

# UC Davis

## UC Davis Previously Published Works

### Title

Reopening Schools Safely: The Case for Collaboration, Constructive Disruption of Pre-Coronavirus 2019 Expectations, and Creative Solutions.

### Permalink

<https://escholarship.org/uc/item/19c7t52m>

### Authors

Cooper, Dan M  
Guay-Woodford, Lisa  
Blazar, Bruce R  
et al.

### Publication Date

2020-08-01

### DOI

10.1016/j.jpeds.2020.05.022

Peer reviewed



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

# Reopening Schools Safely: The Case for Collaboration, Constructive Disruption of Pre-Coronavirus 2019 (COVID-19) Expectations, and Creative Solutions

Q1

Q8

Dan M. Cooper, MD<sup>1,\*</sup>, Lisa Guay-Woodford, MD<sup>2,\*</sup>, Bruce R. Blazar, MD<sup>3</sup>, Scott Bowman, MS<sup>4</sup>, Carrie L. Byington, MD<sup>5</sup>, Jeffrey Dome, MD, PhD<sup>6</sup>, Donald Forthal, MD<sup>7</sup>, Michael W. Konstan, MD<sup>8</sup>, Nathan Kuppermann, MD, MPH<sup>9</sup>, Robert I. Liem, MD<sup>10</sup>, Eduardo R. Ochoa, Jr, MD<sup>11</sup>, Brad H. Pollock, PhD<sup>12</sup>, Olga Acosta Price, PhD<sup>13</sup>, Bonnie W. Ramsey, MD<sup>14</sup>, Lainie Friedman Ross, MD, PhD<sup>15</sup>, Ronald J. Sokol, MD<sup>16</sup>, and Rosalind J. Wright, MD<sup>17</sup>

Q2

In the US, 40% of families have school-aged children and in more than 90% of these households, at least 1 parent is employed outside the home. Schools play an important role in these working families.<sup>1</sup> Yet, schools have been closed for approximately 2 months in an effort to curb the coronavirus 2019 (COVID-19) pandemic, and closing has had a profound influence on family health and well-being. When and how should they reopen? We approach these questions with limited data, and past epidemics provide little guidance for COVID-19.<sup>2</sup> However, we know this: schools will reopen. Their closure is too burdensome on parents, communities, and the economy. Simply put, we cannot fully reopen society without reopening schools. This requires that children will be part of the first wave to re-emerge from shelter-in-place policies. With fast-approaching preparations required for a new school year, a collaborative team of clinicians, scientists, and educators developed this commentary to begin to highlight issues that must be considered to ensure a safe and strategically planned reopening of schools. The American Academy of Pediatrics also has recently posted considerations important to the reopening of schools.<sup>3</sup>

In the US, in an urgent attempt to curb spread of severe acute respiratory syndrome coronavirus 2 and save lives, the nationwide closure of K-12 schools occurred rapidly. Planning for school reopenings must be more deliberate, delineating precisely how, when, under what conditions, and base the reopening on available data. School reopening can mitigate risks to children, families, and school personnel only if it is sensitive to community needs. Models such as the Center for Disease Control and Prevention's Whole School, Whole Community, Whole Child<sup>4</sup> and the School Health Index<sup>5</sup> can provide a helpful framework.

Systematic review of the early Chinese experience reveals that patients younger than 19 years accounted for only 2.2% of 44 672 confirmed cases. Although severe COVID-19 is uncommon in children,<sup>6</sup> a picture of critically ill children in the US is emerging, with up to 22% having no underlying medical condition and the medical conditions of others seemingly varying by communities served.<sup>7-9</sup> Further-

more, without more community-based data, we don't know whether most children actually evade infection or, if infected, largely are asymptomatic. This uncertainty is dangerous. In children, who frequently require hands-on care, asymptomatic infection may pose a greater risk to susceptible individuals than might exposure to an asymptomatic adult.

