Cambridge
Public Health
Department

Agenda
Cambridge COVID-19 Expert Advisory Panel
1 pm, Thursday January 7, 2021

Join with Google Meet

[redacted]

Join by phone

[redacted]

Attendance

1) Clinical, case and wastewater data update

2) UK Variant (is the State or Broad screening for this?)

3) Communicating vaccine safety to different groups

4) KN-95 mask distribution (most important targets, mechanism for distribution)

5) Schools Path to Zero framework adopted by School Committee

Adjourn

Attachments:
1) Cambridge New Case Data (1/4/21)
2) MWRA-BioBot chart (North Boston 1/4/21)
3) Jill's Mask Guidance
4) *Schools Path to Zero*

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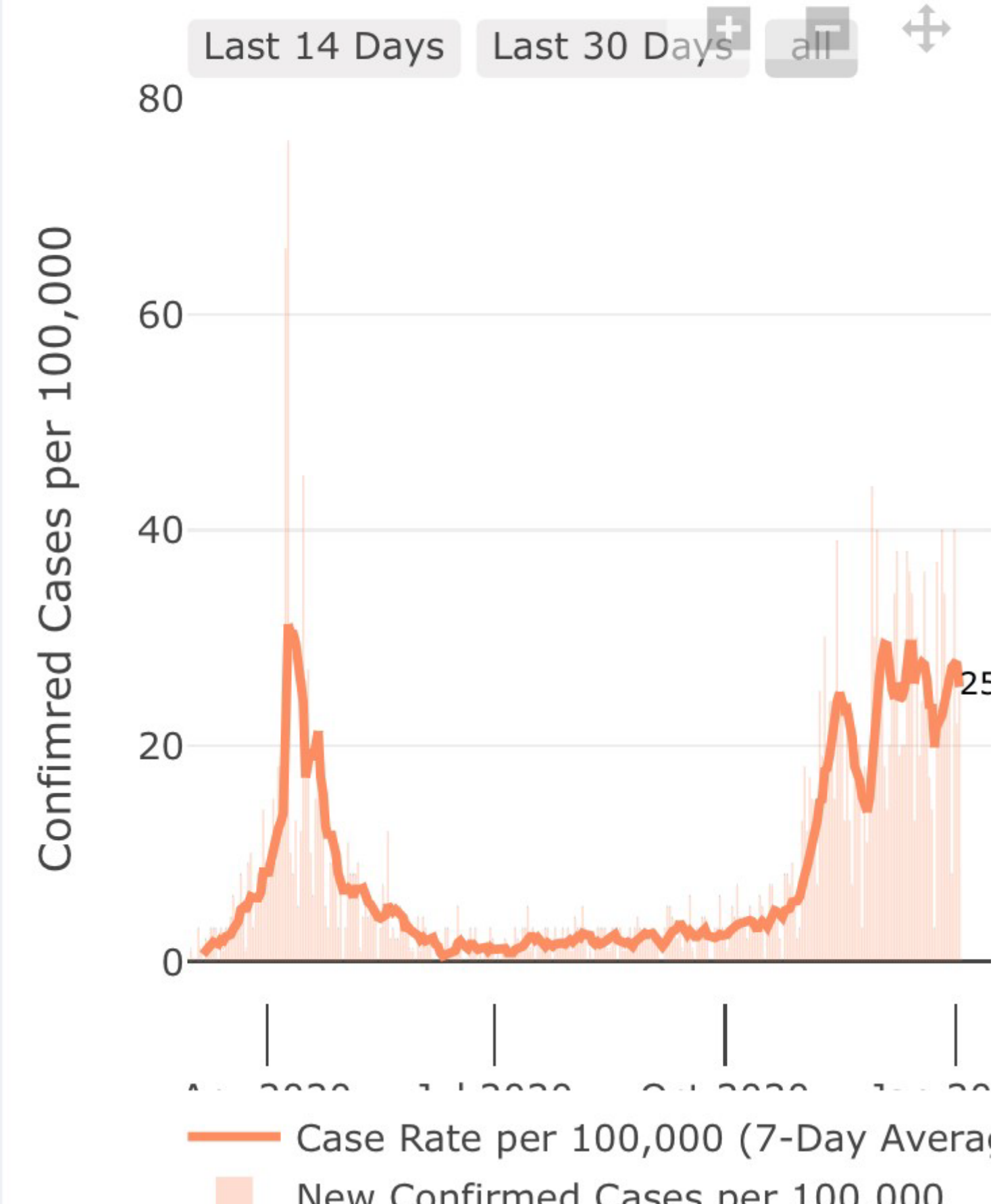
CHA Cambridge Health Alliance

New Confirmed Cases

Case Rate <> Case Count*



CHA Cambridge Health Alliance

Lipson, Sam <slipson@challiance.org>

important mask information

1 message

Jill R Crittenden <jrc@mit.edu> Tue, Jan 5, 2021 at 10:48 AM
To: "Jill Crittenden via groups.io" <jrc=mit.edu@groups.io>

Dear colleagues and friends,

Here is a link to the largest data set available for mask quality that is relevant to protecting the public (from mechanical engineer Aaron Collins). It is based on a standard TSI measurement for how many particles are breathed into a mask when worn (in this case by an adult male).

