

# Building a National Framework to Pair Scientists and Schools During a Global Pandemic

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abstract

The coronavirus disease 2019 (COVID-19) pandemic forced the suspension of in-person education in schools serving students in kindergarten through 12th grade (K–12) across the United States. As time passed, teachers, students, and parents struggled with remote education. With limited guidance at the federal level, physicians and school leaders across the country collaborated to develop local solutions for schools. This article describes the lessons learned from the development of 4 academic-community partnerships and collaboration among these partnerships to provide national leadership on managing COVID-19 mitigation in the K–12 environment. In addition, we describe a pathway forward for using academic-community partnerships to improve child health.



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**WHAT'S KNOWN ON THE SUBJECT:** The coronavirus disease 2019 pandemic forced children, teachers, and their parents into a long-term remote learning environment resulting in an unhealthy void of food, safety, health care, social support, and education for millions of children in the United States.

**WHAT THIS STUDY ADDS:** We share the successes and challenges we encountered while trying to manage coronavirus disease 2019 mitigation in the kindergarten-through-12th-grade environment, as well as offer a potential blueprint to keep children safely in school in the event of future pandemics.

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In March 2020, schools serving students in kindergarten through 12th grade (K–12) across the United States closed to in-person education on the basis of the premise that school closures could help mitigate spread of disease<sup>1</sup> and that in-person education would fuel the coronavirus 2019 (COVID-19) pandemic. Despite suspending K–12 in-person education, COVID-19 cases increased. Schools struggled to teach curricula via remote learning, and throughout the spring 2020 semester, thousands of children were absent from virtual classrooms, many of whom were from underserved communities.<sup>2</sup> School leaders were expected to determine when and how their schools could reopen for safe in-person learning amid ongoing community spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). With minimal federal guidance, limited public health resources, intensely polarized community opinions regarding the safety of returning to school buildings, an incomplete understanding of COVID-19 epidemiology in children or transmission dynamics in the school environment, and significant gaps in successful translation of public health guidance to a school community audience, districts looked elsewhere for help. In parallel, physicians across the nation quickly realized that without an organized national response to guide schools through the COVID-19 pandemic, children would suffer devastating consequences given that in-person learning provides food, safety, health care, social support, and education for >55 million schoolchildren in the United States. Such realizations led to new partnerships between K–12 school districts and medical providers across the United States.

In this article, we describe the partnerships between local school districts and 5 academic medical

institutions in 3 states: Duke University (Durham, NC), University of North Carolina at Chapel Hill (UNC) (Chapel Hill, NC), Children’s Mercy Kansas City (CMCK) (Kansas City, MO), Washington University in St Louis (St Louis, MO), and University of Wisconsin School of Medicine and Public Health (UW SMPH) (Madison, WI). We describe quantitative and qualitative results, exploring the facilitators and barriers to establishing community-academic partnerships in communities with large underserved populations, on the basis of structured qualitative interviews and quanti-guided local grassroots movements that eventually led to coordinated national leadership on managing COVID-19 mitigation in the K–12 environment. We share our successes and challenges, as well as offer a potential blueprint for improved partnerships between schools and public health systems.

## LOCAL GRASSROOTS MOVEMENTS

### Duke University and UNC

In July 2020, board members from a North Carolina–based public school district approached pediatric researchers from Duke University and UNC for help with interpreting existing scientific evidence on COVID-19. Specifically, the school district sought medical guidance on how and when to safely reopen for in-person learning. These discussions led to the development of a formal partnership, deemed The ABC Science Collaborative (ABCs),<sup>3</sup> which pairs school and community leaders with physician-scientists. These physician-scientists, school board members, and interested superintendents from 4 local districts developed a plan for establishing ABCs partnership, including determining who would be involved, memorandums of understanding, and standard protocols for information delivery to the broader school communities.

