 2020).

Airborne transmission (inhalation of infectious particles at a long distance from the source, e.g., through a ventilation system) cannot be ruled out given the potential extended viability of Coronavirus-19 in air (van Doremalen et al., 2020) as shown in laboratory experiments (CDCd, 2019).

Currently, there is uncertainty as to how many virions (viruses) are required to achieve an infectious dose (i.e., how much virus is necessary to infect someone) and about the nature of droplet, aerosol and airborne transmissions including relevant particle sizes, particle behavior over time, and the amount of viable virus present in a given aerosol particle. Since aerosols are a potentially important route of exposure, their control must be considered in a larger, overarching strategy for minimizing Coronavirus-19 transmission in industrial settings. Ventilation, as a type of engineering control, can play an important role in controlling exposure to an infectious aerosol in an indoor industrial workplace.

Hierarchy of Controls

As part of the normal hazard assessment, experts such as Certified Industrial Hygienists (CIHs) should inspect and evaluate each area of the workplace through the Hierarchy of Controls lens to determine how best to protect workers. This assessment involves noting all processes and conditions that have the potential to harm employees through chemical/dust

exposures, hazardous energy, dangerous machinery, etc. During the current pandemic, it is necessary to look for instances that may increase the risk of worker exposure to the virus.

This worker exposure will primarily be through prolonged close proximity to other workers who are infected, but exposure could also include the use of shared tools, inadequate or poorly directed ventilation, and close contact associated with an excessive number of employees in common areas (such as cafeterias) at one time.

As shown in Figure 1, the methods of controlling a hazard generally become less effective moving down the hierarchy. **Elimination** requires source removal, which could involve removing infected individuals from the workplace through screening or testing, assigning remote work (where possible) or limiting the number of individuals in a space at one time (and enforcing social distancing) to lower airborne concentration. **Substitution**, replacing the source with something less hazardous, may not be relevant although automation (e.g., robots) may be useful in some instances. **Engineering controls, administrative controls and personal protective equipment (PPE)** all have a place in protecting workers during the pandemic. While engineering controls are generally most protective for workers, due to the nature of the virus and the limitations of most industrial ventilation systems, administrative controls or some form of personal protection may also be essential in combination with engineering controls, such as ventilation.

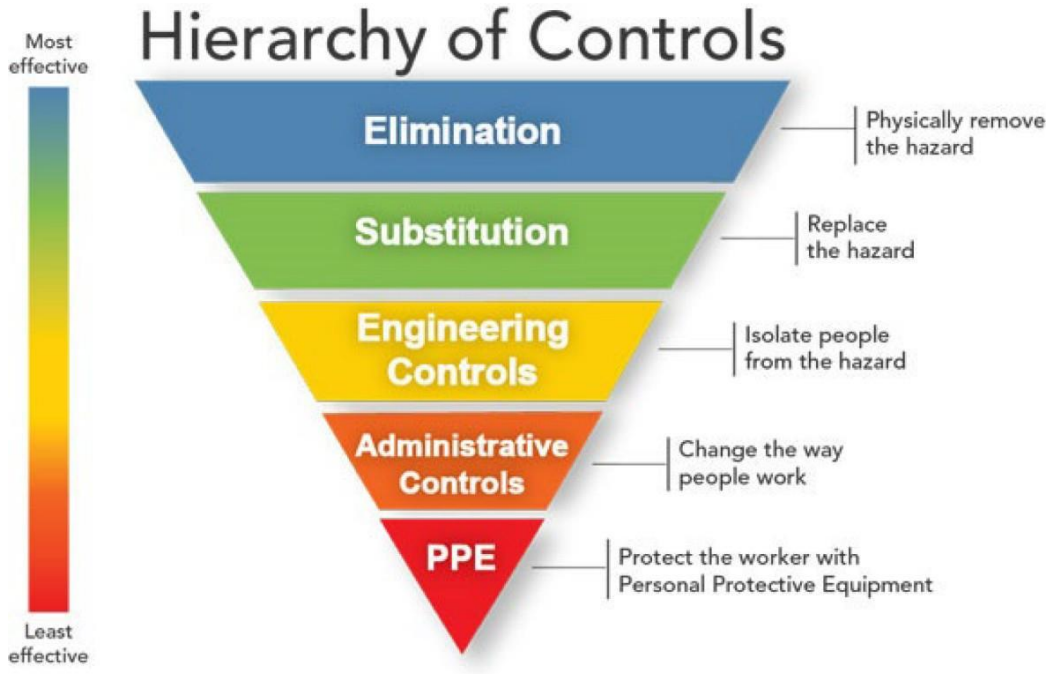


FIGURE 1. Hierarchy of Controls (NIOSH, 2020)

Engineering Controls

Basic Principles for COVID-19 Ventilation in an Industrial Setting

Ventilation, if designed and implemented properly plays a critical role in mitigating disease by reducing droplets and aerosols in air, and subsequent airborne transmission. The two types of ventilation that can impact concentration include general exhaust ventilation (GEV) in the form of dilution ventilation, and local exhaust ventilation (LEV). Dilution ventilation occurs when contaminants of concern within a space are reduced by removing contaminated air and replacing it with clean air. This may be accomplished either by 1) replacing room air parcels with clean ones (plug or laminar flow, 50–150 feet per minute) (see Figures 2 and 3), or 2) diluting existing contaminated air with cleaned, outside air using mixing (see Figure 4). Alternatively, LEV occurs when contaminants generated within a space are captured using exhaust capture devices (e.g., hoods) at or close to the source.

In order to fully understand how a ventilation system is working, an audit should be conducted to determine where and how air enters and exits from the space. Then a general idea about the overall airflow pattern can be estimated. For any air that is being recirculated, such as from LEV or from office spaces, the ability to remove as much of the virus load as possible before reintroducing the air is critical. (See section titled Filtration in this document and ASHRAE 2020 document.)

1. General Exhaust Ventilation

For typical industrial applications, the intent of dilution ventilation is to either replace parcels of contaminated air or dilute those parcels with clean, outside air (or filtered recirculated air) to reduce the contaminant level below some recommended level to avoid worker overexposures and adverse health effects. In the case of Coronavirus-19, where each worker is a potential contaminant source, the airflow pattern is the most critical issue to determine, modify, and control.

Dilution ventilation consists of exhaust fans that pull air through exhaust openings in the workspace and the makeup air and supply fans that replace the air that was removed. The makeup air may come from supply fans or openings in the building envelope such as windows, doors, or vents.

If open doors, windows, or vents are currently the only source of available replacement air, consideration should be given to installation of a ducted, powered air system, with airflow introduced at or near the floor level so the replacement air can move past a worker and up to the exhaust without passing other workers (combined with social distancing practice). If there is an existing supply air system, consider modifying the system to duct and deliver the air at or near floor level. Figure 2 illustrates an example of an appropriate supply/exhaust airflow arrangement.

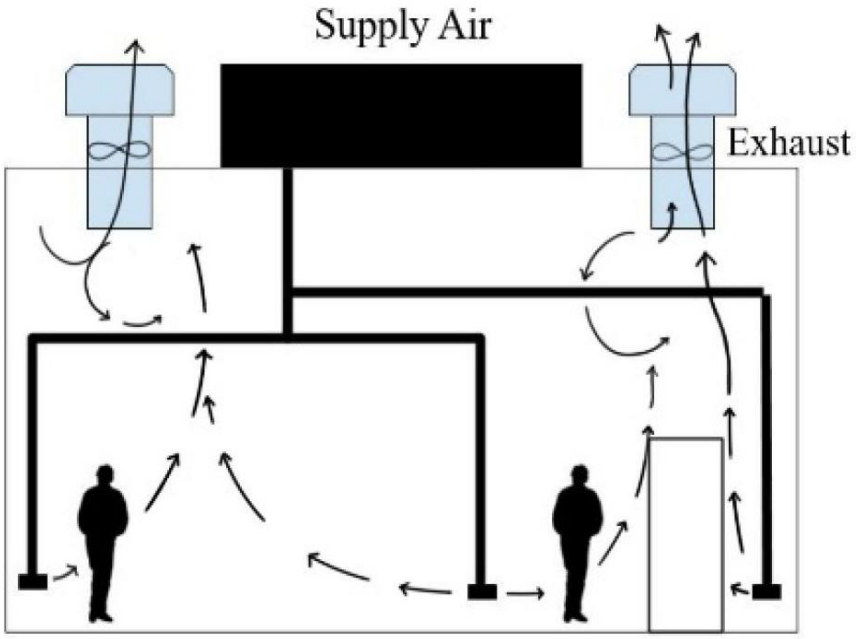


FIGURE 2. Displacement Ventilation

Vertically directed dilution ventilation, taking advantage of thermal displacement (warmer air at the breathing zone rising up toward the exhaust source) should effectively reduce risk of worker exposure to potentially infectious aerosols exhaled or generated by other workers. To understand thermal rise for a human being, consider the fact that the air expelled from human lungs is significantly lighter and more buoyant than most air because of its inherent relative humidity and human body warmth (see Figure 3). In general, replacing air at low velocities is preferable to mixing air with high velocities when a high toxicity contaminant is present. In certain applications, turbulent mixing may increase the potential for employee exposure.

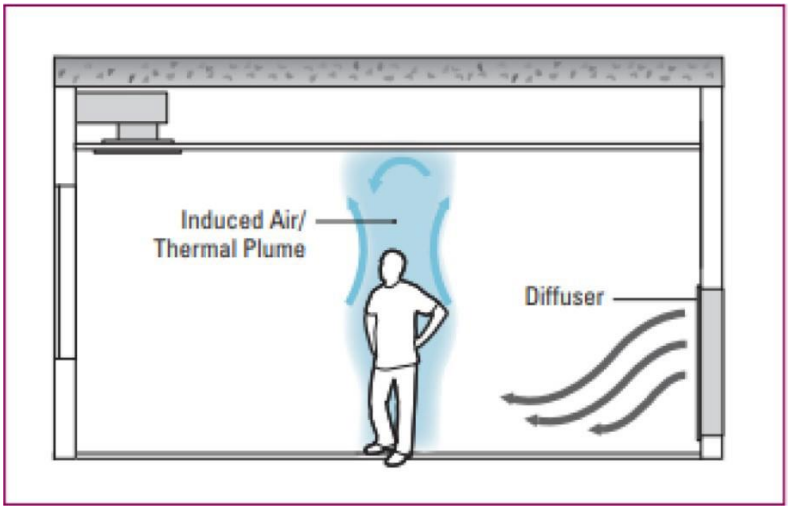


FIGURE 3. Thermal Plume in Displacement Ventilation (Courtesy of Price Industries)

2. Local Exhaust Ventilation

LEV utilizes dedicated exhaust fans and ducts to capture contaminants at their source, keeping them from creating potential exposures. See Chapters 5, 6, and 7 in *Industrial Ventilation: A Manual of Recommended Practice for Design,* 30th Edition (the "Design Manual") (American Conference of Governmental Industrial Hygienists, 2019). Examples of LEV in industrial settings include fixed or portable snorkels for capturing welding fumes or downdraft tables for capturing grinding particles in metal working applications. See VS-80-01 and VS-90-02 in the Design Manual (American Conference of Governmental Industrial Hygienists, 2019). LEV offers the advantage of much lower airflows and lower volume of make-up air. The major disadvantage of LEV is that the capture point is fixed and not always located at the point of contaminant generation (in the case of Coronavirus-19, the worker's face). To protect the worker from workplace contaminants, the worker should be located upstream of the contaminant when possible, not positioned downstream of another potentially infectious worker.

3. Fans

Large ceiling fans will cause downflow of air around workers and potentially return buoyant viral particles back towards worker breathing zones. Taking the large ceiling fans offline during a pandemic should be considered. Ideally, air replacement at or near the floor in the building with roof exhaust is preferred to promote displacement ventilation and establish the optimal direction of airflow. However, where displacement ventilation cannot be established, mixing air using ceiling fans with dilution ventilation may be the only practical alternative (Figure 4).

Personal cooling fans are another source of air movement. Without the benefit of perspiration/evaporative cooling, many industrial workers could suffer harm from heat-stress related illnesses. Therefore, personal cooling fans should **NOT** be removed in industrial settings without regard for worker health. By ensuring that the air source moved by the cooling

fan is originating from a cleaner area and not near another worker, these fans can provide safe cooling airflow. It is important to make sure that a fan does not blow air from one worker to another. The preferred airflow arrangement is vertical displacement with supply coming in above the floor baseboard level and being exhausted at or near the ceiling.

A study from a recent COVID-19 outbreak in a restaurant (Jianyun Lu, 2020) indicates that a high-velocity HVAC air current induced a countercurrent flow vector that appears to have effectively spread the virus to a number of other patrons who were in or very near the airflow pattern but still proximate to the primary infectious individual. Ventilation practitioners should keep in mind the potential for eddy currents and other airflow disturbances to avoid virus transmission.

4. Filtration

Filtration at the appropriate level may be capable of conditioning air to a contaminant level that is equal to or reasonably as clean as outside or “fresh” air. Replacing air is important, measured as air changes per hour (ACH) or the total air delivered to a space per hour divided by the volume of the space. Both mixing ventilation (turbulent flow) and displacement ventilation (streamline or plug flow) have application in dilution ventilation schemes as the application demands. See Figure 4 for both of these concepts. [The white box shown in the corner is a low-velocity non-turbulent supply diffuser.]

ACH = CADR (ACFM) × 60 (min/hr)/room volume (cu ft)

CADR = airflow rate (ACFM) × removal efficiency

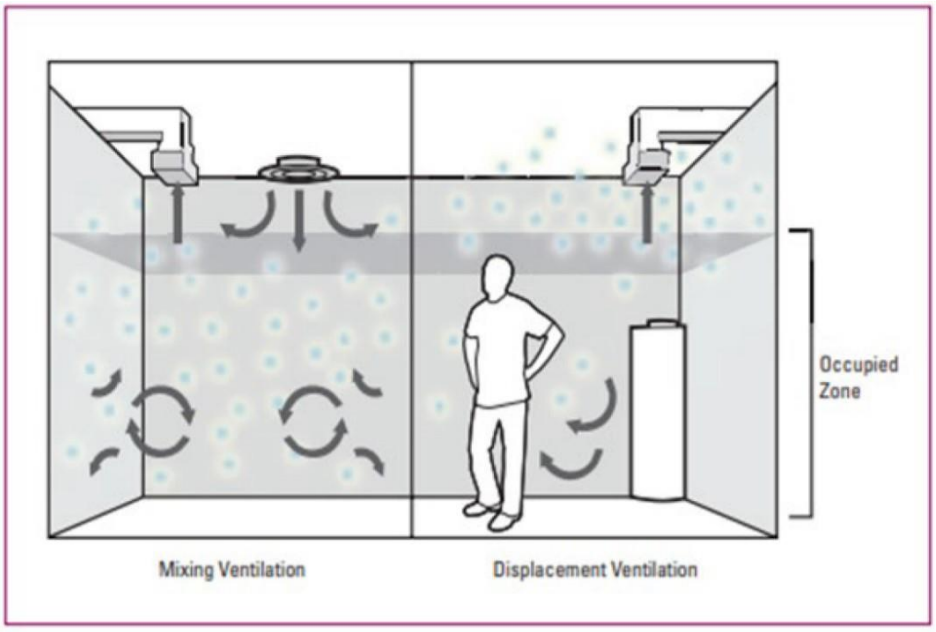


FIGURE 4. Mixing vs. Displacement Ventilation

Filtration of 99+% of particles requires high efficiency particulate air (filtration, HEPA) (ASHRAE MERV 17; MERV—Minimum Efficiency Reporting Value) or greater efficiencies, and existing make-up air and recirculating systems are not typically capable of handling true HEPA filtration due to the high pressure drop and size constraints of this type of filter. However, a recent ASHRAE study shows that *electret (electrostatic charged)* MERV 13 or 14 filters are capable of high filtration efficiencies on viral particles (89%–97%) with filter sizes similar to existing MERV 5–8 "throwaway" filters commonly used in HVAC applications (Zhang et al., 2020). Figure 5 shows the efficiencies of various MERV rated filters. The blue shaded areas indicate the size of particles created by humans while breathing normally (light blue), and with other respiratory activities (dark blue) (Parienta et al., 2011).

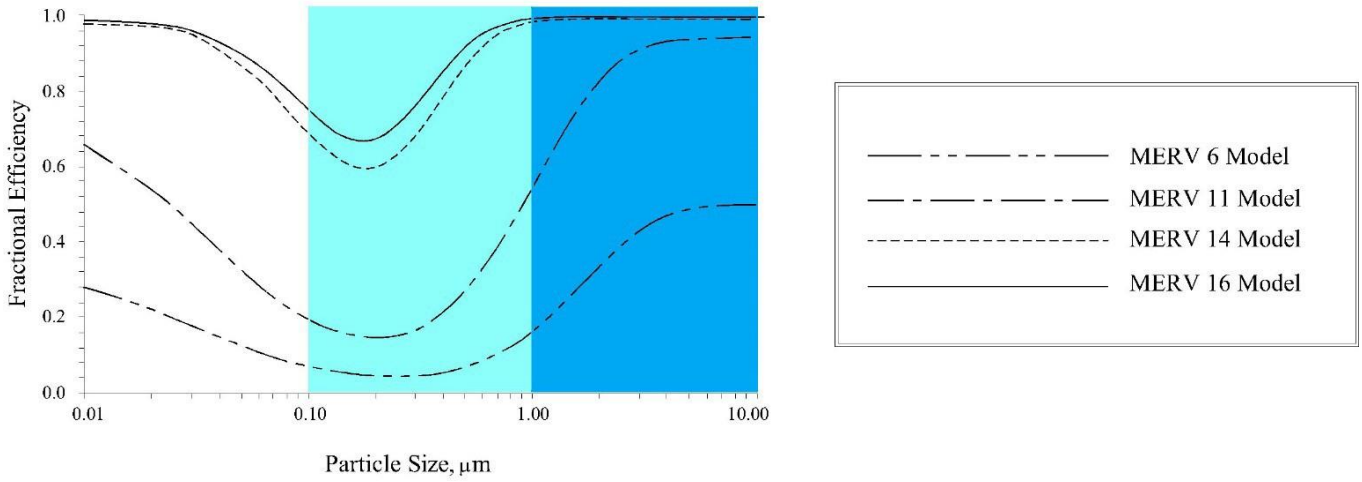


FIGURE 5. Filtration Efficiency at Different Particle Sizes for Different MERV Efficiencies (Figure adapted from ACGIH® 2019)

In addition, it should be known that air filtered through conventional fabric filter (baghouses, etc.) and electrostatic precipitators are capable of similar efficiencies and specifically that a "seasoned" fabric filter typically exhibits a similar efficiency to HEPA filtration. These dust collector style filters will also reduce the risk of Coronavirus-19 distribution and transmission as long as the air is reintroduced to the plant in a non-turbulent fashion and in a manner that establishes the preferred airflow direction (see Chapter 8 of the Design Manual)

Portable HEPA filtration units could be useful if placed in close proximity to workers who remain in place during their working day. These units have a limited area of influence and many units do not meet their stated efficiency, particularly the electrostatic units. These portable units should be considered carefully before purchase and use. Existing portable HEPA filtration should not be turned off, but one should consider the potential for exposure of

downstream individuals if an infected worker is located between the unit and other individuals in the same room.

Employers should investigate the use of improved filtering systems that may be available and either compatible or potentially fitted to their existing air handling systems. Good examples of this are ‘electret’ filters and electrostatic precipitators (ESPs). Both of these filtration technologies are robust, have been used effectively for many years, and remove fine and ultrafine particles with predictable success. Placed in series within an air handling system, they could be effective in the capture and reduction of Coronavirus-19 in air. Seek professional design help before modifying any air handling system.

Paint-spray and other large exhaust booths are useful in reducing Coronavirus-19 exposure risks because they require the facility ventilation system to supply large amounts of outdoor (replacement) air. In addition, workers stationed in the booth have a low risk of Coronavirus-19 exposure due to the high air volume turnover rates.

Local exhaust hoods are typically not effective in capturing particles at more than one hood diameter away from the hood inlet. At three times the hood diameter, aerosols are significantly more influenced by room currents than by the LEV (see Chapter 6, Hood Design, of the Design Manual). This does **NOT** mean that LEV systems should be turned off during a viral pandemic. In fact, they are an important source of reducing local airborne virus concentrations. LEV systems evacuate air from the space creating a negative pressure gradient therefore encouraging air at higher pressure (outside the building) to infiltrate in an attempt to balance the pressure difference between inside and outside. Permit LEV systems to operate continuously while workers are present. In a general sense, LEV systems are designed to replace exhausted air with makeup air unless it is a recirculated system. As usual, maintain makeup air systems to reduce air sweeping into the workspace through open doorways and windows.

All established LEV systems should continue to be used for existing workplace hazards. The presence of a new hazard – infectious aerosols – does not negate or change the ongoing need for continued protection of workers from all other hazards. As with any new hazard, assessment of exposures and selection of controls must be done in the context of all hazards. Allow the GEV and LEV systems to operate continuously or long enough to allow for several complete air changes following the departure of all building occupants. If the system is shut down or set back overnight (i.e., between work shifts), return to full operating conditions prior to occupant return. Permit LEV systems to operate continuously. If variable air volume laboratory hoods are present, leave the hood sash in the up position to allow for maximum airflow and maximum air volume to be exhausted when not in use by workers.

If an industrial site has an HVAC system for the purposes of general dilution and comfort control, it may be appropriate to:

- Increase the amount of outdoor air supplied by the system to the maximum capacity permitted by the system. Additional considerations include climate and local air quality (e.g., humidity).
- If air is recirculated, a MERV 13 or better filter is recommended to improve the capture of infectious aerosols.

- Consult with a ventilation system engineer to ensure that the system is operating correctly, is well-maintained and can accommodate the added pressure drop caused by a MERV 13 or better filter.
- Depending on the actual air exchange rate and number of occupants, it may be appropriate to operate the HVAC system for an extended period of time after all occupants have departed, to ensure adequate clearance of infectious particles.