This researcher's recommendation is the KF94 (Korean standard for public use) from BeHealthy distributor because it is highly performing, comes in multiple sizes and is the least expensive ($1.60/mask when purchased in bulk): https://behealthyusa.net/collections/blue-industry-1/products/blue-kf94-kf80-3d-masks-large-adult-size?variant=36887012409508

For those who want a decorative printed mask that is effective, here is his recommendation: https://masklab.us/

There are many more effective mask options available for purchase from reputable sites, including in child sizes, as you can see from the table. The two key numbers are filtration efficiency (the higher the better) and pressure drop (breathability, the lower the number the better): https://docs.google.com/spreadsheets/d/1ZEK83iVm380-p1ODJ3j5iHyHtNugLPdxmnMLhvbb8DQ/edit?fbclid=IwAR2LNLFbjNVUhQ3OvTYsmUwrRGSedLso3sG8vpPjiLI37r_dNULUKYSo7Qs#gid=0

Importantly, and not surprisingly based on N95 studies, his data show that repeated wearing does not block filtration. Surgical masks are also safe to rewear because bacteria and fungi do not grow on surgical mask material (they do on cotton). The material prevents water penetration, likely increasing the humidity of air breathed in, to support healthier mucous membrane resistance to infection).

Mask fit is important. If the mask is too loose or too tight, earsavers should be used to adjust the fit (widely available on e-commerce). Most of these masks provide much better fit on the average face than does a flat surgical mask because they go under the chin and far up the nose, in addition to good cheek coverage. This extended coverage is likely to be particularly important while speaking. The importance of fit is exemplified by his test of flat surgical mask Zhushi- without a nose-clip, it has filtration of only 28% and very high breathability; after nose-clip is fastened it has filtration of 78% and lower breathability (now the air cannot simply come in through gaps).

He did not test many cloth masks because they are known to always have poor filtration.

The mask tests that I am doing with Lincoln Labs measure the filtration and breathability of a cut-out, so they do not provide a measure of how many particles come in through gaps the way the TSI test does. I will share additional data from tests done this week as soon as available. However, the resource above is useful immediately. Please share as widely as possible so that teachers and families can protect themselves and others.

Here is a link to Aaron Collins latest youtube video describing the TSI test and results: https://www.youtube.com/watch?v=Gu0GkjOpOj0&fbclid=IwAR3SdjvUJivKpgIuPj0xhcgfXpDT_Tpw0QBIyxozRtpQJXkf6fv0tFiiS4Q

Best, Jill

Jill Crittenden, Ph.D.