ABCs physician-scientists have expertise in adult and pediatric infectious diseases, critical care, primary care, community engagement, and clinical research. Supported by seed funding from the National Institutes of Health, ABCs focused on a 3-tiered approach: (1) informing evidence-based decision-making, (2) delivering educational resources for all, and (3) advancing public health for any interested school district in North Carolina. ABCs facilitated biweekly group meetings with superintendents across the state, with groups formed on the basis of preexisting regions or district size. During these meetings, superintendents received education from ABCs physician-scientists and shared lessons learned from remote or in-person education. ABCs physician-scientists also presented the latest and most relevant data to local school boards and met regularly with leadership from the North Carolina Association of Educators to interpret the most up-to-date information on COVID-19 transmission in schools, explain important steps to mitigate transmission, and partner with teachers on advocating for a culture of safety and transparency. Finally, ABCs physician-scientists used educational webinars and community meetings to meet directly with school communities, including parents, school staff (eg, bus drivers), and students to discuss COVID-19 transmission, mitigation strategies in schools, and vaccinations. By the end of the 2020–2021 school year, across >50 districts participating in ABCs, ABCs physician-scientists had participated in >50 board meetings, hundreds of group and 1:1 calls with school leaders and staff, and dozens of community meetings. In a survey completed by 18 ABCs school district participants and guided by the Consolidated Framework for Implementation Research (which is

used to enable assessment of factors that influence implementation and effectiveness of initiatives across several domains), we inquired about the degree of influence of 8 characteristics of ABCs that drove their choice to partner.<sup>4,5</sup> Although the total number of responses was limited, thereby limiting the potential conclusions from this evaluation, the most commonly cited “very influential” reasons included that the partnership was with a knowledgeable public health organization ( $n = 18$ ; 100%), ABCs would allow districts to communicate decision-making with credibility ( $n = 13$ ; 83%), and ABCs would help them interpret guidance from government agencies (eg, North Carolina Department of Health and Human Services and Centers for Disease Control and Prevention [CDC]) for use in their own districts ( $n = 13$ ; 72%).

A central feature of ABCs was the advancement of public health through the collection of data on within-school COVID-19 transmission, the effect of sports on transmission, the effectiveness of various mitigation strategies and diagnostic testing initiatives, and pandemic-related educational outcomes. Data collected through ABCs partnership led to scientific publications, many of which formed the foundation for the first CDC guidance on school reopenings, as well as North Carolina legislation in which K-12 school reopening was mandated: the Reopen our Schools Act of 2021 (S.L. 2021-4).<sup>6</sup>

### CMKC

CMKC is a freestanding, 354-bed academic pediatric medical center located in Kansas City, MO. CMKC provides comprehensive primary and tertiary specialty care to children from a region consisting of 189 counties in Missouri and Kansas. Given the tremendous

challenges faced by schools throughout the pandemic and the resulting number of questions raised by local and regional districts, CMKC used the existing infrastructure and relationships of the CMKC school-based health services program to develop the CMKC COVID-19 School Task Force. The Task Force comprises leaders with expertise in pediatric infectious diseases, nursing, emergency preparedness, pediatric psychology, sports medicine, and environmental health. Support from marketing, community health, and government relations was also available. Throughout the pandemic, the Task Force provided medical-related guidance to superintendents, school boards, principals, teachers, teachers’ unions, school nurses, and school staff. Such guidance included risk mitigation strategies for in-person schooling, screening recommendations (eg, how and when to provide screening and what symptom[s] to assess for), algorithms for SARS-CoV-2 testing and interpretation thereof, isolation and quarantine protocols, and contact-tracing resources. Guidance was disseminated through multiple virtual town halls, 1-on-1 virtual meetings, educational sessions to large groups (including superintendents across the state) about COVID-19 in children and in-school mitigation strategies, electronic resources, (eg, bimonthly newsletters and continuously updated written guidance), and in-person school walk-throughs to assess risk mitigation strategies.

A central feature of the Task Force operations included the COVID-19 school assistance portal, which is available on the CMKC Web site.<sup>7</sup> Using the portal, the Task Force provides school personnel an easy way to request consultation through an online form. A response is provided within 2 business days by

a member of the Task Force. Since July 1, 2021, 162 consultations from 77 school districts, charters, early childhood centers, and community organizations have been administered. In Supplemental Table 1, we outline some of the consultation topics requested of the CMKC Task Force. In a survey on consultation effectiveness, researchers found 83% were very satisfied with the consultation response, 45% modified their COVID-19 school plan, 22.5% changed mitigation strategies on the basis of the consult’s advice, 17.5% used the information to provide education to caregivers and students, and 47.5% used the information to provide education to staff (Supplemental Methods). In Supplemental Table 2, we display the strategies, implementation process stage, and lessons learned from the CMKC Task Force. Although the response rate was limited (33%), this feedback provides preliminary evidence that the CMKC COVID-19 school assistance portal is an effective way to provide real-time consultation to schools during the pandemic.

