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# EDUCATING DURING A HEALTH EMERGENCY: AN INTEGRATIVE REVIEW OF THE LITERATURE FROM 1990 TO 2020

**Kathlyn E. Elliott, Katie A. Mathew, Yiyun Fan, and David Mattson**

## ABSTRACT

*Prior to 2020, empirical research and reports on approaches to education during health crises were limited. They focused primarily on reporting local-level response and provided only limited analysis. Various historic epidemics, like SARS, Ebola, and HIV/AIDS, provided important lessons about educational efficacy during major health emergencies. However, the sudden emergence of the COVID-19 pandemic led to an explosion of research on educating during a worldwide health crisis. This integrative literature review (Torraco 2005) uses the INEE Minimum Standards framework to conceptualize the response to pandemics and epidemics from 1990 to 2020. The research analyzes 124 empirical studies, practitioner and governmental reports, and historic accounts of Ebola, SARS, and other epidemics, as well as early responses to COVID-19, in order to understand how education stakeholders continued educating during the spread of highly communicable illnesses. The high-level themes that emerged included the foundational role of context and community support; access to an equitable education in the digital age; the social-emotional wellbeing of teachers and students; teachers' role in adapting curriculum and pedagogy; the need for additional training and support for teachers; and the opportunity for a creative shift in practices and policies in education.*

## INTRODUCTION

The COVID-19 pandemic disrupted education globewide, and even countries not accustomed to delivering education in emergencies had to develop strategies for emergency teaching (Hodges et al. 2020). Consequently, research on educating during a worldwide health crisis exploded, in particular to find alternatives to

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face-to-face teaching to help mitigate the spread of viral disease. Prior to 2020, research on providing education during health crises was limited; there were isolated reports and localized studies, but a broad understanding of teaching during a health crisis had not been achieved. Because epidemics and pandemics provide important lessons about providing education effectively during major health emergencies, we conducted an integrative literature review to explore what has been learned and written about education in emergencies, both from historic disease events and during the first year of the COVID-19 pandemic.[1]

An epidemic is a sudden outbreak of a disease in a certain geographic area, whereas a pandemic is an outbreak of a disease across several countries or continents (CDC 2012). Between the years 1990 and 2020, epidemics and pandemics affected education around the world. Previous pandemics, such as sudden acute respiratory syndrome (SARS) in 2003 and influenza type A (H1N1) in 2009, led to mass school closures to limit the spread of the viruses (Brown et al. 2011; Davis et al. 2015; Fox 2004). The HIV/AIDS pandemic, which began in 1981 (CDC 2021), put a devastating strain on schools and families in sub-Saharan Africa (Robson and Sylvester 2007; Shaeffer 1994) and became an important global public health education challenge (Van Rompay et al. 2008). Although the MERS epidemic in 2012 and Ebola in 2014 were contained geographically, they posed a threat to education in the regions where they occurred (Jalloh and Raschid 2018). Both had long-term consequences for education outcomes (Smith 2021) and negatively affected students' psychosocial wellbeing (Al-Rabiaah et al. 2020). However, no prior disease events have had the same degree of global impact on education as the COVID-19 pandemic that began in 2020.

When evidence from previous disease events is considered in combination with emerging evidence from COVID-19, it is essential to ensure that access to education is disrupted as little as possible. Much of the literature examined in our review addressed underresourced contexts, where foreign aid was used for education projects run by nongovernmental organizations (NGOs) and United Nations agencies. Some local research universities, governments, and organizations had researched particular communities' responses to such a crisis in well-resourced countries. Both situations are significantly different from the COVID-19 pandemic, thus it should be acknowledged that, while the existing literature provides insights on past events, it also highlights the novelty of COVID-19.

1 The integrative literature review, as defined by Torraco (2005), is a distinctive form of research that generates new knowledge about the topic reviewed.

Education is a fundamental human right articulated in the UN Declaration of Human Rights (UNESCO-IIEP 2022), and it must be provided for, even in emergency situations such as conflict, disaster, and disease outbreaks (Burde et al. 2017). To ensure a quality, coordinated humanitarian response in communities affected by disaster, the Inter-agency Network for Education in Emergencies (INEE 2012) established the Minimum Standards Framework (MSF) for education in emergencies. The MSF provides a base of technical knowledge and good practice to ensure that all children and youth will have access to safe, quality education, even in crisis situations. However, educating during a disease emergency presents a particular set of constraints for education stakeholders in terms of delivering quality education in a coordinated and equitable manner. In this integrative literature review, we explore how education stakeholders globewide implemented the five MSF domains during disease events. We employed the MSF to map the education response to pandemics and epidemics from 1990 to 2020. The research questions that guided this review are:

1. What affordances and challenges do teachers, instructors, and school leaders experience during health emergencies?

2. What pedagogical and curricular tools were most effective and equitable for teaching and learning in various emergency contexts?