Scientific Advisor, McGovern Institute for Brain Research at MIT

Member, N95Decon.org

CPSD Task Force and City of Cambridge COVID-19 Expert Advisory Panel

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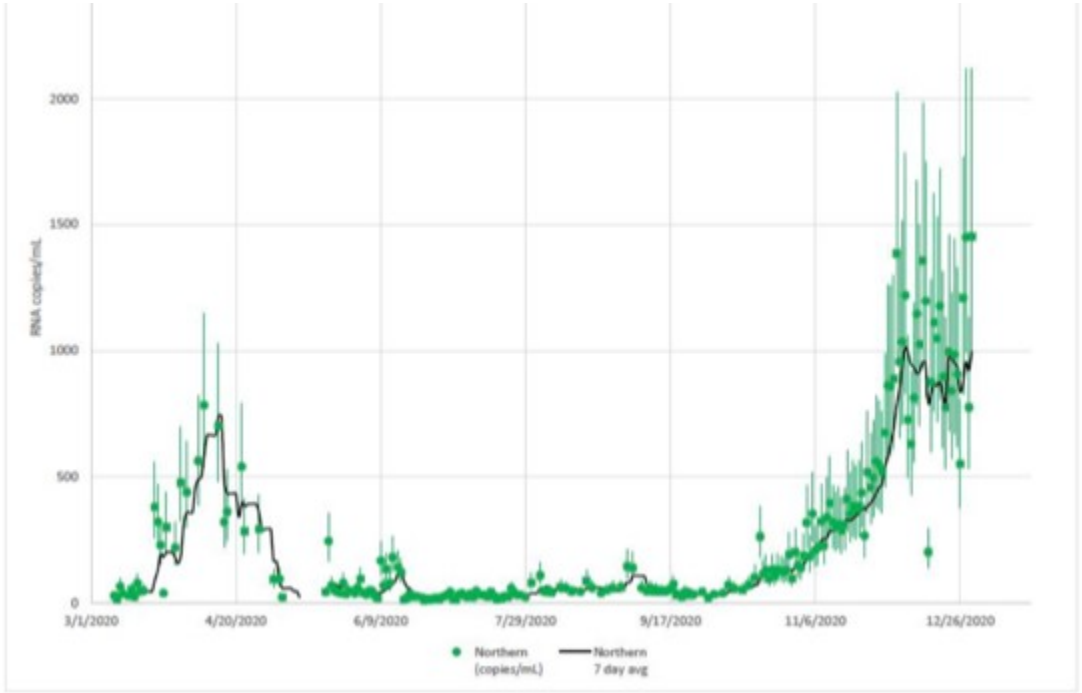
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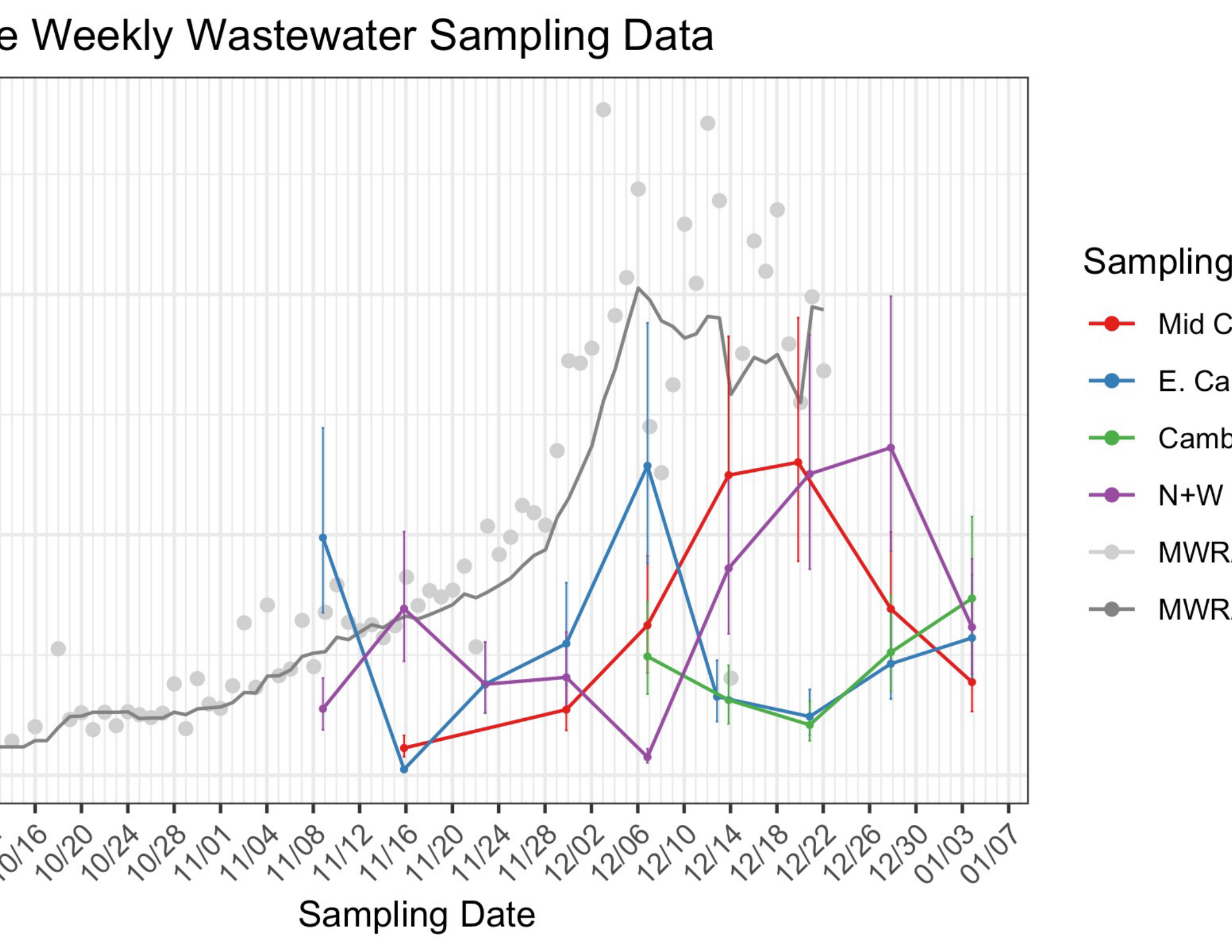
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Schools and the Path to Zero
Strategies for Pandemic Resilience in the Face of High Community Spread

The nation's educators are living through extraordinary challenges. Recommendations to get students back for in-person learning are necessary, for the good of students, and reasonable, because safety can be achieved.

Schools should use metrics of community spread as general points of information, not on-off switches for closure and opening, and should focus their own attention on developing ways to measure any in-school transmission and the quality of their infection control regime, in relation to the elements of infection control laid out below. **For in-school transmission, the goal should be zero or near zero transmission.**

These recommendations increase the workload on schools, however, by introducing the need for robust infection control programs, and short and long-term investment in our public education system's infrastructure and workforce. Our nation's educators deserve full support from state and federal governments and the general public as they undertake the heroic labor of holistically transforming their practices to meet this urgent need.

Why we need new guidance

In July, we published guidance for school leaders making decisions about school re-openings that offered a tiered structure for thinking about risk at different levels of community spread. We recommended that schools be closed once the average daily case rate rose above 25 cases/100,000 people, at the county level. Since July, our scientific understanding of COVID has increased significantly, as has our understanding of degrees of risk in schools, and **we can now recommend that schools be open even at the very high levels of spread we are now seeing, provided that they strictly implement strategies of infection control.** Evidence supports the view that student, staff, and educator risk can all be brought to acceptably minimal levels with robust infection control practices when implemented in a collaborative and transparent way among all stakeholders, including educators and other school personnel, administrators and district leaders, families, and students.

In our previous guidance we recommended closure above the 25 per 100,000 rate because we thought that was the level of community spread at which it would no longer be possible to implement contact tracing at levels that could keep up with the disease. Our metrics baked in the idea that opening for in-person learning hinged on judgments about capacity to implement infection control procedures. However, it is in fact possible to implement infection controls that minimize risk even at higher levels of community spread, and schools that can develop that capacity should seek to stay open for in-person learning even at higher levels of community spread. Also, when increases in community spread test a school's capacity to maintain infection control practices, for instance, contact tracing, we should seek to remedy resource-constraints prior to determining that the necessary solution is to reduce in-person learning.

