

COVID-19 & K-12 Education



Executive Summary

The COVID-19 pandemic has disrupted schooling due to infections of [children and school staff](#), school closures, and increased reliance on virtual learning. Both academic performance and Socio-Emotional Learning (SEL) of children have been negatively impacted by the COVID-19 pandemic. COVID-19 has also been documented to cause negative physical health outcomes in some children. Additionally, the wrap-around services of schools, such as free or reduced-price lunches and reporting of child abuse, are more difficult to maintain in remote education settings. Schools have historically responded to disease outbreaks with a host of mitigation responses, including vaccinations, periods of closures/distance learning, and outdoor learning environments.

Highlights

- As pediatric cases of COVID-19 have increased in recent months due to the Delta and Omicron variants, 15 states and Washington, D.C. have implemented rules in schools to mitigate viral spread.
- From 2019 to 2021, math proficiency rates in Missouri have declined by 5.8% on average, English language arts proficiencies have declined by 2.9%, and science proficiencies have declined by 3.8%.
- The COVID-19 pandemic has impacted student perceptions of mattering in school and their mental health more broadly.
- Teacher shortages have been exacerbated by COVID-19.
- Children have experienced increased rates of hospitalization (particularly in obese children) and Multisystem Inflammatory Syndrome as a result of COVID-19 infections.

Limitations

- While certain mitigation measures like school closures do not have a proven substantial impact on disease transmission rates, mitigation measures such as masking, testing, ventilation, and staying home when sick have proven more effective.
- Because of the recent and ongoing nature of the COVID-19 pandemic, research on the long-term effects of COVID-19-related disruptions to education is relatively limited.

Research Background

School Responses to COVID-19

Starting with the 2021-22 academic year, most schools have returned to in-person education.

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However, some schools have instituted temporary closures, isolations of students infected with COVID-19, or delayed returning to in-person learning in early 2022. While school districts, counties, and individual schools across the country have adopted different COVID-19 mitigation strategies throughout the pandemic, as of January 2022, 15 states and the District of Columbia have rules in place at the statewide level for schools that have resumed in-person learning (Figure 1).¹

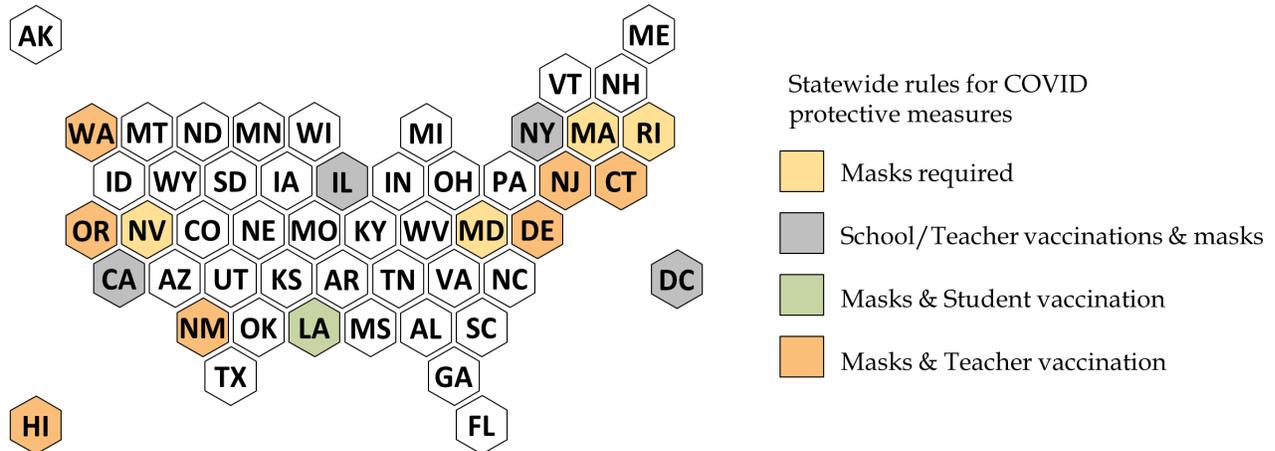


Figure 1. Map of COVID-19 mitigation requirements in K-12 schools. Map of states with colors related to whether a state has a schoolwide masking requirement (yellow), a schoolwide mask requirement and vaccination requirements for students and teachers (gray), a schoolwide masking and student vaccination requirement (green), and a schoolwide masking and teacher vaccination requirement (orange). Map made with data from the National Academy for State Health Policy.¹

