The Public Schools of Brookline
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Evidence of Scientific Consensus
In Support of Reduction of 6-Foot Distancing Parameters
(updated 2.19.21)

STATE OF PRACTICE IN BROOKLINE (THROUGH FEBRUARY 18, 2021)

Summary

1) The data show PSB's measures are working.

- **Individual hygiene compliance**: PSB mask compliance and handwashing/sanitizing compliance has been high with staff and students.
- **Ventilation**: PSB has invested to meet or exceed all ventilation and air circulation targets (a minimum of 4 air changes per hour (ACH) in classrooms, most science labs and art rooms are at 5-6+ ACH, Nursing spaces are 8+ ACH, and many spaces are at higher levels than the minimum required).
- **Sanitation and disinfecting**: PSB has invested to meet or exceed recommended sanitation and disinfecting protocols for buildings and rooms.
- **Asymptomatic infection rates**: PSB has had extremely low asymptomatic teacher test rates (0.17% or 3 positives out of 1805 total tests) based on 3 weeks of surveillance data, which occurred during and just after the winter peak of positive community cases. Pooled surveillance testing will begin again in March for teachers and begin to include students.
- **In-school transmission**: PSB has had virtually zero cases of in-school transmission (two likely and one possible instance, out of the 227 total close contacts, out of 7,000 in-person students and staff.
- **Distancing**: PSB has maintained 6' distancing between student seats even though 3-6' distancing is consistent with state, federal, and international public health guidance for schools.

2) *No* major public health body is requiring 6' distancing at this point; scientific evidence from peer-reviewed studies supports this approach. The measures listed above, when paired with many other factors such as consistently low overall community infection rates and extremely high compliance with all recommended protocols around close contact tracing, quarantining, isolation, and keeping students and staff home when symptomatic are all part of a multi-layered approach to health and safety, which PSB will continue to implement.

3) The mental health costs to students of keeping schools closed are increasingly alarming — a big increase from last fall and a clear alarm bell.

4) The clear public health imperative is to bring back as many students as quickly and safely as possible.

Detailed Explanation

- Since the summer, the district has been guided by the work of Expert Panel 4 on "Public Health, Safety and Logistics", a team of world-class experts from local hospitals and academic institutions.

- There has been very good compliance with district-imposed individual safety measures such as masking and hand hygiene (Panel 4 and other experts have stressed that perfect compliance is not a necessary or realistic standard to achieve.) These individual safety measures complement the district-managed enhanced ventilation and cleaning protocols that were implemented at the beginning of the year. Whereas a typical school building in the U.S. gets enough clean air to exchange its whole indoor air volume about 1.5 times per hour, Brookline's classrooms now have nearly three times that level of ventilation, a pandemic-informed minimum of four air changes per hour (ACH) in all classrooms and similar spaces, with many at even higher levels.
- Recent district-funded COVID-19 testing of asymptomatic staff working in the buildings showed that of 1805 staff tests completed, just three were positive - an extremely low positivity rate of 0.17%. Those tests were conducted during and just after the peak of the winter case surge in Massachusetts and Brookline, with contemporaneous test positivity among Town of Brookline residents averaging around 2.0% (~10x the PSB staff positivity rate) and statewide test positivity averaging around 5.5% (~30x the PSB staff positivity rate).[1]
- PSB is aware of 223 total COVID-19 cases among PSB staff and students (including fully-remote staff and students) from the beginning of school in mid-September through February 11, 2021. 49 of those cases had a total of 227 in-school close contacts identified (using the CDC definition of within 6 feet of an infected individual for a total of 15 minutes or more during the likely contagious period). In total, over 3.5-5 months of in-person school (depending on grade level), PSB is aware of just 2 likely cases and 1 possible case of in-school transmission in populations of approximately 5,500 in-person PK-12 students and 1,500 in-person staff members.
- Since December, the COVID-19 related Health and Safety consultations between the BEU and the District have been ongoing and productive.
- There is growing concern about the mental health of PSB students, as highlighted in a recent presentation to the School Committee by guidance and ELE staff and reinforced by recent School Committee listening sessions with students in grades 6-12 and caregivers at all schools, and Panel 4's February 12, 2021 meeting with school- and community-based counseling, social work, mental health, and pediatrics professionals.