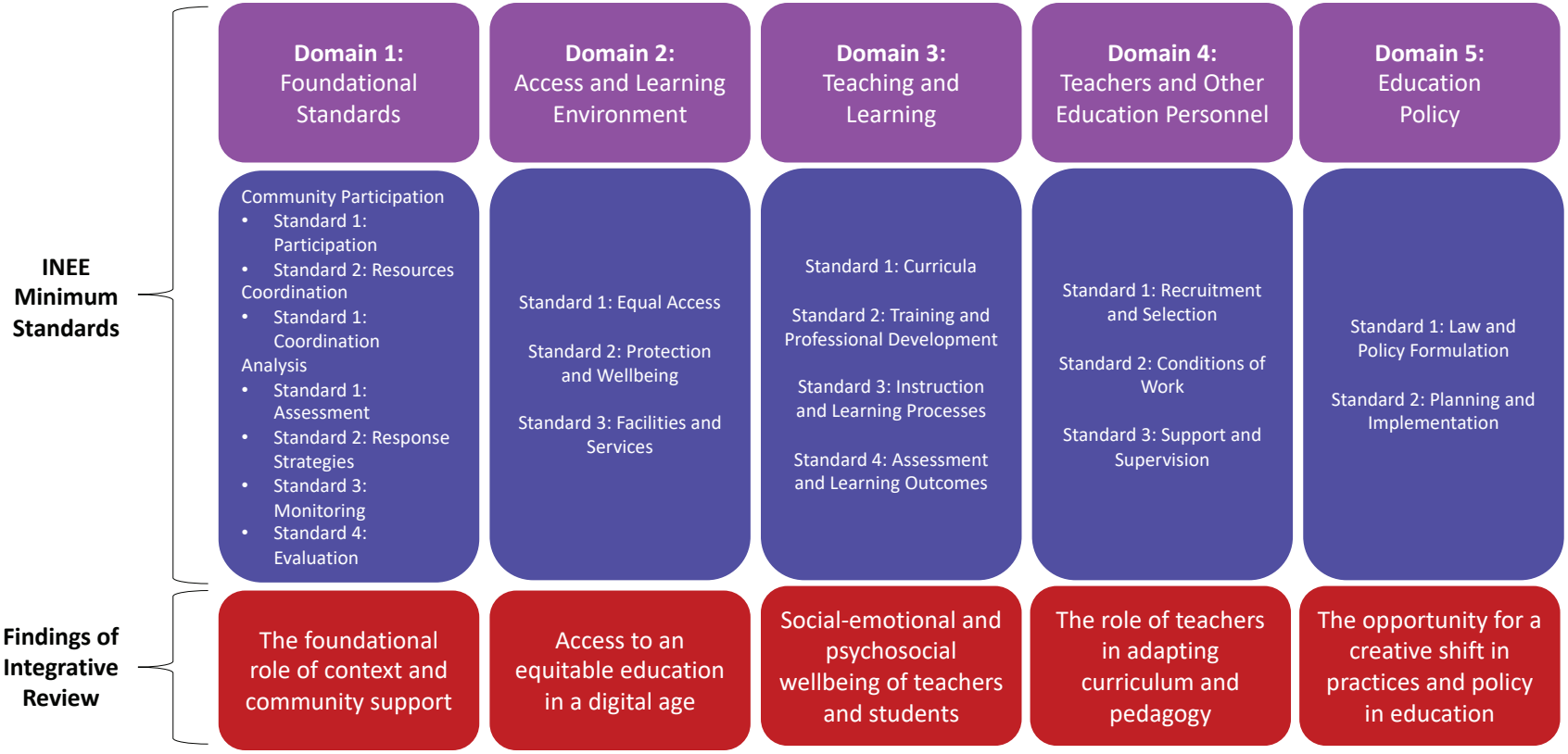
3. What lessons from previous epidemics have been applied during the COVID-19 crisis?