In restrooms, the following practices are recommended:

- Restroom fans should be operated continuously and should exhaust directly outdoors.
- To minimize aerosolization of infectious particles not removed by handwashing, disposable paper towels should be used for hand drying, rather than air dryers.

3. Room/Building Pressurization

An additional ventilation control technique is room pressurization. By adjusting the volumes of air entering and leaving a particular space, that space can be balanced to become positively, negatively, or neutrally pressurized. Slightly positively pressurized spaces tend to keep air from coming in from outside to control contaminants from the adjoining space. Negatively pressurized spaces tend to limit the escape of contaminants generated within the space such as with airborne infection isolation rooms and autopsy rooms. These required conditions may have application to the ventilation schemes addressed above and should be considered. It is recommended that the ventilation professional at industrial facilities consider positive or negative room pressurization to potentially control the spread of COVID-19 in their facilities.

Additionally, an entire facility or large workspace can be positively pressurized, thereby eliminating indraft currents that may cause unpredicted airflow from one employee towards another. Bringing a facility under positive pressure (vs. atmospheric pressure) causes the area to have a mixing factor (m_i or K factor) of 1. This technique is discussed in Chapter 11, Supply Air Systems, of the Design Manual. Consult local codes for compliance.

4. Ultraviolet Germicidal Irradiation

Ultraviolet germicidal irradiation (UVGI) has been used for supplemental engineering control (ventilation being the primary control technique) of airborne microbial contamination in indoor spaces. It has been most commonly used in homeless shelters and hospitals. UVGI systems have been applied for disinfection and inactivation of fungal and bacterial microorganisms for sixty (60) years or more; they have been examined in remote applications including in ducts, inside filter banks, and also in point-of-use and upper room (ceiling return) applications. UVGI has been determined to provide a viable, supplemental control technology for Coronavirus-19 applications. However, a thorough treatment of this topic is beyond the scope of this paper; additional information can be found in ASHRAE, 2019. Note: The use of UVGI at typical wavelengths (i.e., ~254 nm, UVC) requires protection from the light emitted from the UV source for employees, maintenance personnel, and other room occupants, as UV exposure is harmful to human skin and eyes at relatively low source power.

Before World War II, much research was conducted on the germ-destroying ability of UV light, which later diminished with the advent of antibiotics. Recently, however, due to the pandemic a resurgence of interest in the use of UVGI has brought this technology back as a valid viral inactivation treatment for large amounts of air that may be readily applied to the manufacturing workplace. One must do the research to determine whether the UVGI vendor truly understands the application and requirements for effective virus inactivation. UVGI effectiveness requires addressing the ability of the system design to meet the specific conditions while considering the light wavelength, the contact time and the distance from the source (intensity), which are the primary criteria for effective disinfection by UVGI.

Administrative Controls

Administrative controls are ways of changing how employees conduct their job that will tend to limit their risk of exposure to hazards. Some administrative controls may reduce the potential for worker exposure to infectious aerosols. A number of these are mentioned below.

- Inform all employees about the hazards and symptoms of COVID-19. Tell them to stay home or to leave work if they feel sick.
- Provide a station to screen employees entering the building using a standard questionnaire and non-contact temperature measurement device.
- Provide training for all employees about rules for social distancing, sanitation, handwashing, and sick leave policies. Have a plan to separate sick employees if someone fails the health check or becomes ill during the workday.
- Develop enhanced cleaning and sanitation plans for the entire facility. Use EPA-registered disinfectants that are effective against Coronavirus-19. A link to this list may be found here (EPA, 2020).
- Remind employees to stay six (6) feet apart with signage and by placing marks on the floor or using stanchions. Workers should be reminded about maintaining social distancing during breaks, in restrooms, and when entering and leaving the facility.
- Supply additional handwashing stations to facilitate regular handwashing. No touch hand sanitizer dispensers should also be supplied for times when workers cannot wash their hands with soap and water.
- Remind employees to cover their coughs and sneezes with their elbow or a tissue. Dispose of the tissue and wash hands afterward. This can be accomplished with signage.
- Arrange workstations to allow for adequate physical distancing – at least six (6) feet – between workers. This may require rerouting aisles to keep workers from passing too close to one another. One-way (i.e., unidirectional) aisles are another way to avoid workers coming into close contact with one another (Figure 6).
- Supply paper towels, tissues, and no touch waste receptacles.

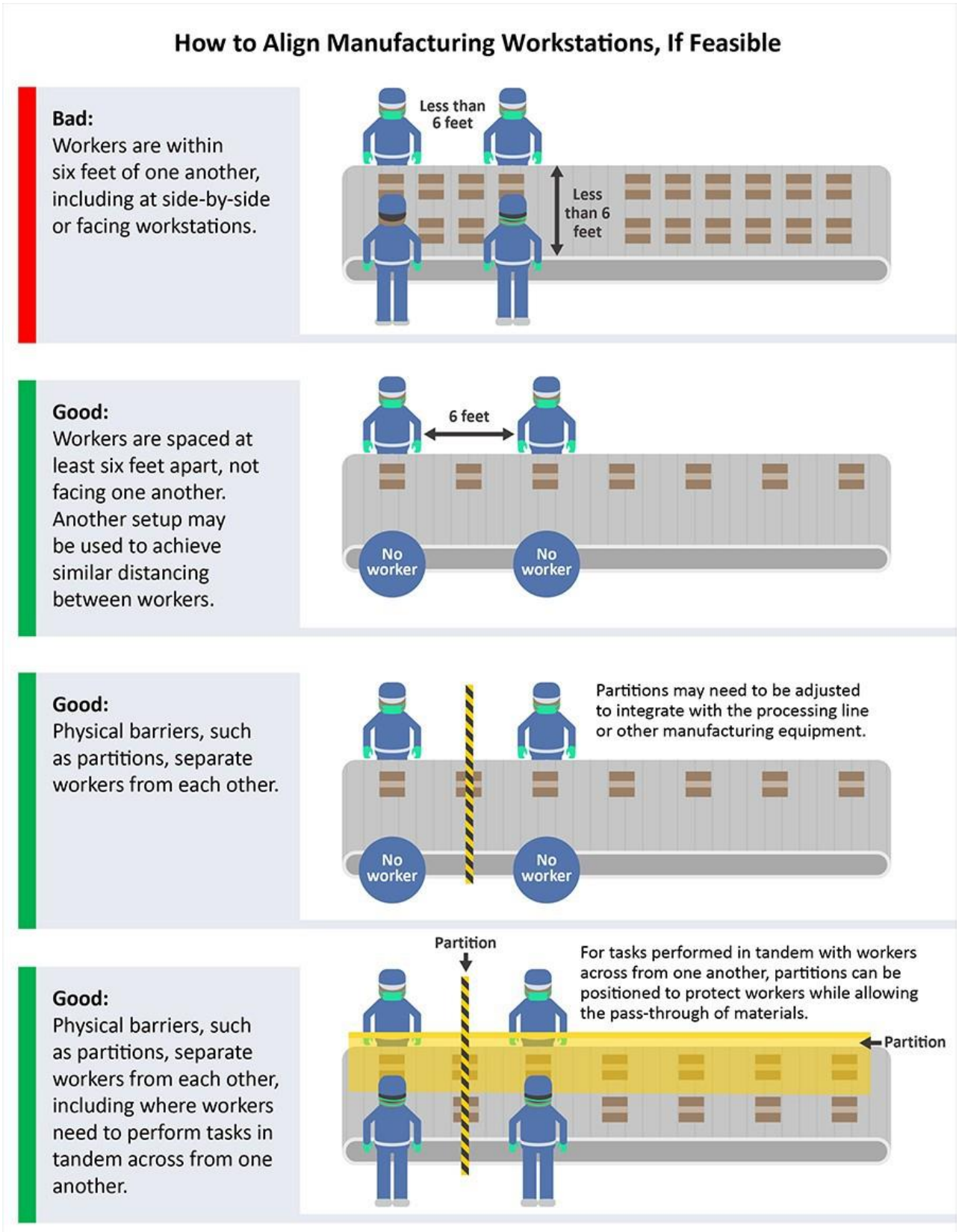


FIGURE 6. How to Align Manufacturing Workers (CDCc, 2020)

Personal Protective Equipment

PPE, particularly respiratory protective equipment (RPE), is usually the least favorable choice in the Hierarchy of Controls strategy. However, due to the uncertainties associated with COVID-19 transmission and the unknown infectious dose, most localities are requiring that individuals wear cloth face coverings or a form of respiratory protection. A cloth face covering helps protect others from respiratory droplets, but it does NOT protect the person wearing it or others from smaller particles. If everyone in the workplace wears a cloth face covering, it is expected that the risk of exposure to Coronavirus-19 will be decreased by limiting droplet exposure. It is important to recognize that only NIOSH-certified respirators are true RPE that provide reliable protection for the wearer. Surgical and similar procedural masks (including cloth face coverings) are primarily for protecting others from contaminants exhaled or generated by the wearer. To protect the wearer from Coronavirus-19 exposure, current guidelines indicate that a NIOSH-certified N95 filtering facepiece respirator affords the minimum recommended protection. Such a respirator must be properly fitted and used on a clean shaven face. In locations such as meat packing facilities, where employees actively work within 6 feet of each other, engineering controls (such as ventilation and barriers, see Figure 6) alone should NOT be relied upon to provide the protection needed for continued worker health. PPE such as respirators may be required for control of potential exposure to Coronavirus-19 during this type of work.

CDC recommends wearing cloth face coverings as a protective measure in addition to social distancing (i.e., staying at least 6 feet away from others). Cloth face coverings may be especially important when social distancing is not possible or feasible based on working conditions. Cloth face coverings are not PPE or RPE. They are not appropriate substitutes for PPE such as respirators (like N95 respirators) or medical facemasks (like surgical masks) in workplaces where respirators or facemasks are recommended or required to protect the wearer (OSHA, 2011).

A cloth face covering may reduce the amount of large respiratory droplets that a person spreads when talking, sneezing, or coughing. Cloth face coverings may prevent people who do not know they have been infected with the Coronavirus-19 virus from spreading it to others. Cloth face coverings are intended to protect other people—not the wearer (CDCc, 2020). Employers who determine that cloth face coverings should be worn in the workplace, including to comply with state or local requirements for their use, should ensure the cloth face coverings are worn appropriately (CDCe, 2020)

Important Suggested Measures

- Increase the outdoor air supply to 100%, if possible, or to the maximum allowed by the capabilities of the ventilation system. Some additional considerations include the climate, air pollution, and system capacity, and making sure the outdoor air intakes are clear and not drawing air from a parking lot, traffic side of building, or near smoking areas or loading docks. Make sure the ventilation system is performing as designed and has been properly maintained per ASHRAE 62.1.
- Maintain between 6 and 12 ACH, which will provide greater than 99% purge in 30–60 minutes (CDCd, 2019).
- Increase the filtration efficiency of the system to MERV 13 or as high as the filter racks and fan pressure drop will allow. System designers should attempt to accommodate Tier 1 MERV filters (MERV 13 and 14) in their current and future designs, as applicable, to ensure best airflow through the system with equipment that can withstand the added pressure drop.
- Provide additional dilution ventilation to disperse small airborne particles. Dilution ventilation should be introduced into the facility at low velocities at floor level whenever possible, with directed flow toward exhaust fans above, and spread over large areas.
- Allow the ventilation system to operate continuously if the building is occupied or long enough to allow for several complete air changes following the departure of all building occupants. If the system is shut down or set back overnight, return to full operating conditions prior to occupant return.
- Make sure restroom fans operate continuously and are exhausted directly outdoors with exhausts away from facility ventilation supply intakes. Temporarily disable or discontinue use of hand dryers in restrooms and replace with disposable paper towels.
- Allow LEV systems to operate continuously while attended. If variable air volume laboratory hoods are present, leave the hood sash in the up position to allow maximum airflow and maximum air volume to be exhausted when not in use.
- General airflow direction should be from cleaner air to less clean air, and processes and workers should be placed on the cleaner side of the airflow pattern within this general airflow pattern to reduce their exposures. Avoid having personal or pedestal fans blow from one person to another. Remember they will blow 30–40 times the fan diameter very effectively.
- Typically, more outdoor air is better. However, high velocity currents passing through open doorways or from a pedestal fan can project viruses hundreds of feet in rapid fashion (although some dilution will also occur). Where inflow occurs at high velocity near workers, attempt to diffuse large air currents by directing or blocking the flow stream to avoid moving the air from person to person. Expanded metal and perforated or unperforated screens are very effective to diffuse large air masses at high velocity.

Useful Resources for COVID-19 Related Information

CDC (Centers for Disease Control and Prevention). Coronavirus (COVID-19) (cdc.gov/coronavirus/2019-nCoV)

Businesses and Workplaces (https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/businesses-employers.html)

Cleaning and Disinfecting (https://www.cdc.gov/coronavirus/2019-ncov/community/clean-disinfect/index.html)

Guidance for Reopening Buildings after Prolonged Shutdown or Reduced Operation (https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html)

Worker Safety and Support (https://www.cdc.gov/coronavirus/2019-ncov/community/worker-safety-support/index.html)

OSHA (Occupational Safety and Health Administration). COVID-19. (osha.gov/SLTC/covid-19)

National Safety Council. Guidance for Employers: COVID-19 and the Workplace. (https://www.nsc.org/work-safety/safety-topics/coronavirus)

EPA (Environmental Protection Agency). Coronavirus (COVID-19). (epa.gov/coronavirus)

AIHA (American Industrial Hygiene Association). Coronavirus Outbreak Resource Center. (aiha.org/public-resources/consumer-resources/coronavirus_outbreak_resources)

National Association of Manufacturers. Covid-19 Resources (nam.org/coronavirus)

ACGIH. Industrial Ventilation: A Manual of Recommended Practice for Design, 30th Edition

ACGIH. Bioaerosols: Assessment and Control

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CDCe. (2020, August 7). *Coronavirus Disease 2019 (COVID-19)/How to Wear Masks.* Retrieved from How to Wear Masks: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-wear-cloth-face- coverings.html

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VENTILATION FOR PUBLIC BUILDINGS DURING THE PANDEMIC

One day there was no COVID-19, and the next day it was everywhere including in the air. Soon is was clear that masking with cloth, distancing, and sanitizing would only work when the air was not highly contaminated. That meant building operators needed to control the amount of fresh air coming into buildings and replacing contaminated air. However, older buildings often have no ventilation systems at all and relied on occasional air sources such as windows and doors. Buildings with heating and air-conditioning (HVAC) systems often had limitations due to the system's age, design limits, or poor maintenance. In addition, building managers often assumed incorrectly that systems performing in compliance with the appropriate building code standard would be sufficient.

ASHRAE 62.1. The standards for public building HVAC systems are those of the American Society for Heating, Refrigerating and Air-conditioning Engineers (ASHRAE). The most relevant standard for this discussion is ASHRAE 62.1, *Ventilation for Acceptable Indoor Air Quality*. The standard's purpose is stated as follows:

> 1.1 The purpose of this standard is to specify minimum ventilation rates and other measures intended to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimizes adverse health effects.

"Acceptable to human occupants" means providing air that does not result in a significant number of complaints, and "minimizes adverse health effects" means measurable adverse effects in occupants that are related to the poor quality of the air. Unstated in this purpose, but equally important in practice, is saving energy. This puts the emphasis on "minimum" fresh (outside) air to reduce heating and cooling costs and save the building owner or operator money as well.

ASHRAE 62.1 heating and air-conditioning (HVAC) systems accomplishes these goals by drawing a small amount of air from outside of a building into the system and adding it to a much larger amount of recirculated air. Recirculated air is air that has been removed from rooms throughout the building through ducts and returned to the HVAC air handler to be mixed with that small amount of outdoor air. The amount of fresh air is usually under 20 %.

Next this air mixture is adjusted for temperature and humidity, and run through a particulate filter and returned to those same rooms in the building. This cycle is constantly repeated. The speed at which these cycles occur is usually quantified in air changes per hour (ACH)

NEW ASHRAE POSITION. All this changed on April 14, 2020, when ASHRAE published their *Position Document on Infectious Aerosols*. Their new recommendations for"non-healthcare buildings" (e.g., public buildings, schools, etc.) advise "modifications to building HVAC system operation..." which include:

- *Increase outdoor air ventilation (disable demand-controlled ventilation and open outdoor air dampers to 100% as indoor and outdoor conditions permit).*
- *Improve central air and other HVAC filtration to MERV-13... or the highest level achievable.*
- *Keep systems running longer hours (24/7 if possible).*

- Add portable room air cleaners with HEPA or high-MERV filters with due consideration to the clean air delivery rate (AHAM 2015). ....

In addition, ASHRAE 62.1 itself contains directives that it cannot be used for control of a hazardous bioaerosol such as SARS-CoV-2. This is clear in its definition of Class 4 air (ASHRAE 62.1-2016):

4. Class 4: Air with highly objectionable fumes or gases or with potentially dangerous particles, bioaerosols, or gases, at concentrations high enough to be considered as harmful.

5.18.3.4 Class 4 Air. Class 4 air shall not be recirculated or transferred to any space or recirculated within the space of origin.

OTHER AGENCIES AGREE: The American Industrial Hygiene Association (AIHA), the American Conference of Governmental Industrial Hygienists (ACGIH), and the Occupatioal Safety and Health Administration (OSHA) also published consistent opinions.

1) AIHA. In their document: ***Reducing the Risk of Covid-19 using Engineering Controls***, a diagram on page four shows that when a MERV 17 (HEPA) is used, the "Effective Engineering Controls" require ACH of 6 to 12. In addition on page 8 it says that:

In non-healthcare facilities where occupant density cannot be limited to fewer than 1 person per ~30 ft2 (i.e. 6-foot radius), or there is likelihood that infected persons are present, delivering higher air change rates than 6 ACH may be necessary.

2) ACGIH. Their white paper:AD ***Ventilation for Industrial Settings during the COVID-19 Pandemic***, August 2020, page 16, has a list of "Important Suggested Measures." The second bullet point reads: "Maintain between 6 and 12 ACH, which will provide greater than 99% purge in 30-60 minutes (CDCd, 2019)." And note, they refer to the Centers for Disease Control (CDC) for this recommendation (see: cdc.gov/coronavirus/2019-CoV).

3) OSHA. Guidance on Ventilation in the Workplace, OSHA Alert, November 4, 2020, which included the following bullet points:

* Use HVAC system filters with a Minimum Efficiency Reporting Value (MERV) rating of 13 or higher, where feasible.
* Increase the HVAC system¡|s outdoor air intake. Open windows or other sources of fresh air where possible.
* Be sure exhaust air is not pulled back into the building from HVAC air intakes or open windows.
* Consider using portable high-efficiency particulate air (HEPA) fan/filtration systems to increase clean air, especially in higher-risk areas.

Clearly ASHRAE 62.1 cannot be used in the expressed opinion of ASHRAE itself. And the other major standard setting agencies for workplace air and ventilation, AIHA, ACGIH, and the OSHA all recommend upgrading existing HVAC systems. To do this properly, it I first necessary to fully understand ACH, filters, and outdoor air requirements.

AIR CHANGES PER HOUR (ACH). The ceilings of most rooms with these ventilation systems have circular or square "diffusers" where this mixture of recirculated air and fresh air comes into the room. And in other locations, usually also in the ceiling, there are grilles or slots through which the room air is returned to the air handler to go through another recirculating cycle.

When the volume of air coming through the diffuser equals the volume of air in the room, one air exchange has been achieved. This does not mean all the air in the room has been replaced because the air flows slowly into the room through the diffuser and mixes with the air in the room.

In other words, it takes many air changes in order to completely replace the air in a room. And the rate at which these air changes are delivered is measured in air changes per hour (ACH). If you do the math you will also see that the closer you approach 100 % replacement, the longer it takes to remove those last amounts of remaining air. And theoretically, you never remove every last molecule. This phenomena is reflected in Table 1 which shows the time it takes to get from 99% to 99.9 % complete replacement. For this reason, is it easier to use the 99 % figure for replacement.

Diffuser

TABLE 1 - ACH EFFICIENCY

ACH	Time (mins.) required for 99 % replacement	Time (mins.) required for 99.9 % efficiency
2	138	207
4	69	104
6	46	69
8	35	52
10	28	41
12	23	35
15	18	28
20	14	21
50	6	8

THE FILTERS. The ASHRAE rating for filters is the Minimum Efficiency Reporting Value, or MERV. And while they were originally developed to control what ASHRAE deemed as ordinary dust, today we have empirical data on the capture efficiency of these filters at various particle sizes.

Only 16 MERV filters categories were developed originally by the ASHRAE. But since even better filters were needed, the standards for high efficiency particulate filters (HEPA) were adopted by ASHRAE for the MERV 17 to MERV 20 filters. These capture essentially all very small particles such as those from some manufacturers' "clean rooms" or the COVID-19 particles.

THE VIRUS. The COVID-19 virus particles are emitted with the liquid droplets created when we sneeze, cough, sing, talk, and even just breath through our noses. The large visible mist and droplets settle to surfaces quickly and are unlikely be drawn up into the ventilation system. But the smaller ones, especially those under 10 microns in diameter can float in the air for long periods of time.

The longer these tiny droplets remain in the air, the more of the water in them evaporates leaving only mucous and other secretions from our lungs plus the virus itself (which is 0.125 microns in diameter). These dehydrated particles of virus and dry secretions can be in the range of 0.3 to 1.0 microns. Some of these particles have been documented to have remained airborne for many hours. One study's tests showed the particles were are still capable of infecting people after 16 hours.*

FILTERS FOR COVID-19. There is evidence from a study in which the virus has been detected on the through-side of a MERV 15 in both air handlers in a hospital** plus a number of cases of viral transmission that can only be easily explained by ventilation system transmission.

That evidence of ventilation system transmission is in the process of being confirmed. And it should be no surprise since COVID-19 is easily made airborne, it survives many hours in the air, and it is small enough to go through many types of filters and HVAC systems.