In 2021, COVID-19 vaccines have been estimated to have averted the death of roughly 1.1 million Americans.² While mandatory COVID-19 vaccinations are not required in Missouri, voluntary uptake of the vaccine, especially in school-age children, has remained low. As of January 2022, 21.6% of Missouri children 5-14 years old and 42.5% of Missouri children aged 15-17 have received two vaccine doses.³ Missouri has a total vaccination rate of 54%; the nationwide average is 63%.³

Computer modeling studies have suggested that during influenza outbreaks, school closures may not necessarily limit total cases of influenza in the community, but could reduce the peak number of cases and the subsequent effect on healthcare services.⁴ However, many analyses during the COVID-19 pandemic have shown that indoor transmission can be mitigated with consistent mask use. One study of counties during the 2021-2022 school year that implemented universal mask use in the Fall have shown more than a two-fold reduction in pediatric COVID-19 cases compared to counties that did not implement masks.⁵ The CDC has recommended the universal use of masks in all school settings, and to consider NIOSH-approved N95 for better protection.⁶ In addition, testing, ventilation, handwashing, staying home when sick, contact tracing in combination with quarantine and isolation (5 days

for exposures or positive tests), and cleaning and disinfection are also important layers of prevention that the CDC recommends to keep schools as safe as possible.⁶

Vaccination Requirements in the School Setting

Vaccinations against a variety of infectious agents, including chickenpox, measles, mumps, rubella, diphtheria, and polio, are currently required in the U.S. in various populations and contexts. As of 2020, all 50 states require DTaP/Tdap, MMR, Hib, polio, and chickenpox vaccinations in schools.⁷ According to a 2019 policy analysis of 10-year-old children in the U.S., vaccines prevented 40,000 deaths and will prevent 20 million preventable illnesses for the 4.3 million children born in 2009.⁸ More than 90% of American children were in compliance with vaccination goals set by the CDC in 2010.⁸ However, exemptions from childhood vaccinations are on average 2.31 times higher in states with looser nonmedical exemption rules.⁹

Additionally, childhood vaccinations have been cited as a cost-effective measure, saving \$10.20 in healthcare costs and lost productivity for every dollar spent on immunizations.⁸ Smallpox, which was labeled as non-existent in 1980 by the World Health Organization, is one prominent example of a successful childhood vaccination campaign.¹⁰

For more information on the effect on health and transmissibility of COVID-19 and the efficacy and approval process of vaccines to prevent severe disease, see our previously published Science Note: [COVID-19 Delta Variant and Vaccine Efficacy](#).

The Impacts of COVID-19 on Learning

Academic Performance

Test scores have declined during the COVID-19 pandemic both in Missouri and nationwide. In an analysis of student test scores across 12 states, math pass rates have declined 14.2% on average while English Language Arts (ELA) declined 6.3%.¹¹ Schools that were fully in-person also had lower pass rates in the 2020-21 school year, compared to other years, but their declines in math were smaller than those of schools that were primarily hybrid or distance learning schools (4.1% for math and 3.1% for ELA).