## ANALYTICAL FRAMEWORK

In this article, we employ the MSF as an analytical framework to understand more fully how the international community has responded to pandemics and epidemics. The MSF has five key domains: foundational standards (community participation, coordination, analysis); access and learning environment; teaching and learning; teachers and other educational professionals; and education policy (INEE 2012). We examine community participation, Domain 1, which many of the articles reviewed said was crucial to a successful education response (Jameson et al. 2020). Bromley et al. (2017) stressed that community support is key to success and gave an example of effective community resilience that stemmed from high-touch, bidirectional learning, such as frequent trainings for at-risk populations and diverse partnerships with the local government that are led by community members. Domain 2 highlights the importance of access, to education broadly and

to the virtual and physical spaces where emergency education is often provided, especially during disease outbreaks (INEE 2021). Domain 2 (INEE 2012) also includes concerns about personal safety during a disease outbreak, which has been interpreted primarily as psychosocial wellbeing and hygiene. Domain 3 includes curricula, training, professional development, pedagogy, and assessment. This was a particularly fruitful area that offered many research studies, especially around curriculum and pedagogy, and teacher training; therefore, we separated these items into two sections in our findings. We combined teacher training with Domain 4, which covers the recruitment and selection of teachers, as well as the conditions of their work, supervision, and support. Domain 5 focuses on education law, policymaking, and implementation. For the purposes of this review, Domain 5 was understood to address policy changes, and it captures creative responses to educating during disease emergencies.

*Figure 1:* MSF and Findings



In our literature analysis, we did not flesh out all aspects of each domain. This article reflects the way the literature conceptualizes each domain and highlights gaps in how each area is understood in the research and in published works. There are gaps in equitable access, effective distance learning strategies (INEE 2021), and concerns about teacher support (World Bank 2020) and the mental health of students (Chang-Bacon 2021) and teachers (Chabbott and Sinclair 2020).

## METHODOLOGY

Torraco (2005) argued that a chief purpose of an integrative literature review is to address emerging topics that would benefit from a holistic conceptualization and a synthesis of the literature to date, and to offer a new perspective. This is different from a traditional literature review, which summarizes the existing literature without offering analytical commentary. The purpose of this integrative literature review is to review the literature that has emerged around education responses to prior epidemics, such as Ebola, MERS, SARS, H1N1, HIV/AIDS, and early responses to the COVID-19 pandemic. It does not seek to systematically review all literature on the topic of educating during disease outbreaks, and instead combines perspectives to support a theoretical model (Snyder 2019). The INEE MSF was the guiding framework for this review.

While literature reviews enable researchers and practitioners to map and survey a given field, they are limited in two significant ways. They only consider work documented in academic and government reporting systems, which leaves important work unacknowledged or unseen. In addition to this limitation, our search was limited to articles in the English language and to studies on formal schooling. We found few studies focused on highly marginalized populations, street children, rural students, and ethnic and religious minorities.

We undertook this review in two stages, the first starting in April 2021. The authors began by conducting a search via Google Scholar, ERIC, and EBSCOhost using key search terms (Table 1). The search was limited to the period beginning January 1990 and ending December 2020. We chose 1990 as our earlier boundary to include the HIV/AIDS epidemic and the beginning of access to personal technology, such as at-home computers and the internet. We selected December 2020 as the end date because it enabled us to document publications about the early stages of the COVID-19 pandemic.

We crossed the primary search terms related to specific disease events with secondary and tertiary search terms related to education (Table 1). This combination of search terms, which was designed to capture articles related to education responses to epidemics and pandemics, returned empirical studies, practitioner and government reports, and historical accounts. In the first stage of the review, the authors reviewed the abstracts of all articles resulting from the search. This included all articles related to P-20 education, higher education, formal and nonformal education, teachers, students, school administrators, and education environments. We excluded articles that focused on medicine or medical education, were intended for a medical audience, and/or related to public health campaigns. When there were questions about whether an article qualified, the team made the decision together. The articles that met the inclusion criteria were then organized according to emergent themes: health/hygiene education, pedagogy, equity, leadership/administrators, students, teachers/instructors, social-emotional learning and psychosocial wellbeing, and creativity.

*Table 1:* Search Terms

| Primary Search Terms | Secondary Search Terms | Tertiary Search Terms |
|---|---|---|
| Ebola | Pedagogy | P-20 |
| SARS | Curriculum | Online |
| MERS | Teaching | Alternative |
| H1N1 | Education | Remote |
| HIV/AIDS | Hygiene | Distance |
| COVID-19 | Social-Emotional Learning | |
| | Psychosocial | |
| | Access | |

In the second stage of review, the researchers reviewed the selected articles in greater depth. The main ideas of each article were coded according to the five MSF domains. The main goals were to critically analyze the literature according to different areas of concern and to examine the body of literature for best practices and for gaps in services provided or communities served (Snyder 2019). In total, we reviewed 124 articles (Table 2). We debated adding an additional domain because of the significant number of articles that listed best practices without discussing them in depth; it seemed that a new type of literature was developing before our eyes. However, because many of these best practices fit into the existing domains and we had not fully fleshed out a theory that explained the new type

of literature we were seeing, we decided against adding an additional domain. This subsection of literature is discussed in the conclusion.