EVIDENCE OF SCIENTIFIC CONSENSUS

National and global evidence are also increasingly clear that the risk of SARS-CoV-2 virus transmission in school settings is low when masks are worn, ventilation/air filtration are enhanced, and other basic precautions are taken.

CDC's newly updated (February 12, 2021) "Transmission of SARS-CoV-2 in K-12 schools" Science Brief states:

- "Based on the data available, in-person learning in schools has not been associated with substantial community transmission. Although national COVID-19 case incidence rates among children and adolescents have risen over time, this trend parallels trends observed among adults. Increases in case incidence among school-aged children and school reopenings do not appear to pre-date increases in community transmission."
- "When a combination of effective mitigation strategies is implemented and strictly adhered to in the K-12 in-person learning environment, the risk of transmission in the school setting appears to be lower than or equivalent to the transmission risk in other community settings."

[1] Obviously, these comparisons have some limitations, as neither the Town of Brookline nor the Commonwealth has a full-scale asymptomatic testing program in place for all residents. But they clearly indicate that PSB's suite of mitigation is working well to keep in-school transmission risk very low for staff.

- "Findings from several studies suggest that SARS-CoV-2 transmission among students is relatively rare."
- "Conclusions: COVID-19 transmission in schools is associated with community transmission. Transmission spread within schools can be limited with strict implementation of layered mitigation strategies. When community rates of COVID-19 are high, there is an increased likelihood that SARS-CoV-2 will be introduced to, and potentially transmitted within, a school setting. Evidence to date suggests that when schools implement mitigation strategies with fidelity, transmission within schools can be limited."

Dr. Benjamin Linas, an epidemiologist and infectious disease physician who is a member of Expert Panel 4, presented some recent analyses at the panel meeting on January 29. In his words, "fall and winter have been challenging, but the silver lining is that we now have data and lived experience." He presented several new peer-reviewed pieces of evidence that contribute to consensus around the low risk of in-school transmission, particularly to adults, including a recent CDC analysis of COVID-19 cases and transmission in K–12 Schools in Wood County, WI. Despite widespread community transmission, COVID-19 incidence in schools conducting in-person instruction was 37% lower than that in the surrounding community and of the identified in-person transmission (7 of a total of 191 cases); none of those 7 was to or from staff. Six feet of physical distancing was used as a goal in the schools that were studied, but it apparently was only observed consistently by staff members keeping distance from others and was not enforced to any significant degree between elementary-age students (except to require masks when within 6 feet of one another).[2]