TABLE 2 - MERV FILTER PARAMETERS

MERV #	0.1 - 0.3µ*	1.0 - 3.0µ*
9	n/a	35 %
10	n/a	50 %
11	20 %	65 %
12	35 %	80 %
13	50 %	85 %
14	75 %	90 %
15	85 %	90 %
16	95 %	95 %
17 (HEPA)	99.97 %	~100 %

*µ = micron

Commonly, MERV 7 to 10 filters that aren't rated for the fine particles are used and only about 10 to 20 % fresh air is usually provided.

If this is true, the following are both facts:

1. The system meets ASHRAE 62.1 and is compliant with the standards.

2. The system cannot protect occupants from exposure to the virus, even if they all wear masks and keep six feet apart.

HOW VIRUS EXPOSURE OCCURS. The reason an ASHRAE-compliant ventilation system can no longer be considered safe for occupants is that the ASHRAE standard is totally inappropriate for controlling a tiny particle generated inside the rooms by the occupants. This tiny airborne particle can travel on air currents all through the room. If the HVAC system provides the typical two ACH, then the air in the room is only replaced 99 % after over two hours. And if the filter is not a MERV 17, the virus can be recirculated back into rooms in the building.

DISTANCING AND CLOTH MASKS. Only the large droplets are likely to settle within six feet in still air. The tiny aerosol particles float on air currents all over the room and around barriers and shields. The N95 masks can capture 95 % of these tiny particles, but the more commonly used cloth masks are only meant to stop the large droplets expelled by the person wearing the mask.

PERCENTAGE OF FRESH AIR. The last piece of this puzzle is the percentage of fresh air added on each cycle. Many HVAC systems provide 10 to 20 % fresh air. This is too low to sufficiently dilute the virus particle in the air. Resetting the HVAC system's fresh air intake to 100 % will provide a high level of protection but can raise heating and cooling costs unsustainably. More reasonable strategies involve raising fresh air in tandem with better filters and more ACH.

AIR TESTING. To prove to occupants that the ventilation is providing enough air for good air quality, building owners or engineers often do air testing. They test for the carbon dioxide that is emitted when people breathe which can accumulate to uncomfortable levels when there is insufficient fresh air. ASHRAE 62.1 limits the amount of carbon dioxide (CO_2) to 700 parts per million above outdoor air levels. But since the source of the CO_2 is people's breath, this test is only valid when the building has a normal occupancy load. Obviously, ALL rooms that are either empty or have a low occupancy due to distancing will pass the CO_2 test even if they are getting no outdoor air whatever. The test is useless in this pandemic.

Tests for particulates are equally useless since particulates are mostly from outside air. During this crisis, outdoor air is "good" air even if it contains pollution particles. We are safer outdoors than in.

HOW DO WE FIX THIS? The operators of the HVAC system must report to users owners and workers and their unions, data on three ventilation parameters:

1. **Air exchanges per hour.**
2. **The grade of the filter in the air handling unit.**
3. **The percentage of fresh air introduced.**

With these three items available, it is possible to calculate a risk reduction estimate and provide employees and other building occupants with the period of time it would take replace 99 % of the air in various rooms. The two major national industrial hygiene organizations are in basic agreement on strategies that should be considered.

1. AIHA RECOMMENDATIONS. The American Industrial Hygiene Association (AIHA) published a guidance document called *Reducing the Risk of COVID-19 using Engineering Controls*, Version 1, on August 11, 2020. It includes a graphic on page four that plots relative risk reduction against ACH (see Table 3). But these calculations are for a system using a MERV 17 (HEPA) filter. This means that the percentage of fresh air is only relevant to comfort since both fresh and recirculated air meet the objective of being virus-free.

TABLE 3
EFFECTIVE ENGINEERING CONTROLS
(for HVAC systems with MERV 17 filters)

AIR CHANGES/HOUR and Other Methods	**RELATIVE RISK REDUCTION**
12 ACH	99.9 % *
10 "	99 % *
6 "	95 % *
4.5 "	90 %
3 "	78 %
1 "	40 %
Face covering for all occupants	10 %
Face covering for CoV positive	5 %
N95 respirators for occupants	90 %

* AIHA rates these levels as highly effective

The "relative risk reduction" is the theoretical reduction of the risk of getting the virus. They show that 99.9% to 95 % risk reduction can be achieved if six ACH and a MERV 17 filter are used along with masking, distancing and sanitizing. And Table 1 (above) shows that at six ACH, the room is 99 % purged of contaminated air in 46 minutes. And it is these high ACH rates of 6 to 12 that they recommend be used.

The AIHA reports "relative" risk reduction because the absolute risk cannot be known. It is not possible to know if there are no infected people in the room or there are ten. (It is also important to note that face coverings for all occupants only provides an estimated 10 % risk reduction. Distancing also is not very effective against the aerosol.)

This use of the term "relative risk reduction" should serve to remind us that no matter how HVAC systems are run, there are no guarantees. The ventilation reduces that risk by purging the virus from the room in as short a period of time as possible. However, this strategy cannot prevent more virus from being generated by someone who is infected. An occupant working in a room with someone who is infected still may be exposed. Risk can be reduced, but not eliminated.

And the almost 100 % relative risk reduction in Table 3, requires a MERV 17 filter and 12 ACH which can replace (purge) the air in a room in 23 minutes. However, ordinary HVAC systems usually are not able to run with a MERV 17 filter or provide. Some HVAC systems cannot provide 6 ACH and certainly not even higher air changes.

2. ACGIH WHITE PAPER RECOMMENDATIONS. Also in August 2020, the American Conference of Governmental Industrial Hygienists (ACGIH) published their *White Paper on Ventilation for Industrial Settings during the COVID-19 Pandemic.* Their first suggested measure for COVID-19 control (Page 15) is to "Increase outdoor air supply to 100 % if possible, or to the maximum allowed by the capabilities of the ventilation system." If the system is run at 100 % outdoor air, all of the air coming into the building is outdoor air and virus-free. And if, as suggested in their second bullet point, the ACH are maintained between 6 and 12, then a 99 % purge (replacement) of the air can be achieved in 30 to 60 minutes (see Table 1 above).

The ACGIH's third recommendation is to "Increase the filtration efficiency of the system to MERV 13 or as high as the filter racks and fan pressure drop will allow." But actually, if you are running at 100 % outside air, there is no need to have a filter except for reducing outdoor pollution particulates in the incoming fresh air.

The second recommendation is to maintain the ACH between 6 and 12. The third is to increase the filtration efficiency of the "system to MERV 13 or as high as the filter racks and fan pressure drop will allow." It is clear that the two major industrial hygiene organizations are in agreement. The ACGIH also provides information on the need to modify ventilation systems to meet these needs.

But it is clear that the similarities between the AIHA and the ACGIH recommendations are that:

1. **MERV 13 to 17 filters should be used**
2. **The ACH should be between 6 and 12.**
3. **The more outdoor air the better and even running at 100 % outdoor air when the filter is less than a MERV 17 is recommended**

Unfortunately, most buildings do not have HVAC systems with fans powerful enough to push air through the high resistance of a MERV 17 filter. It may be necessary to operate at the least effective MERV 13 that can only capture 50 % of the particles of 0.3 microns. Then if the ACH are raised to six and as much air as possible is provided, (e.g., 40 % as a minimum) an acceptable relative risk reduction may be achieved. Table 4 provides examples of some minimum outdoor air percentages.

TABLE 4
SUGGESTED MINIMUM OUTDOOR AIR (OA) AT 6 ACH

MERV #	MINIMUM OA
17	20 %*
16	25 %
15	30 %
14	35 %
13	40 %
any #	100 %

* Although the efficiency of the MERV 17 essentially removes all small particles rendering the recirculated air virus-free, 20 % outdoor should still be added for comfort and good air quality.

The values in Table 4 are only minimum suggestions. The ACGIH recommends providing as much outside air as possible. It is also clear that increasing the ACH could theoretically allow a decrease in outdoor air. But it would be best practice to add as much as possible.

Buildings whose HVAC systems cannot achieve at least these minimum specifications in the three recommendations above need to be off-limits for theatrical and film workers.

The only other ventilation system that qualifies a building as a usable workplace is the dilution (or displacement) industrial ventilation system.

INDUSTRIAL DILUTION VENTILATION. Occasionally a building will be, or will contain, a shop, studio, or lab that has a 100 % exhaust industrial system. If the air supply for this system is air from the building they are in, this room evaluated based on the quality of the building air's

HVAC system plus the number of ACH provided by the exhaust fans. But if the room has a separate air supply from a make up air unit that brings in and conditions air specifically for that room and if the exhaust fans can provide 6 to 12 ACH for that room, it is acceptable – even preferred.

RECLAIMING ROOMS WITH INADEQUATE VENTILATION. Small rooms, such as light booths, single person offices, broadcasting studios, and similarly sized rooms with very limited numbers of occupants may be made acceptable by using HEPA (equivalent to MERV 17) air purifiers. These units usually have a label or manual that provides the square feet of room they can be expected to clean. However, that square footage is usually based on the assumption that the ceiling height is 8 feet. Recalculation is needed for buildings with higher ceilings. These devices also tend to form circular air currents around them as the air at the exhaust portal which is under positive pressure seeks the negative pressure area at the intake. Careful observation of the operation of these units and attention to changing filters is also needed.

OTHER AIR PURIFIERS. Not recommended are ultraviolet (UV) filter units, air ionizers, negative ion generators, ozone generators, and other devices that are hazardous to occupants. Ionizers and ion and ozone generators cause particles to drop rapidly out of the air by charging them so that they are attracted to walls, floors, tabletops, draperies, and even to occupants. This might be acceptable for outdoor air pollution particles, but not for an infective virus. The virus particles are still in the room on surfaces where they can be touched or resuspended by air currents. Toxic ozone gas is produced by ozone generators, ion generators, UV lights, and some other electronic air cleaners. It is counter intuitive to add a gas known to cause respiratory irritation to the air at even low levels when there is a potential for exposure to a respiratory virus.

NATURAL VENTILATION. Older buildings may rely on open windows for ventilation. This system will provide ASHRAE-compliant ventilation when the weather is good enough to leave the windows open. But open or closed, windows do not make these buildings acceptable workplaces now. Air can blow in or out of windows and there is no internal system for filtering the air. These buildings should not be used as workplaces during the pandemic. (See Appendix A)

WINDOW AIR-CONDITIONERS. Anyone who has washed the filter on their air conditioner knows this is only to protect the internal mechanism from dust in your house as it draws air in. The unit draws in room air, passes it over the cold half of the condenser coil, and blows that same air out. The extension on the back is where hot half of the condenser coil can release the heat to the outdoors. Window air conditioners provide no ventilation at all.

UNIT VENTILATORS (UNIVENTS). These units are common, for example, in older schools. Many of these units are installed with no connections through outside walls or windows. They only draw room air in from the bottom, heat or cool it, and blow that same air out a grille on top. Their filters are often not even rated and a few models (e.g., made by Trane) can be upgraded to use a MERV 7. They are useless for infection controls.

If the unit has an outside connection and is adjusted to 100% outdoor air, the ACH provided can be calculated, but most provide between 750 and 1500 cubic feet/minute (cfm) which is unlikely to create the 6 ACH for the average size classroom. And this outside air is expelled into the room under positive pressure which drives it with its potential viral load into the rest of the building.

---

footnotes:

* Fears AC. et. al. Persistence of Severe Acute Respiratory Syndrome Coronavirus 2 in Aerosol Suspensions. EID. Volume 26, Number 9—September 2020. https://wwwnc.cdc.gov/eid/article/26/9/20-1806_article?deliveryName=USCDC_331-DM35835.

** Horve, Patrick F., et al., SARS-CoV-2 in Healthcare HVAC Systems, medRxiv preprint doi: https://doi.org/10.1101/2020.06.26.20141085

APPENDIX A

There are three national organizations in the US that set standards and procedures for providing proper air quality and good ventilation for workplaces including schools. These are:

* The American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE);
* The American Conference of Governmental Industrial Hygienists (ACGIH); and
* The American Industrial Hygiene Association (AIHA).

All three of these organizations have issued written opinions about ventilation for COVID-19 control. None of these organizations suggested an slightly open window would be sufficient. Only one mentioned windows:

ASHRAE: *Position Document on Infectious Aerosols*. April 14, 2020 states on page six:

> Many buildings are fully or partially naturally ventilated. They may use operable windows and rely on intentional and unintentional openings in the building envelope. These strategies create different risks and benefits. Obviously, the airflow in these buildings is variable and unpredictable, as are the resulting air distribution patterns, so the ability to actively manage risk in such buildings is much reduced.

In addition,

* windows in some public buildings such as schools are cannot open more than six or seven inches due to child safety requirements.

* windows will tend to be closed in cold or inclement weather.

* air can blow in, out, or not at all through open windows depending on prevailing outdoor winds, whether or not there is a door or other opening through which incoming air can pass through the room, and other conditions.

It is clear that open windows are not a reliable source of fresh air.

AIHA™

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Reducing the Risk of COVID-19 using Engineering Controls

Guidance Document

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Version 1 | August 11, 2020

Sponsored by the AIHA® Indoor Environmental Quality Committee

Early case reports and epidemiological studies of groups where SARS-CoV-2 has led to outbreaks of COVID-19 indicates that the primary means of disease transmission is the indoor spread of exhaled droplet aerosols. Armed with this knowledge, industrial hygiene professionals may limit SARS-CoV-2 transmission using the hierarchy of controls. 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 workplaces.

Relying upon individuals to maintain social distancing, perform perpetual hand washing, and, when available, wear the lowest form of personal protective equipment (PPE) on the market can only achieve so much in preventing the spread of COVID-19. And because infected people transmitting the disease can be asymptomatic or presymptomatic, it is impractical to "eliminate" all sources of infection. With this in mind, the industrial hygiene profession has long recognized that engineered solutions to reduce exposure to hazardous agents offer much greater protection than PPE or administrative controls in most workplace settings. (NIOSH) (See Figure 1)

Many employers and the public incorrectly assume that wearing face coverings or a respirator is the only way to reduce their risk of exposure. Invariably this is not the case—the reality is that wearing a respirator properly every day, all day, is uncomfortable and rarely done properly. Engineering controls have historically proven to be more reliable because they are less prone to human error.

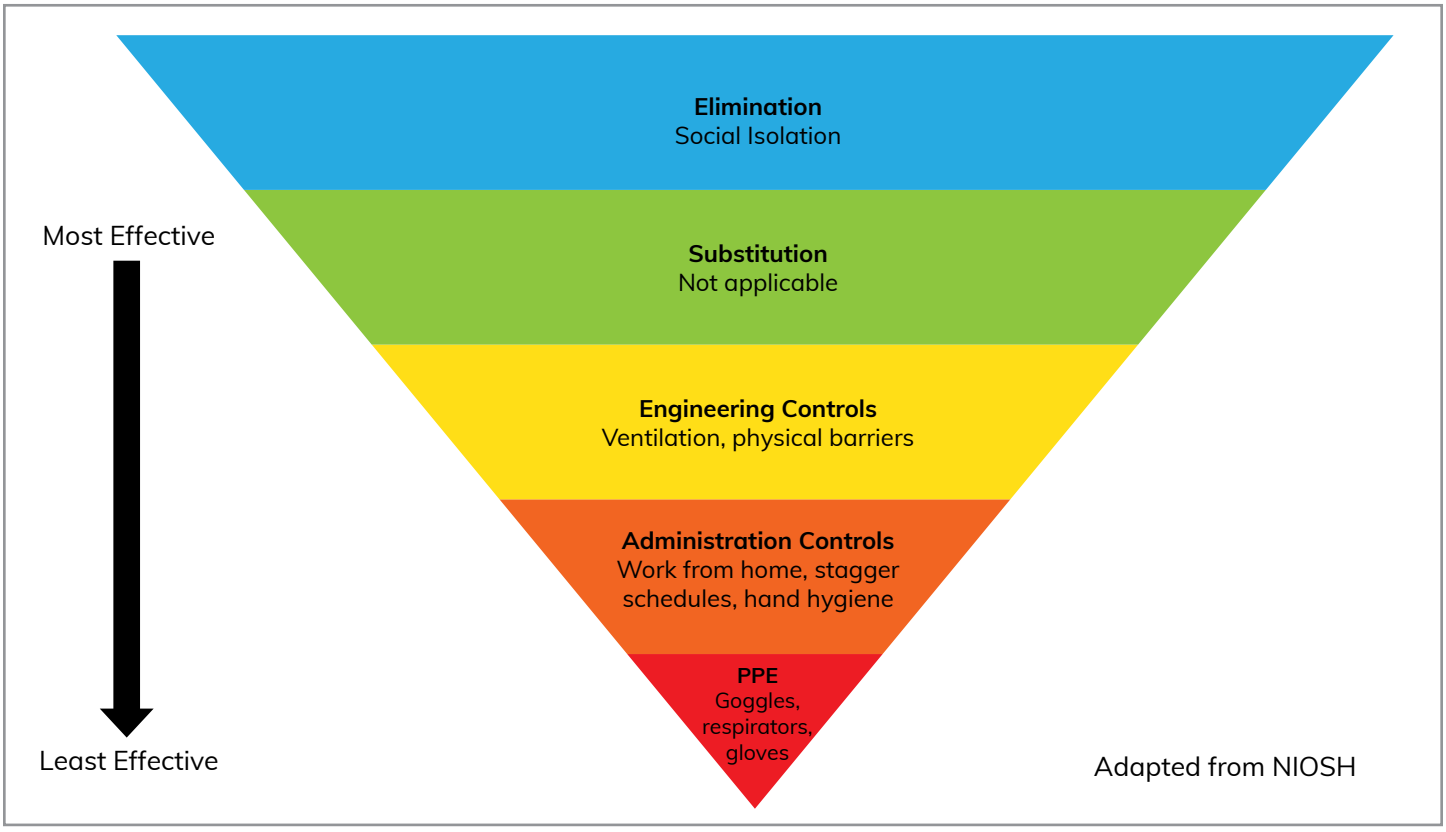

Figure 1: Applying the Hierarchy of Controls for COVID-19.

Accordingly, while federal and state OSHA plans require employers to ensure workers can use a selected respirator, OSHA also requires employers to consider feasible engineering and administrative options before resorting to their use or that of other PPE. Employers should select off-the-shelf, reliable, and effective engineering controls to reduce the risk of workplace disease spread.

The cost of PPE is also higher than most employers realize. Because OSHA requires medical evaluation, fit testing, and training, respiratory PPE is not a recommended long-term solution to prevent disease transmission outside of healthcare settings. Respiratory PPE is best used for short-term protection until engineering controls can be implemented. Costs to implement engineered solutions in a workplace can vary, depending upon the size of the facility and number of occupants, including employees and transient customers. Once engineering controls are installed, concerns of shortages and supply interruptions that have plagued PPE supplies are not likely to be an issue.

The American Industrial Hygiene Association (AIHA) and its volunteer committees of industrial hygienists recommend the use of engineering controls in all indoor workplaces, even those outside of the healthcare industry, to reduce the spread of COVID-19. The broad category of engineering controls that may be effective against the SARS-CoV-2 virus includes the following:

- Physical barriers, enclosures, and guards
- Automatic door openers and sensors
- Local exhaust ventilation
- Enhanced filtration to capture infectious aerosols
- Devices that inactivate or "kill" infectious organisms
- Dilution ventilation and increasing outside air delivery

Dilution Ventilation and COVID-19

Exemplifying one kind of engineered control, ASHRAE, a professional association of engineers, has issued position statements maintaining that changes to building and HVAC operation can reduce the airborne concentration of SARS-CoV-2 and the risk of it spreading through indoor air.

Increasing the number of effective air changes per hour—essentially, increasing the amount of "clean" or outdoor air delivered to the room—lowers the occupant's level of exposure to airborne viruses and therefore his or her relative risk of contracting the disease. Diluting indoor airborne virus concentrations can lower the risk of contracting the disease for the same reason that outdoor environments pose less risk of disease transmission.

This suggests that the risk of contracting COVID-19 can be significantly reduced by increasing indoor dilution ventilation rates and improving room air mixing—a principle recommended by the CDC and healthcare licensing bodies for hospitals and infectious disease wards. Indoor environments pose a much greater risk of exposure and spread of disease than outdoor environments. Outdoor environments offer "infinite dilution" of infectious aerosols, which strongly suggests that the risk of contracting COVID-19 can be significantly reduced by increasing dilution ventilation rates and improving room air mixing. To reduce the risk of disease transmission, maintain aerosol concentrations at very low levels, keep occupancy density low, and maintain physical distance. Accordingly, fundamental principles and equipment to capture and dilute aerosols can be applied to non-industrial workplaces to achieve more effective and reliable control of SARS-CoV-2 than face coverings and social distancing.

Effectively increasing the number of air changes in a room or building can be achieved by one or more of the following approaches. Using stand-

alone "off-the-shelf" HEPA filtered air cleaners , installing enhanced filtration in central HVAC systems, and increasing the volume of outside air introduction are practical and immediate measures that can be implemented by building operators and employers.

Properly selected and installed, standalone single-space HEPA filtration units that are ceiling mounted or portable can effectively reduce infectious aerosol concentrations in a single space room or zone, such as a classroom, elevator, lobby, or office area. While in-room filtering units cannot eliminate all risk of disease transmission because many factors besides virus aerosol concentration contribute to the issue, the reduced concentration and residence time of infectious aerosols can substantially decrease an individual's likelihood of inhaling an infectious dose. (ASHRAE Position Statement on Infectious Aerosols, 2020)

Choosing and Implementing Engineered Controls

Compared to solutions relying mostly or exclusively on PPE, engineered solutions removes the onus from individuals and their personal habits or attentiveness. Machines do not get tired, sloppy, or distracted.

However, when selecting engineering controls, such as increasing the number of air changes per hour (ACH), the minimum level of protection offered by the new control should exceed the protection offered by PPE alone. In Figure 2, the expected relative risk reduction offered by an N95 respirator is 90 percent, therefore only engineering controls that offer greater than 90 percent relative risk reduction should be considered. In this instance, engineering controls that offer fewer than 4.5 effective air changes per hour are no better than commercially available respiratory protection.