*Table 2:* Results of Coding

| Emergent Themes | Number of Articles Coded |
|---|---|
| Context and community support | 26 |
| Access to an equitable education | 53 |
| Social-emotional and psychosocial wellbeing | 17 |
| Teachers and other professionals | 62 |
| Creative shifts in practices and policy | 15 |

*Note:* Forty-nine articles were double coded and are reviewed in more than one category.

## FINDINGS

We discuss our findings from the articles in accordance with the five MSF domains: the foundational role of context and community support, access to an equitable education in the digital age, teachers' and students' social-emotional and psychosocial wellbeing, teachers' role in adapting curriculum and pedagogy and their need for additional training and support, and the opportunity for a creative shift in education practices and policies.

### Domain 1: Context and Community Support

Research has demonstrated that community participation is the key to successful emergency responses (Jameson et al. 2020). The first domain of the MSF emphasizes community participation as it relates to community practices and resources in a time of need; however, a clear definition of "community" is lacking (INEE 2012). For this review, the term can be understood broadly as both geographic (e.g., neighborhood) and relational (e.g., professional) communities where members feel a sense of belonging, fulfilled needs, and connection (McMillan and Chavis 1986). In the education context, it can refer to schools, institutions, districts, professional teacher networks, and online learning communities, to name a few.

Public policies and empirical research in education highlight the role of community participation and engagement in public health crises. The CDC (2014) recommends, for example, that universities collaborate with their local communities to develop an influenza pandemic response plan. In a crisis context, healthy community-school partnerships can help provide emergency assistance,

support for the emergency transition of schools to virtual or remote learning, family assistance, and community outreach (Valli, Stefanski, and Jacobson 2016). Collaborative efforts within school districts have the potential to enhance disaster preparedness (Burke et al. 2015). Emergency contexts, including public health crises, can create challenges for school-community partnerships, including interrupting the normal operation of institution-sponsored community services such as schooling, child care, and health care, but crises can also present unique opportunities to build relationships and improve regional resilience (Sutton and Tierney 2006). Saleh and Mujahiddin (2020) argue that higher education's role in implementing community empowerment practices during COVID could provide new models of community participation after emergencies (Iyengar et al. 2021).

Communities in a crisis context can also be relational. In response to educators' concerns about maintaining a sense of community in emergency remote learning environments, researchers have explored ways teachers can encourage engagement in order to maintain students' sense of belonging (Gares, Kariuki, and Rempel 2020). During the COVID-19 pandemic, institutions made an effort to maintain a sense of community, including by organizing virtual campus events (Fritz et al. 2020). Researchers adopted the concept of a community of practice (CoP; Lave and Wenger 1991) to describe education communities that enable learning to take place in situ through social participation and coconstruction, like teaching apprenticeships. Bolisani et al. (2020), who conducted a case study on the CoP among faculty members at an Italian university during the COVID-19 pandemic, identified characteristics such as a flexible management style, diverse skills and levels of involvement, and self-organization as important in building effective CoP models in emergency contexts. While CoP are often conceptualized as a type of professional learning, the literature demonstrates that these groups also provide emotional support and a sense of cohesion that mimic in-person communities.

Emergencies affect the stability of communities by interrupting people's usual roles, relationships, and activities (UNESCO 2010). In-person communities can be disrupted by epidemics and pandemics when social distancing is required, which may help to explain the limited literature on place-based communities in health crises compared to the plethora of research on online communities. Informal, self-directed online communities and networks serve as an alternative to in-person communities in emergency contexts (Macia and Garcia 2016). For example, at the onset of the COVID-19 pandemic, a community of teachers and administrators at a Dutch university shared their knowledge about remote teaching (Wolfensberger and Ding 2020). Social media have been used increasingly to share resources and build community among educators and academics during

health crises (Greenhow and Chapman 2020; Sobaih, Hasanein, and Elnasr 2020). However, despite the immense opportunities they present to build community and encourage participation in said online communities in emergencies, social media are still underutilized by education stakeholders (Fan and Elliott 2022).

### Domain 2: Access to an Equitable Education

Access continues to be the greatest education challenge during disease outbreaks. While it is also a central challenge during natural disasters and civil conflicts, disease emergencies require different solutions. It must be understood how disease affects education access; technology can make it seem easier but it often simply creates new hurdles. Cutri, Juanjo, and Whiting (2020), for example, highlight the way remote teaching can hide equity issues. It is important that researchers continue to investigate how physical distance and remote teaching affect both the perception and the measurement of education access and equity.

