

# Safety Issues with the Hunter College Campus Schools Reopening

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## **Introduction**

In many countries that have “flattened the curve” of COVID-19 infections, schools are now beginning to reopen for in-person learning. However, schools naturally pose a transmission risk, as they involve large groups of children and prolonged close contact in confined indoor spaces. Some countries, such as Denmark, South Korea, and China, have reopened schools successfully with few new infections. However, other countries have experienced serious problems. In a single Israeli school, 153 students (13%), 25 staff members (16.6%), and 87 relatives and friends of students were infected. (Stein-Zamir, 2020) Some Israeli health officials believe that outbreaks in schools may have played a significant role in the second wave of COVID-19 currently occurring in Israel. (Winer, 2020) Several U.S. schools have suffered outbreaks as well, and have been forced to partially or completely close.

Many organizations, including the U.S. Centers for Disease Control and Prevention, have emphasized the importance of reopening schools. They have cited the benefits of in-person instruction and interaction, the importance of childcare and nutrition for low-income families, and the low death rate of children from COVID-19. (Centers for Disease Control and Prevention, 2020a) While most students are unlikely to suffer serious complications from COVID-19, many staff, teachers, and parents/relatives of students are high risk. It does not benefit students to risk the lives of their families and communities, or the safety of their teachers and staff. And any outbreak will disproportionately impact members of marginalized groups, who are disproportionately likely to live in crowded conditions with high-risk relatives.

Having read the Hunter reopening plan, I am seriously concerned that it may be inadequate to protect its students, staff, and teachers from COVID-19. Though it may comply with legal requirements, it does not meet the standards laid out in school reopening guidelines published by the Harvard T.H. Chan School of Public Health and the U.S. National Academies of Sciences, Engineering and Medicine (NAS). (Jones, 2020; National Academies of Science, 2020). Though not perfect, these guidelines employ good scientific evidence to determine what is needed to reopen schools safely. When compared to these guidelines, **the HCCS plan is deficient in two key areas: mitigating airborne transmission and dividing students into small cohorts.** Until these areas can be addressed, I do not believe that Hunter can reopen for most of its students.

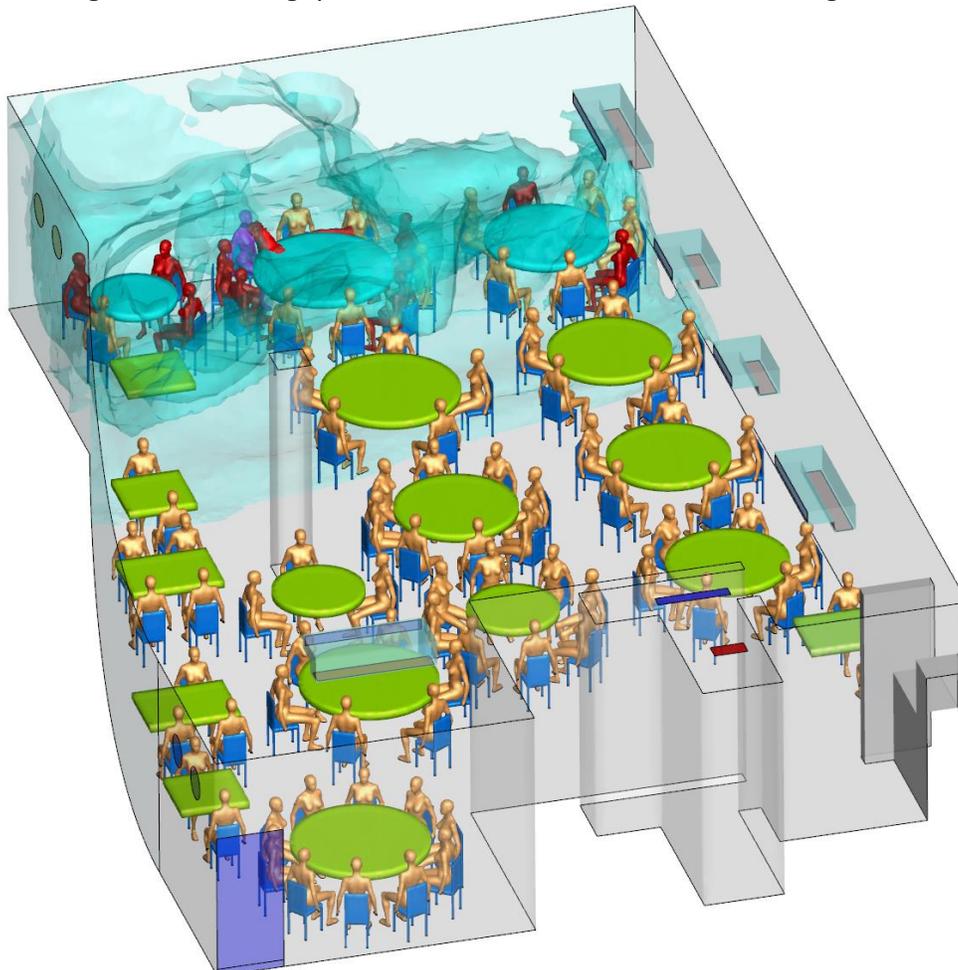
I know that I am asking Hunter to make tough decisions. But I am writing this because I love Hunter with all my heart. My 13 years at Hunter made me the person who I am today, and I am eternally grateful to the dedicated teachers and staff who educated and supported me. I care deeply that they stay safe and healthy, along with their students, their students’ families, and everyone in the broader Hunter community.

