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Emergency Preparedness and Factors Influencing Decision-Making in a Sample of Public K–12 Schools During the COVID-19 Pandemic: A Mixed Methods Study

Laima Licitis, MPH¹, India Rose, PhD, MPH, CHES², Zachary Oberholtzer, MPH^{3,4}, Colleen Murray, Dr PH², Catherine N. Rasberry, PhD⁵, Lisa C. Barrios, Dr PH, ScM³, Sanjana Pampati, PhD⁵

¹Oak Ridge Institute for Science and Education, Oak Ridge, TN, USA

²ICF, Atlanta, GA, USA

³Division of Readiness and Response Science, Office of Readiness and Response, Centers for Disease Control and Prevention, Atlanta, GA, USA

⁴ES Corporation, San Antonio, TX, USA

⁵Division of Adolescent and School Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

Abstract

Objectives: Evaluate factors influencing the decision-making processes of school administrators and investigate the existence and use of emergency operations plans (EOPs) during the COVID-19 pandemic.

Methods: Using survey data representative of US K-12 public schools in 2022, the prevalence of 16 factors that influenced reporting school administrators' COVID-19 prevention strategy implementation decision-making (Wave 4; $N = 399$) and the presence and use of school EOPs (Wave 5; $N = 400$) are presented overall and by urban-rural classification, poverty level, and school level. Qualitative interviews were conducted with a subset of school administrators and used thematic analysis to understand factors influencing implementation of prevention strategies and emergency preparedness.

Results: School district requirements or recommendations (81.6%) was the top reported factor influencing decisions on the use of COVID-19 prevention strategies. Although most schools created or updated their EOP during the 2021/2022 school year (78.1%), only 26.7% implemented or exercised an EOP during the COVID-19 pandemic. Themes from qualitative analysis focused

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Corresponding author: Sanjana Pampati; mix2@cdc.gov.

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on factors influencing the implementation of prevention strategies, limitations of current EOPs, and importance of continuous investment in school preparedness.

Conclusions: Investing in actions to improve schools' capacity to respond to emergencies such as developing comprehensive EOPs, building partnerships, and defining roles and responsibilities is important.

Keywords

schools; emergency preparedness; COVID-19; children; infectious disease

To prevent severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission and maintain in-person learning while keeping students, staff, and families safe, kindergarten through 12th grade (K-12) schools across the United States (US) made decisions about the use of Coronavirus disease 2019 (COVID-19) prevention strategies. Recommended prevention strategies included improving ventilation, recommending mask wearing, promoting hand hygiene and respiratory etiquette, following cleaning and disinfection protocols, and establishing COVID-19 vaccination and testing programs.^{1–3}

In practice, US schools took vastly heterogeneous approaches to COVID-19 prevention throughout the pandemic. Studies have identified differences in strategy implementation by various characteristics, including urban-rural classification, region, poverty, and presence of health infrastructure.^{4–7} Several factors might have contributed to schools' decision to implement—or not implement—specific strategies, such as access to resources (e.g. human, building), cost of implementation, or community feedback.^{8–10} Yet, few systematic examinations documenting the factors that influence schools' decision-making processes have been published.

A school's emergency operations plan (EOP) is a plan developed collaboratively by key individuals across the school, community, and local first response agencies which describes what will be done and by whom before, during, and after an emergency.¹¹ An EOP can be activated when defined criteria are met in response to emergencies such as natural disasters, violence-related emergencies, or infectious disease outbreaks and are generally recommended to include specific short- and long-term step-by-step actions specific to each type of emergency.¹² EOPs can generally be scaled up or down based on resource availability, severity of the emergency, and current needs. An effective emergency response is especially important in school settings, as children can be at an increased risk for physical and psychological harm as a result of emergencies or disasters.¹³ There was little precedent for prolonged emergency responses in schools, such as occurred with COVID-19, and existing EOPs may have been insufficient to inform responses.

To elucidate how schools approached the developing landscape of the pandemic, factors that influenced the decision-making processes of school administrators were determined and the use of EOPs during the COVID-19 pandemic was investigated using data collected from a national sample of schools.