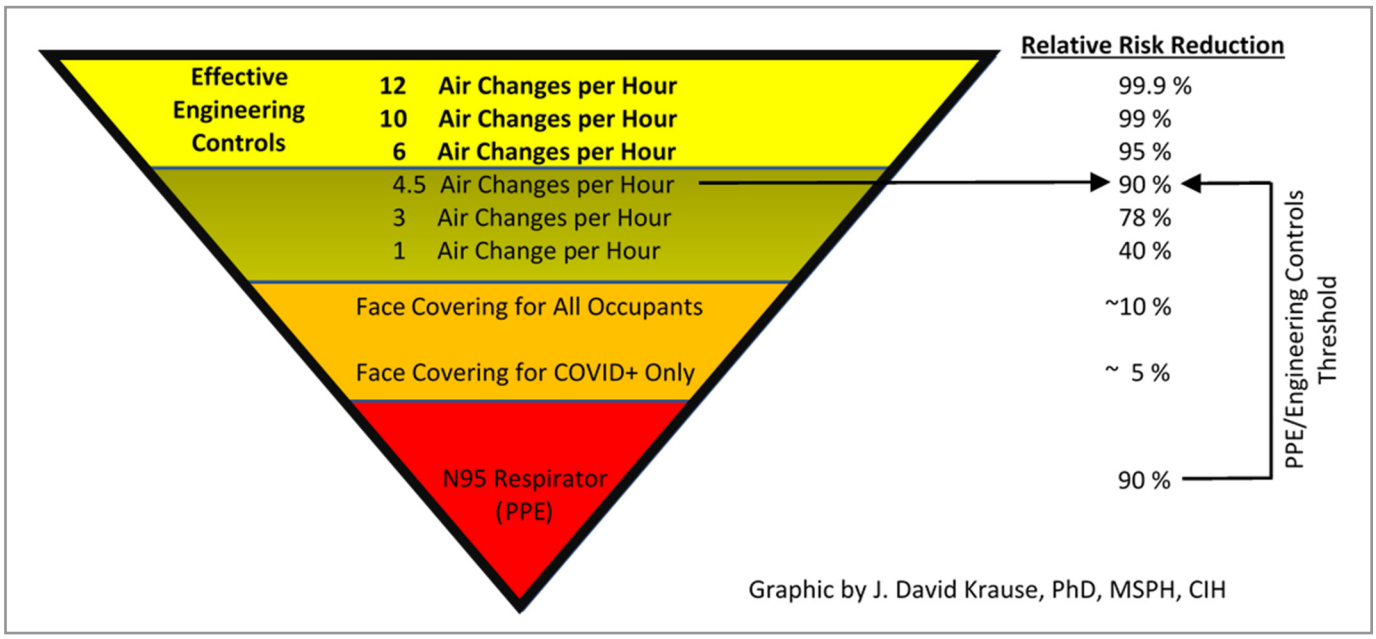

Figure 2

In hospitals and other indoor environments where infectious people are likely present, delivering between 6 and 12 air changes per hour of outside or clean air significantly reduces the spread of infectious airborne diseases. (See Figure 3) In non-healthcare facilities where occupant density cannot be limited to fewer than 1 person per ~30 ft^2 (i.e. 6-foot radius), or there is likelihood that infected persons are present, delivering higher air change rates than 6 ACH may be necessary.

Additional factors must be considered for site-specific engineering controls, such as in-room air mixing, the number of occupants per square foot of office space, and the air flow dynamics already in place. A knowledgeable mechanical engineer and industrial hygienist familiar with ventilation controls and infection prevention should be consulted when selecting, installing, and evaluating engineering controls for a workplace.

In most office buildings and small retail settings, using a computational fluid dynamics (CFD) model is not necessary to achieve intended effects. However, in complex buildings with existing mechanical and exhaust systems, CFD modeling may be needed to design and implement a robust and reliable system.

Standalone high efficiency particulate arrestance (HEPA) air filtering devices (AFDs) can be used to supplement outdoor air ventilation supplied through HVAC systems in order to achieve equivalent air exchange rates (AERs) capable of significantly reducing infectious aerosol concentrations in workplaces and offices. The CDC's *Guidelines for Environmental Infection Control in Health-Care Facilities*, published in 2003 recommends using recirculation HEPA filters to "increase the equivalent room air exchanges." The guidelines further suggest that "recirculating devices with HEPA filters may have potential uses in existing facilities as interim, supplemental environmen-

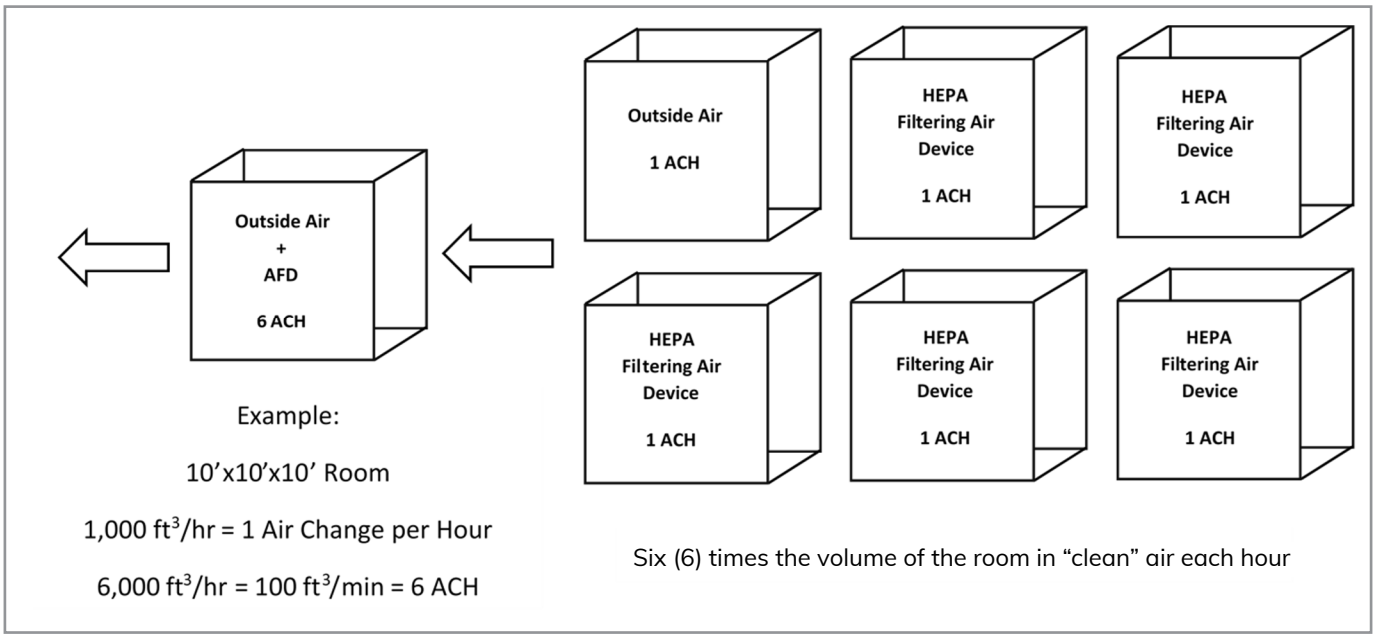

Figure 3

tal controls to meet requirements for the control of airborne infectious agents." (https://www.cdc.gov/infectioncontrol/guidelines/environmental/appendix/air.html#tableb1)

But HEPA rated filters are not necessary to achieve meaningful reductions in airborne concentrations. Enhanced filtration using filters with MERV (minimum efficiency reporting value) ratings between 13 and 15 can also be used, but higher flow rates may be necessary to achieve similar effects. Installing improved filtration (MERV 13 or higher) in central HVAC systems can serve to supplement air change rates by further reducing infectious aerosol concentrations in recirculated air. Increasing filtration of an HVAC system should be evaluated by a mechanical engineer to ensure the fan can handle the increased pressure load and that air does not bypass the filters. Increased maintenance and filter changes will likely be needed.

While ultraviolet germicidal irradiation (UVGI) and other technologies to inactivate, but not capture, viruses may be capable of reducing airborne concentrations of infectious aerosols, many factors can reduce their effectiveness without being readily recognized by users. Such technologies and equipment can often require significant modification to existing mechanical equipment and ongoing service.

Engineering Precautions

When increasing outside air delivery through HVAC systems, engineers must take precautions to avoid exceeding the mechanical system's design and operational capabilities. Too much outdoor air can introduce high levels of humidity, causing mold and bacterial growth within the HVAC system, its ducts, and the occupied areas of the building. When outdoor air pollution from wildfires, nearby excavation, or demolition activities threatens the area, outside air dampers may have to be temporarily closed.

When installing AFDs it is important to avoid air flows that interfere with existing HVAC systems, or that directs potentially contaminated air into a clean area. This often requires the expertise of an engineer, industrial hygienist, or experienced contractor to properly site each device.

Ongoing maintenance and cleaning of AFDs, including changing pre-filters and HEPA filters, is necessary to ensure effective operation. Precautions must be taken to prevent worker exposures to accumulated infectious viruses on the filters or the AFD exterior during filter changes and maintenance. PPE recommended for maintenance activities such as filter changes and periodic cleaning include goggles, gloves, apron, and N95 respirator. This should be performed when unprotected individuals are not nearby.

Any modifications made to central HVAC systems, either to accommodate a new use of the space, changes in occupant density, or to improve filtration should be specified and reviewed by a mechanical engineer.

Conclusions

As the nation moves to restart the economy and in-person education, we must seriously consider and adopt effective engineering controls in public buildings in order to protect the health of employees and occupant. Using "off-the-shelf" technologies, equipment, and time-tested methods to control infectious aerosols is the most reliable way to reduce the risk of disease spread. Relying upon control measures that only offer marginal protection against the spread of disease could extend this pandemic until a vaccine is developed, produced, and distributed. Scientifically proven methods to control the spread of airborne diseases that include enhanced ventilation with outdoor air, and high efficiency filtration, have not been widely implemented outside of healthcare facilities.

Industrial hygienists and mechanical engineers can design, install, and evaluate engineering controls that are capable of keeping infectious aerosols at very low levels indoors and offer more reliable protection. Together, we can help reduce the risk of disease transmission among workers and members of the community in properly designed and maintained buildings through the use of engineering controls.

ASHRAE Position Document on Infectious Aerosols

Approved by ASHRAE Board of Directors
April 14, 2020

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HISTORY OF REVISION/REAFFIRMATION/WITHDRAWAL DATES

The following summarizes this document's revision, reaffirmation, and withdrawal dates:

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1/25/2012—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

1/19/2014—BOD approves revised Position Document titled *Airborne Infectious Diseases*

1/31/2017—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

2/5/2020—Technology Council approves reaffirmation of Position Document titled *Airborne Infectious Diseases*

4/14/2020—BOD approves revised Position Document titled *Infectious Aerosols*

Note: ASHRAE's Technology Council and the cognizant committee recommend revision, reaffirmation, or withdrawal every 30 months.

Note: ASHRAE position documents are approved by the Board of Directors and express the views of the Society on a specific issue. The purpose of these documents is to provide objective, authoritative background information to persons interested in issues within ASHRAE's expertise, particularly in areas where such information will be helpful in drafting sound public policy. A related purpose is also to serve as an educational tool clarifying ASHRAE's position for its members and professionals, in general, advancing the arts and sciences of HVAC&R.

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ABSTRACT

The pathogens that cause infectious diseases are spread from a primary host to secondary hosts via several different routes. Some diseases are known to spread by infectious aerosols; for other diseases, the route of transmission is uncertain. The risk of pathogen spread, and therefore the number of people exposed, can be affected both positively and negatively by the airflow patterns in a space and by heating, ventilating, and air-conditioning (HVAC) and local exhaust ventilation (LEV) systems. ASHRAE is the global leader and foremost source of technical and educational information on the design, installation, operation, and maintenance of these systems. Although the principles discussed in this position document apply primarily to buildings, they may also be applicable to other occupancies, such as planes, trains, and automobiles.

ASHRAE will continue to support research that advances the knowledge base of indoor air-management strategies aimed to reduce occupant exposure to infectious aerosols. Chief among these ventilation-related strategies are dilution, airflow patterns, pressurization, temperature and humidity distribution and control, filtration, and other strategies such as ultraviolet germicidal irradiation (UVGI). While the exact level of ventilation effectiveness varies with local conditions and the pathogens involved, ASHRAE believes that these techniques, when properly applied, can reduce the risk of transmission of infectious diseases through aerosols.

To better specify the levels of certainty behind ASHRAE's policy positions stated herein, we have chosen to adopt the Agency for Healthcare Research and Quality (AHRQ) rubric for expressing the scientific certainty behind our recommendations (Burns et al. 2011). These levels of certainty, as adapted for this position document, are as follows:

Evidence Level	Description
A	Strongly recommend; good evidence
B	Recommend; at least fair evidence
C	No recommendation for or against; balance of benefits and harms too close to justify a recommendation
D	Recommend against; fair evidence is ineffective or the harm outweighs the benefit
E	Evidence is insufficient to recommend for or against routinely; evidence is lacking or of poor quality; benefits and harms cannot be determined

ASHRAE's position is that facilities of all types should follow, as a minimum, the latest published standards and guidelines and good engineering practice. ANSI/ASHRAE Standards 62.1 and 62.2 (ASHRAE 2019a, 2019b) include requirements for outdoor air ventilation in most residential and nonresidential spaces, and ANSI/ASHRAE/ASHE Standard 170 (ASHRAE 2017a) covers both outdoor and total air ventilation in healthcare facilities. Based on risk assessments or owner project requirements, designers of new and existing facilities could go beyond the minimum requirements of these standards, using techniques covered in various ASHRAE publications, including the ASHRAE Handbook volumes, Research Project final reports, papers and articles, and design guides, to be even better prepared to control the dissemination of infectious aerosols.

EXECUTIVE SUMMARY

With infectious diseases transmitted through aerosols, HVAC systems can have a major effect on the transmission from the primary host to secondary hosts. Decreasing exposure of secondary hosts is an important step in curtailing the spread of infectious diseases.

Designers of mechanical systems should be aware that ventilation is not capable of addressing all aspects of infection control. HVAC systems,[1] however, do impact the distribution and bio-burden of infectious aerosols. Small aerosols may persist in the breathing zone, available for inhalation directly into the upper and lower respiratory tracts or for settling onto surfaces, where they can be indirectly transmitted by resuspension or fomite[2] contact.

Infectious aerosols can pose an exposure risk, regardless of whether a disease is classically defined as an "airborne infectious disease." This position document covers strategies through which HVAC systems modulate aerosol[3] distribution and can therefore increase or decrease exposure to infectious droplets,[4] droplet nuclei,[5] surfaces, and intermediary fomites[6] in a variety of environments.

This position document provides recommendations on the following:

- The design, installation, and operation of heating, ventilating, and air-conditioning (HVAC) systems, including air-cleaning, and local exhaust ventilation (LEV) systems, to decrease the risk of infection transmission.
- Non-HVAC control strategies to decrease disease risk.
- Strategies to support facilities management for both everyday operation and emergencies.

Infectious diseases can be controlled by interrupting the transmission routes used by a pathogen. HVAC professionals play an important role in protecting building occupants by interrupting the indoor dissemination of infectious aerosols with HVAC and LEV systems.

COVID-19 Statements

Separate from the approval of this position document, ASHRAE's Executive Committee and Epidemic Task Force approved the following statements specific to the ongoing response to the COVID-19 pandemic. The two statements are appended here due to the unique relationship between the statements and the protective design strategies discussed in this position document:

Statement on airborne transmission of SARS-CoV-2: Transmission of SARS-CoV-2 through the air is sufficiently likely that airborne exposure to the virus should be controlled. Changes to building operations, including the operation of heating, ventilating, and air-conditioning systems, can reduce airborne exposures.

Statement on operation of heating, ventilating, and air-conditioning systems to reduce SARS-CoV-2 transmission: Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus

[1] Different HVAC systems are described in *ASHRAE Handbook—HVAC Systems and Equipment* (ASHRAE 2020).
[2] An object (such as a dish or a doorknob) that may be contaminated with infectious organisms and serve in their transmission.
[3] An aerosol is a system of liquid or solid particles uniformly distributed in a finely divided state through a gas, usually air. They are small and buoyant enough to behave much like a gas.
[4] In this document, *droplets* are understood to be large enough to fall to a surface in 3–7 ft (1–2 m) and thus not become aerosols.
[5] Droplet nuclei are formed from droplets that become less massive by evaporation and thus may become aerosols.
[6] Fomite transmission is a form of indirect contact that occurs through touching a contaminated inanimate object such as a doorknob, bed rail, television remote, or bathroom surface.

the risk of transmission through the air. Unconditioned spaces can cause thermal stress to people that may be directly life threatening and that may also lower resistance to infection. In general, disabling of heating, ventilating, and air-conditioning systems is not a recommended measure to reduce the transmission of the virus.

1. THE ISSUE

The potential for airborne dissemination of infectious pathogens is widely recognized, although there remains uncertainty about the relative importance of the various disease transmission routes, such as airborne, droplet, direct or indirect contact, and multimodal (a combination of mechanisms). Transmission of disease varies by pathogen infectivity, reservoirs, routes, and secondary host susceptibility (Roy and Milton 2004; Shaman and Kohn 2009; Li 2011). The variable most relevant for HVAC design and control is disrupting the transmission pathways of infectious aerosols.

Infection control professionals describe the chain of infection as a process in which a pathogen (a microbe that causes disease) is carried in an initial host or reservoir, gains access to a route of ongoing transmission, and with sufficient virulence finds a secondary susceptible host. Ventilation, filtration, and air distribution systems and disinfection technologies have the potential to limit airborne pathogen transmission through the air and thus break the chain of infection.

Building science professionals must recognize the importance of facility operations and ventilation systems in interrupting disease transmission. Non-HVAC measures for breaking the chain of infection, such as effective surface cleaning, contact and isolation precautions mandated by employee and student policies, and vaccination regimens, are effective strategies that are beyond the scope of this document. Dilution and extraction ventilation, pressurization, airflow distribution and optimization, mechanical filtration, ultraviolet germicidal irradiation (UVGI), and humidity control are effective strategies for reducing the risk of dissemination of infectious aerosols in buildings and transportation environments.

Although this position document is primarily applicable to viral and bacterial diseases that can use the airborne route for transmission from person to person, the principles of containment may also apply to infection from building reservoirs such as water systems with *Legionella spp.* and organic matter containing spores from mold (to the extent that the microorganisms are spread by the air). The first step in control of such diseases is to eliminate the source before it becomes airborne.

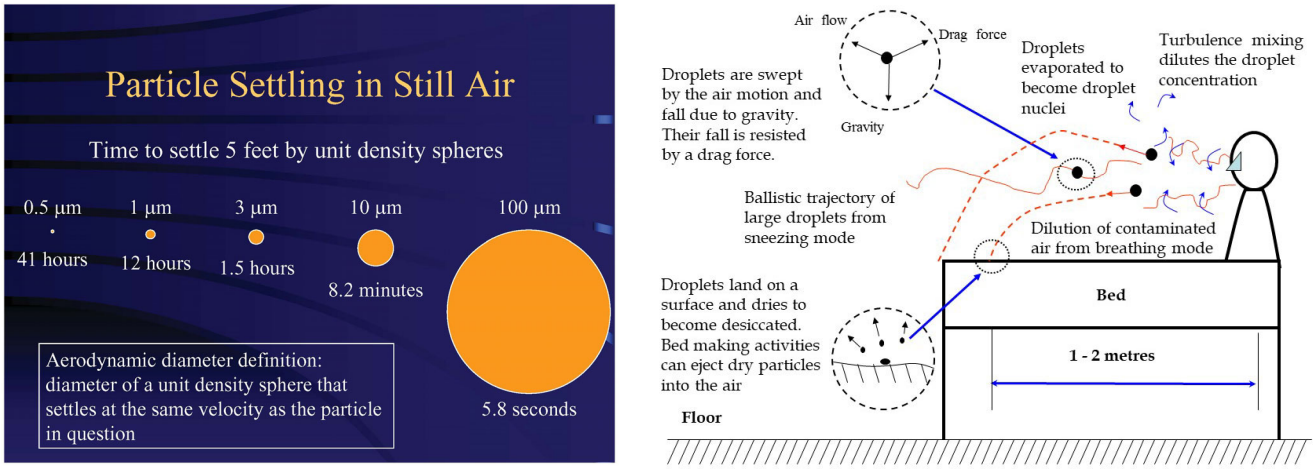
2. BACKGROUND

ASHRAE provides guidance and develop standards intended to mitigate the risk of infectious disease transmission in the built environment. Such documents provide engineering strategies for reducing the risk of disease transmission and therefore could be employed in a variety of other spaces, such as planes, trains, and automobiles.

This position document covers the dissemination of infectious aerosols and indirect transmission by resuspension but not direct-contact routes of transmission. *Direct contact* generally refers to bodily contact such as touching, kissing, sexual contact, contact with oral secretions or skin lesions and routes such as blood transfusions or intravenous injections.

2.1 Airborne Dissemination

Pathogen dissemination through the air occurs through droplets and aerosols typically generated by coughing, sneezing, shouting, breathing, toilet flushing, some medical procedures, singing, and talking (Bischoff et al. 2013; Yan et al. 2018). The majority of larger emitted droplets are drawn by gravity to land on surfaces within about 3–7 ft (1–2 m) from the source (see Figure 1). General dilution ventilation and pressure differentials do not significantly influ-



(a) (b)

Figure 1 (a) Comparative settling times by particle diameter for particles settling in still air (Baron n.d.) and (b) theoretical aerobiology of transmission of droplets and small airborne particles produced by an infected patient with an acute infection (courtesy Yuguo Li).

ence short-range transmission. Conversely, dissemination of smaller infectious aerosols, including droplet nuclei resulting from desiccation, can be affected by airflow patterns in a space in general and airflow patterns surrounding the source in particular. Of special interest are small aerosols (<10 µm), which can stay airborne and infectious for extended periods (several minutes, hours, or days) and thus can travel longer distances and infect secondary hosts who had no contact with the primary host.