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## Mitigating airborne transmission

There is increasing scientific evidence that airborne transmission through small respiratory droplets (aerosols) is the dominant way in which COVID-19 spreads (Morawska and Cao, 2020; Zhang et al., 2020). These droplets are rapidly dispersed outdoors, but in indoor environments with limited air exchange they hang in the air for prolonged periods of time and can pose a serious infection risk. [239 scientists have signed a letter urging governments and institutions to address airborne transmission of COVID-19](#) (Morawska and Milton, 2020). I will also highlight a few pieces of evidence in particular for the importance of airborne spread:

- Airborne transmission is the best explanation for an outbreak among members of a choral group at Washington State (Miller et al., 2020).
- Almost all outbreaks of COVID-19 in China were traced to indoor environments with limited air exchange (Qian et al., 2020).
- After a person with COVID-19 dined at a Guangzhou restaurant, airflow modeling explained which other customers were infected (Li et al., 2020). Figure 3 reproduced below. Purple: initial infected patient, red: newly infected diners, orange: uninfected diners. Light blue shading: predicted concentration of virus-bearing airborne droplets.



Airborne transmission is difficult to mitigate, so many school boards and government agencies are ignoring it. However, the National Academy of Sciences and Harvard School of Public Health reopening guidelines explain how airborne spread of COVID-19 can occur in schools, and outline the measures needed to address it.

The Hunter reopening plan does not conform to the standards in the Harvard and NAS guidelines, and presents a serious risk for airborne transmission of COVID-19. First, all classrooms need a source of ventilation to reduce airflow transmission. According to the Harvard report, this can be accomplished in either of two ways—but I do not believe Hunter will achieve either.

- For buildings relying on natural ventilation, open windows and install window fans to promote air exchange. This will be impossible in many Hunter classrooms.
- For buildings with mechanical ventilation, open HVAC system dampers to maximize air intake, and install MERV 13 filters in ducts that recirculate air between classrooms.

(Portable MERV 13-rated HEPA filters, air ionizers, UV-C irradiation, and other means of circulating/sterilizing air can be used **in addition** to the above, to further improve safety.)

Many Hunter classrooms lack windows, and from what I have heard, the Hunter HVAC system is currently nonfunctional. I believe there are plans to repair the system and open the dampers, but that there is no plan to install MERV 13 filters. The DOE plan indicates that MERV 13 filters will be installed “where necessary”—and if they are not necessary in a building with no windows, I do not know where they would be. (New York City Department of Education, 2020a) Without MERV 13 filters, **the HVAC system may actually spread viral particles between classrooms.** Even under ideal circumstances, I am unsure based on my personal experience with Hunter of whether its HVAC system can provide sufficient airflow.