Methods

Data

This study uses a mixed-methods design using data from the National School COVID-19 Prevention Study (NSCPS). NSCPS was initiated by the US Centers for Disease Control and Prevention (CDC) and conducted by ICF, a research and evaluation consulting firm, to understand how K-12 schools responded to the COVID-19 pandemic. One component of the NSCPS was a series of longitudinal surveys designed to be representative of public K-12 schools. The sample consisted of 1602 K-12 public schools in 50 US states and the District of Columbia, obtained by conducting a stratified random sample of schools using strata defined by region (Northeast, South, Midwest, West), school level (elementary, middle, high), and National Center for Education Statistics (NCES) locale (city, town, suburb, rural). School level was categorized as elementary (included any grade from kindergarten-grade 4), middle (included grade 7 or 8), or high (included any grade from 10-12). Schools assigned to more than 1 core level (e.g., K-8) were considered separate schools for sampling purposes. School demographic data used to define strata were obtained through the Common Core Data from the NCES¹⁴ and data from the MDR Education database.¹⁵ Schools were invited to participate through email and phone recruitment. Web-based surveys were administered to school-level administrators who were familiar with the COVID-19 prevention strategies the school was implementing. Electronic informed consent was obtained for all survey participants at each survey wave. The consent form specified that participation was voluntary, survey responses will remain confidential, and findings will only be shared in aggregate form without attributing specific responses to any individual or school. The Wave 1 survey retrospectively assessed prevention strategies implemented during the 2020-2021 school year and was conducted with a smaller subset of schools. Survey waves 2-5 focused on the 2021-2022 school year at 4 timepoints between September 2021 and May 2022. This study presents quantitative data from survey waves 4 (February 14-March 27, 2022) and 5 (April 4-May 27, 2022), as these waves included relevant survey questions. Of the 1602 schools invited to participate in the NSCPS, 420 in Wave 4 (26.2% response rate) and 412 in Wave 5 (25.7% response rate) participated. Survey respondents were offered a \$50 electronic gift card for completing each survey.

A subset of school-level administrators were interviewed by ICF to further contextualize the results of the survey from May to August 2022. The interview subsample was created by reaching out to school administrators who participated in at least 2 survey waves at the time of recruitment ($n = 375$). To select interviewees, ICF utilized a purposive recruitment strategy¹⁶ to ensure representation across the US in terms of school level, US region, and school size, based on student enrollment. The final interview sample included 21 school administrators, with representation from elementary ($n = 8$), middle ($n = 6$), and high schools ($n = 7$). The majority of participants were school principals (67%), while 19% were district or school nurses, and 14% held other school-related positions. School locations varied, with 33% in urban areas, 24% in rural areas, and 29% in the Southern US. Virtual interviews lasted an average of 45 minutes and were conducted using Microsoft Teams. Interviews were audio and/or video recorded with participant consent. Interview participants received a \$75 electronic gift card. This study was approved by the Institutional Review

Board of ICF in accordance with CDC's policies. Paperwork Reduction Act requirements were waived as this was a voluntary collection of information during a public health emergency. A consent form was electronically shared with participants prior to the interview and informed verbal consent was obtained from all interviewees at the beginning of each interview. The consent form specified that participation was voluntary, that participation can stop at any time with no penalty, and that responses will not be linked to any individual or school.

Measures

Surveys: NSCPS Survey Wave 4 assessed factors that influenced administrators' decisions to add, remove, or modify COVID-19 prevention policies, such as state government requirements, community levels of transmission, and teacher or staff input. Wave 5 examined the existence and creation of school EOPs, and whether or not schools exercised or implemented them. These survey questions can be found in Appendix 1. School characteristics included NCES school locale (city, suburb, town, rural), school poverty level (low, medium, high), and school level (elementary school, middle school, high school). Poverty level was calculated using the percentage of students who qualified for free or reduced-price lunch in the 2019-2020 school year. Cut offs were as follows: low poverty was $\leq 25\%$, medium was $26\% - 75\%$, and high was $\geq 76\%$.^{17,18}

Interviews

A semi-structured interview guide was developed by ICF and consisted of 16 primary questions on schools' responses to the COVID-19 pandemic, including factors influencing implementation of COVID-19 prevention strategies, lessons learned, and emergency preparedness (Appendix 2).

Analysis

Quantitative analysis: For each survey wave, survey weights were created accounting for nonresponse and design strata. For both Waves 4 and 5, city schools were less likely to participate than non-city schools. Thus, a non-response adjustment class was created based on this characteristic. Additional description of the creation of weights have been published elsewhere.⁴ Unweighted numbers, weighted percentages, and 95% confidence intervals (CIs) of factors influencing implementation of strategies and EOP experiences among K-12 public schools were estimated overall and by school locale, poverty, and school level. Chi-square tests were used to test for differences by school characteristics. *P* values < 0.05 were considered statistically significant. Estimates with a relative standard error (RSE) $> 30\%$ were suppressed. Quantitative analyses were conducted using R version 4.4.0 (2024-04-24).¹⁹

Qualitative analysis: Thematic analyses were conducted for interviews with 21 school administrators. Interview audio files were transcribed, cleaned, de-identified, and quality checked by research staff to ensure accuracy. A qualitative codebook, informed by previous published literature, was developed to better understand school-level decision making related to COVID-19 prevention strategy implementation, lessons learned, and future emergency preparedness. *A priori* codes included successes and challenges implementing

COVID-19 prevention policies, influences on policy modifications, and availability and utilization of school EOPs. Prior to coding, all coders underwent training on the intercoder reliability process and the application of the established coding scheme. Group-coding of 2 transcripts was conducted by 4 analysts to assess consistency, coder reliability, and application of codes. Inconsistencies were discussed and iterative adjustments to code definitions occurred throughout the coding process. Intercoder reliability was established between the 4 analysts (Fleiss Kappa = 0.81). MAXQDA 2022²⁰ was used for coding. When inconsistencies in code application were observed, coders engaged in detailed discussions to reach a consensus on the appropriate interpretation and application of codes. This collaborative process resulted in iterative adjustments to code definitions, enhancing the reliability of the coding.