### Washington University in St Louis

When the COVID-19 pandemic began, St Louis, MO, formed a city-wide task force that comprised representatives from 4 local major health care systems and health departments. Faculty from Washington University in St Louis School of Medicine (WUSM) are affiliated with many of the hospitals within the Barnes-Jewish HealthCare system, including St Louis Children’s Hospital. Members of the WUSM Department of Pediatrics’ Division of Infectious Diseases became key members of 2 committees that have helped and continue to guide schools through the COVID-19 pandemic.

The first committee comprised WUSM pediatric infectious diseases specialists and a group of superintendents from local school districts involved with EducationPlus, which is a nonprofit educational service assisting school districts with resources. During committee meetings, members of the local health departments and medical experts discussed current COVID-19 guidelines and helped establish best practices for schools to follow. A school-based document with an outline of the safest way to reopen schools was developed, with primary input from 2 WUSM pediatric infectious diseases physicians. These 2 WUSM physicians established relationships with individual superintendents, which resulted in numerous presentations and outreach to individual school districts, as well as weekly meetings with the group of independent schools, medical advisory committee participation, and presentations to school boards.

The second committee was named the Pandemic Task Force School Committee, in which WUSM pediatric infectious diseases physicians discussed COVID-19 mitigation strategies, data on school-based transmission, and collaborative projects with pediatric specialists and public health leaders from other health care departments. One key work product resulting from the efforts of this committee was a school-specific dashboard in which COVID-19 data according to age and public school district zip code were provided. The second key work product resulting from this committee was the development of a study in which researchers evaluated the frequency of COVID-19 transmission in schools. This study was performed in collaboration with the CDC and resulted in the CDC changing the

required distance between individuals in school from 6 ft to 3 ft.<sup>8</sup>

With the 2021–2022 school year approaching, the EducationPlus Committee and Pandemic Task Force School Committee have been combined in hopes of nourishing more collaboration with medical experts, as well as developing a better understanding of the challenges currently faced by school districts.

### UW SMPH

UW SMPH is located in Madison, WI, in Dane County. The UW SMPH's partner health care institution, University of Wisconsin (UW) Health, includes the American Family Children's Hospital and serves >600 000 patients each year. In the fall of 2020, Wisconsin public school districts requested medical advisors from the UW Department of Pediatrics to participate in school board meetings, have discussions with school leaders, and serve on medical advisory committees. While figuring out the best way to manage these requests, the UW Department of Pediatrics recognized a number of issues: (1) there were numerous individuals throughout the institution and across specialties involved in medical advising for districts, (2) messaging from these individuals lacked consistency, (3) isolated advisors often failed to consider the larger-scale complexity of the issues surrounding return to school and frequently lacked preexisting experience in advising schools or nonmedical community settings, (4) there was no standard process to provide medicolegal protection for advising physicians, and (5) the piecemeal approach created inequity in access to medical advisors, thereby threatening to worsen disparities. In parallel to these considerations, the Healthy Kids Collaborative, which is UW Health's child health advocacy

coalition, redesigned "School-Friendly Health Systems" within UW Health as a way of formalizing cross-system partnerships and improving student health. Recognizing that school systems and physicians were overwhelmed, the Healthy Kids Collaborative looked for opportunities to strengthen its intra-health system partnerships to bridge the gap between school districts and health care providers. Such efforts resulted in a partnership between the Healthy Kids Collaborative and the UW Department of Pediatrics, called the UW Health Coordinated Response to Schools Task Force, which has a standard memorandum of understanding process and/or protection to cover all the health systems statewide.

The UW Health Coordinated Response to Schools Task Force met weekly with local superintendents and school leaders and had close interactions with the Wisconsin Departments of Public Instruction and Health Services. The Task Force worked to interpret existing COVID-19 literature and produce educational content for local school districts and their communities that would encourage informed decision-making and prioritize the safety and holistic health needs of students. The resulting online educational series, Safe, Strong & Healthy Schools, was designed to present current COVID-19 scientific evidence to a school stakeholder audience. The Safe, Strong & Healthy Schools series was launched via the Healthy Kids Collaborative YouTube channel, featuring twice-weekly prerecorded presentations and conversations with Wisconsin doctors on high-interest topics, such as the basic science of COVID-19, school transmission, safety of athletics, vaccine 101, and the impact of COVID-19 and remote learning on adolescent mental health. The

9-episode series received >1500 views from >500 unique viewers. A weekly newsletter in which summaries from these episodes were featured, as well as links to curated lists of research and resources, was sent to >200 subscribers from urban, suburban, and rural locales across the state. Viewer feedback was positive, with respondents saying that they learned something from this series applicable to their work.

