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The Path to Zero and Schools: Achieving Pandemic Resilient Teaching and Learning Spaces

The single best policy to support school re-opening prior to the development of a vaccine or treatment is suppression of COVID to near zero case incidence via Testing, Tracing and Supported Isolation (TTSI).

Facing the reality, however, that this cannot be achieved before the start of the new school year and that the mounting costs to children of school shutdowns are significant, the second best policy, and path we should pursue, is to re-open in-person Grades K-5 (1st priority) and Grades 6-8 (second priority) in lower risk level jurisdictions, provided there is a sufficient supply of pandemic resilient teaching and learning spaces in the district to do so equitably.

As of mid-July, all countries that have opened schools without further school-based outbreaks had achieved low case incidence levels by the time they opened schools. Since opening, they have maintained focus on infection control and ongoing TTSI programs for disease control. In the U.S., we should differentiate school reopening policy by case incidence levels in the relevant jurisdiction (counties and districts) at the time of reopening. Some states—for instance, Maine, Montana, Alaska, and Hawaii—currently have sufficiently low case incidence levels across counties/districts to plan for full re-openings of the K-12 system, with adaptations to teaching and learning spaces for pandemic resilience. Other states—for instance, Arizona, California, Minnesota, Texas, and Florida—currently have such high case incidence in many counties/districts that those counties/districts should plan to begin the fall semester with online learning. In such contexts, educators and district leaders should focus on preparing for higher caliber online learning opportunities than were achieved in the spring, building on existing research about e-learning.

The most challenging contexts are those with low to moderate case incidence levels. Infection control guidelines co-developed with healthcare practitioners for clinics and hospitals emphasize spatial sequencing, personal hygiene infrastructure, materiality, ventilation and filtration, and legibility of spaces (through signage and other markers) to support appropriate protective practices in each category of space (e.g. always needing to wear a mask in hallways despite being able sometimes to have masking breaks in classrooms during reading time).

In this briefing, we explain how risk incidence levels, the creative adaptation of infection control guidelines for healthy buildings, and national investment in pandemic resilient schools can optimize operations, keep people safe, and restore our schools as trusted sites of learning in a densely populated world in which novel coronavirus and influenza epidemics are becoming increasingly frequent.

WHAT IS A PANDEMIC RESILIENT LEARNING SPACE?

Schools are sites of community building, learning, physical and cultural nourishment, health care, adult education, after-school child care, and, in many places, voting. They are community and civic centers and central nodes in neighborhood networks. They are conventionally sited in "school buildings" but they need not be. Schools have also been held in parks and plazas, and a variety of open air spaces. A pandemic-resilient learning space is one in which the physical space for learning is conducive to health and limits the risk of disease transmission, while nonetheless providing the conditions for social connection and intellectual growth.

A pandemic resilient learning space keeps learners, educators, and other staff all safe and is a trusted space. Pandemic resilient teaching and learning spaces can mean different things for students of different ages. With COVID-19, people 18 and younger have far lower risk of death, hospitalization, and severe outcomes and are also less likely to get infected. Within this group, students in the younger age band of 10 and under also transmit at lower rates. This last point about lower rates of transmission may also pertain to people 15 and younger, a point that research should clarify in coming weeks. Keeping levels of risk low for young children via pandemic resilient teaching and learning spaces is more readily achievable than doing so for high school age students and the adult educators and staff in the school building.

Creating Schools for Health requires healthy classrooms, healthy buildings, healthy policies, healthy schedules, and healthy activities. Leaders need to establish a culture of health, safety, and shared responsibility. A full picture of what requires attention can be found in using the "Schools for Health" guide at **https://schools.forhealth.org/**.

For all students, a healthy building with enhanced outdoor air ventilation and upgraded filtration is necessary, as are sanitation resources, hygiene practices, pandemic resilient bathrooms, physical and group distancing, and legibility of spaces (through signage and other spatial markers) so that behavior protocols in particular spaces align with the appropriate risk mitigation actions (e.g. always needing to wear a mask in hallways despite being able sometimes to have masking breaks in classrooms during reading time).