Results

Quantitative Findings

Of 399 (unweighted) responding schools for Wave 4, the most common factors reported to influence the use of COVID-19 prevention strategies were school district requirements or recommendations (81.6%), state COVID-19 policy requirements/bans (58.8%), community transmission levels (58.0%), and local health department guidance and input (57.0%; Table 1). The factors reported least often were financial cost of strategies (3.6%) and previous levels of compliance with policies in place (4.5%). Most administrators in wave 5 (unweighted $N = 400$) reported their school had an EOP prior to the COVID-19 pandemic (89.2%) and 78.1% reported their school created or updated their EOP during the 2021-2022 school year. However, only 26.7% reported that their school implemented or exercised the EOP during the pandemic and 10.1% reported not knowing if the EOP was implemented or exercised.

City/county COVID-19 policy requirements/bans, as a factor that influenced the use of COVID-19 prevention strategies, varied significantly by NCES locale, with city schools showing the highest prevalence of reporting this as an influencing factor (53.5%), followed by suburban schools (43.1%), town schools (35.9%), and rural schools (33.8%; Table 2).

Prevalence of state COVID-19 policy requirements/bans; vaccination rates among teachers, staff, and students; community vaccination rates; and community and/or parent support, as factors of COVID-19 prevention strategy decision-making, varied by school poverty level (Table 3). Mid-poverty schools reported the lowest overall prevalence that these factors influenced their decisions for COVID-19 prevention, while low-poverty schools showed the highest prevalence. For example, 72.0% of respondents at low-poverty schools, 54.0% of respondents at mid-poverty schools, and 62.4% of respondents at high-poverty schools reported that state COVID-19 policy requirements/bans influenced their use of COVID-19 prevention strategies ($P = 0.040$).

Only 1 factor varied significantly by school level, with 87.6% of elementary schools, 76.4% of high schools, and 74.2% of middle schools reporting school district requirements or recommendations as a factor influencing the use of COVID-19 prevention strategies (Table

4, $P = 0.013$). The presence and use of EOPs did not vary significantly by NCES locale, school poverty level, or school level.

Qualitative Findings

Six themes related to decision-making for COVID-19 prevention strategy implementation and EOPs emerged.

Theme 1: Most schools indicated that guidance at various levels (e.g., federal, state) informed COVID-19 prevention strategy decision-making and implementation. Schools noted that they relied heavily on guidance at multiple levels (e.g., federal, state) to help students and school staff remain healthy during the COVID-19 pandemic. One school administrator described how guidance was disseminated from the federal to the state to the school level stating:

“We received guidance from our district health Executive Director of Nursing and Wellness...When they received guidelines and figured out what was best practice and where we were at in the pandemic then they updated the guidelines as needed. So, they would get that information and disseminate it out to principals. I think the chain of protocol would be that the county offices were following the guidelines of either the state health department which is following the guidelines of the CDC.”

Most schools indicated that CDC operational guidance was foundational to their decision-making related to implementation of COVID-19 prevention strategies. Schools reported that, as CDC operational guidance changed, implementation at the school level also changed. One school administrator commented, “*State guidance followed CDC guidance, and they would say CDC is recommending this, that’s why we’re putting this [into action].*” Another stated, “*We would always pull up the CDC’s most updated information as it changed and compare it to our plan, and we tried to stay as much in alignment with what CDC recommended as possible.*” While schools highlighted the importance of CDC’s guidance, they also noted that frequent changes in guidance presented challenges for schools to implement prevention strategies effectively and in a timely manner.

Theme 2: There was variation in schools’ reported use of local COVID-19 case counts or other metrics to inform COVID-19 prevention strategy implementation. Some schools mentioned that local case counts informed changes to their COVID-19 prevention plans. One administrator commented, “*All of our efforts were more concentrated early in the school year when we were having pretty high numbers in the area as far as confirmed COVID cases.*” In some instances, changes in case counts or transmission rates in the community influenced strategy implementation. One administrator described their school’s reliance on local COVID-19 metrics and how it informed decision-making, “*We would always keep an eye on the numbers... and follow our county and local positivity rates as far as how strict we needed to be here with things like masking and things like that.*” Schools noted the importance of tracking and monitoring data to inform their decision-making. One school commented, “*Basically, it always came back to our data. Our superintendent always looked at the data to decide if it was time to make a move.*” Another administrator shared, “*[Our superintendent] had us looking at the trend data. At one point we were doing it daily.*”

And kept a dashboard of outbreaks so we had that accessible as well. So, when the decisions were being made and suggestions made about going to voluntary masking and things like that..." However, most schools reported that they did not use local metrics when making decisions regarding strategy implementation.