In June and July, we were still in crisis mode, delivering policy guidance on the basis of the best available knowledge at the time. Now we have a much fuller picture of the disease, its therapies, and the effectiveness of specific infection control techniques. It is time to transition from crisis management to the organizational and cultural change necessary for pandemic resilience.

Schools fill essential functions in our society including education, child care and provision of nutrition and health. School closures, combined with the lack of paid leave and limits on support for small businesses, have had profound impacts. Parents are forced out of work. The deep inequities of American society are reinforced and expanded. Despite the best efforts of education districts, there is no doubt that remote instruction generates large learning gaps and links to higher rates of mental illness, while depriving children of formative social and peer relationships. For untold

thousands of children, schools are their only source of healthy meals. And for too many children, they are a refuge from a precarious home life, a place where observant teachers can be a safety net. Some children will struggle to make up the growing social and educational deficit caused by prolonged school closings.

The most critical question is whether schools can achieve in-building safety in support of in-person learning, even with broad community spread, between now and the end of the school year. Thereafter we can expect that widespread vaccination will reduce the challenge of maintaining a safe-from-disease environment for in-person learning. That said, even with widespread vaccination, ongoing infection control is likely to be necessary. The work we describe herein is likely to be a new and permanent part of school building practices.

Evidence gathered this fall around the world and in the U.S. suggests that schools can open, even in conditions of wide community spread, and achieve low and even near zero transmission in the school building. This evidence, combined with the benefits to learners of in-person schooling and harms of remote schooling, suggests that the time has come to pursue in-person learning across most school contexts, provided that the school in question has established reasonable infection control protocols to safeguard student, educator (including paraprofessionals), and staff safety. The federal governments should include investments in school infection control in the next coronavirus relief package.

To facilitate in-building safety for in-person learning, even in contexts with significant community spread, schools (and the municipal, state, and federal institutions that support them) need to address six central topics in setting their strategy: trust (which includes both labor-management issues and community relations); transportation; infection control; occupational health and safety standards; testing; and vaccines. Set against the backdrop of these six topics, **this briefing focuses on measures of infection control necessary for in-building safety at high levels of community spread.**

Americans are familiar with stories about educators buying supplies for their classrooms and for their students because schools are under resourced. We know that educators and school personnel regularly put their students' needs ahead of their own. In asking school personnel to return to school we are, yet again, asking them to do this work. Instead of asking this of them, we should be equipping them with the tools they need to do their jobs effectively. This is precisely why we think focusing on infection control measures is so important. In order to reopen schools, we must make them as safe as we can - for children and the adults educating them, and for the families to which learners and school educators and staff return each day.

I. Central topics in settling on a strategy

Different schools in different contexts will need to pursue different strategies for pandemic resilience and will necessarily make different decisions about how to balance the trade-offs between in-person and remote learning. Yet most agree that, where feasible, in person learning is a preferable option to remote learning.

To facilitate in-building safety for in person learning, even in contexts with significant community spread, schools (and the municipal, state, and federal institutions that support them) need to address six central topics in settling on their strategy: **trust; transportation; infection control; occupational health and safety standards; testing; and vaccines.**

Generally, only trust and infection control are matters that schools themselves can have a significant impact on independently of other actors. They can make significant progress on these dimensions especially when school leadership, educators, and families can work together effectively. In contrast, transportation, occupational health and safety standards, testing, and vaccines are areas for which schools need assistance from municipalities, the state, and the federal government. That said, in our highly politicized environment, even trust often depends on factors beyond the reach of schools themselves.

We first review all six topics, but then devote the rest of the briefing to infection control, which has rarely been addressed within the context of schools specifically and which is the element most under schools' control.

Trust, including labor-management and community relationships

One of the single greatest barriers to in-person learning at this point in time is challenges schools are having in staffing classrooms. Educators, including both teachers and paraprofessionals, and staff must feel safe at work and also in traveling to and from work, for in-person learning to resume. Trust is not a matter merely of levels of community spread. It is also a question of how school leaders make decisions, how well they do at incorporating educators, paraprofessionals and other staff in decision-making processes, how well they do at communicating around decision-making, and how well their decisions include an aligned focus on the health and safety of everyone in the building, students but also educators, para-professionals and other staff. Too much discussion about school reopening has focused almost exclusively on the question of risk to children. Their safety is critical but so too is the safety of staff and educators, and their ability to have a voice in decision-making.

Four challenges for trust

Clear presentation of what we do and do not know about student, staff, and educator safety is critical to rebuilding trust as are effective and productive labor-management and community partnerships for decision-making School districts should assemble a diverse health and safety committee including representatives from all groups within the school community.

A second critical trust issue relates to the politicization of public health guidance. Schools face a greater challenge for safe re-openings in contexts where communities will not support mask-wearing in schools or, more broadly, contact tracing and community mitigation strategies.

A third critical trust issue relates to families' trust in schools and districts to keep their children safe. Absence of such trust explains why many districts that are "open" nonetheless have a high percentage of remote learners. Very often families of color are less likely to trust in the safety provided by the school, leaving them unable to take advantage of potential opportunities for in-person learning. In New York City, for instance, the families of African American students have been much less likely to send students back for in-person learning, out of concern that students will bring the virus home to vulnerable family members. This trust issue is a significant barrier to success in restoring in-person learning and requires direct attention and engagement.