Many diseases are known to have high transmission rates via larger droplets when susceptible individuals are within close proximity, about 3–7 ft (1–2 m) (Nicas 2009; Li 2011). Depending on environmental factors, these large (100 µm diameter) droplets may shrink by evaporation before they settle, thus becoming an aerosol (approximately <10 µm). The term *droplet nuclei* has been used to describe such desiccation of droplets into aerosols (Siegel et al. 2007). While ventilation systems cannot interrupt the rapid settling of large droplets, they can influence the transmission of droplet nuclei infectious aerosols. Directional airflow can create clean-to-dirty flow patterns and move infectious aerosols to be captured or exhausted.

3. PRACTICAL IMPLICATIONS FOR BUILDING OWNERS, OPERATORS, AND ENGINEERS

Even the most robust HVAC system cannot control all airflows and completely prevent dissemination of an infectious aerosol or disease transmission by droplets or aerosols. An HVAC system's impact will depend on source location, strength of the source, distribution of the released aerosol, droplet size, air distribution, temperature, relative humidity, and filtration. Furthermore, there are multiple modes and circumstances under which disease transmission occurs. Thus, strategies for prevention and risk mitigation require collaboration among designers, owners, operators, industrial hygienists, and infection prevention specialists.

3.1 Varying Approaches for Facility Type

Healthcare facilities have criteria for ventilation design to mitigate airborne transmission of infectious diseases (ASHRAE 2013, 2017a, 2019a; FGI 2010); however, infections are also transmitted in ordinary occupancies in the community and not only in industrial or healthcare occupancies. ASHRAE provides general ventilation and air quality requirements in Standards 62.1, 62.2, and 170 (ASHRAE 2019a, 2019b, 2017a); ASHRAE does not provide specific requirements for infectious disease control in homes, schools, prisons, shelters, transportation, or other public facilities.

In healthcare facilities, most infection control interventions are geared at reducing direct or indirect contact transmission of pathogens. These interventions for limiting airborne transmission (Aliabadi et al. 2011) emphasize personnel education and surveillance of behaviors such as hand hygiene and compliance with checklist protocols and have largely been restricted to a relatively small list of diseases from pathogens that spread only through the air. Now that microbiologists understand that many pathogens can travel through both contact and airborne routes, the role of indoor air management has become critical to successful prevention efforts. In view of the broader understanding of flexible pathogen transmission modes, healthcare facilities now use multiple modalities simultaneously (measures that are referred to as *infection control bundles*) (Apisarnthanarak et al. 2009, 2010a, 2010b; Cheng et al. 2010). For example, in the cases of two diseases that clearly utilize airborne transmission, tuberculosis and measles, bundling includes administrative regulations, environmental controls, and personal protective equipment protocols in healthcare settings. This more comprehensive approach is needed to control pathogens, which can use both contact and airborne transmission pathways. Similar strategies may be appropriate for non-healthcare spaces, such as public transit and airplanes, schools, shelters, and prisons, that may also be subject to close contact of occupants.

Many buildings are fully or partially naturally ventilated. They may use operable windows and rely on intentional and unintentional openings in the building envelope. These strategies create different risks and benefits. Obviously, the airflow in these buildings is variable and unpredictable, as are the resulting air distribution patterns, so the ability to actively manage risk in such buildings is much reduced. However, naturally ventilated buildings can go beyond random opening of windows and be engineered intentionally to achieve ventilation strategies and thereby reduce risk from infectious aerosols. Generally speaking, designs that achieve higher ventilation rates will reduce risk. However, such buildings will be more affected by local outdoor air quality, including the level of allergens and pollutants within the outdoor air, varying temperature and humidity conditions, and flying insects. The World Health Organization has published guidelines for naturally ventilated buildings that should be consulted in such projects (Atkinson et al. 2009).

3.2 Ventilation and Air-Cleaning Strategies

The design and operation of HVAC systems can affect infectious aerosol transport, but they are only one part of an infection control bundle. The following HVAC strategies have the potential to reduce the risks of infectious aerosol dissemination: air distribution patterns, differential room pressurization, personalized ventilation, source capture ventilation, filtration (central or local), and controlling temperature and relative humidity. While UVGI is well researched and validated, many new technologies are not (ASHRAE 2018). (Evidence Level B)

Ventilation with effective airflow patterns (Pantelic and Tham 2013) is a primary infectious disease control strategy through dilution of room air around a source and removal of infectious

agents (CDC 2005). However, it remains unclear by how much infectious particle loads must be reduced to achieve a measurable reduction in disease transmissions (infectious doses vary widely among different pathogens) and whether these reductions warrant the associated costs (Pantelic and Tham 2011; Pantelic and Tham 2012). (Evidence Level B)

Room pressure differentials and directional airflow are important for controlling airflow between zones in a building (CDC 2005; Siegel et al. 2007) (Evidence Level B). Some designs for airborne infection isolation rooms (AIIRs) incorporate supplemental dilution or exhaust/capture ventilation (CDC 2005). Interestingly, criteria for AIIRs differ substantially between regions and countries in several ways, including air supply into anterooms, exhaust from space, and required amounts of ventilation air (Fusco et al. 2012; Subhash et al. 2013). A recent ASHRAE Research Project found convincing evidence that a properly configured and operated anteroom is an effective means to maintain pressure differentials and create containment in hospital rooms (Siegel et al. 2007; Mousavi et al. 2019). Where a significant risk of transmission of aerosols has been identified by infection control risk assessments, design of AIIRs should include anterooms. (Evidence Level A)

The use of highly efficient particle filtration in centralized HVAC systems reduces the airborne load of infectious particles (Azimi and Stephens 2013). This strategy reduces the transport of infectious agents from one area to another when these areas share the same central HVAC system through supply of recirculated air. When appropriately selected and deployed, single-space high-efficiency filtration units (either ceiling mounted or portable) can be highly effective in reducing/lowering concentrations of infectious aerosols in a single space. They also achieve directional airflow source control that provides exposure protection at the patient bedside (Miller-Leiden et al. 1996; Mead and Johnson 2004; Kujundzic et al. 2006; Mead et al. 2012; Dungi et al. 2015). Filtration will not eliminate all risk of transmission of airborne particulates because many other factors besides infectious aerosol concentration contribute to disease transmission. (Evidence Level A)

The entire ultraviolet (UV) spectrum can kill or inactivate microorganisms, but UV-C energy (in the wavelengths from 200 to 280 nm) provides the most germicidal effect, with 265 nm being the optimum wavelength. The majority of modern UVGI lamps create UV-C energy at a near-optimum 254 nm wavelength. UVGI inactivates microorganisms by damaging the structure of nucleic acids and proteins with the effectiveness dependent upon the UV dose and the susceptibility of the microorganism. The safety of UV-C is well known. It does not penetrate deeply into human tissue, but it can penetrate the very outer surfaces of the eyes and skin, with the eyes being most susceptible to damage. Therefore, shielding is needed to prevent direct exposure to the eyes. While *ASHRAE Position Document on Filtration and Air Cleaning* (2018) does not make a recommendation for or against the use of UV energy in air systems for minimizing the risks from infectious aerosols, Centers for Disease Control and Prevention (CDC) has approved UVGI as an adjunct to filtration for reduction of tuberculosis risk and has published a guideline on its application (CDC 2005, 2009).[7] (Evidence Level A)

Personalized ventilation systems that provide local exhaust source control and/or supply 100% outdoor, highly filtered, or UV-disinfected air directly to the occupant's breathing zone (Cermak et al. 2006; Bolashikov et al., 2009; Pantelic et al. 2009, 2015; Licina et al. 2015a, 2015b) may offer protection against exposure to contaminated air. Personalized ventilation may be effective against aerosols that travel both long distances as well as short ranges (Li 2011).

[7] In addition to UVGI, optical radiation in longer wavelengths as high as 405 nm is an emerging disinfection technology that may also have useful germicidal effectiveness.

Personalized ventilation systems, when coupled with localized or personalized exhaust devices, further enhance the overall ability to mitigate exposure in breathing zones, as seen from both experimental and computational fluid dynamics (CFD) studies in healthcare settings (Yang et al. 2013, 2014, 2015a, 2015b; Bolashikov et al. 2015; Bivolarova et al. 2016). However, there are no known epidemiological studies that demonstrate a reduction in infectious disease transmission. (Evidence Level B)

Advanced techniques such as computational fluid dynamics (CFD) analysis, if performed properly with adequate expertise, can predict airflow patterns and probable flow paths of airborne contaminants in a space. Such analyses can be employed as a guiding tool during the early stages of a design cycle (Khankari 2016, 2018a, 2018b, 2018c).

3.3 Temperature and Humidity

HVAC systems are typically designed to control temperature and humidity, which can in turn influence transmissibility of infectious agents. Although HVAC systems can be designed to control relative humidity (RH), there are practical challenges and potential negative effects of maintaining certain RH set points in all climate zones. However, while the weight of evidence at this time (Derby et al. 2016), including recent evidence using metagenomic analysis (Taylor and Tasi 2018), suggests that controlling RH reduces transmission of certain airborne infectious organisms, including some strains of influenza, this position document encourages designers to give careful consideration to temperature and RH.

In addition, immunobiologists have correlated mid-range humidity levels with improved mammalian immunity against respiratory infections (Taylor and Tasi 2018). Mousavi et al. (2019) report that the scientific literature generally reflects the most unfavorable survival for microorganisms when the RH is between 40% and 60% (Evidence Level B). Introduction of water vapor to the indoor environment to achieve the mid-range humidity levels associated with decreased infections requires proper selection, operation, and maintenance of humidification equipment. Cold winter climates require proper building insulation to prevent thermal bridges that can lead to condensation and mold growth (ASHRAE 2009). Other recent studies (Taylor and Tasi 2018) identified RH as a significant driver of patient infections. These studies showed that RH below 40% is associated with three factors that increase infections. First, as discussed previously, infectious aerosols emitted from a primary host shrink rapidly to become droplet nuclei, and these dormant yet infectious pathogens remain suspended in the air and are capable of traveling great distances. When they encounter a hydrated secondary host, they rehydrate and are able to propagate the infection. Second, many viruses and bacteria are anhydrous resistant (Goffau et al. 2009; Stone et al. 2016) and actually have increased viability in low-RH conditions. And finally, immunobiologists have now clarified the mechanisms through which ambient RH below 40% impairs mucus membrane barriers and other steps in immune system protection (Kudo et al. 2019). (Evidence Level B)

This position document does not make a definitive recommendation on indoor temperature and humidity set points for the purpose of controlling infectious aerosol transmission. Practitioners may use the information herein to make building design and operation decisions on a case-by-case basis.

3.4 Emerging Pathogens and Emergency Preparedness

Disease outbreaks (i.e., epidemics and pandemics) are increasing in frequency and reach. Pandemics of the past have had devastating effects on affected populations. Novel microor-

ganisms that can be disseminated by infectious aerosols necessitate good design, construction, commissioning, maintenance, advanced planning, and emergency drills to facilitate fast action to mitigate exposure. In many countries, common strategies include naturally ventilated buildings and isolation. Control banding is a risk management strategy that should be considered for applying the hierarchy of controls to emerging pathogens, based on the likelihood and duration of exposure and the infectivity and virulence of the pathogen (Sietsema 2019) (Evidence Level B). Biological agents that may be used in terrorist attacks are addressed elsewhere (USDHHS 2002, 2003).

4. CONCLUSIONS AND RECOMMENDATIONS

Infectious aerosols can be disseminated through buildings by pathways that include air distribution systems and interzone airflows. Various strategies have been found to be effective at controlling transmission, including optimized airflow patterns, directional airflow, zone pressurization, dilution ventilation, in-room air-cleaning systems, general exhaust ventilation, personalized ventilation, local exhaust ventilation at the source, central system filtration, UVGI, and controlling indoor temperature and relative humidity. Design engineers can make an essential contribution to reducing infectious aerosol transmission through the application of these strategies. Research on the role of airborne dissemination and resuspension from surfaces in pathogen transmission is rapidly evolving. Managing indoor air to control distribution of infectious aerosols is an effective intervention which adds another strategy to medical treatments and behavioral interventions in disease prevention.

4.1 ASHRAE's Positions

- HVAC design teams for facilities of all types should follow, as a minimum, the latest published standards and guidelines and good engineering practice. Based on risk assessments or owner project requirements, designers of new and existing facilities could go beyond the minimum requirements of these standards, using techniques covered in various ASHRAE publications, including the ASHRAE Handbook volumes, Research Project final reports, papers and articles, and design guides, to be even better prepared to control the dissemination of infectious aerosols.
- Mitigation of infectious aerosol dissemination should be a consideration in the design of all facilities, and in those identified as high-risk facilities the appropriate mitigation design should be incorporated.
- The design and construction team, including HVAC designers, should engage in an integrated design process in order to incorporate the appropriate infection control bundle in the early stages of design.
- Based on risk assessments, buildings and transportation vehicles should consider designs that promote cleaner airflow patterns for providing effective flow paths for airborne particulates to exit spaces to less clean zones and use appropriate air-cleaning systems. (Evidence Level A)
- Where a significant risk of transmission of aerosols has been identified by infection control risk assessments, design of AIIRs should include anterooms. (Evidence Level A)

- Based on risk assessments, the use of specific HVAC strategies supported by the evidence-based literature should be considered, including the following:
  - Enhanced filtration (higher minimum efficiency reporting value [MERV] filters over code minimums in occupant-dense and/or higher-risk spaces) (Evidence Level A)
  - Upper-room UVGI (with possible in-room fans) as a supplement to supply airflow (Evidence Level A)
  - Local exhaust ventilation for source control (Evidence Level A)
  - Personalized ventilation systems for certain high-risk tasks (Evidence Level B)
  - Portable, free-standing high-efficiency particulate air (HEPA) filters (Evidence Level B)
  - Temperature and humidity control (Evidence Level B)
- Healthcare buildings[8] should consider design and operation to do the following:
  - Capture expiratory aerosols with headwall exhaust, tent or snorkel with exhaust, floor-to-ceiling partitions with door supply and patient exhaust, local air HEPA-grade filtration.
  - Exhaust toilets and bed pans (a must).
  - Maintain temperature and humidity as applicable to the infectious aerosol of concern.
  - Deliver clean air to caregivers.
  - Maintain negatively pressurized intensive care units (ICUs) where infectious aerosols may be present.
  - Maintain rooms with infectious aerosol concerns at negative pressure.
  - Provide 100% exhaust of patient rooms.
  - Use UVGI.
  - Increase the outdoor air change rate (e.g., increase patient rooms from 2 to 6 ach).
  - Establish HVAC contributions to a patient room turnover plan before reoccupancy.
- Non-healthcare buildings should have a plan for an emergency response. The following modifications to building HVAC system operation should be considered:
  - Increase outdoor air ventilation (disable demand-controlled ventilation and open outdoor air dampers to 100% as indoor and outdoor conditions permit).
  - Improve central air and other HVAC filtration to MERV-13 (ASHRAE 2017b) or the highest level achievable.
  - Keep systems running longer hours (24/7 if possible).
  - Add portable room air cleaners with HEPA or high-MERV filters with due consideration to the clean air delivery rate (AHAM 2015).
  - Add duct- or air-handling-unit-mounted, upper room, and/or portable UVGI devices in connection to in-room fans in high-density spaces such as waiting rooms, prisons, and shelters.
  - Maintain temperature and humidity as applicable to the infectious aerosol of concern.
  - Bypass energy recovery ventilation systems that leak potentially contaminated exhaust air back into the outdoor air supply.
- Design and build inherent capabilities to respond to emerging threats and plan and practice for them. (Evidence Level B)

[8] It is assumed that healthcare facilities already have emergency response plans.

4.2 ASHRAE's Commitments

- Address research gaps with future research projects, including those on the following topics:
  - Investigating and developing source generation variables for use in an updated ventilation rate procedure
  - Understanding the impacts of air change rates in operating rooms on patient outcomes
  - Determining the effectiveness of location of supply, return, and exhaust registers in patient rooms
  - Conducting controlled interventional studies to quantify the relative airborne infection control performance and cost-effectiveness of specific engineering strategies, individually and in combination, in field applications of high-risk occupancies
  - Evaluating and comparing options to create surge airborne isolation space and temporary negative pressure isolation space and the impacts on overall building operation
  - Understanding the appropriate application of humidity and temperature control strategies across climate zones on infectious aerosol transmission
  - Investigating how control banding techniques can be applied to manage the risk of infectious aerosol dissemination
- Partner with infection prevention, infectious disease, and occupational health experts and building owners to evaluate emerging control strategies and provide evidence-based recommendations.
- Educate stakeholders and disseminate best practices.
- Create a database to track and share knowledge on effective, protective engineering design strategies.
- Update standards and guidelines to reflect protective evidence-based strategies.

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RWDSU
Retail, Wholesale and Department Store Union

Stuart Appelbaum, *President*
Jack C. Wurm, Jr., *Secretary-Treasurer*
Joseph Dorismond, *Recorder*

New York City Council Committee on Civil Service and Labor
Testimony regarding Workplace Safety in the Covid-19 Era
November 20, 2020

My name is Josh Kellermann and I am the Director of Public Policy at the Retail, Wholesale and Department Store Union, RWDSU. We represent approximately 40,000 workers in the NYC region and around 100,000 nationwide. Our members work in retail and grocery stores, pharmacies, food service, food processing, car washes, nursing homes, airlines, non-profit social service organizations and more. A significant portion of our members have been working through pandemic in the food supply chain and in healthcare. I am testifying in support of all four bills before the committee.

I cannot overstate the impact of COVID-19 on the members of RWDSU. It has been deadly. Over 40 RWDSU members have lost their lives to COVID. It has resulted in workers in the grocery store industry, many of whom earn the minimum wage, fearing for their lives every day they show up to this "essential" job. It has caused untold misery in the poultry and meatpacking industries. It has put enormous strain on our healthcare workers.

Many workers in non-essential industries, like apparel retail and carwashes, earn low wages and had little financial cushion prior to the crisis. These workers will continue to need financial and other support as the pandemic continues. We have coordinated funding drives to financially support our furloughed members and have coordinated food drives as well. We have also spent an enormous amount of time educating union and non-union members about the resources available to them during the pandemic: testing, PPE, paid sick leave, unemployment insurance, workers comp. Many workers, particularly in non-union workplaces, were surprised to learn of all the benefits available to them, highlighting the importance of education and outreach.

Our experience in New York is that a clear plan with enforceable standards can set the right trajectory in motion. For example, requiring that all customers in retail and grocery must wear masks has created a clear standard that everyone can understand. Employers have responded to this clear standard, as there is almost no store in NYC that lacks a sign on the front door saying, "No Mask, No Service." There is no doubt that this policy has saved workers' lives and contributed significantly to lowering the curve on infections. Clear, enforceable standards from the government create a clear standard for employers to follow and ultimately it is the workers who are protected.

Let me also note that prior to the No Mask, No Service standard being put in place, most union employers already had such a requirement in place. Why? Because unions have bargaining power in the workplace and we demanded that our employers, from the outset, do the utmost to protect their workers. This is the value of workplace democracy and in moments like this, during a

pandemic, the value of unions comes into sharp relief.

The RWDSU supports all four bills before this committee and I would like to say a few words about each.

T2020-6370: resolution calling on the Governor to sign A8142E/S6266D, the Healthy Terminals Act. RWDSU Local 1102 represents thousands of workers at NYC's airports, primarily in airline catering and terminal concessions. Most of these workers do not get health insurance from their jobs and instead rely on Medicaid or other publicly funded programs, and many others go without any insurance at all. Due to the pandemic, many of these workers are now out of work. However, we assume that once a COVID vaccine is widely available, airline travel will resume in earnest. As the workforce gets back on its feet, we must ensure these workers can access health care when they need it. This is in the interest of workers, our airports' operations, and our public health. Thank you for moving this resolution to pass the Healthy Terminals Act.

Int. No. 1797: creating an informational campaign concerning workers' rights under the earned safe and sick time act. Earned safe and sick time is an issue both of worker rights and public health. We are lucky to be in a city with such a robust law on the books. While union members have had paid sick leave for decades through their union contracts and are educated on their rights in the workplace, many other workers do not know about their rights. Encouraging pharmacies, doctors' offices, and hospitals to display paid sick time information is a great idea that we fully support. We will attempt to work with our employers at unionized pharmacies, food retail and apparel retails stores to put this information in front of customers.

T2020-6717: establishing a board to review workplace health and safety guidance during the COVID-19 pandemic. Although the current pandemic is far from over, we must begin immediately to reflect on and understand what has worked and what has not worked to protect workers from the disease. Drawing these conclusions could improve our current response and would create a blueprint for future response. We suggest that the board specifically include an occupational health expert in addition to a public health expert, and that labor representatives are included to add input directly from the shop floor.

T2020-6606: disseminating occupational safety and health information to city employees during a public health emergency. Providing the most up to date information on occupational safety and health during a public health emergency to city employees is an important step to safeguarding public health more broadly.

Now more than ever we need bold ideas to protect workers and build back better. We look forward to working with you and our other labor and community partners to fight this pandemic and create a more just and equal economy that works for all.