Theme 3: Schools reported that district-level infection prevention and control (IPC) teams were key influencers of decision-making for COVID-19 prevention strategy implementation. Schools indicated that prevention strategy implementation decisions were discussed at the district level and then shared with school administrators prior to implementation with one participant commenting, *"Most of the COVID decisions were bounced off the entire school administration."* Schools also noted the importance of IPC teams and the role that they played in informing prevention strategy decision-making:

"Our district level had a committee that includes some local physicians, it includes someone from the Department of Health. It included a variety of parents, a few district employees, some school level employees and district office employees, and there was 1 high school principal. The committee, they would convene multiple times and come up with some ideas or strategies to recommend."

Theme 4: For many schools, community input informed implementation of school-based COVID-19 prevention strategies. Community, district, and parental support were integral to schools' ability to make decisions regarding prevention strategy implementation. This was especially important for divisive strategies like mask use, vaccinations, and physical distancing. School administrators indicated that having school district support helped schools address community and parental opposition, and that community opposition, at times, hindered decision making regarding COVID-19 prevention strategy implementation. One administrator described this challenge stating, *"[School board meetings were] a little contentious, [when] we talked about masks. All the parents were coming to board meetings and expressing their opinion about masks, wanting masks removed much earlier."* Schools contending with community opposition often faced difficult decisions related to prevention strategy prioritization and reported that this frequently resulted in limited strategy implementation.

Theme 5: The COVID-19 pandemic highlighted the need for schools' EOPs to include more guidance on addressing infectious diseases outbreaks. Most schools indicated that their EOPs were insufficient for addressing the COVID-19 pandemic. Some schools reported having existing EOPs in place prior to the COVID-19 pandemic but noted that these plans need to be broadened to address a wider range of emergencies, *"We had a baseline crisis protocol, but we have incorporated our mental health protocol for that, COVID, and we are looking at even further broadening that scope besides just tornadoes, fire drills, and active shooters."* Schools indicated that the pandemic prompted them to update their protocols, *"Definitely I think when you talk about emergencies, we had to revisit all the emergency protocols. Does everybody know their roles, does everybody know what we would do. [Are] there resources we don't have that we would need more of?"* Schools also noted the importance of tailoring plans, *"There was a district plan, but realistically what worked at the high school might not work at the elementary school. What works in one school is not*

going to work in another school because of the size of the classrooms, population whatever it might be.”

Theme 6: Schools emphasized lessons learned from the COVID-19 pandemic and investing in preparedness for future threats. Following the height of the pandemic, some schools updated their EOPs and developed contingency plans in the event of a future public health emergency. Schools revealed that the pandemic taught them a lot about preparedness, *“I think it taught us that we weren’t doing as much as we thought [in terms of IPC].”*

Another administrator highlighted this, stating, *“We kind of have a framework for that stuff and it wouldn’t be like reinventing the wheel going forward.”* One school administrator commented on the importance of having an EOP in place, *“I think we’ve got things in place and if things make a downturn and change as far as positivity rates, if they go up around the area, then we have a plan for how to get back to making decisions to be able to get it back to where it was.”* Schools emphasized the critical role of EOPs in protecting the health of students and school staff. They noted the importance of not only updating the plan, but also evaluating it over time, *“We can handle it [an infectious disease outbreak] better than we did the first time yes, but we have to evaluate as we go along again.”* In the aftermath of the pandemic, schools concluded that they are better prepared for future infectious disease outbreaks because of their experiences navigating the COVID-19 pandemic, *“And really having the process set up for an emergency type situation, knowing how to get the group together, knowing how to make decisions, knowing how to form guidelines. Knowing the right questions to ask. We don’t have to learn that anymore because we’ve already been through that [COVID-19 pandemic].”*

Limitations

This study has limitations. Both survey and interview findings may have been affected by recall and social desirability bias from school administrators. For quantitative data, small sample sizes did not allow for examination of specific school subgroups and multivariate analyses. Although sample sizes were low for the qualitative sample ($n = 21$), research suggests that sample sizes of a minimum of 9-17 interviews are sufficient for thematic saturation (i.e., no new themes are identified by study participants) in qualitative research.²¹ The low response rate for the survey may have affected the representativeness of these data, but non-response weights were incorporated to adjust for this. Survey and interview participants were primarily school administrators, and it is possible that their awareness of relevant school district processes affecting decision making may be limited. Lastly, while we acknowledge the value of standardized reporting guidelines, the STROBE checklist was not used for the qualitative interview portion of this study. This omission represents a limitation, as its application could have facilitated a more comprehensive and structured presentation of our findings.