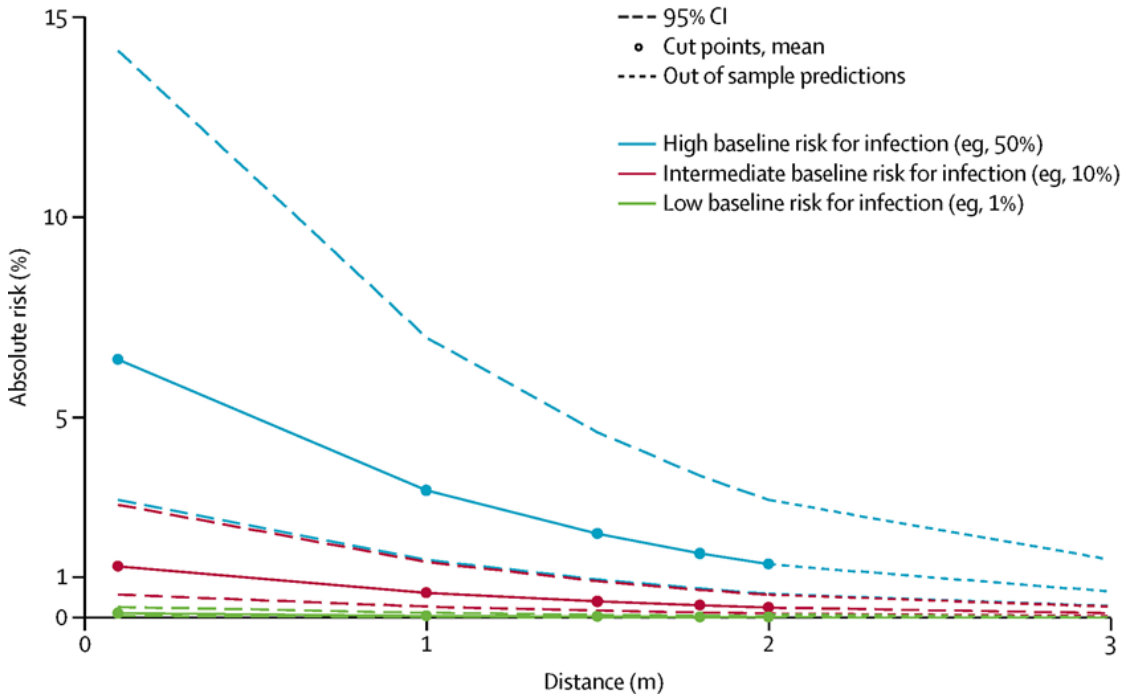
This and other similar analyses are summarized in a recent JAMA editorial, which notes that "Accumulating data now suggest a path forward to maintain or return primarily or fully to in-person instructional delivery" and "the type of rapid spread that was frequently observed in congregate living facilities or high-density worksites has not been reported in education settings in schools."

Separately, there is greater understanding and subsequent concerns about the impact on students on continued reduced in-school time. A recent JAMA Pediatrics editorial "To Spread or Not to Spread SARS-CoV-2—Is That the Question?" by Colorado pediatrician Sean T. O'Leary, MD, MPH, notes "We have already seen short-term consequences of these closures, and the potential longer-term consequences of a missed year (or more) of learning are dire" and "we must prioritize the reopening of childcare facilities and elementary schools to full time, in-person learning without exception." Updated AAP guidance (advisory, full guidance) also states "the AAP strongly advocates that all policy considerations for school COVID-19 plans should start with a goal of having students physically present in school."