Hoadley (2007) looked at school as a place where students could be cared for during the HIV/AIDS epidemic, arguing that understanding school as a place of care is crucial to protecting the key mission of schooling—teaching and learning. While there was concern about providing accessible and equitable education during the HIV/AIDS epidemic, face-to-face education continued. The combination of remote virtual and in-person learning, also known as blended learning, during the COVID-19 pandemic raises questions about what care looks like in virtual and remote spaces and how educators can provide care in both synchronous and asynchronous environments.[2]

Specific concerns about access to education include reaching rural students and students with learning difficulties, and providing the special education supports they need. Jameson et al. (2020) find that, during school closures, students in rural areas with special education designations, such as those with autism or dyslexia who require augmentative and alternative communication, may not receive the services they qualify for. Schwartzman (2020) adds that most online platforms are not adaptive for those who have disabilities. Some schools concerned about not being able to provide adequate services for students in special education did not transition to remote learning at all (Jameson et al. 2020). Rural schools tend to be underresourced, and rural students are less likely than their suburban and

2 Synchronous classes run in real time, with students and instructors attending together from different locations. Asynchronous classes run on a more relaxed schedule, with students accessing class materials during different hours and from different locations; see https://thebestschools.org/resources/synchronous-vs-asynchronous-programs-courses/.

urban counterparts to have a computer or internet access at home or to own a smartphone, which makes it harder for the rural students to access curriculum. Moreover, teachers in rural schools often lack professional development in technology and special education training. Based on quantitative data from Sierra Leone and Guinea during the Ebola outbreak, Smith (2021) argues that rural and poor students are most likely to leave school during disease emergencies. García and Weiss (2020) show that the COVID-19 pandemic has exacerbated the opportunity gaps between wealthier and poorer students, especially those who lack access to food, shelter, and health care. University students in the United States faced barriers to success in their courses, due mostly to challenges with internet connectivity, and some struggled with housing insecurity; both problems were greatest for non-White first-generation and female students (Gillis and Krull 2020). According to the Kansas State Department of Education (2020), immigrant students in Kansas face unique challenges, such as not being able to access school information in their native language, and they suggest potential solutions, like making school- and district-level plans for multilingual families. Disengagement is another concern for educators in largely minoritized and poor communities, as it leads to poor achievement, frequent absence, and disruptive behavior (Drane, Vernon, and O'Shea 2020). Roman's (2020) findings on disengagement extend to preservice teachers, who also are susceptible to disengaging from their learning.

The literature also shows that a range of responses to schools' concerns about digital inclusion emerged during the COVID-19 pandemic (García and Weiss 2020), including the use of TV channels in New Zealand and Australia. Portugal delivered all educational materials through the mail, and the United Arab Emirates set up a technical hotline for students who encountered technology troubles (Drane et al. 2020). As has been made clear during the current pandemic, the lack of access to personal technological devices can be a major challenge during a crisis. Allier-Gagneur et al. (2020) argue that national or international policies could be implemented to lower the cost of these devices, such as by lifting taxes, using Universal Service and Access Funds to bring down costs, or allowing installment payments. They note that limited internet connectivity is another major concern. Rush, Wheeler, and Partridge (2014) argue that access to the internet and technological devices during emergency situations often depends on the generosity of companies; Verizon, for example, gave US$43 million to New York City Public Schools to use to bridge the digital divide (Verizon 2022).

Access to internet-connected devices is an especially significant problem in countries and regions where there is poor internet connectivity. Adnan and Anwar (2020) looked at higher education in Pakistan, where funding to keep up with technology was lacking even before the COVID-19 pandemic. Qazi et al. (2020) had similar findings in Brunei and Pakistan, where rural students were less satisfied with online learning than their urban and suburban counterparts. Students in Pakistan also found it difficult to access the curriculum online, saying that internet connections were too expensive and they had trouble with connectivity (Adnan and Anwar 2020). Jalloh and Raschid (2018) highlighted similar problems during the Ebola epidemic in Sierra Leone, where many universities cancelled classes for an entire year. Samuel et al. (2020) showed that, in Nigeria, internet is not advanced enough to support e-learning for all students; for example, in some rural areas there is no regular power supply.

The literature demonstrates that some of the challenges faced by students during health emergencies break down around gender. For example, girls globewide bear more responsibility than boys for household chores and are less likely to have access to internet and devices (Allier-Gagneur et al. 2020). Evans (2002) looked at the relationship between education and HIV/AIDS among street children in Tanzania. While all these children come from extremely poor families, those who lost parents to AIDS were in an even more precarious situation, a problem exacerbated by gender. In a system of fee-paying schools, where many orphaned students have to work rather than attend school, young women are often vulnerable to sexual and labor exploitation (Robson and Sylvester 2007). During the HIV/AIDS crisis, teenage girls were especially vulnerable to contracting the disease, as many engaged in sexual relationships to fund their education (Evans 2002). Girls were similarly affected by Ebola; in Sierra Leone, government policy shifted after the Ebola epidemic (Lázaro Lorente et al. 2020), and pregnant girls were no longer allowed to attend school (Pärnebjörk 2016). Menzel (2019) problematized this policy, arguing that many young women in Sierra Leone were pregnant before Ebola, but the increased concern over maintaining foreign funding from the international community led to more emphasis on the rate of pregnancy in young women. Smith (2021) also questioned the impact the Ebola epidemic had on girls and orphans dropping out of school, finding relatively limited data to support claims that these were the populations that had been most affected. The effects disease emergencies have on teachers also affect access to education more broadly. Robson and Sylvester (2007) highlighted the loss of teachers in Zambia during the HIV/AIDS epidemic, which made class sizes larger and limited the number of students who could be enrolled. Santos and Novelli (2017) stated that teachers in Liberia were without work during Ebola due to the school closures,