Discussion

This study leverages qualitative and quantitative data collected through the NSCPS to highlight the multitude of factors that influenced decision-making processes in a sample of K-12 public schools from 50 US states and the District of Columbia throughout the

COVID-19 pandemic. School administrators underscored the important role that federal, state, and school district guidance played in informing their responses to the COVID-19 pandemic. Qualitative data illustrated a hierarchical and iterative process where federal guidance informed state guidance, which, in turn, informed school district guidance, which then influenced school-level protocols and procedures. CDC provided guidance and support on COVID-19 prevention for US schools since the onset of the pandemic^{1–3} and various state and local health departments and professional organizations (e.g., American Academy of Pediatrics) also released guidance for school-based COVID-19 prevention.^{22–24} Such guidance was often used as a starting point in informing schools' responses that were further tailored based on the local context. Additionally, the role communities played in informing schools' decisions on the use of prevention strategies was evident. Many participants noted contentious school board meetings where families shared opinions about the use of various prevention strategies, which could both facilitate or hinder the adoption of specific strategies.

Schools' use of data-driven decision making such as implementing or lifting prevention strategies based on local metrics varied based on the specific metric, ranging from 9.5% for community vaccination rates to 58.0% for community transmission levels. Such approaches are likely more resource intensive due to requiring expertise in accessing and interpreting data, continuous monitoring of data, and the ability to update prevention plans and communicate updates efficiently, which might explain lower uptake in some instances. This finding underscores the importance of assisting schools with accessing, interpreting, and potentially collecting relevant data and providing technical assistance to support schools in data-driven decision making. Further, the financial cost of strategies was the least indicated factor influencing decision making for prevention strategy implementation. This may be because the strategies often discussed were lower cost (e.g., masks) and federal financial support for public schools was available during the COVID-19 pandemic.^{25–29}

Although most schools had an existing EOP when the COVID-19 pandemic started, fewer schools reported implementing or exercising the EOP during the 2021–2022 school year. This finding reflects potential limitations of existing EOPs in addressing a large-scale public health emergency, such as the COVID-19 pandemic, as corroborated by qualitative findings. Importantly, even before the COVID-19 pandemic, studies identified gaps in school emergency planning and existing EOPs, such as a lack of or limited planning for pandemic scenarios and disruption of learning.^{30–36}

Conclusions

Findings show that federal, state, and school district guidance; community input; and local public health data helped shape schools' approaches to COVID-19 prevention. Further, data suggest that updating existing EOPs to address a broader range of situations, including infectious disease related outbreaks, may be an important area for improvement. Collectively, findings can be useful in informing emergency planning for schools and for identifying future targets and mechanisms for promoting interventions in schools before, during, and after emergency situations.

Building on momentum from the COVID-19 pandemic, schools can work toward bolstering their preparedness on how to respond to a range of different emergency situations. To help achieve these goals, schools can maintain and strengthen relationships built during the pandemic and cultivate new partnerships in their communities. Schools can create multidisciplinary teams that work to keep schools safe and promote healthy environments during both emergency and non-emergency situations.^{37,38} The US Department of Education's Readiness and Emergency Management for Schools Technical Assistance (REMS TA) Center provides a suite of resources and training programs to help schools with emergency planning and creating and updating EOPs to better address a range of emergency situations.^{39,40} Furthermore, developing communication plans to keep students, staff, family members, and the broader community informed while gathering their input can be instrumental for buy-in and subsequent cooperation. By taking into consideration existing gaps and recommended resources and practices, schools can strengthen their preparedness and response strategies to address future emergencies and help safeguard the health and wellbeing of staff, students, and their families.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Factors influencing the use of COVID-19 prevention strategies and creation and use of an emergency operations plan among a sample of K–12 public schools during the 2021/2022 school year — The National School COVID-19 Prevention Study