### Coordinated Response

Amid a global pandemic, many local and national pediatricians, pediatric infectious diseases physicians, and other pediatric subspecialists were being called on to aid schools but had limited ability to mobilize or leverage infrastructure at their own institutions. The science of COVID-19 was new and uncertain, but the common goal of safely reopening schools was shared, so academicians from institutions and organizations across the country leaned on each other in an effort to have a unified message and move forward. The American Academy of Pediatrics and the Pediatric Infectious Diseases Society successfully provided physicians, parents, and children with high-level guidance on how to navigate the pandemic. Similarly, leaders at CMKC, Duke, UNC, WUSM, and UW SMPH used a collective voice to better understand the science surrounding COVID-19 in schools and address the daily challenges of implementing mitigation strategies in a school setting.

Before the pandemic, a national antimicrobial stewardship listserv managed by the Sharing Antimicrobial Reports for Pediatric Stewardship Collaborative had been used to discuss many different facets of antibiotic use.<sup>9</sup> When COVID-19 began, this listserv was transitioned to be a mechanism for both local St Louis pediatricians and

national pediatric subspecialists to ask COVID-19 questions, including how to conduct in-person school during the pandemic. Associated webinars were conducted to specifically address return-to-school experiences, concerns, and publications, including presentations about emerging science on COVID-19 and schools. By the end of the 2020–2021 school year, the listserv had been used to generate answers to hundreds of questions and conduct multiple webinars that consistently involved >100 physicians who represented most states across the country.

Like the Sharing Antimicrobial Reports for Pediatric Stewardship listserv, ABCs sought to expand and coordinate efforts beyond North Carolina, particularly as the discussions regarding how to safely restart in-person learning were becoming increasingly politicized and divisive. From November 2020 to January 2021, ABCs identified and contacted physicians and public health professionals who were known to lead efforts on COVID-19 and schools and authors who had published on COVID-19 and schools in a major medical journal. In addition, ABCs issued a formal request for applications to academicians who had established relationships with local school districts and were interested in formally supporting schools during the pandemic. The resulting national network of scientific leaders met regularly to (1) identify practical, science-based solutions and discuss issues faced by superintendents and school leaders in each state; (2) develop a coordinated, evidence-based, school-focused response to changing national guidance (eg, CDC recommendations to limit masking to those unvaccinated<sup>10</sup>); (3) share data and resources; and (4) collectively use data to solve school-related COVID-19 questions.

Therefore, ABCs' national collaboration has been instrumental in providing the data, evidence, and framework for supporting more local interactions between academicians and school communities.

Leaders from ABCs were invited to present to the National Advisory Child Health and Human Development Council on lessons learned from working with school districts, the impact of the COVID-19 pandemic on child health, and proposed solutions. A significant emphasis of this discussion was the importance of a clearly defined federal response to school reopening that would ensure equitable access to school buildings for every child. Shortly after this presentation, the National Institute of Child Health and Human Development, in collaboration with the National Institute of Minority Health and Disparities Rapid Acceleration of Diagnostics (RADx) Underserved Populations (RADx-UP) program, issued a request for applications for academic-community partnerships to investigate the effect of SARS-CoV-2 testing and other mitigation strategies promoting return to school, particularly among underserved populations.<sup>11</sup>

### CHALLENGES AND LESSONS LEARNED

The programs at CKMC, Duke, UNC, WUSM, and UW SMPH were hastily initiated during a time of substantial turmoil for all partners, yet these programs grew into successful, scalable alliances capable of meeting the expectations of local and partnering districts. Moreover, these grassroots relationships built the foundation for a coordinated, national response to a pandemic affecting the health and well-being of all children across the United States. Nevertheless, numerous challenges arose throughout the development process. On the basis

of our collective experience, we have compiled some challenges and lessons learned. To increase potential for generalizability, we have framed the various strategies that our partnerships used using the well-established Expert Recommendations for Implementing Change (ERIC) compilation.<sup>12</sup>