From: Shirley H. Smith
Sent: Wednesday, November 11, 2020 9:42 PM
To: Una Clarke ; NYC Council Hearings ; Carol Rial ; Rosa Squillacote and Bettina Damiani ; Barron, Inez
Subject: Re: CUNY ASSOCIATE PROFESSOR and STUDENT ADVOCATE VICTIM of RETALIATION

On Wed, Nov 11, 2020 at 9:28 PM Shirley H. Smith <dr.shirley.smith@gmail.com> wrote:

---------- Forwarded message ---------
From: **Shirley H. Smith** <dr.shirley.smith@gmail.com>
Date: Wed, Nov 11, 2020 at 9:24 PM
Subject: Fwd: CUNY ASSOCIATE PROFESSOR and STUDENT ADVOCATE VICTIM of RETALIATION
To: <Hearings@council.nyc.gov>, <IBarron@council.nyc.gov>
Cc: Una Clarke <Kittyclarke@hotmil.com>, Rosa Squillacote and Bettina Damiani <bdamiani@pscmail.org>, Carol Rial <crial@pscmail.org>

Higher Education Committee Hearing
Council Member Inez Barron, Chair
Thursday, November 12, 2020
10am

I, Shirley H. Smith, Ph.D., Associate Adjunct Professor, Hunter College/CUNY, only wish to submit this online testimony to the Higher Education Committee Chair: Council Member Inez Barron for Higher Education Committee Hearing, Thursday, November 12, 2020 10am

dr.shirley.smith@gmail.com
No public phone number

ONLINE WRITTEN TESTIMONY Letter to CUNY Board Trustee and Chair of Student Affairs Committee

---------- Forwarded message ---------
From: **Shirley H. Smith** <dr.shirley.smith@gmail.com>
Date: Wed, May 13, 2020 at 4:32 PM
Subject: CUNY ASSOCIATE PROFESSOR and STUDENT ADVOCATE VICTIM of RETALIATION
To: Una Clarke <Kittyclarke@hotmail.com>

Good Afternoon Trustee Clarke,

Hope you and the family are well. Great speaking with you. Thank you for fielding my concern. As a Member of the CUNY Trustee Board and Chair of Student Affairs, you asked that I share my recent experiences at Hunter College/CUNY during the 2019-2020 academic year. A record of e-mail messages and a letter sent from the department Chair, indicates that I have been abruptly cut from the Adjunct faculty of Hunter, as a result of my successful advocacy for a minority student facing a racially disparate treatment within my department. All I seek is a correction of this unilateral punishment from a department Chair, Terrie Epstein, and that I be re-appointed for another one-year contract for Fall 2020 - Spring 2021.

For the past 13 years, I have served without incident and with decorated and documented distinction, and have received a promotion, to Associate Adjunct Professor in the Department of Education, in Science. I have an earned Ph.D. from New York University with a concentration in Physics and Chemistry and for the last several years, have served as a clinical supervisor of graduate students and science teachers who are getting their Master's degrees in Science Education. My time at Hunter has been a "match made in heaven" among professors, students and people in pedagogy. Students of Color have been particularly vocal in their support for how I have served and my ratings have been very
good from all of my students.

However, a new Department Chair was appointed this past Fall semester to the Education Department at Hunter and they failed to send my 1 year letter of re-appointment, in which, I was entitled. At first, I was not assigned an Appointment for Fall, 2019. I prevailed in my grievance with the PSC and was then sent the letter of my 1 year re-appointment, as well as my assignment for Spring 2020. I was assigned 2 chemistry student teachers, one placed in an appropriate placement of a high school with a licensed NYC High school Chemistry teacher and the 2nd student teacher (an Asian American) was inappropriately placed in a Middle school with a 7th grade teacher. Both Hunter students were master's degree students with a concentration in chemistry.

When I spoke to the Asian American student and asked if he questioned the placement, he said that the placement person said that she could not find a high school one. I reached out to a former Hunter Physics student teacher I supervised last year, who teaches Physics at one of the NYC Specialized High Schools, Brooklyn Tech, where the current NYC Mayor's son attended, to see if a Chemistry teacher would take my
Hunter student teacher. When I secured an appropriate high school placement for my 2nd student, I informed the Chair, Terrie Epstein. In addition, I informed her of my recent visit to the Middle school and meeting with the 7th grade placement teacher and my student teacher. During our meeting, we discussed the expectations of both the student teacher and the cooperating teacher. After that visit, I was sure that this middle school placement would not maximize the student teaching experience of this chemistry student since chemistry is
not taught in middle school.

I sent a letter to Chair Epstein informing her that I could not, in good conscience, supervise a master's chemistry student teacher doing their student teaching in a 7th grade class, in a middle school. My student

was assigned to another Hunter adjunct supervisor. E-mail messages provided to me from within the department indicated that Chair Epstein had made disparaging remarks about me, and demonstrated animus toward me in the wake of my advocacy, including a claim, in writing, that I "drive everybody crazy." If that were true, I would not have scores of excellent student evaluations and letters acclaiming my value and given a promotion to Associate Adjunct Professor within the department.

On May 1, 2020, I received an email letter from Chair Epstein informing me that I would not be offered an Adjunct position for Fall 2020. In fact, the PSC filed a grievance against her because she sent out non-reappointment letters to a large number of adjuncts in error within the department, against Contract rules.
The PSC Contract affords adjuncts who receive non-reappointment letters to request through the Union Representative to meet informally with the Chair to discuss the non-appointment and Chair Epstein refused to meet with me and the Representative. In her email response she said, she had already spent too much of her time with me. Unfortunately the PSC Contract does not have a provision for seniority for Adjuncts.
Two of my colleagues with less experience were called back and given re-appointments to work for Fall 2000. I am convinced that Chair Epstein retaliated against me and did not offer me my 1 year re-appointment for having engaged in protective activity of advocating for my master's degree. Chemistry student's inappropriate student teaching placement, under the cover of Covid-19 CUNY budget considerations.

Anything you can do to correct this error so that I might avoid the time consumption of grievances, hearings, etc. would be greatly appreciated.

Thank you.

Sincerely,
Shirley

Shirley H. Smith, Ph.D.
Associate Adjunct Professor
Hunter College/CUNY
Department of Education
Teaching & Leaning
Science
917.403.9520

SPLC | ACTION

Addressing Online Hate and Radicalization
Hearings Before the
Committee on Civil and Human Rights
New York City Council
New York, New York
November 16, 2020

In advance of the Civil and Human Rights Committee oversight hearing on *Addressing Online Hate and Radicalization,* we write to provide you the views of the Southern Poverty Law Center (SPLC) Action Fund. We appreciate the invitation to participate in this important Committee hearing and ask that this statement be included as part of the official hearing record.

Founded in 1971, SPLC's mission is ***to be a catalyst for racial justice in the South and beyond, working in partnership with communities to dismantle white supremacy, strengthen intersectional movements, and advance the human rights of all people.***

Since then, SPLC lawyers have worked to shut down some of the nation's most violent white supremacist groups by winning crushing, multimillion-dollar jury verdicts on behalf of their victims. We have helped dismantle vestiges of Jim Crow, reformed juvenile justice practices, shattered barriers to equality for women, children, the LGBT community and the disabled, and worked to protect low-wage immigrant workers from exploitation.

SPLC began tracking white supremacist activity in the 1980's, during a resurgence of the Klan and other organized extremist hate groups. Today, the SPLC is the premier U.S. non-profit organization monitoring the activities of domestic hate groups and other extremists. In the early 1990s, the SPLC launched its pioneering Teaching Tolerance program to provide educators with free, anti-bias classroom resources such as classroom documentaries and lesson plans. Teaching Tolerance reaches millions of schoolchildren with award-winning curricular materials that promote understanding of our nation's history and respect for others, helping educators create inclusive, equitable school environments.

The SPLC Action Fund is dedicated to fighting for racial justice alongside impacted communities in pursuit of equity and opportunity for all. Along with our partners at the Southern Poverty Law Center (SPLC), we work primarily in the Southeast United States where we have offices in Alabama, Georgia, Florida, Louisiana, Mississippi, and Washington, D.C. The SPLC Action Fund promotes policies and laws that will eliminate the structural racism and inequalities that fuel oppression of people of color, immigrants, young people, women, low-income people, and the LGBTQ+ community.

Myth Busting about Online Radicalization: False Narratives Can Lead to Bad Policymaking

Prevalence

Too often our discussions of online radicalization begin and end with a discussion of how much extremism exists online and the many and diverse social media platforms that extremists currently utilize. It is particularly troubling to consider the growing prevalence of online extremism as individuals – especially children and adolescents – are spending substantial amounts of time on social media platforms, alone and with less supervision, during the COVID-19 pandemic.

But prevalence alone does not answer the questions we have about whether individuals are being influenced by this easily accessible material and, if so, in what ways? We know far more about the extent or prevalence of online extremist material – and the availability of networking – than we know about how social media and gaming platforms facilitate the radicalization process. What we do know is that very few people radicalize toward violent extremism, and so the challenge becomes how to best prevent targeted violence carried out by so few but that afflicts tragedy too often on so many.

Causality

Obviously, given the growing role of digital media in society generally, active online involvement among extremists is not surprising. Especially in the aftermath of a targeted hate crime or terrorist incident, many sources routinely cite the Internet as the "primary cause" of radicalization – especially among right-wing extremists. But these claims reinforce a sense that we know more than we actually do about the process of online radicalization. As J.M. Berger has written, "while there has been "a lot of attention and funding for fighting online activity compared with other avenues for radicalization…there are *still no established causal links between online extremism and offline violence.*"[1]

Offline Influences

A common caveat in studies of online radicalization involves the admission that it is unclear whether the individuals included in these samples were radicalized by the exposure to the online extremist content or whether they were radicalized offline or through some combination of on and offline material. Too frequently our discussion of online radicalization and how to best respond makes two false assumptions:

1) Each person is equally likely to be exposed to online extremism; and
2) Each person exposed to online extremism is equally likely to become radicalized.

Neither of these assumptions are correct. First, we know that some individuals are more likely to be exposed to online extremism because of their personal interests, Internet search tendencies, and other factors. And second, we know that, when presented with the same extremist material, some people are more susceptible than others. It is not surprising that some people are "primed" for radicalization by the dominant culture around them – including systemic racism and white supremacy – as reflected in both media and civil society.

Naturally, this priming occurs uniquely in each individual's life, informed by experiences offline and online. This greater susceptibility may result from a host of different physical world factors, including family situation, mental and cognitive health, and unresolved trauma. These

[1] Berger, J. M. (2018). *Extremism*. Cambridge: MIT Press.

offline factors make it difficult to determine how online influences affect the radicalization process.

In reality, therefore, no single source of influence is likely to produce a particular outcome. It is clear that the number of people exposed to online extremism dwarfs the number of people who actually commit targeted hate crimes or terror attacks. This should discourage overly simplistic explanations of how extremism online "causes" radicalization.

Redirecting, Quarantining and Deplatforming Online Hate

Clearly, there is no single piece of policy or technological fix to a problem that is deeply rooted in our social fabric and country's history. However, there has been some indication of the effectiveness of the tech industry's "Redirect Method." While several different iterations of Redirect have been developed, the basic idea is to "prevent unobstructed access to extremist content"[2] – to identify individuals searching for extremist content online and redirect them to either counter messaging or other content that might diminish the influence of extremist content. This technique requires more thorough study and evaluation and far more transparency and buy-in from social media companies. In a report released in May, the Tech Transparency Project (TTP) found that Facebook's "redirect tool even failed to work on groups that Facebook has explicitly banned" and that "even organizations that have 'Nazi' or 'Ku Klux Klan' in their names escaped the redirect effort.[3]" TTP quantified Facebook's failures as follows, as the company claimed to be "redirecting users who search for terms associated with white supremacy or hate groups to the Page for "Life After Hate," an organization that promotes tolerance—[but the function] only worked in 6% (14) of the 221 searches for white supremacist organizations."

Another widely discussed approach to countering the highly accessible nature of online hate and extremism involves a call for tech companies to more aggressively quarantine, de-platform, or shut down accounts of online extremists based on breaches of their own user agreements. The logic behind this approach recognizes several things:

- Mainstream platforms help to legitimize online extremists;
- The powerful algorithms maintained by these platforms provide an increasingly broad audience and a megaphone to instantly promote their propaganda and hateful messages.

Yet, de-platforming may have unintentional consequences that undermine the effectiveness of the approach. A 2019 Anti-Defamation League's (2019) study of Twitter's de-platforming efforts[4] showed migration from closed accounts from Twitter to Gab, a platform much more reinforcing, since it is more heavily populated with white supremacists and various other types of right-wing extremists. In short, the effectiveness in reducing the threat of extremists by forcing them off platforms is unclear.

Deplatforming erodes the ability of extremists to recruit widely, cultivate larger audiences for propaganda, while also damaging efforts to monetize their work in simpler ways. But the method is limited in its long-term efficacy and does nothing to address aspects of our society that create drivers for white extremism, including systemic white supremacy, our deeply

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[2] Todd C. Helmus and Kurt Klein, *Assessing Outcomes of Online Campaigns Countering Violent Extremism: A Case Study of the Redirect Method* (Santa Monica, CA: RAND Corporation, 2018).
[3] https://www.techtransparencyproject.org/articles/white-supremacist-groups-are-thriving-on-facebook
[4] Anti-Defamation League, *Quantifying Hate: A Year of Anti-Semitism on Twitter,* 2019.

polarizing political climate and the predominance of anti-immigrant and nativist messages and policies within it, and more.

Writing for *The Atlantic* in 2019, JM Berger notes that "Deplatforming helped reduce the overall reach of white-supremacist propaganda, but users who migrated to less prominent platforms quickly created a pressure-cooker environment where radicalization to violence could take place very quickly, with adherents goading one another into ever more extreme views and actions.[5]"

Despite these misconceptions and uncertainty, it is clear that online extremism is a serious problem that needs to be addressed. Here are several approaches that work:

Building Resilience & Confronting Risk in the Covid-19 Era: A Parents and Caregivers Guide to Online Radicalization

We have known for years that it can be all too easy for individuals to become radicalized without even leaving home. The proliferation of extremist spaces and content online has created new and powerful avenues for radicalization, especially for young people who are often the targets of radical-right propaganda.

This year, with the COVID-19 pandemic forcing most Americans to remain at home for months on end amid great social, political and economic uncertainty, the threat of online radicalization must be addressed with increasing innovation and attention. To address the issue, and to give parents and caregivers a resource to know how to respond, SPLC, in partnership with American University's Polarization and Extremism Research and Innovation Lab (PERIL), developed a guide to help parents, caregivers and educators understand how extremists are exploiting this time of uncertainty and targeting children and young adults. The guide, *Building Resilience & Confronting Risk in the COVID-19 Era,*[6] provides tangible steps to counter the threat of online radicalization, including information on the new risks during the COVID-19 crisis, ways parents can identify warning signs that their kids might be vulnerable to extremist propaganda, ways to build resilience to those narratives, and proactive approaches that can help young people be less vulnerable to extremist rhetoric when they do encounter it.

This time of heighted anxiety is a perfect storm for extremist propaganda and recruitment. The more than 70 million children and young adults who are now learning online – primarily at home, away from structured activities, dislocated from their peers, frequently in families under economic and psychological distress – have become a target for extremists, who promise easy answers and scapegoats to blame for their situation.

The SPLC PERIL Guide describes new risks in the COVID-19 era this way:
Unprecedented time online. 55 million children and adolescents in the US have seen their school activities moved online since the outbreak of COVID-19. Nearly 15 million college students have switched to online learning as well. The hours previously spent at school or in classrooms under the supervision of trusted adults are now largely spent online.

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[5] J.M. Berger, *The Strategy of Violent White Supremacy Is Evolving, The Atlantic, August 7, 2019* https://www.theatlantic.com/ideas/archive/2019/08/the-new-strategy-of-violent-white-supremacy/595648/

[6] https://www.splcenter.org/sites/default/files/splc_peril_covid_parents_guide.pdf

Distracted parents and caregivers. Work has not stopped for most parents and caregivers. Some adults must work online during much or most of the day. Many other adults must continue to go to work outside the home, leaving children's online activities unsupervised. Parents and caregivers are relaxing screen time restrictions in order to find more time for their own work, both in and outside the home.

Risks associated with at home digital learning. Significant increases in time spent online increase the likelihood of encounters with bad actors. This is the case with child exploitation, according to an FBI warning issued in April 2020,5 and it is also true for risks of encountering extremist propaganda.

Reduced social supports from trusted adults. The network of teachers, coaches, and other instructors who can assist parents in spotting changes to a child's behavior are no longer able to do so.

Isolation from others who might challenge new beliefs. Social restrictions prevent children from accessing the peers and mentors who could discourage and refute emerging extremist attitudes. The sense of belonging to peer groups, sports teams, extracurricular activities and other social groups that provides important resilience to extremist recruitment may be weaker during this time of isolation in ways that create more susceptibility to extremist groups' promises of brotherhood, belonging and a sense of purpose.

Uncertainty and Loss. The COVID-19 era is a time of great uncertainty and loss. Almost every family in the United States will be touched by the loss of life from COVID-19. Young people have also lost their regular network of peer support, the rewards and milestones of the school year (sports, dances, graduation, etc.), and their daily routine and structure. COVID-19's impact on the economy is pushing caregivers into unemployment, promising an ongoing loss of financial stability for all who depend on them.

Scapegoating and simplistic answers. Extremist groups exploit tragedy and loss by pushing blame onto scapegoats who they claim are responsible for the virus and its broader impacts. Such groups thrive during times of uncertainty by offering simplistic answers and easy targets to blame.

Broadening support base. Some extremist groups are exploiting COVID-19 as a public relations opportunity, engaging in community service aimed at softening their public image as hate groups.

New extremist content circulating. Extremists have quickly seized on the virus to circulate videos, memes, and other materials that promote racist and xenophobic arguments and conspiracy theories about the virus' origin, its impact on minority communities, and the government's response.

Some of this material has circulated widely on mainstream social media channels, increasing the likelihood of encountering hateful or extremist content. This situation creates a "perfect storm" for individuals to explore extremist spaces and content online, as Online radicalization is helped by a lack of competing views or challenges to the ideologies people encounter online. Extremist groups thrive in situations such as these by exploiting legitimate fears and grievances while preying on vulnerable children and adolescents.

The good news is that parents and caregivers are the people in the best position to stop radicalization in its tracks during the COVID-19 pandemic. The Guide provides strategies for parents and caregivers on how to recognize warning signs, how to get help, and how to engage a radicalized child or young adult:

LISTEN to what children are saying. If they begin to repeat themes or vocabulary associated with extremists and conspiracy theories, try not to ridicule or punish them. Ridicule and scolding have actually been shown to strengthen problematic belief systems.10 Instead, suggest that the people spreading these messages may have their own motives besides the truth and a child's well-being. Then, reach out for help from one of the resources provided at the end this guide.

ASK QUESTIONS about what children are doing online, what they are learning, and what kinds of websites and platforms they spend time on. Approach these questions from a place of curiosity rather than monitoring. Ask open ended questions, like "What values do you stand for?" or "What kind of person do you want to be?" Asking questions that show genuine interest in a child's activities and hobbies may open up new lines of communication and sharing about what they do online. Ask questions that let them teach you something from their lives, like "How does that game work?" or "How do you think your teachers could be doing better in the transition to online learning?" Teenagers may open up more if you raise questions during casual activities where they are not the only focus of your attention. Talking while driving in the car, folding laundry, or taking a walk can reduce the pressure.11

DISCUSS the news with children in an age-appropriate way. Visit sites like the News Literacy Project to learn how you can avoid misinformation and propaganda. Screen content they are watching by looking at the reviews and parent/child ratings on Common Sense Media. Proactively suggest materials published by trustworthy news sources and read an article together each day. Subscribe and listen to a credible current events podcast together. Pay attention to the news sources children favor and ask them how they know the sources of their information are credible. Help direct them toward reliable news sources. Continue to educate yourself on how to identify misinformation and disinformation in the news and elsewhere.

EDUCATE children on the ways that propaganda and misinformation are used to manipulate people. Talk to them about both the styles and strategies of extremist propaganda (such as scapegoating or offering simple solutions to complex problems). Explain that propaganda can be delivered in any medium—writing, video, music, memes, etc.—and can often disguise itself as humor.

ADVISE children to practice good internet safety. They should be cautious about clicking on links they don't recognize and should not click on links sent from people they don't know. Maintaining privacy settings— and updating them regularly—on all apps and social media accounts is important.

ENCOURAGE your children to critically examine messages they receive, and to treat the information they consume as persuasive devices, meant to convince them of a world view. Talk about what they can do if they encounter an extremist message online or in real life (see "Responding to Hate," below). These critical thinking skills and vigilance can help a child spot and overcome radicalizing messages.

EXPOSE the way extremists prey on a young person's sense of vulnerability and identity. Demonstrate to children how these messages might even appeal to them. Be honest about a

time in the past when you may have been deceived by an individual or group who didn't have your best interests at heart. See the resources provided at the end of this guide to learn more about the experiences of former extremists and share them.

REMIND children that people may not be who they say they are online. The internet allows anyone to wear a mask—especially predators. Sometimes, people who seem popular and successful are really failures. People who seem fun and accepting can be intolerant and even abusive. This is especially true in extremist spaces, where violence and exploitation within groups is quite common.

Promoting Digital and Media Literacy

The internet is an amazing tool for teaching and learning. But, before we can teach students to harness its power and become good citizens of the web, we need to understand the intricacies of how it works and how it can be manipulated to mislead and even harm users.

SPLCs Teaching Tolerance staff has developed its "Digital Literacy Framework[7]" in order to support educators, parents, and youth alike. Teaching Tolerance's framework offers seven key areas in which students need support developing digital and civic literacy skills. The framework outlines the overarching knowledge and skills necessary while also detailing more granular examples of student behaviors to help educators evaluate mastery. Those seven areas are as follows:

1. Students can locate and verify reliable sources of information.
2. Students understand how digital information comes to them.
3. Students can constructively engage in digital communities.
4. Students understand how online communication affects privacy and security.
5. Students understand that they are producers of information.
6. Students understand their role as customers in an online marketplace.
7. Students can evaluate the value of the internet as a mechanism of civic action.

Teaching Tolerance's framework also offers dozens of sample lessons for K-12 educators. Those lessons are tailored for age groups. Further resources for professional development and support around digital literacy are also available.