	Unweighted <i>n</i>	% [95% CI]
Factors influencing use of COVID–19 prevention strategies ^{a,b}	<i>N</i> = 399	
School district requirements or recommendations	321	81.6% [77.2–85.3]
State COVID–19 policy requirements/bans	231	58.8% [53.6–63.9]
Community transmission levels	234	58.0% [52.7–63.1]
Local health department guidance and input	236	57.0% [51.9–62.0]
State health department guidance and input	221	54.7% [49.4–59.9]
Number of reported COVID cases among teachers, staff, and students	195	47.2% [42.0–52.6]
City/county COVID–19 policy requirements/bans	175	42.7% [37.9–47.7]
Student and/or staff absenteeism rates	159	38.6% [33.7–43.7]
Federal government guidance	137	33.0% [28.338.1]
Local hospital or intensive care unit occupancy rates	86	20.6% [16.8–25.1]
Community and/or parent support (or lack of support)	54	12.3% [9.3–16.0]
School and/or classroom closures	46	11.9% [9.0–15.7]
Vaccination rates among teachers, staff, and students	45	11.4% [8.4–15.3]
Community vaccination rates	39	9.5% [6.8–13.0]
Previous levels of compliance with policies in place	15	4.5% [2.7–7.5]
Financial cost of strategies	15	3.6% [2.0–6.2]
EOP ^c prior to the COVID–19 pandemic ^d	<i>N</i> = 400	
Yes	357	89.2% [85.4–92.1]
No	15	3.6% [2.1–6.0]
Don't know	28	7.2% [4.9–10.5]
Create/update EOP during 2021/2022 school year ^d	<i>N</i> = 400	
Yes	310	78.1% [73.5–82.0]
No	45	10.4% [7.8–13.9]
Don't know	45	11.5% [8.5–15.4]
Implement or exercise EOP during the COVID–19 pandemic ^d	<i>N</i> = 400	
Yes	105	26.7% [22.5–31.5]
No/Did not have EOP	256	63.2% [58.1–68.0]
Don't know	39	10.1% [7.3–13.9]

^aFrom Wave 4 conducted February 14–March 27, 2022 (*N* = 399)

^bResponse options “other” and “none of the above” have been excluded from analysis due to small cell sizes

^cEOP = emergency operations plan

^dFrom Wave 5 conducted April 4–May 27, 2022 (*N* = 400)

Table 2.

Factors influencing the use of COVID-19 prevention strategies and creation and use of an emergency operations plan by National Center for Education Statistics locale among a sample of K-12 public schools during the 2021/2022 school year — The National School COVID-19 Prevention Study

	City (N = 92)			Suburb (N = 118)			Town (N = 55)			Rural (N = 96)			Chi-square p-value
	n	%	[95% CI]	n	%	[95% CI]	n	%	[95% CI]	n	%	[95% CI]	
Factors influencing use of COVID–19 prevention strategies ^{a,b}													
School district requirements or recommendations	78	87.0%	[78.6–92.5]	99	84.2%	[75.5–90.2]	43	78.0%	[62.9–88.1]	71	74.3%	[63.8–82.6]	0.131
State COVID–19 policy requirements/bans	51	58.9%	[47.6–69.4]	71	61.4%	[51.4–70.4]	31	53.9%	[39.3–67.9]	54	55.3%	[45.1–65.2]	0.788
Community transmission levels	56	59.0%	[47.1–69.9]	73	60.9%	[51.7–69.4]	34	61.7%	[46.5–74.8]	48	49.8%	[38.5–61.1]	0.437
Local health department guidance and input	61	63.5%	[52.2–73.5]	72	58.0%	[48.7–66.7]	31	53.5%	[39.9–66.7]	48	48.8%	[37.8–59.9]	0.247
State health department guidance and input	52	58.7%	[47.4–69.1]	69	55.6%	[45.6–65.2]	31	51.9%	[38.3–65.2]	46	47.4%	[36.7–58.2]	0.483
Number of reported COVID cases among teachers, staff, and students	43	43.2%	[32.6–54.5]	56	47.8%	[38.2–57.6]	28	50.0%	[36.4–63.5]	47	46.3%	[35.7–57.3]	0.876
City/county COVID–19 policy requirements/bans	52	53.5%	[43.5–63.2]	50	43.1%	[33.5–53.1]	22	35.9%	[25.1–48.3]	35	33.8%	[24.8–44.3]	0.030
Student and/or staff absenteeism rates	39	37.3%	[27.4–48.4]	47	40.4%	[31.5–50.0]	23	43.7%	[30.8–57.6]	35	34.0%	[24.8–44.6]	0.688
Federal government guidance	29	33.2%	[23.8–44.2]	42	34.6%	[26.0–44.4]	21	35.8%	[23.9–49.8]	27	26.0%	[17.9–36.1]	0.545
Local hospital or intensive care unit occupancy rates	26	27.1%	[18.4–38.1]	22	18.7%	[12.8–26.5]	13	20.6%	[11.4–34.3]	14	14.0%	[8.3–22.5]	0.147
Community and/or parent support (or lack of support)	---	---	---	13	10.1%	[5.9–16.7]	12	18.9%	[10.4–31.9]	13	13.0%	[7.1–22.4]	0.483
School and/or classroom closures	---	---	---	13	10.2%	[6.4–16.0]	---	---	---	13	13.9%	[7.9–23.4]	0.693
Vaccination rates among teachers, staff, and students	13	15.8%	[9.0–26.4]	13	10.5%	[5.9–18.2]	---	---	---	---	---	---	0.253
EOPs ^c in schools ^d													
EOP prior to the COVID–19 pandemic ^d	85	92.0%	[84.3–96.1]	107	86.2%	[77.6–91.8]	49	87.0%	[74.0–94.1]	81	88.1%	[78.5–93.7]	0.683
Create/update EOP during 2021/2022 school year ^d	67	73.6%	[63.5–81.7]	96	78.9%	[70.2–85.5]	43	73.7%	[57.7–85.2]	71	79.1%	[69.2–86.5]	0.220