which increased their economic precarity and resulted in a shortage of teachers. As a result of this shortage, along with restrictions on class size to control Ebola, many students were pushed out of the education system (Santos and Novelli 2017).

### Domain 3: Social-Emotional and Psychosocial Wellbeing

A 2018 addition to INEE's MSF defines psychosocial support as "processes and actions that promote the holistic wellbeing of people." This addition encouraged national governments and the international aid community to adjust curricula, such as by including an emphasis on self-confidence and hope. The global community's broader emphasis on ensuring developmental psychosocial support and wellbeing for teachers and students coincided with the onset of the SARS epidemic, as well as the ongoing Ebola and HIV/AIDS crises, which means the literature has been concerned with both mental and physical health since the Sphere Guidelines were published in 1997 (Alfadhli and Drury 2016).[3]

Our analysis revealed two important themes. First, the impact of emergencies differed according to social and cultural contexts; second, it differed according to the specific disease. A meta-analysis by Burde et al. (2015) suggests that the social-emotional needs of students in areas of protracted conflict and natural disasters may differ from the needs of students in areas where the threat has subsided. A study related to cases of MERS among medical students also highlighted disparities in how people of different genders respond to psychological threats, with females having a higher mean stress average than males (Al-Rabiaah 2019). External factors, such as war and conflict, also contribute to a pandemic's impact on the psychosocial and emotional wellbeing of students and teachers (Murray 2019).

Violent conflict can lead to the spread of disease and disrupt the basic social networks that promote social-emotional health, including schools, which have a social contract with parents stipulating that they will provide a degree of safety for their children. This was seen in Liberia, with schools navigating a delicate balance of fulfilling the expectations of parents and the need for public safety as communities recovered from Ebola outbreaks (Santos and Novelli 2017). Quarantine protocols also severely disrupt social routines, and parents fear both possible infection and quarantine restrictions. National volunteers, implemented as part of the Liberian Ministry of Education's response to Ebola, particularly those familiar with the local communities, helped address both practical safety protocols and social dynamics. In a comparison of a student population in

3 See https://en.wikipedia.org/wiki/The_Sphere_Handbook.

Guangzhou China and the general public in Hong Kong, Gu et al. (2015) found that students in Guangzhou held unsubstantiated beliefs about the threat of H1N1 and experienced higher levels of anxiety than the Hong Kong public because of these false beliefs. Interventions by university counseling centers that prioritized contextual and cultural knowledge proved more successful in helping students cope with stress during the SARS epidemic. Longitudinal data provide evidence that the needs of students and teachers during stressful times diverge across differences in gender and culture. Ignoring these differences may cause educators to misunderstand how cultural identity informs individual students' choice of mechanisms to cope with anxiety and stress (Main et al. 2011).

A consistent finding across these diverse contextual factors is that psychosocial distress during a pandemic is a direct result of interrupted schooling. Chang-Bacon (2021) highlights the difficulty faced by students whose schooling was interrupted and suggests that traditional concepts of how interrupted schooling affects students may need to be adjusted to reflect the experiences of those who lost academic advancement and suffered psychosocial distress due to having to learn remotely during COVID-19. School routines and rituals support resilience because they provide children with an element of a normal life and a sense of consistency (Burde et al. 2015). Their relationships with their peers and teachers also provide important emotional and developmental support, and the destabilization of their normal routines is a common cause of psychosocial distress (INEE 2018). Recognizing the importance of these relationships and the distress caused by isolation helps to determine the appropriate education response. According to Crosby, Howell, and Thomas (2020), trauma-informed teaching practices focus on developing teacher-student-peer relationships to combat the effects of trauma on psychosocial wellbeing. They also point out that necessary social-distancing guidelines may interfere with teachers' ability to encourage healthy relationships with and between their students. Helping teachers model emotional regulation skills, encouraging conversation to give students an opportunity to process their experiences, and increasing the amount of time spent interacting playfully with peers are pedagogical strategies recommended in multiple articles reviewed for this study, especially for high-risk children (Çifçi and Demir 2020; Crosby et al. 2020; Roman 2020).

