JOURNAL ARTICLE

Assess Ventilation When Determining Safe Distancing in Schools to Control Coronavirus Disease 2019 (COVID-19) Transmission FREE

Richard M Lynch ✉, Elissa Favata, Michael Gochfeld

Clinical Infectious Diseases, Volume 73, Issue 6, 15 September 2021, Pages e1404–e1405, https://doi.org/10.1093/cid/ciab353
Published: 25 April 2021 **Article history** ▾

Issue Section: Correspondence

TO THE EDITOR—

We read with interest and are responding to the recent paper by van den Berg et al [1]. This statewide study compared coronavirus disease 2019 (COVID-19) transmission incidence rate ratios for students and staff in Massachusetts on a district level based on reported distancing practices of 3 feet or 6 feet spacing with other mitigation measures, such as universal masking, implemented. The authors concluded that the difference in rates was not statistically significant at the .05 level, creating the impression that 3 feet spacing is just as effective as 6 feet spacing in preventing COVID-19 transmission in elementary schools. As practicing Certified Industrial Hygienists and Occupational Medicine Physicians working with school districts to reduce COVID-19 transmission risk, we believe the limitations inherent in this study should be clarified before becoming the basis for practice or public policy.

This is an "ecologic design" associating outcome (COVID-19 positivity rates) with spacing practices by district, whereas the

first 8 weeks of the study period. Had the study been limited to 8 weeks (ending before Thanksgiving and year-end holidays), the difference favoring 6 feet would have been statistically significant (binomial test = 0.03).

The 3 feet and 6 feet comparison groups were based upon school policy statements from publicly available sources, arguably the best source of information for a retrospective study design. However, in our New Jersey experience, schools with in-person or hybrid teaching during the same months typically had actual classroom attendance levels far below 25–50% of normal occupancy (eg, 1–9 students present). Hence, for classrooms normally designed for 20 students, this decreased occupancy ipso facto produced >6 feet distancing. Also, because many districts used staggered schedules, the study's 80% cut point for "high" versus "low" enrollment likely mischaracterizes classroom density estimates. Accordingly, we are concerned that the inherent limitations of this retrospective study present significant potential for misclassification bias; which favors the null hypothesis (a type II error) [2].

Finally, the analysis did not address ventilation rates, an important control strategy for indoor respiratory transmission of microbes. Smaller respiratory droplets and particles can remain suspended in air for hours [3–7] resulting in virus transmission if ventilation dilution and/or filtration are inadequate [8]. Classroom ventilation design guidelines factor both occupant density and area (square footage) [9, 10]. Hence, classrooms with more outdoor air dilution relative to the number of occupants will be more effective at interdicting transmission. Because ventilation rates (a confounder for spacing distance) could not be evaluated, the authors' conclusions that the lack of a significant difference in COVID-19 positivity rate was due to distancing alone is misleading.

In conclusion, we recognize the importance of safely reopening schools as quickly as possible and recommend that school districts

remain part of a layered strategy to reduce COVID-19 transmission risk for students and staff.

Notes

Potential conflicts of interest. The authors: No reported conflicts of interest. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

References

1. Van den Berg P, Schecter-Perkins E, Jack R, et al. Effectiveness of 3 versus 6 feet of physical distancing for controlling spread of COVID-19 among primary and secondary students and staff: a retrospective, state-wide cohort study. *Clin Infect Dis* 2021; ciab230. doi:10.1093/cid/ciab230.
Google Scholar WorldCat

2. Rothman K. *Modern epidemiology*. Little, Brown and Co Boston/Toronto;1986.
Google Scholar Google Preview WorldCat COPAC

3. Lynch RM, Goring R. Practical steps to improve air flow in long-term care resident rooms to reduce COVID-19 infection risk. *J Am Med Dir Assoc* 2020; 21:893–4.
Google Scholar Crossref PubMed WorldCat

4. Meselson M. Droplets and aerosols in the transmission of SARS-CoV-2. *NEJM* 2020; 382:2063.
Google Scholar WorldCat

5. Bourouiba L. Turbulent gas clouds and respiratory pathogen emissions: potential implications for reducing transmission of COVID-19. *JAMA* 2020; 323:1837–8.
Google Scholar PubMed WorldCat

6. Tang S, Mao Y, Jones RM, et al. Aerosol transmission of SARS-CoV-2? Evidence, prevention and control. *Environ Int* 2020; 144:106039.
Google Scholar Crossref PubMed WorldCat

7. Lindsley WG, King WP, Thewlis RE, et al. Dispersion and exposure to a cough-generated aerosol in a simulated medical examination room. *J Occup Environ Hyg* 2012; 9:681–90.
Google Scholar Crossref PubMed WorldCat

8. Shen Y, Li C, Dong H, et al. Community outbreak investigation of SARS-CoV-2 transmission among bus riders in Eastern China. *JAMA Intern Med* 2020; 180:1665–71.
Google Scholar Crossref PubMed WorldCat

9. American Society of Heating Refrigeration and Air-Conditioning Engineers. ASHRAE 62.1–2019 Ventilation for Acceptable Indoor Air Quality. Available at: https://ashrae.iwrapper.com/ASHRAE_PREVIEW_ONLY_STANDARDS/STD_62.1_2019. Accessed 29 March 2021.

10. Centers for Disease Control. Science Brief: Transmission of SARS-CoV-2 in K–12 schools. Available at: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/transmission_k_12_schools.html#print. Accessed 29 March 2021.

Comments

0 Comments