Because of the congregate nature of the school context, adults working in the school building in jurisdictions at low, moderate, and high risk levels, should be deemed essential workers, like health care workers. They will also need PPE, spatial sequencing, personal hygiene infrastructure, materiality, appropriate ventilation/filtration, and legibility that helps them understand different risk levels in different parts of their building. These are all elements of a "pandemic resilient teaching and learning space." Depending on the level of community spread in the area surrounding the school, or the "risk incidence level," essential workers in schools should have access to routine testing and may merit hazard pay. Those in high risk groups should also have access to alternate, remote assignments, other reasonable accommodations, or disability benefits, where applicable.

WHAT ARE RISK INCIDENCE LEVELS AND WHAT THEY CAN TELL US ABOUT WHAT IT TAKES TO CREATE A PANDEMIC RESILIENT LEARNING SPACE?

To get to a near zero case incidence level, jurisdictions need to first understand the severity of the outbreak they are responding to. To determine their COVID level, they should assess case incidence levels as follows:

Covid Risk Level	Case Incidence	
Red	>25	daily new cases per 100,000 people
Orange	10<25	daily new cases per 100,000 people
Yellow	1<10	daily new cases per 100,000 people
Green	<1	daily new case per 100,000 people

While this guide to risk levels uses daily new confirmed cases, it is important that this metric be triangulated with others for full confidence in its reasonableness as a guide. The most important other measures are: **case trend as an estimate from the new deaths trend, new COVID hospitalizations, in each case with a seven day rolling average, and test positivity (percentages of tests that come back positive)**. Death and hospitalization data points will reveal where case counts are low only because testing is low; where such undercounting is apparent, jurisdictions should not rely on case incidence to assess risk but only on death and hospitalization metrics. Increases in test positivity above 10% are also an indicator of a strong likelihood of undercounting. (For a full picture of how these metrics can be used, please see **"Key Metrics for Suppression Framework."**)

These COVID levels help decision-makers and community members know where they are in terms of community spread, and therefore underlying population risk. The green level aligns with the CDC's low incidence plateau threshold. The levels also communicate the intensity of effort needed for control of COVID at varying levels of community spread.

To determine the levels, incidence numbers can be used at county, MSA, or other local health district jurisdiction level, and at the state level. Policy decisions about which strategies of disease response are best for a jurisdiction should be made by looking at both the local level and the state picture and considering the dynamic relationship between them. For schools, the first reference point should be district and county, and decision-makers should consider both the rates in their own districts and counties and the rates in the districts and counties with which they share a border.

In addition to paying attention to the incidence levels, decision-makers should pay close attention to direction of trend and rate of change. While jurisdictions may plateau in yellow, in the orange level spread tends to have more velocity—i.e. conditions may shift from orange to the red level more quickly than from yellow to orange.

A rough guide for how these incidence levels can help think about pandemic resilient schools is as follows:

Risk Levels	Strategy for Pandemic Resilient Teaching and Learning
Red	Stay-at-home orders in place; all learning remote for all learners; districts, states, and federal government invests in remote learning.
Orange	**1st priority for re-opening:** Grades preK-5 open if conditions for pandemic resilient teaching and learning spaces can be achieved at scale; districts, states, and federal government invest in healthy buildings and healthy classrooms; in the absence of conditions for pandemic resilient teaching and learning spaces, schools continue with remote learning. In-person opportunities for special needs students at grade-levels preK-8 are also included here. **2nd priority for re-opening:** Grades 6-8 open if conditions for pandemic resilient teaching and learning spaces can be achieved at scale; districts, states, and federal government invest in healthy buildings and healthy classrooms; in the absence of conditions for pandemic resilient teaching and learning spaces, schools continue with remote learning. In-person opportunities for special needs students at grade-levels 9-12 are also included in this planning. **Not a priority for re-opening:** Grades 9-12 maintain remote learning for all learners; districts, states, and federal government invest in remote learning.
Yellow	**1st priority for re-opening:** Grades preK-5 open if conditions for pandemic resilient teaching and learning spaces can be achieved at scale; districts, states, and federal government invest in healthy buildings and healthy classrooms; in the absence of conditions for pandemic resilient teaching and learning spaces, schools continue with remote learning. In-person opportunities for special needs students at grade-levels preK-8 are also included here. **2nd priority for re-opening:** Grades 6-8 open if conditions for pandemic resilient teaching and learning spaces can be achieved at scale; districts, states, and federal government invest in healthy buildings and healthy classrooms; in the absence of conditions for pandemic resilient teaching and learning spaces, schools continue with remote learning. In-person opportunities for special needs students at grade-levels preK-8 are also included. In-person opportunities for special needs students at grade-levels 9-12 are also included in this planning. **3rd priority for re-opening:** If sufficient pandemic resilient learning space is available AFTER allocation to K-8, grades 9-12 open on a hybrid schedule, with only a subset of students on campus at any particular point of time to facilitate de-densification; districts, states, and federal government invest in healthy buildings and healthy classrooms AND in remote learning.
Green	All schools open if conditions for pandemic resilient teaching and learning spaces can be achieved at scale; districts, states, and federal government invest in healthy buildings and healthy classrooms