In addition, current data indicate that children and adults have different infection outcomes. Possible mechanisms include changes in innate and adaptive immune responses with maturation, pediatric vaccinations or common infections that stimulate protective innate responses in children or, conversely, previous infections with common upper respiratory infection coronaviruses that stimulate deleterious acquired responses in adults, and differences in virus binding and infectivity of host epithelial cells.

Although severe acute respiratory syndrome coronavirus 2 community surveillance testing has yet to be standardized, large-scale viral nucleic acid and serologic testing in children is needed to guide safe school reopening. This testing approach will require activation of nontraditional testing sites, such as homes and schools, and "child-friendly" self-collection methods. Testing capability is only the first step. The second is understanding the test results in the appropriate context. As large-scale testing is implemented, care must be taken to ensure that these test results are interpreted

From the <sup>1</sup>Institute for Clinical and Translational Science, University of California at Irvine, School of Medicine, Irvine, CA; <sup>2</sup>Children's National Research Institute, George Washington University School of Medicine and Health Sciences, Washington, DC; <sup>3</sup>University of Minnesota Medical School; <sup>4</sup>Irvine Unified School District, California State University, Los Angeles; <sup>5</sup>University of California Health; <sup>6</sup>Children's National Hospital, George Washington University School of Medicine and Health Sciences; <sup>7</sup>University of California, Irvine School of Medicine & School of Biological Sciences; <sup>8</sup>Case Western Reserve University School of Medicine; <sup>9</sup>University of California, Davis School of Medicine; <sup>10</sup>Ann & Robert H. Lurie Children's Hospital of Chicago; <sup>11</sup>University of Arkansas for Medical Sciences College of Medicine; <sup>12</sup>University of California, Davis School of Medicine & Clinical Translational Science Center; <sup>13</sup>University of Washington School of Medicine; <sup>14</sup>George Washington University Milken Institute School of Public Health; <sup>15</sup>University of Chicago MacLean Center for Clinical Medical Ethics & Institute for Translational Medicine; <sup>16</sup>University of Colorado School of Medicine; and <sup>17</sup>Kravis Children's Hospital, Icahn School of Medicine at Mount Sinai

\*Contributed equally.

Funded by the National Institutes of Health National Center for Advancing Translational Sciences Clinical and Translational Science Awards (UL1 TR001414 [to UC Irvine] and UL1 TR001876 [to Children's National Research Institute]). L.R. serves on the Editorial Board for *The Journal of Pediatrics*. The other authors declare no conflicts of interest.

0022-3476/\$ - see front matter. © 2020 Elsevier Inc. All rights reserved.

<https://doi.org/10.1016/j.jpeds.2020.05.022>

COVID-19 Coronavirus 2019

and communicated appropriately so as to inform, empower, and protect families, school personnel, and communities.

The safe reopening of schools also demands sensitivity to community inequities. All schools present unique challenges for mitigation strategies commonly implemented in the rest of society, eg, physical distancing, face coverings, and good hygiene practice. In addition, many school systems face additional challenges related to food security, safe transportation, healthcare safety nets, and emergency preparedness policies, which often also are within their purview. These interventions will be more difficult for resource-constrained Title 1 schools, which often are situated in low-income and minority neighborhoods.

How do we recover from the psychological, medical, and economic damage resulting from school closures? Schools are a bedrock of the American social network, providing not only education but also nutritional support, healthcare, and social services. The response to pandemic-related challenges will require augmenting existing school-based programs. The pandemic has impacted students' access to and relationships with healthcare providers, with many children needing more behavioral and medical care services. As schools reopen, school-based health centers should be expanded. These centers improve student health and educational outcomes and reduce healthcare disparities among vulnerable student populations while providing demonstrable cost savings.<sup>10</sup> In addition, federally assisted school-based meal programs annually benefit nearly 30 million children.<sup>11</sup> Student eligibility for these programs, meal distribution practices, and food safety standards must be reviewed and adjusted to meet the unprecedented circumstances. Consideration must be given to the availability of these programs to student caregivers and parents, more of whom are unemployed with each passing week. Finally, schools and communities must support teachers and staff returning to school. Concerns and stress among school staff may exacerbate already-high rates of teacher turnover that disproportionately affect students attending under-resourced schools. Greater school instability could undermine safe school reopening.