The current plan also suggests that large numbers of students may gather for “non-instructional purposes” in certain poorly ventilated spaces, as long as they remain six feet apart: up to 112 students in the HCCS gym, 64 in the main cafeteria, 80 in the auditorium, and 49 in the library. **Large indoor gatherings pose a serious risk for COVID-19 spread, even if people are six feet apart.** The installation of dividers in the gym or cafeteria, as seems to be indicated in the plan, is insufficient to prevent airborne transmission of the virus.

## **Cohorting**

Keeping children in one consistent group or cohort throughout the school day is broadly recommended by many organizations, including the U.S. Centers for Disease Control and Prevention (CDC), to reduce the spread of COVID-19 when schools reopen (Centers for Disease Control and Prevention, 2020b). The size of these cohorts is very important—small cohorts are much more effective than large ones. The National Academy of Sciences recommends maximum cohort sizes of 10-11 students. (National Academies of Science, 2020) Countries that

have reopened schools safely generally do so with very small cohorts; for example, Denmark employs cohorts of 10 or 11 students, while Norway has cohorts of 15-20. (Melnick, 2020) New York City's [Regional Enrichment Centers](#), which have safely provided childcare and learning to children of essential workers throughout the pandemic, have class sizes of 9-12 students (Jarrett, 2020; New York City Department of Education, 2020b). Schools Chancellor Richard Carranza has stated that DOE classrooms will also have 9-12 students per classroom during the coming school year. (Eyewitness News, 2020)

Hunter's plan does involve cohorting, but **the usual travel class size of 24 is far in excess of these guidelines**. Hunter should adopt the DOE standard of maximum 12 students per cohort/travel class. Although there is precedent for cohorts larger than 12 in countries like Norway, New York has almost 4x higher COVID-19 prevalence<sup>†</sup> and [poor testing/tracing ability](#).

In addition, **mixing of cohorts in non-instructional spaces poses a safety hazard**. Cohorts must be kept consistently in separate rooms with separate airflow; if several cohorts are in the auditorium or gym together, all of them will effectively become close contacts of each other, even if they distance and wear masks. This completely undermines the purpose of cohorting.

## Screening and tracing

The incubation period of COVID-19 is five days on average, but can be as short as three, (Lauer et al., 2020) and pre-symptomatic people may be responsible for more than half of transmission. (Casey et al., 2020) As such, infected individuals must be identified quickly and their contacts traced and isolated in order to prevent outbreaks. **The cost of delays can be huge**. A camp in Georgia closed four days after the first person reported symptoms; 49% of all campers and 56% of all staff members ultimately tested positive. (Szablewski CM, 2020)

The HCCS plan for testing and contact tracing is very similar to the Department of Education plan. If executed quickly, this plan could be effective. However, **NYC testing and tracing are too slow and inefficient for this to be the case**. The NAS guidelines state that tests should ideally come back within 24 hours. (National Academies of Science, 2020) While it has recently decreased to 2-3 days, the median turnaround time for Quest Diagnostics was 7 days late last month. (Quest Diagnostics, 2020) Moreover, if the median is 2-3 days, that means half of tests take longer to come back.

In addition, NYC Test and Trace is a horribly mismanaged operation, and has been crippled by political infighting between the Mayor, the Department of Health and Mental Hygiene, and NYC Health and Hospitals. The New York Times recently ran an [article about the program's many failures](#). (Otterman, 2020) Through my work with the [Coronavirus Working Group-New York](#), I personally spoke to tracers with the program and several people on the Community Advisory Board, who indicated the situation is even worse than presented in the article.