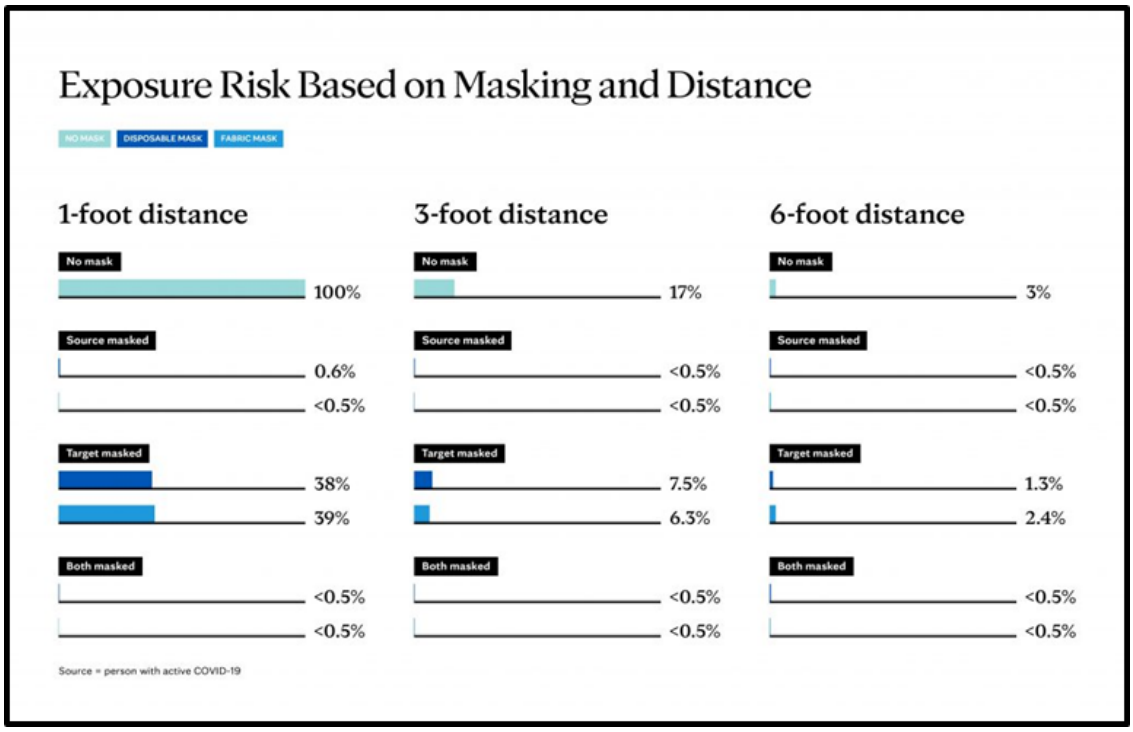
Evidence specific to reduced distancing

Studies focused specifically on the risk protective effect of physical distancing consistently show that such risk reduction is a gradient, not a binary, effect and the absolute reduction in transmission risk going from 3-foot to 6-foot distancing is very small to practically non-existent in a low risk setting (e.g., as a result of universal mask wearing, enhanced ventilation, and other mitigation measures in our schools), which is highly consistent with the lived experience of health care professionals and others who work in settings where physical distancing frequently is not possible. Figure 3 from a meta-analysis of several studies published by Chu, et al. in *The Lancet*, June 1, 2020, shown below, is particularly helpful in understanding the nature of the relationship between distancing and infection risk mitigation (with PSB's environment falling on the green--low baseline risk--line). As shown, there is virtually no increased absolute risk between 2m (~6.6-foot) and 1m (~3.3-foot) distance in the low baseline risk environment depicted by the green line.

[2] https://globalhealth.massgeneral.org/covidlibrary.pdf (p56)



Unpublished data from a team at the Mayo Clinic illustrate the same relationship between baseline risk (mitigated by masks) and the impact of physical distancing, showing that physical distancing significantly reduces risk in unmasked settings (the top row of the chart) but has no practical effect once risks already have been lowered by universal mask wearing (the bottom row of the chart):



This principle explains why it is consistent and appropriate for public health authorities to recommend 6-foot distancing as a guideline for the general public (to address widely varying degrees of mask-wearing and other mitigation measures in place across a wide range of settings) but to allow less distancing in specifically-controlled settings such as schools. To that end, as listed below, neither the World Health Organization (WHO), nor the CDC, nor the Massachusetts Department of Health and Department of Elementary and Secondary Education (MA DPH/DESE) has historically required 6-foot distancing in school settings when masks are worn, and CDC's newly-issued guidance only does so under conditions of substantial to high community transmission.

- In the PK-12 school context, CDC has long recommended a goal of 6-foot distancing where feasible to do so, but historically did not make that a requirement for low-risk school operations except in communal dining settings, e.g.:
    - "Space seating/desks at least 6 feet apart ***when feasible***."
    - "Modify learning stations and activities as applicable so there are fewer students per group, placed at least 6 feet apart ***if possible***."
    - "***As feasible***, have children eat meals outdoors or in classrooms, while maintaining social distance (at least 6 feet apart) ***as much as possible***, instead of in a communal dining hall or cafeteria."
    - "If communal dining halls or cafeterias will be used, ***ensure that*** children remain at least 6 feet apart in food service lines and at tables while eating."