Children with chronic conditions will be especially vulnerable during this return to school. Although the symptoms of COVID-19 are mild in most otherwise-healthy children, we cannot assume that the estimated 10%-15% of children with chronic diseases will be similarly resilient. Children with underlying neurologic conditions and medical complexity have been among those severely affected in the US.<sup>7-9</sup> Early data from Italy<sup>12</sup> suggest that most patients with cystic fibrosis in community settings generally may be avoiding COVID-19 infection through physical distancing. Whether this effect can be achieved in schools remains unknown. Some data suggest that children with cancer have not had severe morbidity with COVID-19<sup>13</sup>; however this experience is not universal,<sup>9</sup> and the full effect of immunocompromising therapies on COVID-19 risk and severity has yet to be determined. In addition, concern about COVID-19 transmission could present a disproportionate

barrier to school re-entry for children with cystic fibrosis or asthma who frequently have chronic, often-productive cough. Acute chest syndrome in children with sickle cell disease may be difficult to distinguish from COVID-19-related lung disease.<sup>14</sup> Under current conditions of increased sensitivity to possible COVID-19 symptomatology, children with these chronic health disorders risk being socially shunned and unnecessarily removed from school. More research is needed to understand the risks that all children, including those with chronic conditions, may encounter in school settings in the COVID-19 era.

Even as we curtail physical contact, we must not reflexively abandon after-school activities and physical education. This would exacerbate the more slow-moving pandemic of childhood physical inactivity and obesity while also denying the physical- and mental health-enriching benefits of extracurricular activities. Early-life physical activity is beneficial for child health and health across the lifespan, and physical fitness in children is associated with improved school learning. Conversely, the lack of participation of adolescents in physical education classes is associated with social isolation and loneliness. Of note, obesity is a serious complicating comorbidity of the COVID-19 pandemic in adults.<sup>15</sup> Data preceding the pandemic indicate that children with obesity admitted to pediatric intensive care units required more invasive therapeutic interventions than children without obesity.<sup>16</sup> Preparations for school reopening should include novel approaches to physical education, structured recesses, and access to safe after-school activities.

Finally, we must recognize that reopening schools raises a number of ethical issues, including safety, privacy, autonomy, vulnerability, proportionality, and health disparities, that impact children and their families, as well as teachers, staff, and administrators. Parents and caregivers, as well as viral surveillance and contact tracing teams, likely will require more frequent monitoring of the school environment. These activities will influence costs, the educational dynamic in the classroom, risks related to privacy, and the autonomy of older children and adolescents. If wearable devices or smartphones are deployed to collect health information, who will be required to seek and provide consent and at what age will children be asked to assent? What will happen if a child or caregiver refuses to comply with surveillance programs? How do long-standing issues with immigration status and health disparities influence the effective implementation of school reopening plans?

In the US, states made rapid decisions to shutter K-12 schools in response to the pandemic. Public safety dictated this haste, but safe school reopening must be more deliberate and carefully planned. Reopening inherently carries risk and solutions that will be disruptive may need to be considered (eg, staggered start times). It is clear that healthy school-reopening strategies will require creativity and considerable monetary investment to obtain unique pediatric data on symptoms and the dynamics of virus shedding, the ability to test for the presence of serum antibody and to understand its meaning, as well as the capability to perform contact

tracing in real time related to inevitable exposures. New educational strategies must be developed, and the generally inadequate allocation of school nurses will need to be reconsidered.