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<sup>†</sup> On average over the past 7 days, New York had an average of 733 cases, or 3.77/100K pop. Norway had an average of 53 cases, or 0.98/100K pop. Source: [Worldometers](#)

Hunter should implement the following changes to its screening and tracing procedures:

- HCCS should not assume that all parents will have an accurate thermometer or know how to take their child's temperature. Symptom checks, including measuring temperatures with a no-contact thermometer, should be performed immediately before students enter the school. This is in line with DOE reopening policy.
- If a student or teacher has COVID-19 symptoms and a test does not come back within 24-36 hours, **they should be treated as a presumptive positive until a laboratory test comes back negative.** Their cohort(s) should transition to remote learning, and their contacts should be traced.
- Hunter should be prepared to conduct tracing itself (identifying contacts and having them transition to remote) while waiting for the city to complete its investigation.

## Personal protective equipment

Masks and personal protective equipment (PPE) are one of the most powerful tools we have to control COVID-19, **if worn correctly and consistently** (over the mouth and nose, and especially while talking or speaking). See Appendix for an overview of the most commonly used types of PPE, and the best evidence for the efficacy of masks.

The National Academy of Sciences guidelines recommend that all students, including elementary school students, wear non-medical or cloth masks whenever possible. They also recommend that teachers and staff receive N95 respirators or medical-grade surgical masks, which provide a higher level of protection. Surgical masks were considered most practical, as they are easy to wear for long periods of time. (National Academies of Science, 2020)

The Hunter plan has two main issues as far as masks are concerned:

- **Teachers and staff should be provided with medical-grade surgical masks or N95s.**
- Bandanas, neck fleeces, and other thin or loose-fitting face coverings should not be permitted, as the most recent evidence indicates that they do not work. (Fischer et al., 2020) **Students who lack tight-fitting masks should be provided with them.**

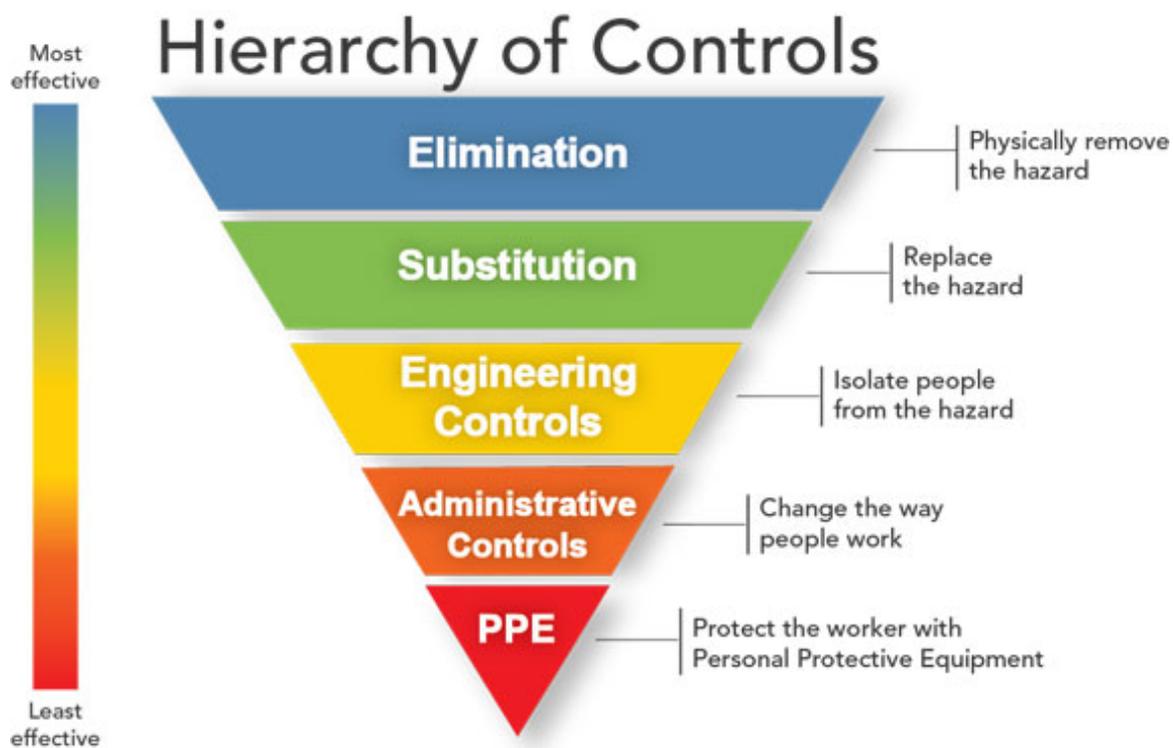
Students who are eating cannot wear a mask, so lunchtime is also a transmission hazard. The Harvard guidelines recommend that students eat within their cohorts in the classroom. However, in order for this to be safe, Hunter would need to take measures to improve ventilation in classrooms and reduce cohort sizes. These measures are not in the current reopening plan, so **I do not think eating in classrooms will be safe for students or teachers.**