A fourth critical trust issue relates to the level of acceptance in any given community of vaccination. This will affect the pace of vaccination and rate of reduction of risk in a community.

Transportation

For school reopenings to succeed, not only the in-building school environment needs to be safe, but so too the process of getting to school must be safe. In urban environments, where educators, paraprofessionals and staff are dependent on public transportation or ride share to get to work, rising levels of community spread meaningfully transform the degree of risk they face in getting to work. Depending on context, districts and public officials may need to address safety on public transport. Districts and principals, working with unions and staff, also need to include school buses in their infection control protocols. Simple measures like window cracked 3" and riders wearing masks make this lower risk. Monitoring of buses shows that 20-40 air changes per hour can be achieved when moving with windows down a few inches.At this level of air changes, air flow is much less relevant because dilution will be quick. Also, everyone should be masked on the bus.

Infection control

Our knowledge about the virus and about mitigation strategies for infection control has increased significantly from July. Based on 3 months of varying school re-openings across the country that have served as a national natural experiment, it is now clear that schools with in-person learning that use effective mitigation strategies are very unlikely to create super spreader events and, even more importantly, can create safe environments. Effective mitigation strategies can achieve lower secondary transmission rates than the primary transmission rates of the surrounding community. While we are still in the process of studying schools that have had outbreaks, it is now reasonable to expect that those situations reflect breakdowns in systems of infection control. The most important elements of infection control that matter are:

- universal masking (including while speaking)
- hand and bathroom hygiene
- achieving 4-6 air changes per hour of 'clean' air through any combination of ventilation and filtration (or outdoor classrooms)
- 3 ft social distancing for young learners at all levels of community spread
- 6ft social distancing for high schools when levels of community spread rise above 100/100,000 daily new cases; 3ft social distancing below that level
- robust quarantine policies and contact tracing practices
- and, where feasible, surveillance/screening testing, also discussed below under “testing.”

Occupational Safety and Health Standards

Importantly, the regulations of the Occupational Safety and Health Agency (OSHA) do not apply to the vast majority of school employees who work at public schools, and many states have no comparable workplace safety laws in place for public sector workers. It’s time for states to fill this gap. Schools need clear, adequate, and enforceable rules and protocols for protecting students, education workers, and their families—regardless of where they live. While the development of these policies is critical in the long-term, the process of developing them should not slow down the adoption of best practice infection control measures and a return to in-person learning.

Testing

Screening or surveillance testing can make infection control significantly easier and more effective and can restore trust in the safety of the environment. It can help stabilize an infection control regime by giving public health officials and school leaders full visibility into the prevalence of covid-19 in the school community and can help identify potential failures of infection control more rapidly.

Testing may engender trust in the individual being tested, but also on a population level based on the knowledge that other educators, paraprofessionals, staff, and students are also being tested and unlikely to be in school with COVID-19. That said,testing programs must be carried out with transparency in the reporting of results, or they risk engendering distrust.

Surveillance testing for educators, paraprofessionals, and other staff is recommended in order to reduce the risk of asymptomatic transmission, once the level of community spread has exceeded 20/100,000 daily new cases. Surveillance testing for high school students is recommended once the level of community spread has exceeded 100/100,000 daily new cases. These recommendations are drawn from the work of the Duke-Margolis Health Policy Center (Risk Assessments and Testing Considerations for Reducing Sars-COV-2 Transmission in K-12 Schools.). Group testing, which is much cheaper, is now available and can be used effectively to increase infection control in schools.

That said, testing infrastructure varies considerably across the country and from school district to school district, and disciplined implementation of infection control protocols can also serve to substantially reduce risk even in the absence of testing. The perfect should not be the enemy of the good, and the absence of testing should not be an obstacle to schools' developing robust infection control protocols.

Vaccines

Each state is currently developing its plans for vaccine prioritization. While healthcare workers, those in high-risk categories, and essential workers who work in higher transmission and risk contexts are often and rightly being prioritized for early access to vaccines, those who work in schools should be among the next categories in the population to receive vaccines for covid-19 when they become available. Pediatric vaccines are likely to come behind vaccines for the adult population. Consequently, infection control will continue to be necessary in schools for the next 6-9 months. While the U.S. Department of Health and Human Services has not asked states to submit testing plans beyond December 2020 and has shifted the focus to the submission of vaccine plans, in fact we will need both for much of 2021.

The rest of this briefing document will focus on infection control.

II. What we now know about COVID-19 transmission in schools

To make assessments about the level of risk involved in in-person learning in contexts of community spread, we need to look to data around the world, where schools have commonly been open, as well as to data in the U.S. All the data is partial. Here we present what the data can currently tell us about outbreaks and transmission in schools, and the degree of risk affecting the safety of students and of the adults in the building (educators, including paraprofessionals, and staff).

There is a growing body of evidence that students are not at heightened risk from school re-openings (and as we said above, in-person schooling brings lots of benefits to students and families). A wide range of scientific papers find that both susceptibility and infectivity increase with age. A CDC report on Covid infections in children in the U.S. has found that between March and September 2020, children 12-17 years old have been diagnosed with Covid about twice as often as children 5-11 years old, while both groups' infection rates have consistently been significantly lower than those of adults. The most comprehensive data tool currently available for understanding what is happening with schools and Covid in the United States is the National COVID-19 School Response Dashboard. It records data from over 8 million students (out of 57 million nationally), of whom roughly half participate in in-person learning. Within the database, from September through November 2020, cases in schools largely mirror community trends: The cumulative percentage of in-person students who are assumed or confirmed positive for Covid is 1.2%, compared to a community case rate of 1.5% in the same areas during the same time frame. That said, these numbers capture a variety of different mitigation and testing methods across communities and schools and therefore provide only an initial impressionistic picture, warranting further analysis.