- CDC issued updated guidance for K-12 schools on February 12, 2021, in which it started by stating, "It is critical for schools to open as safely and as soon as possible, and remain open, to achieve the benefits of in-person learning and key support services. To enable schools to open safely and remain open, it is important to adopt and consistently implement actions to slow the spread of SARS-CoV-2 both in schools and in the community." This updated CDC guidance continues to recommend a goal of 6-foot distancing for all K-12 schools "to the greatest extent possible" in locations where community transmission falls in a low (blue) or moderate (yellow) category, but now more formally

requires 6-foot distancing for schools located where community transmission is substantial (orange) or high (red).

  - As of data available through February 16, 2021, the Town of Brookline falls squarely in CDC's low (blue) category on one measure (test positivity). Brookline falls near the border of CDC's substantial (orange) and moderate (yellow) categories on the second measure (weekly case incidence), and is trending down quickly into the moderate (yellow) category on that measure, based on a four-week downward case trend to date. **Thus, while continued monitoring is required, it is expected that Brookline will unambiguously fall within the range in which CDC guidance prioritizes full in-person instruction over strict 6-foot distancing by the time any reduction in distancing within our schools actually would be made.**

- CDC's guidance on classroom setup options similarly includes options with and without 6-foot distancing. CDC Director Dr. Rochelle Walensky, at the February 12th press conference announcing the new guidance, told reporters that CDC intentionally did not set 6-foot distancing as a requirement across the board because CDC did not intend it to be a barrier to full return to in-person school where community transmission conditions were sufficiently under control (i.e., in CDC's low to moderate range).

- The Massachusetts Department of Elementary and Secondary Education (MA DESE)'s most recent guidance related to in-school distancing similarly recommends 6 feet where feasible but sets an "acceptable minimum" of 3 feet when masks are worn:
  - "DESE recommends that districts aim for 6 feet of distance ***where feasible***. When 6 feet is not feasible, 3 feet is an acceptable minimum as long as staff and students wear masks covering the nose and mouth at all times." (Protocols for Responding to COVID-19 Scenarios - Updated 12/16/2020)
  - "Students ***must*** be at least 6 feet apart during mask breaks." (FAQs 9/21/2020)
  - DESE has also indicated, "Districts and schools in communities designated gray, green, or yellow are expected to have students learning ***fully in-person***, if feasible. A hybrid model should be used ***only if*** there is no other way to meet health and safety requirements." (Updates to Guidance on Interpreting DPH COVID-19 Health Metrics - 11/6/2020)
- MA DPH signed onto an 8/19/2020 joint guidance document with DESE expressing agreement with the 3-6 foot guideline for schools, while noting that both CDC and DPH more generally recommend 6 feet of distancing outside of school contexts.
- The American Academy of Pediatrics has issued similar guidance setting 6-foot distancing as a goal, where feasible, and 3-foot distancing as a minimum standard:
  - "In many school settings, 6 feet between students is not feasible without drastically limiting the number of students. Some countries have been able to successfully reopen schools after first controlling community-wide spread of SARS-CoV-2 while using 3 feet of distance between students without increases in community spread. Physical distance between desks should follow current public health guidance, and desks should be placed ***at least 3 feet apart and ideally 6 feet apart***. … ***Schools should weigh the benefits of strict adherence to a 6-feet spacing rule between students with the potential downside if remote learning is the only alternative.***"
  - **Elementary Schools:** "Desks should be placed at least 3 feet apart, and ideally 6 feet apart. ***If this reduces the amount of time children are present in school, harm may outweigh potential benefits***."
  - **Secondary Schools:** "Desks should be placed 6 feet apart ***when feasible***."
  - "Given what is known about SARS-CoV-2 transmission dynamics, adults within schools should maintain a distance of 6 feet from other people ***as much as possible, particularly around other adult staff***."