Another alternative would be for students to eat outside while distanced. In its reopening plan, Hunter claims that it can fit 290 students in the Hunter courtyard: 250 in the main area and 40 in the elevated section on 94<sup>th</sup> St. Silberman only has outdoor space for 30 students, which is likely to be insufficient for the 9<sup>th</sup> and 10<sup>th</sup> grades.

## Conclusions

The Hunter reopening plan largely complies with the best evidence-based guidelines in terms of mask wearing. However, it falls far short of these guidelines in two other crucial areas: mitigating airborne transmission and cohorting. While masks are necessary and effective, they are not sufficient to prevent COVID-19 transmission in the absence of these measures.

In its approach to reopening safely, the NAS cites the National Institute for Occupational Safety and Health’s “Hierarchy of Controls”: the best way to protect people from a workplace danger is to provide a safe environment, rather than relying on their behavior. (National Academies of Science, 2020; National Institute for Occupational Safety and Health, 2015)



The Hierarchy of Controls. *National Institute for Occupational Safety and Health, 2015.*

In addition to the issue of lunchtime, anyone who has interacted with children knows that they are unlikely to comply perfectly with mask wearing—as we have all seen, even adults struggle with this. **If Hunter cannot improve indoor ventilation and shrink cohorts, it cannot provide a safe environment for its staff, students, and teachers, and it should not reopen.** In the short term, Hunter could consider a model like New York City’s Regional Enrichment Centers, with small class cohorts and utilizing only classrooms with windows, that would enable the Hunter students in greatest need of in-person education to return to school safely.

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## Appendix: PPE

Types of PPE:

- N95/KN95 respirators: These provide very good protection against COVID-19: anyone wearing a properly-fit N95 or KN95 along with a face shield should be protected from COVID-19 infection. N95 is the American standard, KN95 is the Chinese standard. There are three main issues with these:
  - They are often reserved for medical professionals. They are now becoming available to the public but are still expensive (several dollars per mask)
  - In order to be more effective than a surgical mask, they must be fit tested.
  - There are a number of fake KN95 masks on the market.
- Medical-grade surgical masks: Surgical masks provide some protection against COVID-19, though generally have lower filtering efficiencies than N95 masks. The Rockefeller University, where I am a student, currently recommends these for its employees and provides them to us free of charge.
- Disposable, non-medical grade face masks: These sometimes look like surgical masks, but may offer less protection.
- Reusable fabric masks: Tight-fitting cloth masks can offer similar protection to a disposable, non-medical-grade face mask, though it varies based on the material.
- Bandanas/neck fleeces: Recent research shows that bandanas and neck fleeces are ineffective at preventing spread and should not be used. (Fischer et al., 2020)
- Face shields: Plastic face shields can offer protection in addition to a mask. Some people have proposed them instead of masks, but they do not offer good protection against aerosol spread, so I don't think they are an acceptable mask substitute.

Case studies showing that masks protect both the wearer and others from infection:

- In a Missouri hair salon, 139 clients were exposed to two symptomatic hair stylists with COVID-19. Both stylists and all clients wore nonmedical masks. [No new infections were reported as a result](#). 67 clients were tested, and all tested negative. (Hendrix, 2020)
- At a Swiss hotel, guests and staff were allowed to wear either a mask or a face shield. During a COVID-19 outbreak in July, [all of those infected were found to have chosen the face shield; no one wearing a mask was infected](#). (Waldmeier, 2020)