The major question is about adult risk, which we'll focus on for the rest of this section. On that front, we know the following:

- **School reopenings with strong controls in place have limited impact on community-transmission rates.** In global settings, school reopenings accompanied by strong mitigation measures have not been associated with spikes in infection in the school setting or broader community. Diverse education systems across the UK, Spain, Thailand, Vietnam, Japan, and South Africa have been able to safely reopen without spikes. Where school openings have been drivers of transmission there has typically been either an absence of key in-school mitigation measures such as masking and ventilation, and/or an absence of other mitigation strategies in the broader community. In addition, secondary schools appear to have been drivers more so than primary schools.

- **Clusters associated with schools often seem to originate from outside the school rather than as a result of within-building transmission.** We are unaware of any outbreaks in the U.S. that were caused by in-school transmission in schools where infection controls have been in place. A review of the literature (in the U.S. and internationally) up to October, concluded that where there have been outbreaks in schools, they have been linked to schools and communities with limited control measures and more frequently occurring in secondary, rather than elementary schools. Data from a random testing study in the UK, where schools opened fully in September with few mitigation strategies in place, showed that prevalence in elementary age students only started to increase 3-4 weeks after schools opening, indicating that this age group is less likely to get infected and transmit and was only impacted once community transmission increased substantially. Prevalence in the secondary school age students showed increases sooner after reopening and to higher levels. However, this was in the absence of mitigation strategies. After a national lockdown was implemented in November, schools remained open and within 2-3 weeks, prevalence in the school age children decreased, despite being in school every day. WHO also recently confirmed that only a few large outbreaks have been linked to schools, most of which began in the community, and from adult personnel. The WHO further cites secondary and high schools as the prime nodes of these outbreaks in schools, noting children under 10 appear less likely to be infected.

- **The COVID-19 School Response Dashboard shows that school staff have a cumulative infection rate (Aug-Nov) of 1.9% vs. 1.5% for the communities in which the schools are located.** That said, these figures cover a wide degree of variation across districts. In some districts, staff case rates are twice or three times as high as community spread rates. While the data, as mentioned above, provide only an initial picture, this figure is concerning and needs further investigation. There are also data comparability concerns that could explain a higher number, for example the fact that the 1.9% of staff cases includes suspected cases whereas the 1.5% community case count is only confirmed cases. Also use of surveillance testing for teachers but not in the broader community could impact the comparison. There are also important concerns about teachers being at higher risk either in schools because of lack of infection control measures or outside of school because they have to get to and from school. However, infection control measures can successfully mitigate this risk, as a study by Walter S. Gilliam of the Yale Child Study Center has shown: "Within the context of considerable infection mitigation efforts in U.S. child care programs, exposure to child care during the early months of the U.S. pandemic was not associated with elevated risk for COVID-19 transmission to providers."

- **Teachers face no greater risk than other comparatively low-risk front-line workers such as grocery clerks or retail workers--and far less than meatpackers and health care aides, for instance.** It would be beneficial if the nation's public health authorities were to collect comparative data by work-place sector but we do not currently have such data in any

comprehensive way. The UK has such data and it shows that the risk to teachers is on par to retail and customer service workers and well-below health care workers. The increased risk, in comparison to that faced by telecommuting workers, can and should be effectively mitigated through infection control strategies. Achieving this is possible. The U.S. national dashboard data include schools that have achieved near zero transmission rates in school.

- **The accumulated evidence supports the view that schools in general have been and can be quite safe when they implement careful infection-control protocols: millions of schools open globally without significant evidence of school-based transmission.** The fact that some adults may face heightened infection risk in their schools probably says more about the lack of infection-control measures than about the school openings themselves. The relevant comparison for evaluating how safe the school is as a workplace for adults would be to other in-person workplaces outside of healthcare, for instance grocery stores.

III. Achieving in-building safety in contexts of significant community spread

Our knowledge about the virus and about mitigation strategies for infection control has increased significantly from July. It is now clear that schools with in-person learning that use effective mitigation strategies are very unlikely to create super spreader events, can create safe environments, and can achieve lower transmission rates than characterize the surrounding community. Additionally, in person schooling is so important that despite the moderately heightened infection risk to educators even under good infection control measures, we think that schools can reopen safely and should do so. While we are still in the process of studying schools that have had outbreaks, it is now reasonable to expect that those situations reflect breakdowns in systems of infection control. The most important elements of infection control are, again:

- universal masking (including while speaking)
- hand and bathroom hygiene
- achieving 4-6 air changes per hour of 'clean' air through any combination of ventilation and filtration (or outdoor classrooms)
- 3 ft social distancing for young learners at all levels of community spread
- 6ft social distancing for high schools when levels of community spread rise above 100/100,000 daily new cases
- robust quarantine policies and contact tracing practices

- and, where feasible, surveillance/screening testing, also discussed below under “testing.”