- An interdisciplinary team from Harvard and Brown Universities, including their respective schools of public health, issued updated guidance in December calling for:
    - "3 ft social distancing for young learners at all levels of community spread."
    - "6 ft social distancing for high schools when levels of community spread rise above 100/100,000 daily new cases; 3 ft social distancing below that level." (For reference, the MA statewide average daily new case rate reached a maximum of approximately 80 cases per 100,000 people this winter, and the Town of Brookline resident average daily new case rate reached a maximum of approximately 28 cases per 100,000 people this winter.)

- In addition to the Wisconsin study described above (in which 6' distancing was inconsistently applied in the studied environments), several scientific studies of the risk of in-school transmission of SARS-CoV-2, and how to mitigate that risk, have concluded that transmission risk is low and can be well-controlled even in environments were physical distancing rules used 1-meter (~3.3 foot) or 1.5-meter (~4.9 foot) or other <6-foot distancing between individuals:
    - Brandal LT, Ofitserova TS, Meijerink HM. Minimal transmission of SARS-CoV-2 from paediatric COVID-19 cases in primary schools, Norway, August to November 2020. Euro Surveill. 2021;26:2002-11. (finding "minimal child-to-child and child-to-adult transmission in primary schools" with basic mitigation measures in place that included 1-meter physical distancing, but no masks worn in school).
    - Gandini S, Rainisio M, Iannuzzo ML, Bellerba F, Cecconi F, Scorrano L. No evidence of association between schools and SARS-CoV-2 second wave in Italy. medRxiv 2021. ePub January 8, 2021. (finding incidence among students from Sept 12 to Nov 7, 2020 was "lower than that in the general population of all but two Italian regions" and that incidence among teachers was statistically the same as the general population when matched for age, leading to conclusion that "COVID-19 infections rarely occur at school and that that transmission from students to teachers is very rare" when precautions including "compulsory 1m seat to seat distance" were in place).
    - Kriemler S, Ulyte A, Ammann P, et al. Surveillance of acute SARS-CoV-2 infections in school children and point-prevalence during a time of high community transmission in Switzerland. Preprint. MedRxiv. 2020; Posted 2020 December 26. doi:10.1101/2020.12.24.20248558 (concluding that, "In a setting of high incidence of SARS-CoV-2 infections, unrecognized virus spread within schools was very low. Schools appear to be safe with the protective measures in place (e.g., clearly symptomatic children have to stay at home, prompt contact tracing with individual and class-level quarantine, and structured infection prevention measures in school)." (The physical distancing standard in place isn't specified in the study, but appears to have been 1.5-meter.)
    - Fricchione et al., Public Health Management and Practice, 12/30/20, Data-Driven Reopening of Urban Public Education Through Chicago's Tracking of COVID-19 School Transmission ("Data collected in the nation's largest Catholic school system suggest that implementation of layered mitigation strategies creates a low- but not zero-risk environment for in-person learning in public schools. Chicago data revealed a lower attack rate for students and school staff than for the city overall during a period of moderate to high COVID-19 incidence.") [While the study itself doesn't specify, MGH Global Health evidence review editors reportedly learned from study authors that 6-foot distancing was used only when students were unmasked at lunch, but less distance was used during masked times. See https://globalhealth.massgeneral.org/covidlibrary.pdf (page 52)]
    - More studies and commentary are collected in the Massachusetts General Hospital Global Health COVID-19 School and Community Resource Library: (summary note on page 145: "11. Physical Distancing - Maintaining physical distancing of approximately 1m (~3 feet) between all persons is likely associated with a reduction in risk of transmission of COVID-19, although most data to support efficacy of physical distancing were generated in the

absence of the use of face masks. There are no direct comparisons of 3' vs. 6' distancing in schools where mask-wearing is universal. Over the course of the fall 2020 semester, several reports have described low rates of in-school transmission at distances less than 6'. Please see Section 4D for available data on distance in each published report of school-associated transmission risk.")