Reports and studies emerging from Finland evidence how impactful an empirically guided, well-structured program of digital and media literacy can be for inoculating a society to the harms of disinformation and misinformation, extremism and radicalization. The Guardian reported in January of this year that Finland "top[s], by some margin, an annual index measuring resistance to fake news in 35 European countries, adding that "the programme aims to ensure that everyone, from pupil to politician, can detect – and do their bit to fight – false information."[8] Finland demonstrates how civil society and government may play an ethical, cutting edge role in helping citizens safeguard their families and communities to such harms through education.

SPLC and PERIL also stress the importance of media and digital literacy in our *Building Resilience & Confronting Risk in the COVID-19 Era* guide for parents, caregivers, and educators.

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[7] https://www.tolerance.org/frameworks/digital-literacy

[8] https://www.theguardian.com/world/2020/jan/28/fact-from-fiction-finlands-new-lessons-in-combating-

The Danish Aarhus Model: Prevention and De-radicalization

This strategy, developed and employed in Aarhus, the second largest city in Denmark, is quite unique, involving both model programs for early detection and prevention and programs to help already radicalized individuals deescalate their involvement and exit from extremism. The purpose of the program is to

> stop or redirect the processes of violent radicalization. A main concern in this regard is to ensure constitutional rights and freedom of expression while at the same time acknowledging the democratic necessity of political and religious activities, and eventually, to guide the political and religious opinions, critiques and activities into legal modes of operation within the framework of democracy.[9]

The goal of the program is to channel youths and adults away from radical environments onto a different path. The Model requires close, interdisciplinary cooperation among existing educational and social welfare agencies identifying and working with vulnerable youth and then evidenced-based intervention and redirection. The Model depends on parents, teachers, peers and others recognizing early warning signs of extremism and then helping the individual find alternative ways to find answers to questions of interpersonal relations and life. An essential element of the Aarhus Model is training a cadre of mentors "with whom the mentee can discuss questions and challenges of daily life as well as the ultimate concerns of existential, political and religious questions of life."[10] Another essential element in the program is early prevention programs, to discuss the threats of terrorism and violent radicalization and to help peers and teachers recognize risk factors for possible radicalization.

The Model also includes an exit program designed to help individuals who want to leave extremism behind and return to daily social life. The program involves investment in community-based employment and education programs, as well as housing, therapy, and medical care. A similar exit support program in the United States, Life After Hate, has existed since 2011. Established by a group of former violent extremists, Life After Hate, provides support and guidance for individuals who want to leave a hate group and for their friends and family members. Using their own experiences with the trauma, abuse, alienation, and shame that could prompt an individual to join a hate group, the group employs evidence-based research in an effort to support "an exit strategy for men and women ready to leave hate behind once and for all."[11]

Stop Funding Online Hate

For decades, the SPLC has been fighting hate and exposing how hate groups use the internet. We have lobbied internet companies, one by one, to comply with their own rules to prohibit their services from being used to foster hate or discrimination. A key part of this strategy has been to target these organizations' funding.

In January 2020, Lecia Brooks, the SPLC's Chief of Staff, testified at hearings House Financial Services Subcommittee on National Security, International Development and Monetary Policy about how technology companies can disrupt the funding, organizing and recruiting efforts of hate groups on their platforms.[12]

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[9] *Preben Bertelsen, Danish Preventive Measures and De-radicalization Strategies: The Aarhus Model in From the Desert to World Cities: The New Terrorism, Konrad Adenauer Stiftung, 2015*

[10] Ibid.

[11] https://www.lifeafterhate.org

[12] https://www.splcenter.org/news/2020/01/15/splc-testifies-congress-financing-domestic-terrorism

After outlining the nature and magnitude of the current threat posed by the white nationalist movement in the United States – unfortunately energized and emboldened by the words and actions of President Trump – her testimony focused on ways in which technology companies, including social media sites and online pay portals, can disrupt the funding, organizing and recruiting efforts of hate groups and bad actors who seek to normalize racism, antisemitism, and anti-immigrant ideologies as well as sexism and anti-LGBTQ animus.

A few highlights from SPLC's testimony:

- hate group sites are funded by peer-to-peer interaction, not by large donors. Even a small amount of money can go a long way in spreading hate online. These groups and individuals are able to spread their toxic ideologies far and wide through ads and events that cost relatively little.
- Tech companies should create policies and terms of service to ensure that social media platforms, payment service providers, and other internet-based services do not provide platforms where hateful activities and extremism can grow and lead to domestic terrorism.
- Removing hate groups from online platforms by removing their funding sources will prevent their ideas from reaching a wider audience and disrupt their networks. To stem the rise of hate and domestic terrorism, we are encouraging tech companies to respect people over profits.
- Hate groups have clearly been damaged by the efforts of the SPLC and its allied organizations, but many extremists are finding new, though often obscure, internet platforms along with technology providers that don't mind providing them with services.
- Charities and donor-advised funds also have a role to play in fighting hate online by blocking donations to hate groups. Charitable gift funds – including the largest charity in the United States – are helping dozens of hate groups raise millions of dollars by allowing their donors not to reveal their identities.

Change the Terms

On Oct. 25, 2018, the Change the Terms[13] coalition – including the SPLC and a coalition of more than three dozen civil rights, human rights, technology policy, and consumer protection organizations released a suite of recommended policies for technology companies that would take away the online microphone that hate groups use to recruit members, raise funds and organize violence.[14] Because these tech platforms are largely owned and managed by the private sector, not the government, we believe these corporations must be part of the solution to address the promulgation of hateful activities online. Our coalition hopes the model policies provide a baseline from which to measure progress tech companies are making, as well as a benchmark for newer companies wrestling with some of these issues for the first time.

In response to Change the Terms' advocacy, several Silicon Valley leaders have made promising changes[15] that align with the coalition's vision for a safer online world. In March

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[13] https://www.changetheterms.org/

[14] Change the Terms, *Recommended Internet Company Corporate Policies and Terms of Service to Reduce Hateful Activities* https://assets.website-files.com/5bba6f4828dfc3686095bf6b/5bd0e36186e28d35874f0909_Recommended%20Internet%20Company%20Corporate%20Policies%20%20Terms%20of%20Service_final-10-24.pdf

[15] https://www.freepress.net/our-response/expert-analysis/explainers/change-terms-year-fighting-online-hate

2019, Facebook banned[16] prominent white supremacists, published a report[17] on content removal and made changes to its Livestream feature while also accepting the coalition's recommendations on tracking URLs from extremist sites.

In August 2019, Internet-infrastructure firm Cloudflare cut its service to 8chan,[18] an infamous online forum. The move came nearly two days after the mass shooting in El Paso, Texas, in which the alleged gunman posted an anti-Latinx manifesto on 8chan 20 minutes before murdering 22 people.

In June 2019, YouTube announced a broadened hate speech policy,[19] in which "content that alleges a group is superior in order to justify discrimination on characteristics like age, race, caste, gender, religion, sexual orientation, or veteran status" would be prohibited.

Improve Hate Crime Training and Data Collection.
Data drives policy. We cannot address a problem if we are not effectively tracking and measuring it. The FBI has been tracking hate crimes and preparing an annual report on reports they receive from state and local law enforcement officials under the federal Hate Crime Statistics Act (HCSA) since 1991. Like all FBI crime reporting, it is voluntary – and it is clearly incomplete. In 2018, the most current data are available, more than 1,500 federal and local police agencies *did not report any data to the FBI* – including eight cities with populations of more than 100,000. Another 77 cities with populations of more than 100,000 affirmatively reported zero (0) hate crimes to the FBI, a statistic that strains credibility. The FBI is scheduled to release their 2019 HCSA today.

At the federal level, because of the special impact of hate violence on communities, SPLC and a broad coalition of civil rights, religious, education, and civic groups are urging the incoming Biden Administration and Congress to make hate crime reporting mandatory. While working to make reporting mandatory, however, Congress should pass the **Khalid Jabara and Heather Heyer National Opposition to Hate, Assault, and Threats to Equality (NO HATE) Act,** which would authorize grants to promote hate crime training, prevention, best practices, and data collection initiatives – and to develop state hate crime reporting hotlines to refer individuals to local law enforcement and support services.

Promote Anti-Bias Education Programs that Help Steer Individuals Away from Hate and Extremism. The law is a blunt instrument to confront hate and extremism; it is much better to prevent these criminal acts in the first place. Since it is not possible to legislate, regulate, or tabulate racism or hatred out of existence, we need federal and state government leadership to promote anti-bias, anti-hate, and democracy-building education programs – such as SPLC's Teaching Tolerance resources – in our nation's schools. Especially in these divided and polarized times, every elementary and secondary school should promote an inclusive school climate and activities that celebrate our nation's diversity.

It is disappointing that the City Council did not renew funding for the Hate Violence Prevention Initiative (HVPI) as part of the FY 21 budget. HVPI had partnered with community-based organizations that direct services to vulnerable, targeted populations – building trust,

[16] https://www.nytimes.com/2019/03/27/business/facebook-white-nationalist-supremacist.html
[17] https://www.nytimes.com/2018/05/15/technology/facebook-removal-posts-fake-accounts.html
[18] https://www.wired.com/story/cloudflare-8chan-support-ddos/
[19] https://blog.youtube/news-and-events/our-ongoing-work-to-tackle-hate

educating about rights and access to victim services, and encouraging communities to report incidents of hate violence to law enforcement authorities. The City Council should renew funding for this important program.

Speak out against hate.

Finally, words matter. It is impossible to overstate the importance of civic and military leaders using their public platforms and bully pulpits to condemn hate and extremism. Failure to do so emboldens extremists. In words and deed, President Trump and his administration have fallen far short of what we have come to expect – what the nation actually needs – from our leaders. In fact, the President's divisive, polarizing rhetoric and executive actions have, too frequently, made things worse, elevating the urgent need for Governors, Mayors, police executives, and federal, state, and local legislators to speak out against hate and extremist acts

Testimony of Saul Fishman, President of the Civil Service Bar Association, on behalf of the Civil Service Bar Association and on behalf of Teamsters Local 237, with which CSBA is affiliated – submitted to the NYC Council Committee on Civil Service and Labor, November 20, 2020

Good morning Civil Service and Labor Committee Chairperson Miller, distinguished Committee Members, Councilmembers, Fellow Labor Leaders, City Government Colleagues and Concerned Guests:

My name is Saul Fishman, I am the President of the Civil Service Bar Association ("CSBA"), which represents the attorneys who work hard and smart each day for virtually every city agency, as in more than 40 mayoral agencies large and small, as well as attorneys working for the Housing Authority and the Transit Authority. We have a touch over 1,000 members, and are proudly affiliated with Teamsters Local 237, which has around 24,000 members.

Our members are dedicated city employees. They believe in their agency's mission, and are a key part of making sure that the laws that this body and others enact are enforced equitably, equally, fairly and justly, without favor or discrimination. Many toil a lot of hours, not to become rich, which they certainly will not become on city salaries, especially given their crushing student debt. But I'm not here today to complain about those things – we can and should have those conversations another day – rather to discuss keeping city workers as safe as possible, and to recommend the passage of Intro 2162-2020, the bill before this committee sponsored by its Chair, the Honorable Daneek Miller and co-sponsored by Councilmember Ampry Samuel.

As we have learned during this hopefully once in a hundred year pandemic, which has already killed more than 250,000 Americans, knowing as much as possible about the risks we are facing from this deadly virus, whether those risks are at home, in our neighborhoods, workplaces, restaurants, gyms, you name it, is essential to keeping ourselves and our families, friends, neighbors and coworkers as safe as possible. This bill would amend the Administrative Code to require the Citywide Office of Occupational Safety and Health ("COSH") to monitor the guidance published by the various Federal, State and City agencies that issue such guidance, forward it to each city agency's health & safety coordinator within 24 hours, who would then be required to send a summary to each employee tailored to what is relevant to that employee based upon the risks posed by that person's job title.

Good as this bill is, and the Civil Service Bar Association and Teamsters Local 237 support it, there is more to be done, more unnecessary risk being inflicted upon city workers that needs exposure and prompt intervention. As we testify safely, remotely today, several CSBA members in the Fire Department are being forced to participate <u>in-person</u> in meetings and hearings with extremely high-risk respondents and witnesses, including Emergency Medical Technicians ("EMTs"). Indeed, the FDNY's own Chief Medical Officer, Dr. David Present, conducted a study concluding that EMTs are about 15 times more likely to be COVID-infected than the average

New Yorker. These meetings and hearings can, should, and in fact have heretofore been conducted safely and effectively remotely by teleconference.

I am specifically referring to the FDNY Bureau of Investigations and Trials unit ("the BITS unit"), where dedicated attorneys act as prosecutors enforcing rules against employee misconduct. These are folks who believe in following the rules, but who are being forced to either follow the brand-new, arbitrary, reckless rules written specifically for their unit, which forces them to appear in person wherever any one party wants an in-person hearing, or to be considered insubordinate for not putting their health and indeed their lives and the lives of their families at risk.

By contrast, and ironically, the Mayor's Office of Labor Relations, which handles Step III disciplinary grievances, is only meeting remotely. We met remotely with them and the Fire Department to try to resolve this issue, but they failed to intervene to have these city workers be kept as safe as OLR is keeping itself. Arbitrators handling the final step, Step IV disciplinaries, via the Office of Collective Bargaining, are also meeting exclusively online. Indeed, all responsible entities are following guidances for remote hearings. The Family Court, which handles important abuse and neglect cases involving children, meets remotely. I know, because we represent approximately 200 members who handle far too many cases for the NYC Administration for Children's Services ("ACS") Family Court Legal Services, many of whom have contacted me about the challenges presented by remote hearings. And you may have heard the news that New York courts have once again stopped having jury trials out of safety concerns during this second wave of the pandemic.

So I am respectfully requesting that this committee investigate and act to stop this city agency's shortsightedness and hypocrisy, while supporting the good work advanced by the bill being considered by this committee.

With that, I am requesting that my colleague from Local 237, Health & Safety Coordinator Susan McGrath, briefly address this committee.

Thank you very much for this opportunity, Chairperson Miller, Council Committee Members and Friends.

For more information, CSBA President Saul Fishman can be reached via sfishman@local237.org.

UNITED PROBATION OFFICERS ASSOCIATION
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(212) 274-9950

Testimony of Dalvanie Powell
Workplace Safety in the Covid-19 Era
Committee on Civil Service and Labor
Friday, November 20, 2020 - 10:00 AM

Good Day Chair Miller and Civil Service and Labor Committee;

Thank you for inviting me to testify on the importance of workplace safety in the Covid-19 era.

When the city shut down in hopes to stop the spread of corvid 19 , the members of the United Probation Officers Association never stopped working. The department instituted mobile schedules where the members continued to supervise our probation/clients, conduct investigations, prepare reports and intakes while they were able to work remotely. The members reported to the office intermittently while they continued to make home visits and practice social distancing. We did not skip a beat even though we lost a member to the disease and at least 35 of our members have fallen ill.

Prior to Covid-19 the Department of Probation was two or three hours short of being 24 hours, however since Covid-19 hit we have become a 7 day a week 24 hours a day agency. As a result, rather than taking steps to limit exposure to Covid, we have substantially increased contact with the probation /clients.

We would like to see the City take active steps to reduce risks for our members. Even the basics like providing PPE can go a long way. Every life matters. And every exposure matters and has a ripple effect. Just making it a priority to value our work and pay attention to the impacts of the pandemic could go a long way which is why we thank this Committee's work on this issue.

Also there is a sense that the City is not paying attention to the way this pandemic impacts our members. Our members are committed to our probation/clients. We participate in volunteer activities outside our on duty responsibilities, such as distribution of food to probation/clients and their communities through the Department of Probation's NEON locations. Our concern is keeping the members safe when interacting with thousands in need. We are also concerned about what happens in the winter months as some of these locations the members are standing outside distributing food. Again, it is not that we want to stop doing this work, our members are hard working and committed to our communities. We want the City's help in ensuring safe practices and reducing risks.

We have never stopped making field visits which carry with them various health concerns. Rather than taking the steps to protect us in this work, the City has leaned on UPOA members

asking us to perform duties outside the scope of our responsibilities under our collective bargaining agreement. By way of example, due the Covid-19 concern the City ordered the release of inmates at Rikers Island. Without offering any additional pay or protection, the Mayor's Office ordered our members to handle these releasees. As a result the department re-instituted the electronic monitoring unit to monitor these individuals as well those probation/clients who are not in compliance or in violation status. This is out of title work for which we were not even given proper PPE despite exposing our members to additional risks such as going into the field, interacting with individuals to attach bracelets, entering the residences such as homeless shelters, etc. We did the work because our members are professionals and rise up in times of hardship for this City. But will the City remember or recognize this? Especially when they don't even properly outfit these members with proper PPE? There are non-expensive steps the City could take if their prioritized our safety such as plexiglass to place on each officers' desk to meet with probation/clients. But the City has fought installing this, suggesting we have to share the plexiglass between desks, which would be impossible, not safe and would raise issues of handling and cleaning the plexiglass or even injuring our members carrying it.

We look forward to working with this Committee to learn better ways to address this pandemic moving forward and to protecting our workers in the era of Covid-19 and beyond.

Thank you.

##

Testimony of Oren Barzilay, President
Local 2507 – FDNY EMTs Paramedics & Fire Inspectors
Workplace Safety in the Covid-19 Era
Committee on Civil Service and Labor
Friday, November 20th at 10:00 AM

Dear Chair Miller and Committee:

Thank you for giving me the chance to speak to you today regarding workplace safety in the Covid-19 era. Our members appreciate your continued advocacy, and especially now as life is even more challenging we appreciate your commitment to protecting civil servants.
There is no question that many of the challenges this City has faced with regards to the Covid-19 pandemic has fallen on the shoulders of First Responders and Health Care Workers, of which FDNY EMS has taken a lion's share.

To date we have lost 7 members to the virus over almost the same amount of months, hundreds of our members have contracted the virus and gotten ill, dozens have developed long term permanent health issues. In March of this year, Christell Cadet one of the speakers at our rally last year to address the culture of discrimination and disparate treatment within the FDNY contracted the disease, battling for her life for months on life support. She is still not able to return to work and has a long road of recovery ahead of her. The impact to the mental wellbeing of these members on the frontlines of Covid also cannot be overstated. Some members have resigned their job due to the overwhelming death they have witnessed. Some are showing signs of PTSD when at work by either breaking down while mid-duty and going home sick.

Unfortunately, while EMS First Responders have shown up to answer the call of duty, risking their lives to save others, our Department continues to demonstrate their lack of commitment to protecting our EMS First Responders.

Almost immediately after the virus hit our communities, the Fire Department made moves to protect their firefighters. In fact, in early March, while Christell Cadet lay on a hospital bed hooked up to a ventilator fighting for her life, the FDNY issued orders pulling firefighters from answering medical calls that described symptoms associated with coronavirus.

But our members did not object. EMS First Responders are the experts best suited, most skilled, and best trained to respond to these dangerous calls. We understand the risks associated with our work and New York City's EMS First Responders are some of the best in the world. We just don't know if the City understands our respects these risks. Where was the Department to rush in and protect us? Instead, our members were put in unnecessarily more dangerous situations while being paid what amounts to minimum wage. Simple things like asking us what we needed, ensuring basic PPE was in put in place timely not seven months after it was needed, setting up protocols, and paying attention to our members, not to mention considering extra pay to help cover the costs and sacrifices our members made, being away from their families day after day, as they rushed into what is in essence was our burning building, would have gone a long way.

We have seen how the Covid pandemic adversely impacts communities of color. Similarly our predominately of color First Respondents are often forgotten, under-protected, and ultimately also adversely impacted by Covid-19.

Rather than ensure we had proper PPE the City directed our members to only where N95 masks when we were intubating patients. Meaning, we would not be allowed to wear masks at scenes where airborne pathogens could lead to illness and possibly death.

Undervaluing our members put their lives unnecessarily at risk. But it also puts the greater community at risk. In March around the time that the Department was issuing orders of protection for its other members, it issued an order for EMS First Responders that even if we were exposed or tested positive for Covid we should report to work as long as we were not symptomatic. In hindsight hopefully even the City can understand how shockingly thoughtless this was. Not only does it put our members in a situation where they are not able to care for themselves, but they are then simply spreading the virus to their co-workers and their patients.

The oversight that this body offers as well as the workplace oversight board being proposed are desperately needed so that we can learn from past mistakes and better protect those on the frontline risking their lives for all of us.

Thank you.

##

Testimony of

Tony Utano, President

Transport Workers Union, Local 100

Establishing a Board to Review Workplace Health and Safety Guidance During the COVID-19 Pandemic.

New York City Council, Committee on Civil Service and Labor

Nov. 20, 2020

I am Tony Utano, President of the Transport Workers Union, Local 100. We represent more than 46,000 workers in the transportation sectors. Nearly 40,000 of these workers operate, maintain and clean the city's bus and subway systems for the MTA. The remainder work at private bus companies, like Liberty Lines Transit in Westchester County; New York Waterway, and in the School Bus and Tour Bus industries.

I want to thank the Committee for extending the opportunity to comment on this important legislation. Also, I wish to thank City Councilman I. Daneek Miller for proposing it.
At the outset, I would suggest that the board not be limited to 9 members. I believe the Board must adequately represent the various essential workforces impacted by the pandemic, including mass transit, police, fire, sanitation, EMS, public health, education and other City workers. Each workforce faced its own particular set of challenges, as we in transit especially experienced. A representative from each of the major unions representing these titles is vital, in my opinion, to achieve the best results possible from this Board.

The pandemic hit the MTA workforces very hard. To date, 133 MTA workers have died of the virus. Two of that number passed just in the last few weeks. The majority of all fatalities were members of the TWU Local 100 family. The remainder were members of the Amalgamated Transit Union, and the supervisory unions.

But these are just numbers, and they don't tell the story of who these wonderful people were; the vital jobs they did in the fight against this pandemic; and, of course, the important lives they lived outside of their jobs as transit workers.

Some were relatively new to the job. Some had more than 35 years of service. They were from every department in transit; buses, subways, stations, car and bus maintenance, cleaners, trackworkers, signals, structures and power. Almost all were loving parents and heads of household.