	City (N = 92)			Suburb (N = 118)			Town (N = 55)			Rural (N = 96)			Chi-square p-value
	n	%	[95% CI]	n	%	[95% CI]	n	%	[95% CI]	n	%	[95% CI]	
Implement or exercise EOP during the COVID-19 pandemic ^d	22	25.8%	[18.0–35.4]	34	29.0%	[21.0–38.5]	20	34.8%	[23.4–48.2]	19	21.0%	[13.5–31.0]	0.563

^aFrom Wave 4 conducted February 14–March 27, 2022 (N = 399)

^bCommunity vaccination rates, financial cost of strategies, and previous levels of compliance with policies in place had to be suppressed due to large RSE values.

^cEOP = emergency operations plan

^dFrom Wave 5 conducted April 4–May 27, 2022 (N = 400)

Table 3.

Factors influencing the use of COVID-19 prevention strategies and creation and use of an emergency operations plan by poverty level among a sample of K-12 public schools during the 2021/2022 school year — The National School COVID-19 Prevention Study

	<u>Low-poverty^d (N = 70)</u>		<u>Mid-poverty^d (N = 218)</u>		<u>High-poverty^d (N = 82)</u>		Chi-square p-value
	<i>n</i>	% [95% CI]	<i>n</i>	% [95% CI]	<i>n</i>	% [95% CI]	
Factors influencing use of COVID–19 prevention strategies ^{b,c}							
School district requirements or recommendations	56	80.4% [68.3–88.6]	175	81.1% [74.8–86.1]	72	88.4% [78.8–94.0]	0.302
State COVID–19 policy requirements/bans	49	72.0% [59.8–81.7]	116	54.0% [46.6–61.3]	50	62.4% [50.9–72.7]	0.040
Community transmission levels	48	69.3% [56.3–79.8]	127	56.6% [49.4–63.6]	41	50.9% [38.3–63.3]	0.117
Local health department guidance and input	49	68.3% [54.8–79.2]	119	52.1% [45.0–59.1]	50	58.5% [45.7–70.2]	0.115
State health department guidance and input	43	59.6% [46.4–71.6]	117	52.2% [44.8–59.4]	44	54.6% [42.0–66.5]	0.639
Number of reported COVID cases among teachers, staff, and students	40	56.7% [43.868.8]	104	45.2% [38.252.4]	36	43.0% [31.0–55.8]	0.266
City/county COVID–19 policy requirements/bans	36	52.1% [39.2–64.8]	89	39.2% [32.4–46.3]	36	42.5% [31.6–54.1]	0.235
Student and/or staff absenteeism rates	31	44.5% [32.257.6]	84	36.7% [30.2–43.8]	30	35.7% [25.0–47.9]	0.535
Federal government guidance	31	44.7% [32.3–57.7]	69	29.4% [23.4–36.2]	30	37.9% [27.349.7]	0.076
Local hospital or intensive care unit occupancy rates	19	28.4% [17.9–41.9]	39	16.6% [12.2–22.3]	22	25.9% [16.6–37.9]	0.084
Community and/or parent support (or lack of support)	17	23.3% [13.8–36.7]	25	9.6% [6.4–14.1]	---	---	0.045
School and/or classroom closures	13	21.9% [12.4–35.7]	22	10.1% [6.7–14.9]	---	---	0.081
Vaccination rates among teachers, staff, and students	15	23.8% [14.0–37.5]	16	6.5% [3.9–10.6]	---	---	0.003
Community vaccination rates	13	18.3% [9.9–31.4]	13	6.3% [3.6–10.7]	12	13.6% [7.423.7]	0.018
EOPs ^d in schools ^e							
EOP prior to the COVID–19 pandemic ^e	61	90.3% [79.0–95.8]	194	89.5% [84.2–93.2]	77	88.4% [79.2–93.9]	0.988

	<u>Low-poverty^a (N = 70)</u>			<u>Mid-poverty^a (N = 218)</u>			<u>High-poverty^a (N = 82)</u>			Chi-square p-value
	n	%	[95% CI]	n	%	[95% CI]	n	%	[95% CI]	
Create/update EOP during 2021/2022 school year ^e	50	74.7%	[61.8–84.4]	170	79.4%	[73.0–84.5]	67	77.0%	[65.8–85.3]	0.575
Implement or exercise EOP during the COVID–19 pandemic ^e	19	27.7%	[17.8–40.5]	58	27.4%	[21.4–34.4]	22	26.6%	[17.9–37.7]	0.965

^aLow, mid, and high poverty were calculated using the percentage of students who qualified for free or reduced-price lunch in the 2019–2020 school year. Cut offs were as follows: low poverty was ≤25%, medium was 26%–75%, and high was ≥76%. 17,18

^bFrom Wave 4 conducted February 14–March 27, 2022 (N = 399)

^cFinancial cost of strategies and previous levels of compliance with policies in place had to be suppressed due to large RSE values.