First, scientific leaders from these academic centers had limited previous experience with community partnerships, particularly with schools and school districts. By default, school districts and academic institutions have differing institutional structures, organizational hierarchies, decision-making processes, and missions. Therefore, academicians proceeded with caution, involved experts from their institutions with community and governmental experience, and looked to partner with school districts in pursuit of common goals. Second, throughout the COVID-19 pandemic, multiple stakeholders in schools have been particularly polarized or politicized. Academic institutions often worked through mediated relationships with decision-makers without direct interaction with families, teachers, and staff.<sup>13</sup> This mediated interaction may have created

additional difficulty in school districts serving large proportions of children of color, low-income children, or children in rural areas. Furthermore, the politicization of COVID-19 in K–12 education generated a new level of medicolegal risk for individuals and universities. Therefore, an essential component to the success of these partnerships was that academicians did not offer opinions on whether to reopen schools. Instead, they focused on if schools were to reopen, how they could reopen safely and successfully, lending to their credibility as a trusted and neutral third party. Third, school districts, often only separated by a few miles, had vastly different viewpoints and organizational structures, thereby making it difficult for an academic-community partnership to have broad impact without substantial time and financial investment. A personalized district approach was particularly necessary in circumstances in which there was local control of decision-making. Fourth, bidirectional learning and sharing, with particular attention paid to learning about each other’s institutions, values, and commitments proved to be an important way of developing empathy and understanding, which

was critical to the success of our community-academic partnerships. Fifth, as the pandemic grew, financial support from academic institutions was minimal or nonexistent, leaving scientists and school districts wondering if their partnerships, manpower, and bandwidth were sustainable long-term. Funding is absolutely necessary for community-academic partnerships to continue. Small grants can be stimulus, but they do not produce outcomes<sup>14</sup>; larger funding sources, such as those supplied by the National Institutes of Health through the RADx-UP, are needed for such community-academic partnerships to survive and thrive. Finally, as a result of the COVID-19 pandemic, an uncountable number of inequalities in child health have been exposed, which have been exponentially compounded by inaccurate reports on the SARS-CoV-2 virus, as well as misinformation surrounding COVID-19 vaccines and potential therapies. The future of healthy children is acutely dependent on public school systems being fluidly and succinctly connected with public health systems, with honest communication at the epicenter of positive development. In Table 1, we outline select challenges faced in the

**TABLE 1** Challenges and Proposed Solutions

Challenge	Proposed Solutions
1. Limited previous experience with community partnership, schools, and school districts	Proceed with caution  Involve experts with community and governmental experience Partner with school districts in pursuit of common goals
2. Polarization/politicization of school stakeholders; academicians work with decision-makers without direct interaction with families, teachers, and staff	Do not offer opinion on whether to reopen schools and instead focus on “if school reopens, how can they ensure success?”
3. Differing viewpoints and organizational structures across school districts makes broad impact of the academic-community partnership difficult	Personalized district approach, especially where there was local control of decision-making
4. Differing institutional structures, organizational hierarchies, decision-making processes, and missions	Bidirectional learning and sharing to develop empathy and understanding
5. Minimal/nonexistent financial support from academic institutions; small grants can be stimulus but do not produce outcomes	Need for large funding sources, such as those supplied by NIH through RADx-UP are needed for the survival of community-academic partnerships
6. Inequalities in child health compounded by remote learning	Communication and connection between public school systems and public health systems

NIH, National Institutes of Health.

endeavor to connect public schools to local scientists, as well as the proposed solutions.

### FUTURE DIRECTIONS

In this article, we detail how local grassroots community-academic partnerships in 3 states came together to coordinate a national approach for managing COVID-19 in the K-12 setting. We are hopeful that this partnership will remain sustainable, even when the imminent threat of an international pandemic has subsided. These partnerships offer tremendous opportunities for improving the health of children and making health care more accessible, affordable, and equitable to all families in the United States. Our partnerships were formed under extreme circumstances but

successfully built a solid foundation that could provide substantial benefit if nourished and supported in the future. The physical and mental impact of the pandemic on our children will be felt for years to come, so community-academic partnerships, like the 1 described in this article, are desperately needed to help heal the hurt and safely lead us forward. We are hopeful that our lessons learned, advice, collaborations, and friendships will serve as a blueprint for safer education, healthier children, and more supportive communities for the remainder of the COVID-19 pandemic and beyond.