Psychosocial distress and challenges to wellbeing may not affect every population the same way. Minahan (2020, 24) points out the disparate impact COVID-19 has had on populations within the United States: "The pandemic is also widening the achievement gap for children living in poverty and children of color, who are experiencing higher rates of illness, death, and economic impact…the

disproportionate impact of the pandemic on the mental health of children of color must be addressed as we return to classrooms." One obstacle facing school administrators who are making changes that center on student mental health and wellbeing is the constant pressure they feel to address academic performance in order to prepare for standardized testing. Chang-Bacon (2021) writes that tension exists between school administrators' desire to get students back on track and to look after their mental health and wellbeing.

### Domain 4: Teachers and Other Professionals

The literature on teaching and learning that emerged in response to educating during disease events underscores the role teachers play in effectively adapting curriculum and pedagogy to provide quality education in emergencies. The studies reviewed revealed three major themes related to teachers' effectiveness during major health crises: individual teachers' and systems' characteristics, teachers' use and adaptation of digital tools, and pedagogical barriers to providing quality education.

Teachers' success in adapting to new education contexts during epidemics/pandemics has been linked to individual teachers' and systems' characteristics. Preliminary findings indicate that teachers' agency was activated by the COVID-19 pandemic as they adapted to an uncertain teaching environment (Gudmundsdottir and Hathaway 2020). Individual affective factors were correlated with university instructors' willingness to take risks with online teaching (Cutri et al. 2020). On a systems level, instructors' autonomy, greater academic freedom, and curriculum control led to a more positive experience of online teaching (Perrotta and Bohan 2020). School-based supports have previously been shown to mitigate technology-related stress by improving teachers' sense of computer self-efficacy (Dong et al. 2019). Several articles across the literature cited the importance of supporting teachers during health crises (Rasmitadila et al. 2020; Rupnow et al. 2020), but whether they received timely and necessary supports was less well understood.

A major challenge teachers must navigate during a health crisis is to adapt their instruction to new modalities. In Hong Kong, SARS provided the impetus for the use of digital tools to provide education from a distance (McNaught 2004). Teachers there experienced the rapid transition to digital education with mixed results (Fox 2004). During Ebola, low-tech digital solutions were used in Guinea and Sierra Leone, especially radio broadcasts (Hallgarten 2020), which had a demonstrated positive impact on students' retention of basic concepts (Barnett et al. 2018). The onset of COVID-19 and the prevalence of modern technology

catalyzed the global use of digital tools to educate more holistically to focus not only on academics but also on social and emotional wellbeing during the pandemic (Carrillo and Flores 2020; Mishra, Gupta, and Shree 2020). Long-term lockdowns during COVID-19 forced teachers to continue educating while adapting to new modalities. They found digital tools useful for instructional planning and delivery but challenging for differentiation and assessment (Research for Action 2020; Rupnow 2020). Hirsch and Allison (2020) argue that remote learning underscores the need for a high-quality, grade-appropriate curriculum. Unfortunately, empirical studies done during COVID-19 reveal that adapting curricula for remote delivery and differentiating the lessons to meet the needs of different learners has been challenging in practice (Alhumaid et al. 2020; Gillis and Krull 2020; Mishra et al. 2020; Schwartzman 2020; Tajik and Vehedi 2021). Huber (2020) argues that online education relegates teachers to the position of the helpdesk and perpetuates systemic inequities by altering the nature of communication and relationships.

A pedagogical barrier frequently cited is students' level of participation in digital learning. Their lack of participation is attributed to two main issues: engagement and accessibility. The first relates to students' indifferent attitude toward online learning (Alhumaid et al. 2020; Pattenaude and Caldwell 2020), which is a difficult obstacle to overcome. The challenge of engaging students in digital learning led Gillis and Krull (2020) to conclude that the choice of instructional technique is less important than how well implemented it is. The COVID-19 pandemic highlighted another barrier: the broader systemic inequities that affect online education (Tajik and Vehedi 2021). The gap between students from different socioeconomic backgrounds—the haves and have nots, remote rural and urban affluent—affects the students' success (Mishra et al. 2020). Applying the same pedagogical approach to all and expecting the same results is bound to fail, due to the digital divide in students' access, skill, and available technology (Schwartzman 2020). Some predict that the learning loss associated with COVID-19 school closures will have a disproportionate impact on disadvantaged students (Kuhfeld et al. 2020).

### Domain 5: Creative Shifts in Practices and Policies

Another area that emerged in the literature review was that disease emergencies offer an opportunity for a creative shift in practices and policies using the resources available and considering the constraints in novel ways. Prior disease events illuminated educators' innovative adaptation of health and hygiene content to reach at-risk individuals. In rural India, for example, educators developed a peer-education model to educate low-literacy communities about the risks of

HIV/AIDS (Van Rompay et al. 2008). Evidence from the Ebola outbreaks in West Africa showed that educators collaborated to address health education and training needs by providing massive open online courses (Evans et al. 2017).