HOW TO IMPLEMENT PANDEMIC RESILIENT TEACHING AND LEARNING SPACES:
DISTRICT LEVEL

Districts should begin by inventorying the stock of pandemic resilient teaching and learning spaces, indoors and outdoors, available to them. Districts will need to map out the increased square footage per learner that they would need to keep an elementary school, a middle school, and a high school open if at a yellow or orange risk incidence level. Such mapping will depend on decisions about how to do group distancing to minimize within-school transmission chains (e.g. creating pods). In other words, decisions about grouping and teaming practices affect calculations of what the necessary increased square footage per learner needs to be.

This mapping also requires an incremental analysis of the stock to identify within each school building what level of risk different spatial components introduce (hallways, classrooms, and convening spaces will bring different levels of risk), what degree of adaptation would be needed to make the space safely usable, and what the maximum learner and educator/staff capacity in the learning space would be. Achieving maximum physical distancing and healthy ventilation and filtration are a top priority.

In addition to inventorying the traditional stock of school buildings, district leaders should identify additional pandemic resilient teaching and learning spaces that might be available for use in their community, conditional on necessary adaptations: e.g. empty or low occupancy college classrooms, office buildings, churches, outdoor spaces, tented spaces, etc. As districts map their space and explore adaptations (using the "Schools for Health" guide), they will discover that they are not able to operationalize all recommended principles. These "adherence gaps" require creative problem solving to create needed social distancing. Adaptations will be local and building specific.

Once the stock of pandemic resilient teaching and learning spaces is inventoried, districts can evaluate whether they can open only grades K-5 or also grades 6 – 8. Districts will recover space for full opening of grades 9-12 as incidence levels fall. Questions of staffing levels will also be pertinent to this inventory. The likelihood of a meaningful percentage of teachers requiring reasonable accommodations suggests that even in yellow and orange contexts, re-opening may well require hybrid in-person and remote practices. Licensure flexibility will be necessary to maximizing available resources.

HOW TO IMPLEMENT PANDEMIC RESILIENT TEACHING AND LEARNING SPACES:
STATE LEVEL

Achieving wide-spread transformation of our school spaces into pandemic resilient teaching and learning spaces will require the formation of learning communities linking school leaders to disseminate knowledge emerging from specific case studies. State departments of education should provide technical advice for space planning consultation. State departments of education should also launch and maintain learning communities to support growth of understanding about how to create pandemic resilient teaching and learning spaces and about how to optimize the remote learning experience. Finally, state departments of education should collaborate with state departments of health to ensure that local health officers (whether municipal or county level) are prepared to support routine testing programs for adult educators and staff serving as essential workers in schools that are open in jurisdictions currently at yellow and orange risk levels. **State testing plans** should incorporate this element of routine testing for adults in schools.

HOW TO IMPLEMENT PANDEMIC RESILIENT TEACHING AND LEARNING SPACES:
FEDERAL LEVEL

While state Departments of Education and districts need to deliver a program in support of Pandemic Resilient Teaching and Learning Spaces, they do need support from the federal government along several dimensions: (1) investment in broadband and provision of laptops to support remote learning; (2) hazard pay for educators working as essential workers in yellow and orange zones; (3) access to disability benefits for educators whose jobs are in yellow and orange zones and who are not in a position to relocate to a green zone; (4) investment in routine testing for adults in school buildings in yellow and orange zones; and (5) investment in building upgrades to America's schools in support of both short and long term pandemic resilience.

WHO

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