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### ABBREVIATIONS

ABCs: The ABC Science Collaborative  
CDC: Centers for Disease Control and Prevention  
CMKC: Children's Mercy Kansas City  
COVID-19: coronavirus disease 2019  
ERIC: Expert Recommendations for Implementing Change  
K-12: kindergarten through 12th grade  
RADx-UP: Rapid Acceleration of Diagnostics Underserved Populations  
SARS-CoV-2: severe acute respiratory syndrome coronavirus 2  
SHARPS: Sharing Antimicrobial Reports for Pediatric Stewardship  
UNC: University of North Carolina at Chapel Hill  
UW: University of Wisconsin  
UW SMPH: University of Wisconsin School of Medicine and Public Health  
WUSM: Washington University in St Louis School of Medicine

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### REFERENCES

1. Potter MA, Brown ST, Cooley PC, et al. School closure as an influenza mitigation strategy: how variations in legal authority and plan criteria can alter the impact. *BMC Public Health*. 2012;12:977
2. Korman HTN, O'Keefe B, Repka M. Missing in the margins: estimating the scale of the COVID-19 attendance crisis. 2020. Available at: <https://bellwethereducation.org/publication/missing-margins-estimating-scale-covid-19-attendance-crisis#Introduction>. Accessed August 13, 2021
3. The ABC Science Collaborative. Available at: <https://abcsciencecollaborative.org/>. Accessed August 13, 2021
4. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci*. 2009;4:50
5. Consolidated Framework for Implementation Research. Home. [cfirguide.org](http://cfirguide.org). Accessed August 23, 2021
6. North Carolina General Assembly. Session Law 2021-4: Senate Bill 220. An act to provide access to in-person learning

- for students in grades kindergarten through twelve. 2021. Available at: <https://www.ncleg.gov/Sessions/2021/Bills/Senate/PDF/S220v4.pdf>. Accessed August 13, 2021
7. Children's Mercy Kansas City. Returning to school and the community safely. 2021. Available at: <https://www.childrensmercy.org/health-and-safety-resources/information-about-covid-19-novel-coronavirus/returning-to-community-activities/>. Accessed August 13, 2021
  8. Dawson P, Worrell MC, Malone S, et al; CDC COVID-19 Surge Laboratory Group. Pilot investigation of SARS-CoV-2 secondary transmission in kindergarten through grade 12 schools implementing mitigation strategies - St. Louis County and City of Springfield, Missouri, December 2020. *MMWR Morb Mortal Wkly Rep.* 2021;70(12):449–455
  9. McPherson CC, Vesouis ZA, Metjian TA, et al. Utilization of the Sharing Antimicrobial Reports for Pediatric Stewardship (SHARPS) Collaborative electronic mailing list (listserv) by healthcare professionals. *Infect Control Hosp Epidemiol.* 2021;42(9):1118–1120
  10. The ABC Science Collaborative. COVID-19 and schools: the year in review and a path forward. 2021. Available at: [https://abcsciencecollaborative.org/wp-content/uploads/2021/06/ABC\\_year-in-review\\_29jun2021-final.pdf](https://abcsciencecollaborative.org/wp-content/uploads/2021/06/ABC_year-in-review_29jun2021-final.pdf). Accessed August 13, 2021
  11. National Institutes of Health Rapid Acceleration of Diagnostics-Underserved Populations. NIH-funded COVID-19 testing initiative aims to safely return children to school. Available at: <https://radx-up.org/nih-funded-covid-19-testing-initiative-aims-to-safely-return-children-to-in-person-school/#:~:text=Known%20as%20the%20Safe%20Return,for%20vulnerable%20and%20underserved%20populations.> Accessed August 13, 2021
  12. Powell BJ, Waltz TJ, Chinman MJ, et al. A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project. *Implement Sci.* 2015;10:21
  13. Hiratsuka VY, Trinidad SB, Ludman EJ, et al. “You actually view us as the experts in our own system”: indigenous-academic community partnership. *Prog Community Health Partnersh.* 2020;14(2):187–195
  14. Alexander L, Sullivan C, Joosten Y, et al. Advancing community-engaged research through partnership development: overcoming challenges voiced by community-academic partners. *Prog Community Health Partnersh.* 2020;14(3):315–326