Three of our lost Brothers were elected officers of Local 100 who contracted the disease while representing their co-workers in the subways.

It is truly hard to describe the depth of the loss felt by the families, and by the co-workers left behind in the depots, shops, barns and crew quarters.

Much of the blame for what has befallen New York and the rest of the country has been directed at the federal government. But, in truth, no one was ready for this crisis. Everyone was caught flat-footed, including the MTA.

The fact that this union – in early March of this year – had to threaten service unless Bus Operators and Conductors who wanted to wear their *own masks* were allowed to do so reveals the depth of the lack of understanding of what was happening.

We fought for many changes in operating safety to mitigate transmission of the disease in those first crucial weeks; including:

- Indefinite suspension of the Kronos, fingerprint time-keeping system;
- rear door boarding and restricted rider areas for buses;
- better shields to protect bus operators.
- cashless transactions in Stations;
- disinfection of work areas and rolling stock daily;
- sufficient supplies of masks and hand sanitizers, and optional face shields for Conductors;
- a systemwide policy that riders be required to wear masks to get on a bus or train.
- Members exposed to COVID-19 received two weeks paid leave (Quarantine).
- Insured that we were among the first workforces to receive preferential tested for COVID-19, free of charge, at any Northwell urgent care facility.
- enforced more aggressive cleaning schedules of work locations.
- responded quickly with state-of-the-art cleaning methods in areas where it was found that multiple members had tested positive for COVID-19.

The problem of social distancing is especially acute at cramped MTA crew rooms and locker facilities, especially in the subway system. To address this issue, we negotiated “office trains” and “parlor buses,” (out of service trains and buses) to be used for break rooms and lunch areas near subway terminals and other reporting locations.

We also fought for the surviving family members. We were able to negotiate a substantial death benefit of $500,000 for the designated beneficiaries of the victims of the pandemic.

Finally, we believe that our heroic workforces deserve the promise of no layoffs, a strong enforcement of the mask requirement throughout the transit system, and city run facilities everywhere, and the promise of hazard pay.

I wish this Committee the best of luck in the formation of this panel. TWU Local 100 stands ready to assist in any way the Committee finds appropriate.

Thank you.

Testimony of

Tony Utano, President

Transport Workers Union, Local 100

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Finally, we believe that our heroic workforces deserve the promise of no layoffs, a strong enforcement of the mask requirement throughout the transit system, and city run facilities everywhere, and the promise of hazard pay.

I wish this Committee the best of luck in the formation of this panel. TWU Local 100 stands ready to assist in any way the Committee finds appropriate.

Thank you.

Written Testimony: Committee on Civil Service and Labor
New York Committee for Occupational Safety and Health (NYCOSH)
Charlene Obernauer, Executive Director
November 20, 2020

Today, in New York State, workers are in crisis. Workers are facing record numbers of unemployment, and workers are facing unprecedented health and safety risks on the job. Essential workers have been exposed to COVID-19 hazards since the virus emerged in New York State, and many have gotten sick—the exact number, we do not know. Some workers have not quite "chosen" to go back to work in unsafe conditions, but have been forced to due to economic necessity, and in doing so, are exposing themselves and their families to health hazards.

Why are workers at such risk when we have an agency, the Occupational Safety and Health Administration, which is intended to protect workers from safety and health on the job? Simply put, the agency is asleep at the wheel. They have issued guidance, and no enforceable standards whatsoever. To make matters worse, they aren't enforcing already existing standards.

We would like to first speak to Intro T2020-6717 which would establish a board to review workplace health and safety guidance during COVID and make recommendations for future public health emergencies. NYCOSH is in support of this legislation. We need to be smart about making improvements to our response in the case of emerging infectious diseases. Creating such a board would bring together some of the best strategists to figure out where New York City's response could be improved. We also believe, however, that this legislation does need to have a specific timeline as to when the report would be completed and released and would urge the Council to ensure that this process will happen quickly so that the recommendations can influence the City's current response to COVID-19.

Second, we would like to address Intro 1797-2019 which would create an informational campaign concerning workers' rights under the earned safe and sick time act. NYCOSH is in support of this legislation. For those of you who may not think this legislation is necessary, I ask you—who do workers call when their employers violate workers' health and safety? They can't call Federal OSHA, because no one will come. These are the kinds of questions that we get every day from workers that we train; they are being exploited at work and they don't know what to do about it. Making workers' rights clear to working people is essential to ensuring that people work to enforce these rights.

Finally, although it is not the subject of this hearing, it is important to note that NYCOSH is joining its colleagues in labor and the community to call on New York State to pass legislation, New York HERO, that would create enforceable standards to protect workers from COVID-19. This would include protocols on: testing, face masks, PPE, social distancing, hand hygiene, disinfection, and engineering controls.

We encourage the Council to work with New York State to protect workers with enforceable standards to protect them from COVID-19.

New York City Council
Committee on Health
Oversight – Vaccines and Future COVID-19 Treatments
Tuesday, November 24, 2020

To the Members of the City Council Committee on Health:

Thank you to the Council's Committee on Health and to Chair Mark Levine whose understanding of the health of New Yorkers before, during, and we anticipate, after this pandemic, give us confidence in our city's ability to meet an unprecedented challenge.

Our time today is brief. But the difficult story of our community – New Yorkers with intellectual and developmental disabilities – and the coronavirus dates to the pandemic's earliest days. We are here to request that the Council recognize the special vulnerability of people with intellectual and developmental disabilities (I/DD), affirm how early access to a potential COVID vaccine will save lives both within and outside of the I/DD community, and demonstrate that outpatient clinics, especially those that specialize in treating people with I/DD, and their staff, must be on the front-lines of vaccine distribution.

The unvarnished truth is painful: the last several months have revealed enormous gaps in the availability of resources to support New Yorkers with intellectual and developmental disabilities. More than four decades after de-institutionalization, New Yorkers with I/DD remain marginalized and unable to access adequate care. We must not watch COVID-19 further exacerbate this disparity.

YAI and Premier HealthCare

YAI is one of the largest nonprofit agencies in New York State, providing comprehensive support for children and adults. YAI is also the institutional home of Premier HealthCare, a primary care and specialty outpatient clinic. YAI and its affiliates operate programs across New York City, and in Long Island, Westchester and Rockland Counties, Northern New Jersey, and California. Our 4,000 employees deliver housing, medical, dental, and mental health care, education, job training, community integration, and social programs to more than 20,000 people with autism, Down syndrome, cerebral palsy, and other intellectual and developmental disabilities, and their families.

Premier HealthCare, an Article 28 clinic under New York State health law, offers primary care and specialty outpatient services. While Premier has expertise in services for children and adults with disabilities, it provides care to everyone and has been actively involved in COVID testing for New York since the start of the pandemic. Doctors and nurses at Premier's five New York City locations are outstanding medical professionals who have been pressed into service despite the

risks to their own health, to help New York conquer coronavirus and limit its spread.

New Yorkers with I/DD must be a priority population for vaccine access.

Despite the prevalence of underlying health conditions within the I/DD population, people with I/DD have flown under the radar since the start of this pandemic. From mid-March to the end of April, COVID cases ballooned with a disproportionate mortality rate at their heels. One national study, published on November 10 in the *New York Times*, showed a mortality rate almost six times that of all patients with COVID-19. November data from New York State's Office for People with Developmental Disabilities is even more distressing: of 3,906 confirmed positive COVID cases among people with disabilities, almost 80 percent lived in certified residential programs like those operated by YAI, the mortality rate was greater than 12 percent.

The challenges of senior housing during this pandemic are serious and well understood. Far less visible, but equally troubling, have been the stories from supported residences for people with I/DD, known to most as group homes. At YAI, which operates more than 80 residences, this fact can be illustrated simply: COVID ultimately affected more than half of our residences. After antibody testing became widely available, we learned that more than 50 percent our residents were found to be antibody-positive.

Many factors explain this outsized vulnerability. Simple preventative measures like social distancing, masks, and handwashing pose serious challenges for people with I/DD. Many have underlying health conditions that exacerbate their susceptibility, which increase over time. At Premier HealthCare, 80 percent of the patients with I/DD have one or more chronic condition that place then at high risk of severe illness from COVID. As with neurotypical patients, these conditions increase with age. People with Down syndrome who reach the age of 40 average more than five chronic health conditions, including hypertension, diabetes, and obesity.

Outpatient clinic workers and direct support professionals who specialize in care for New Yorkers with I/DD should also have prioritized access.

Clinical and direct support staff working in the I/DD field mirror these vulnerabilities because many people we support require hands-on support throughout the day. In March and April, our colleagues lacked just about everything needed to diagnose and treat, reduce transmissions, and protect staff. They went to battle without gowns, masks, cleaning supplies, room dividers, and space to separate residents and limit transmission. Staff are YAI's greatest asset. They were determined to help throughout this nightmare, entering places of known infection, risking their health and the health of their families to keep people safe or ease the journey to peace. Although YAI learned quickly how to contain infection and limit its spread, we did ultimately lose 20 people to whom we provide long-term support as well as three members of our direct support staff.

Outpatient clinics, especially those that specialize in I/DD, should be on the front-line of vaccine distribution

As the state prepares for the massive undertaking of a COVID vaccine, Premier HealthCare and other specialty outpatient clinics should be mobilized in the first phase of vaccine roll-out. Only specialty clinics can effectively administer the vaccine to the I/DD population, relying on knowledge of treating a population that experiences behavioral challenges and a foundation of existing familiarity with other elements of COVID care.

To date, Premier has performed more than 2,000 rapid and PCR COVID tests. Premier has all of the necessary equipment, including medically suitable cold storage, to receive vaccines and retain them at the correct temperature. What's more, Premier can provide vaccines at its five clinic locations, including several underserved areas of the city, and at group homes across the metropolitan area. Outpatient clinics are far safer venues for vaccination than hospitals, which are prioritized in the current plan. As we expect infections in our area to increase in the months ahead, the burden to treat people in hospitals may overwhelm their capacity.

We applaud New York's early efforts to prepare for a vaccine and to understand the need to prioritize the most vulnerable populations, including people with underlying health problems and those living in congregate care settings. We urge the I/DD population and I/DD specialty outpatient clinics be included as priorities from the earliest hours of vaccine availability.

Peter Taback
Chief Engagement and External Affairs Officer, YAI

Hope Levy
Executive Director, Premier HealthCare

Margaret Puddington
Parent Advocate

Statement of Mark Henry, Amalgamated Transit Union (ATU) President/Business Agent, ATU Local 1056
to NYC Council Committee on Civil Service & Labor on Workplace Safety in COVID-19 Era, November 20, 2020

Thank you, Chairman Miller and colleagues on the City Council for this opportunity to present on behalf of Amalgamated Transit Union (ATU) Local 1056 and our sister ATU Locals 726, 1179 and 1181. I am Mark Henry, President/Business Agent of the local and chair of the ATU NYS Legislative Conference Board. Including New York City, ATU represents more than 25,000 hard-working transit workers across New York State; other ATU cities include Albany, Binghamton, Buffalo, Rochester and Syracuse.

While these hearings do not focus per se on the MTA workers, it remains important to emphasize the special plight of our transit workers on the frontlines of the fight against COVID-19. The impact of COVID-19 certainly impacts our civil servants in public transit; this includes the members of ATU Local Locals 1056 and 1179 in Queens, Local 726 in Staten Island, and Local 1181 in Brooklyn – and the riding public. Local 1056 members operate and maintain NYC Transit bus routes serving Queens with some routes extending into The Bronx, Brooklyn and Manhattan. ATU members work under an expired contract that the MTA **REFUSES** to update. The MTA already settled a new contract including new wages for the workers represented by TWU Local 100; this created two classes of workers paid differently to perform the same work. Many of the legislators present today and others flagged this inequity to the MTA and we thank you.

ATU recognizes, as do most experts, that, without a fully functioning transit system, we cannot expect New York City's – and thus our state and national – economy to fully recover and achieve growth beyond. This includes treating all workers fairly and equitable. All who perform the same work must receive the same pay and not be treated as part of some caste. ATU workers deserve a contract for the same work as those the MTA already settled with and refuses to discuss with ATU.

Our members were classified as essential employees and continued to work in order to make sure other essential workers, including doctors, nurses, police, grocery store clerks and others, can get to their jobs and return home to their families. The work of our members has put them at an increased high risk of exposure to the coronavirus. This exposure has not been without consequences. In New York, ATU locals have lost 33 of our brothers and sisters to COVID-19; they put their lives on the line as essential workers during this crisis. And our members perform their jobs in an exemplary manner despite the MTA treating them as second-class workers without the same compensation afforded other brothers and sisters at Local 100 working at the MTA under a new contract.

Transit Workers are unable to shelter in place. We require a workplace that provides the minimum "at home" shelter or better "shelter" at the workplace. Transit workers are exposed to all dangers and still have shown great resiliency mentally and physically under uncertain conditions despite the MTA treating them as second-class workers without the same compensation afforded other brothers and sisters at Local 100 working at the MTA under a new contract.

The priority of the ATU has been to protect the health and safety of our members who are essential workers on the frontline of this crisis. At the start of this crisis, our members were put in harm's way without proper protection. Our workers were not given the personal protective equipment (PPE), such as masks, gloves and cleaning supplies, necessary to prevent transmission of this virus. It

was their unions that supplied those basic and mandatory items. While our members have better but limited access to PPE now, the delay in getting this equipment was too significant. We must ensure that the MTA has access to and supplies PPE equipment to its workers on the frontlines. We must also ensure that the MTA sets mandatory standards for PPE for transit workers and for cleaning buses and transit stations. These standards need not only apply to the situation today but also apply going forward; doing so ensures we are not as ill-prepared for a situation like this in the future. And our members continue to put themselves at risk while the MTA treats them as second-class workers without the same compensation afforded other brothers and sisters at Local 100 working at the MTA under a new contract.

ATU's understanding of the risks faced each day by its own members make clear to the need to also support broad workplace safety protections to safeguard all municipal workers from the threat of COVID-19.

That explains ATU's support for Chairman Miller's worker safety measures:

- T2020-6717, in relation to establishing a board to review workplace health and safety guidance during the COVID-19 pandemic; and
- T2020-6606, in relation to the dissemination of occupational safety and health information to city employees during a public health emergency.

Our members show up to work despite real threats to their health and safety. We believe that our members should be compensated for their work through the implementation of hazard pay, which would be 1.5 times their normal wage rate. Funding already provided from the federal government should also have allocated to the membership. The hardworking men and women came to work and ensured that other essential workers could get to where they needed to go. Their dedication and hard work must be recognized and never marginalized.

ATU also emphasizes that any cuts to bus and subway service puts the public at risk. Crowded buses and subway to get essential workers and others required to reach their places of work, without the ability to work remotely place the these workers in harm's way. Nothing gets gained by putting working people at risk and straining our health care services; just plain penny wise and dollar foolish.

We know that all of these initiatives will require more funding, and we also know that financial situation facing the State right now is dire. Through ATU International, we strongly support the inclusion of $32 billion in emergency operating aid for public transportation in the next round of federal Coronavirus relief funding. These funds would be used to maintain essential service, avoid layoffs, and to purchase PPE to keep our members safe. We are also supporting funding for state and localities because in addition to the emergency aid, we know that funding is needed to shore up the support we receive from the State and the City. We must avert the simply devastating cuts to public transportation being contemplated absent additional funding. We cannot cut public transportation services during this economic downturn or this pandemic. Too many people rely on our services to get to and from work and to and from doctors' appointments, the grocery store and other essential services. COVID-19 has shown all the economic pitfalls and adverse impacts of cost-cutting over past years on programs that never should have been reduced or eliminated in a city this size. But is does not shine attention on public servants delivering public transit as second-class workers without the same compensation afforded other brothers and sisters at Local 100 working at the MTA under a new contract.

The lack of financial support from the federal government also impacts our ability to finalize a contract for our members with the MTA. For decades, pattern bargaining at the MTA resulted in the members of the ATU receiving the same benefits negotiated between the TWU and the MTA. This year, the MTA refuses to honor this pattern bargaining. Settling our contracts collectively involves very little impact on the MTA overall operating budget. We need to ensure that the MTA receives adequate funding so they can honor their contractual obligations.

Thank you for this opportunity to testify today on the impact of COVID-19 on the workplace. At the MTA, we certainly need a protected, safe and healthy workforce and workplace to provide levels of service needed to assure the riding public, they can safely return to work via public transit. Similarly, all workers must be afforded workplace safety in the face of this severe and often deadly epidemic. First hand we know the impact on public transportation and our members has been significant, and thus the risk to those who labor in other workplaces and settings. I appreciate you holding this hearing to hear from those directly impacted.

I am happy to serve as a resource and offer advice and guidance on this and other issues as we move forward.

# # #

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“WORKPLACE SAFETY IN THE COVID-19 ERA”

COBA PRESIDENT BENNY BOSCIO JR’s TESTIMONY BEFORE THE NEW YORK CITY COUNCIL COMMITTEE ON CIVIL SERVICE & LABOR

I.Daneek Miller
Chairman

NEW YORK CITY COUNCIL

November 20, 2020

Good morning Chairman Miller and the distinguished members of your committee. My name is Benny Boscio Jr. and I am the President of the Correction Officers' Benevolent Association, the second-largest law enforcement union in the City of New York. Our members, as you know, provide care, custody, and control of over 4,700 inmates daily in the nation's second-largest municipal jail system.

Today's hearing focuses on the very important topic of workplace safety in the COVID-19 era. As you may know, my members served on the frontlines of the COVID-19 pandemic last winter and they continue to serve on the frontlines as the second wave of the pandemic develops this time around.

The first time around, eight of my members died from COVID-19 and over 1,400 became sick with the virus. According to data collected by the New York Times, the virus has sickened more correction officers in New York, working in the epicenter of the epicenter, than in most other large American cities, including Chicago, Houston, Miami and Los Angeles combined.

The reality is that the City of New York failed to do everything possible to keep my members from dying and from getting sick. From the onset of this crisis, we sounded the alarm about the deadly threats our members were facing. Rather than hearing our cries for help and collaborating with the boots on the ground, the Department of Correction fought us every step of the way.

As the pandemic worsened and other agencies began to adopt protocols for protecting the health and well-being of other essential workers, we were met with silence from the senior managers of our agency. Recognizing that the agency was not actively and systematically distributing PPE, Correction Officers began bringing their own masks to wear. When this happened, they were told that bringing in their own masks wasn't permitted and they should go home. The failure to allow officers to wear masks early on, coupled with the failure to provide PPE, dragged on for weeks throughout the month of March and into April.

Finally, after realizing help was never on the way, COBA purchased over 40,000 K-N95 masks and hundreds of gallons of hand sanitizers for our members to help keep them safe. In short, we did what the DOC and the City of New York failed to do. We also called for Correction Officers to receive COVID-19 testing on Rikers Island. That too fell on deaf ears.

Our union then filed a lawsuit in late March demanding that the City of New York be compelled to provide our members with PPE, COVID testing, and to increase the sanitization of the jails. It was our lawsuit that produced a settlement with the City to not only provide our members with adequate levels of PPE, but to also provide free COVID-19 testing at over 50 Northwell Health Urgent Care locations.

The Chief of the Department of Correction waited until April 18th to finally release a teletype calling for the commanding officer of each facility to ensure that an adequate amount of personal protective equipment (PPE) is available for all uniformed and non-uniformed members of service. So just to be clear, it took

numerous officers getting sick and calling out sick and a lawsuit to finally make PPE distribution mandatory-some six to eight weeks into the pandemic. That is inexcusable.

To make matters worse, the Department's response to the staffing shortage was to force dozens of officers to work triple tours of duty, which required us to file yet another lawsuit on April 23rd, arguing that forcing officers to work for 24 hours straight, during the public health crisis, is a direct invitation to infection and disease because sleep deprivation negatively impacts physical and mental health.

So, if this committee is really interested in examining workplace safety in the era of COVID-19 in the city's jails, we first need to face the facts that I've just outlined. The fact is the record shows a series of gross management failures, negligence, and leadership voids that led to the unnecessary and preventable deaths of 8 of my members and the suffering of my 1,400 members who tested positive. While all of this was going on, my members still went to work and had to grapple with inmates assaulting them and deliberately coughing and spitting in their faces. Correction Officers have always been the unsung heroes of law enforcement and their bravery in the face of adversity throughout the pandemic clearly illustrates that.

So, let's fast forward to today. Over the course of the past several months, we have publicly called for the City of New York to follow the Center for Disease Control's social distancing guidelines in our jails. For example, as it relates to social distancing for our inmate population, the CDC asserts, "Implement social

distancing strategies to increase the physical space between incarcerated/detained persons (ideally 6 feet between all individuals, regardless of symptoms), and to minimize mixing of individuals from different housing units." To be clear that is not happening at any of our facilities, where in fact, the housing areas are near capacity at all but two of our jails.

Worse than this, the city's proposed jail consolidation plan calls for the closure of the Manhattan Detention Center and the closure of the Otis Bantum Correctional Center, which would transfer over 700 inmates and over 1,600 Correction Officers from those facilities to other facilities which are already operating near capacity. The CDC, the State of New York, and the City of New York have all called for lowering the number of people who can occupy restaurants, schools, gyms etc but the Department of Correction on the other hand is actually increasing the population density of our jails with this reckless and negligent jail consolidation plan. If you truly care about the safety of our workplace then I call on each of you and your colleagues in the City Council to publicly oppose the City's jail consolidation plan.

We have also attempted to compel the city to mandate that all Correction Officers test negative before returning back to work if they have tested positive for COVID-19. While the city has refused this request thus far, I ask that you support us in this critical effort to keep our members safe and to keep the inmates safe as well.

We cannot afford to repeat the mistakes of the past. Thousands of lives are on the line and the actions you take now will play a vital role in protecting each and every one of those lives.

I thank you for your time and look forward to a continued dialogue with you to ensure the City of New York meets its obligation to keep our workplaces, the city's jails, safe for everyone.