Within Missouri's Department of Elementary & Secondary Education, the Office of College and Career Readiness created a report on changes to academic proficiency rates during the COVID-19 pandemic.¹² Similar to nationwide results, math proficiency rates also declined more than other subjects by 5.8% on average, compared to 2.9% average declines for ELA, and 3.8% average declines for science. Proficiency rates also declined unequally across all groups. Rates declined more for Black (6%) and Hispanic (5%) students compared to White (4%) students. Additionally, students with distanced or virtual learning tended to have lower academic proficiency rates than onsite or hybrid students. Finally, students with less access to computing devices and the internet had higher declines in proficiency rates (see also our [Online Education](#) Science Note). Because of the recent and ongoing nature of the COVID-19 pandemic, research on the long-term effects of COVID-19-related disruptions on children's education is relatively

limited. Additionally, because schools have often adapted and quickly changed between different teaching modes (e.g., remote, in-person, hybrid) during the pandemic, direct comparison between teaching modes is difficult to control for in studies.

Socio-Emotional Learning

There is a broad scientific consensus that socio-emotional learning (SEL) is an important part of children's education in schools and has positive effects on academic performance and behavior.¹³ SEL is a broad term for the learning of social, emotional, and behavioral skills such as self-control and interpersonal skills. The impacts of switching from full-time, in-person learning to hybrid and/or distance (i.e., virtual) learning due to the COVID-19 pandemic has made students more socially isolated and impacted their perceptions of mattering (i.e., the feeling of importance to another/group) in school¹⁴ and their mental health more broadly.¹⁵ For more information see our Science Note on [COVID-19, Mental Health & Substance Abuse](#).

Lack of in-person education has also decreased access to the supportive wrap-around benefits of schools including access to nutritious foods through the free or reduced-price school lunch program¹⁶ and the ability of teachers to report abuse. One positive effect of the pandemic has been an apparent decrease in bullying.¹⁷ Socio-emotional learning is possible with remote education and resources for the remote implementation of SEL have been created for teachers, schools, and state-level policymakers.¹⁸ However, research has shown that in-person interaction has significant benefits for children's SEL when compared to remote.¹⁹ COVID-19 can have other impacts on children's SEL aside from disruptions to in-person learning. For example, deaths of family members can have significant negative impacts on children's mental health and lead to behavioral problems.²⁰

Teacher Shortages

Schools have seen severe shortages of teachers, substitute teachers, and staff due to COVID-19 infections. Missouri already had a shortage of teachers before the pandemic, with the pre-pandemic retention rate of teachers being less than 50% over 5 years.²¹ Additionally, 27% of surveyed Missouri teachers are considering leaving the profession due to COVID-19. The most common reason teachers gave for considering leaving the profession and the biggest challenge administrators report for teacher recruitment is low teacher pay. For more information see Science Note on [Teacher Recruitment & Retention](#).

The Effects of COVID-19 on Child Health

While the original strain of COVID-19 had lower case and hospitalization rates amongst children, the rise of Delta and Omicron variants have increased the case and hospitalization rates in children.²² Since the appearance of the Omicron variant in November 2021, pediatric COVID cases have escalated nearly five-fold, with holiday gatherings and low vaccination rates amongst this age group likely being contributing factors.²² As of January 2022, 150,000 cases of COVID-19 in children have been reported, and an additional 44,000 probable cases have been identified based on antigen testing.³

Hospitalizations among the 5-11 year old cohort rose ten-fold during the spring and summer of 2021, when the Delta variant became the dominant strain and vaccinations were still not approved for children.²² Further, Multisystem Inflammatory Syndrome (MIS-C), a condition that has been characterized in children as a hyperinflammatory, post-infection syndrome observed between 2-6 weeks after initial infection, was shown to be reduced by 91% with the initial two doses of the Pfizer-BioNTech COVID-19 vaccine—the only pediatric approved vaccine, currently.²³ Additionally, only 5% of children admitted with severe MIS-C in the study were vaccinated for COVID-19.²³ Given that 74.9% of children in Missouri do not meet current activity recommendations (see our previous note on the [Landscape of Obesity in Missouri](#)), obesity may present as an additional comorbidity relevant to Missouri.²⁴ One study found that two-thirds of pediatric patients admitted for COVID-19 hospitalization were obese.²⁵

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