In our July guidelines, we recommended phased approaches to re-opening. Now the point of phasing reopening is less about risk in the surrounding environment and more about ensuring that, at each step of the way, schools and districts have the capacity to deliver the necessary infection control measures for each school building opened. **Capacity for maintaining infection control protocols is the best guide for determining the safety of opening for in-person learning.**

1st priority for re-opening: Grades preK-5 and students in particularly vulnerable groups at grade levels preK-8 open if conditions for pandemic resilient teaching and learning spaces with robust infection control practices can be achieved at scale. Districts also invest in a remote learning option for those who choose it.

2nd priority for re-opening: Grades 6-8 and students in particularly vulnerable groups at grade levels 9-12 open if conditions for pandemic resilient teaching and learning spaces with robust infection control practices can be achieved at scale. Districts also invest in a remote learning option for those who choose it.

3rd priority for re-opening: If sufficient pandemic resilient learning space with robust infection control practices is available AFTER allocation to K-8 and all students in particularly vulnerable groups K-12, then the rest of grades 9-12 open. Districts also invest in a remote learning option for those who choose it.

Finally, capacity requirements can also be adjusted by adjusting the percentage of students in the building based on context-specific prioritizations or hybrid schedules.

The recommendations that follow presume that it is possible for educators, staff, and students to get to schools safely. Where transportation risks are insurmountable, as they may be in some urban settings, remote education may be necessary even if it is in principle possible to make school buildings safe.

Achieving pandemic resilience for in-person teaching and learning requires focusing on **the safety of students, staff, and educators first and foremost.** This focus requires:

1. a widespread culture of employing **universal precautions** at school: masking, hand hygiene, bathroom hygiene, screeners, and self-distancing in hallways, classrooms and shared spaces. This culture of employing universal precautions has to be supported by extensive training and education sustained continuously over time and open and transparent communication with parents and families.

2. a widespread culture of health, safety, and shared responsibility and universal precautions out of school, including **adherence to out-of-school rules for masking, small social circles, and physically distanced socializing** and **staying home when sick.** While stringent controls in the school can keep kids and adults safe, what happens outside of school is just as important.

3. **an infection control team in all schools, established by school administration,** and responsible for dynamic assessments of risk, determining ventilation and air filtration; physical distancing rules, space use; movement flow; programmatic changes to accommodate podding and/or cohorting; isolation rooms; quarantine policies; signage and clear communication of the protocols for universal precautions; protocols for routine screening testing; training; mental health supports for staff and educators; monitoring adherence; and trouble-shooting. The infection control team should include among its personnel some individual or individuals who are explicitly tasked with ensuring that protocols are compatible with developmentally appropriate learning and that the school is prepared to provide remote learning to students who are required to quarantine. The team might consist of existing personnel under a new assignment and supported by professional development from partner organizations, for instance public health departments and health care sites, or might consist of new personnel. **Importantly, the infection control team can learn as it does the work of preparing and maintaining a school for infection control measures. The most important function of the infection control team is to bring intentionality and coherence to the school's plan. In addition, city and county public health offices should be providing these supports to schools that are not able to staff their own infection control teams. This may require investment from the state and/or federal government.**

4. **a situation room for in-person learning** at the district, county, regional, and/or state level, staffed with personnel from the jurisdiction's Department of Education, Department of Public Health, and Contact Tracing Corps. The personnel in the situation room should be prepared to respond immediately to questions about infection control protocols or outbreaks. The purpose of this is to have a cross-agency effort to track and respond to cases that occur in school buildings. Responsibilities would also include supporting clear and transparent communication from district to parents and staff, e.g. what information will be shared, by whom and to whom, and when.

5. **School and district leadership** that takes responsibility, working in partnership with employees and unions as applicable for adjusting the academic program to meet the needs of new circumstances and to analyze, plan, and implement responses, including support for employees in adapting to the real-life changes in practice and roles. In particular schools need both remote and in-person options and need to re-organize staffing plans to support both options over time, also with the expectation that the percentage of students in each category will grow and shrink

over the course of the pandemic, depending on levels of community spread and perceptions about the safety of in-person schooling.

6. **Collaborative state and federal departments of education and departments of health** that can partner to deliver resources and supports for the treatment of teaching and learning as an essential function and school staff and educators as de facto essential workers. On this front, considerations include:

- Mental health
- Workforce training & care
- Determination of the context in which hazard pay for teachers would be appropriate
- Budget/potential lack of resources in schools to support infection control
- Community testing capacity
- Data tools for daily screening of symptoms and daily risk-level assessments
- Funding in support of this new staffing need
- Collective bargaining agreements, that could cover several of the above items
- The goal for infection control teams, situation rooms, and the school administration and state and federal agencies that support them, is zero transmission in school. (Note that there will still be cases that appear in schools as students and staff get infected in the community.)

Fig. 1. Infection control has the job of blocking in-school transmission, even when cases have come into school from the community, and of blocking onward spread back out into the community.

The work of that team should be organized around that goal of zero transmission, and administration and agencies should support toward that goal. That said, transmission itself does not mean that in-person learning has failed. We have to distinguish between occasional transmission and an outbreak, between correctable mistakes (transmission that can be prevented with infection control measures) and non-correctable mistakes (viral spread dynamics that are beyond what can be addressed in a school setting). An ambitious drive for comprehensive health and safety programs will protect those in school buildings in the near term and would also be likely to lay the foundations for a healthy school culture more broadly. Where unions play a role, joint health and safety programs will be critical.

What Are Universal Precautions?