^dEOP = emergency operations plan

^eFrom Wave 5 conducted April 4–May 27, 2022 (N = 400)

Factors influencing the use of COVID-19 prevention strategies and creation and use of emergency operations plan by school level among a sample of K-12 public schools during the 2021/2022 school year — The National School COVID-19 Prevention Study

Table 4.

	Elementary School ^d (N = 219)		Middle School ^d (N = 96)		High School ^d (N = 84)		Chi-square p-value
	n	% [95% CI]	n	% [95% CI]	n	% [95% CI]	
Factors influencing use of COVID–19 prevention strategies ^{b,c}							
School district requirements or recommendations	186	87.6% [82.7–91.2]	70	74.2% [63.1–82.9]	65	76.4% [65.0–85.0]	0.013
State COVID–19 policy requirements/bans	123	56.2% [49.0–63.1]	59	62.8% [52.0–72.4]	49	60.4% [48.7–71.0]	0.565
Community transmission levels	123	53.9% [46.9–60.6]	60	64.7% [53.2–74.8]	51	59.7% [47.8–70.6]	0.248
Local health department guidance and input	134	58.7% [51.7–65.3]	59	61.9% [51.2–71.5]	43	47.7% [36.9–58.7]	0.139
State health department guidance and input	125	55.8% [48.7–62.7]	49	55.0% [43.9–65.6]	47	51.7% [40.4–62.8]	0.831
Number of reported COVID cases among teachers, staff, and students	99	43.2% [36.4–50.3]	49	50.3% [38.9–61.6]	47	53.0% [41.6–64.0]	0.305
City/county COVID–19 policy requirements/bans	99	44.1% [37.5–51.0]	39	39.7% [31.1–49.0]	37	43.1% [32.0–54.9]	0.773
Student and/or staff absenteeism rates	78	35.2% [28.7–42.4]	38	38.8% [28.6–50.1]	43	46.0% [36.1–56.2]	0.254
Federal government guidance	77	34.5% [28.1–41.6]	33	33.7% [24.2–44.7]	27	28.7% [19.6–39.9]	0.654
Local hospital or intensive care unit occupancy rates	43	18.7% [13.9–24.7]	26	25.9% [17.2–37.0]	17	18.8% [12.2–27.8]	0.326
Community and/or parent support (or lack of support)	25	9.6% [6.4–14.2]	17	18.7% [11.2–29.5]	12	10.9% [6.1–18.5]	0.072
School and/or classroom closures	21	10.2% [6.7–15.1]	12	13.0% [7.1–22.4]	13	14.7% [8.5–24.4]	0.545
Vaccination rates among teachers, staff, and students	18	8.7% [5.3–13.7]	13	15.2% [8.6–25.5]	14	13.1% [7.3–22.3]	0.255
Community vaccination rates	17	7.4% [4.6–11.8]	---	---	11	12.2% [6.8–20.7]	0.398
EOPs ^d in schools ^e							
EOP prior to the COVID–19 pandemic ^e	193	87.3% [81.6–91.5]	89	93.4% [85.8–97.1]	75	88.7% [79.2–94.2]	0.333

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	Elementary School ^a (N = 219)			Middle School ^a (N = 96)			High School ^a (N = 84)			Chi-square p-value
	n	% [95% CI]		n	% [95% CI]		n	% [95% CI]		
Create/update EOP during 2021/2022 school year ^e	169	77.9% [71.6–83.2]		73	77.6% [67.4–85.4]		68	78.8% [68.4–86.5]		0.801
Implement or exercise EOP during the COVID–19 pandemic ^e	55	24.7% [19.1–31.3]		22	26.4% [18.8–35.7]		28	31.8% [22.2–43.4]		0.424

^aSchool level was categorized as elementary (included any grade from kindergarten through grade 4), middle (included grade 7 or 8), or high (included any grade from 10 through 12). Schools assigned to more than 1 core level (e.g., K-8) were considered separate schools for sampling purposes.

^bFrom Wave 4 conducted February 14–March 27, 2022 (N = 399)

^cFinancial cost of strategies and previous levels of compliance with policies in place had to be suppressed due to large RSE values.

^dEOP = emergency operations plan

^eFrom Wave 5 conducted April 4, 2022–May 27, 2022 (N = 400)