The community at large will need to view schools as “healthy places” for children and society. This could be accomplished by building public health–focused collaboratives capable of continuous learning and rapid cycles of implementation, as COVID-19 information evolves at breakneck speed. Otherwise, we risk further compounding the incalculable damage already incurred by COVID-19 among children across our country and the world. ■

Submitted for publication May 6, 2020; last revision received May 13, 2020; accepted May 14, 2020.

Reprint requests: Dan M. Cooper, MD, Institute for Clinical and Translational Sciences, 843 Health Sciences Rd, Hewitt Hall 1113, Irvine, CA 92697. E-mail: dcooper@hs.uci.edu

## References

1. Bureau of Labor Statistics. Employment characteristics of families—2019. <https://www.bls.gov/news.release/pdf/famee.pdf>. Accessed XXX.
2. Viner RM, Russell SJ, Croker H, Packer J, Ward J, Stansfield C, et al. School closure and management practices during coronavirus outbreaks including COVID-19: a rapid systematic review. *Lancet Child Adolesc Heal* 2020. in press.
3. American Academy of Pediatrics. COVID-19 Planning Considerations: Return to In-person Education in Schools. <https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/covid-19-planning-considerations-return-to-in-person-education-in-schools/>. Accessed XXX.
4. Lewallen TC, Hunt H, Potts-Datema W, Zaza S, Giles W. The whole school, whole community, whole child model: a new approach for improving educational attainment and healthy development for students. *J Sch Health* 2015;85:729-39.

5. Centers for Disease Control and Prevention. CDC Health Schools. School Health Index. <https://www.cdc.gov/healthyschools/shi/index.htm>. Accessed XXX.
6. Chang T-H, Wu J-L, Chang L-Y. Clinical characteristics and diagnostic challenges of pediatric COVID-19: a systematic review and meta-analysis. *J Formos Med Assoc* 2020;119:982-9.
7. DeBiasi RL, Song X, Delaney M, Bell M, Smith K, Pershad J, et al. Severe COVID-19 in children and young adults in the Washington, DC metropolitan region. *J Pediatr* 2020. in press.
8. Chao JY, Derespina KR, Herold BC, Goldman DL, Aldrich M, Weingarten J, et al. Clinical characteristics and outcomes of hospitalized and critically ill children and adolescents with coronavirus disease (COVID-19) at a tertiary care medical center in New York City. *J Pediatr* 2020. in press.
9. Shekerdeman LS, Mahmood NR, Wolfe KK, Riggs BJ, Ross CE, McKiernan CA, et al. Characteristics and outcomes of children with coronavirus disease 2019 (COVID-19) infection admitted to US and Canadian pediatric intensive care units. *JAMA Pediatr* 2020. in press.
10. Keeton V, Soleimanpour S, Brindis CD. School-based health centers in an era of health care reform: building on history. *Curr Probl Pediatr Adolesc Health Care* 2012;42:132-56.
11. School based food nutrition. <https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program/>. Accessed XXX.
12. Colombo C, Burgel P-R, Gartner S, van Koningsbruggen-Rietschel S, Naehrlich L, Sermet-Gaudelus I, et al. Impact of COVID-19 on people with cystic fibrosis. *Lancet Respir Med* 2020;8:e35-6.
13. Hrusak O, Kalina T, Wolf J, Balduzzi A, Provenzi M, Rizzari C, et al. Flash survey on severe acute respiratory syndrome coronavirus-2 infections in paediatric patients on anticancer treatment. *Eur J Cancer* 2020;132:11-6.
14. Hussain FA, Njoku FU, Saraf SL, Molokie RE, Gordeuk VR, Han J. COVID-19 infection in patients with sickle cell disease. *Br J Haematol* 2020. in press.
15. Finer N, Garnett SP, Bruun JM. COVID-19 and obesity. *Clin Obes* 2020. in press.
16. Peterson LS, Gállego Suárez C, Segaloff HE, Griffin C, Martin ET, Odetola FO, et al. Outcomes and resource use among overweight and obese children with sepsis in the pediatric intensive care unit. *J Intensive Care Med* 2020;35:472-7.