Infection control measures are categorized as individual, environmental, and systemic. Individual controls are those that every individual must be responsible for enacting for the good of self and others. Environmental controls are those that can be built into the physical environment. Systemic controls are those that require changes in organizational practice and process.

Contrary to common practice, in which personal protective equipment is characterized as the last infection control measure to be layered in, and is expected to be added only when the hazard cannot be eliminated and engineering efforts have not sufficed, safety in contexts of community spread during the COVID-19 pandemic requires holistic risk reduction, with masks as a critical and necessary strategy. **The hazard has not been eliminated in the broader community, and it is not possible to fully reduce risk indoors through engineering controls alone. Therefore, masks are an essential and required control strategy. An exception is those situations where schools can rely extensively on outdoor classrooms.**

Below is a chart of the individual, environmental, and systemic controls that pertain to Covid-19. “Universal precautions” are those for which every single individual has responsibility and the fall in the column labeled “individual.”

INFECTION CONTROLS

Individual

- Stay home when sick
- Hand hygiene
- Bathroom hygiene, including de-densification of bathroom use if ventilation falls short of standard code requirements
- Masking, including continuous masking while speaking
- Self - Distancing in hallways; classrooms; shared spaces
- Robust guidance for out of school socializing

Environmental

- Ventilation/Filtration (with masking): >4 to >6 ACH
- Clear rules for PPE use, space movement, airflow control, and contaminated zones
- Effective and succinct communication about rules and protocols
- Outdoor Classrooms

Systemic

- School-level Infection Control Teams
- Infection control training
- Testing
- Contact tracing
- Isolation and Quarantine Protocols
- Classroom Pods, where feasible (mainly in lower grades)
- Programming changes (to athletics and other congregate co-curricular activities)
- De-densification through optional remote only
- Attestation/screeners
- Cafeteria and dining protocols
- Contact surfaces hygiene
- Mandated Distancing in hallways, classrooms; shared spaces
- Protocols for interactions among adult educators and staff.
- Mental health supports and other supports for those carrying out an activity deemed an essential function.
- Protocol for transportation - ex. distancing/ventilation/masking on school buses
- Attention to building a culture of adherence to guidance among kids and families

Notes: As we said above, testing infrastructure varies considerably across the country and from school district to school district, and disciplined implementation of infection control protocols can also serve to substantially reduce risk even in the absence of testing. The perfect should not be the enemy of the good, and the absence of testing should not be an obstacle to schools' developing robust infection control protocols.

Finally, in some higher risk settings in schools, for example where close contact is unavoidable and students may be unable to wear masks (e.g., some special education contexts), additional controls and PPE may be warranted. This could include higher efficiency masks and the use of face shields for teachers and paraprofessionals, lower occupant density in the room, and enhanced engineering controls."

IV. What Is the Purpose of an Infection Control team?

An infection control team has the job of training all students, staff, and educators in the use of universal precautions and also of ensuring that all necessary environmental and systemic infection control measures are in place. Small school-based teams could be supported by district or regional teams with deeper expertise and more frequent access to professional development.

The model of an infection control team comes from the hospital setting. **The risk level in schools is significantly lower than in hospitals.** Schools do not need the same level of infection control as, for instance, an intensive care unit. The Department of Labor categorizes schools as a medium-risk environment, on par with grocery stores, in "Guidance on Preparing Workplaces for COVID-19." Both environments are lower risk than healthcare settings. However, schools do organizationally need to bring an equivalent degree of intentionality to the project of infection control. This is not a new function for schools but does now need to be operationalized with a greater degree of discipline, as is also true for grocery stores.

In our original guidance, we offered recommendations that were tiered in relation to the level of community spread. Given the level of community spread we now have in the U.S. and are likely to have through the first quarter of 2020, however, it no longer makes sense to offer tiered guidance since the vast majority of regions in the U.S. are (or unfortunately soon will be) at dangerously high levels of community spread. It is also clear that many schools and districts intersect with many communities (e.g. not just those in which they are physically located, but also those that teachers commute in from), and hence a precise calculation of community spread for any particular school

or district may be misleading or impossible. Finally, achieving safety for school communities will best be done simply by pursuing all the infection control measures needed for the highest level of risk that could pertain in a school setting.

The recommendations provided above are targeted at maintaining in-building safety even when a high percentage of students, teachers, or staff may have exposure risk outside the building and are at risk of bringing covid-19 into the building and even when a high percentage of the people in the building have underlying conditions or other kinds of vulnerability. Infection control teams should help their schools **act on all the items listed above in the infection controls chart.** They can in addition refer to the Guidance for Medium Risk Workplaces in the OSHA handbook linked above.

By the time current levels of community spread recede, infection control teams will have built up sufficient knowledge that, working with local departments of public health, they can guide their school communities in determining how to loosen or remove infection control measures as appropriate.

Conclusion

The nation's educators are living through extraordinary challenges now, regardless of whether they are teaching remotely, in a hybrid setting, or in person. A recommendation to get students back for in-person learning increases the workload on schools by introducing the need for a robust program of infection control. Such a recommendation in effect proposes an evolution in the nature of the teaching profession and in the demands placed on educators. Such a recommendation is both necessary, for the good of students, and reasonable because safety can be achieved. That said, acting on it will take hard work, supported by significant short and long-term investment in our public education system's infrastructure and workforce. Our nation's educators deserve full support from state and federal governments and the general public as they undertake the heroic labor of holistically transforming their practices to meet this urgent need.

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