Other examples of creative adaptations appear in curricula and student inquiry. In the United States, a significant number of high school science teachers used the Ebola crisis to present scientific concepts, and some teachers even developed hands-on laboratory activities related to the disease (Smith et al. 2016). The COVID-19 pandemic provided the impetus for biochemistry instructors to model science inquiry (Zewail-Foote 2020). Drake and Reid (2020, 6) argue that COVID-19 presented a "wicked problem" and that it gave teachers the opportunity to design learning that enabled students to have a big-picture perspective. An effective shift in pedagogy can have a positive impact on student learning in terms of creativity, academic progress, and autonomy (Bubb and Jones 2020). However, not all students have been able to access effective pedagogy during COVID-19 (Sondah 2020). It is important to acknowledge that, although education emergencies can catalyze beneficial changes to curricula, they also uncover contemporary social challenges which further reinforce inequality in students' access to curriculum.

Many institutions that were reluctant to change their traditional pedagogical approach had no option but to shift entirely to online teaching during the pandemic (Dhawan 2020). As the future of education is reformed postpandemic, various scholars urge thoughtfulness. Nóvoa and Alvin (2020) argue that the pandemic has revealed the possibility of educational transformation and has brought much-needed reinforcement to the role of education as a common public good. Spicksley (2020) suggests that teachers' conceptions of education have changed during the pandemic and caused them to be more pessimistic about the future of education. Shah, Paulson, and Couch (2020) warn that the responsibility for creating resilient education systems should focus not on individuals but on ecologies, and that policymakers and leaders should seek transformative solutions. In the existing literature, creative shifts are attributed mostly to teachers, which reflects their capacity for individual resilience during education crises. But, as Shah et al. (2020) suggest, resilience should be conceptualized as a process and approached from the organizational level.

Evidence in the literature of creative shifts and organizational resilience in national and regional policies was more limited. While some articles discussed ineffective policies, like Sierra Leone's ban on pregnant girls attending school (Pärnebjörk 2016), and made policy recommendations for how to limit learning loss (García and Weiss 2020), few articles directly documented creative pivots in government policy. One article evaluated the effectiveness of closing schools during H1N1

(Brown et al. 2011; Davis et al. 2015) and another documented whether schools had adhered to the government guidelines for school closures (Doyeema et al. 2014). Brown et al. (2011) found that the cost of closing schools due to a lack of child care would far outweigh the cost savings of closing schools to prevent influenza. Davis et al. (2015) similarly demonstrated that school closings were reactive and largely ineffective at reducing influenza-like illness. Doyeema et al. (2014) showed that schools in Michigan generally adhered to statewide policies about closing schools, usually due to significant illness and absenteeism.

However, some education systems have noted creative shifts that anecdotally show improvements. The Roaring Forks school district in the US state of Colorado found that providing for families in need minimized barriers to education, while centralizing the curriculum eased teachers' workload (Center on Reinventing Public Education 2020). The United Arab Emirates set up a national technical hotline for students having technology troubles (Drane et al. 2020), and other places, including the state of Kansas (Kansas Department of Education 2020), passed laws forbidding the cancellation of internet services for nonpayment. Malaysia passed a law allowing school funds to be used to purchase data packages for students in need (Rasmitadila et al. 2020).

The literature also included examples of places where shifting policy has further complicated or worsened a situation. In some areas of the United States, schools were canceled due to legal concerns about equitable access to instruction (Jameson et al. 2020). Ultimately, the research hints at the complicated nature of policymaking during disease emergencies. Some creative shifts in education policy led to positive outcomes, whereas others worsened an already challenging situation.

## CONCLUSION

The findings from this integrative literature review classified the extant literature in accordance with the five domains of INEE's MSF. The MSF was designed to guide humanitarian organizations' delivery of education in emergencies. The advent of the COVID-19 pandemic has shown that disease crises pose unique challenges for education. In general, we found alignment with the MSF in the review, as many of the findings fell into one or more domains. Overall, the literature maintains that education institutions should deliver responses that respect cultural knowledge, expect different communities to experience different effects, and emphasize psychological wellbeing for both teachers and students. Research gathered from this review suggests that adjustments to curricula and pedagogy could be applied

effectively to address the needs of students and teachers. For example, supporting the social-emotional needs of students and teachers was found to be important, especially in high-risk groups and communities. Addressing students' diverse needs means that schools' often scarce resources are divided multiple times, and none of these needs receive enough funding. The literature points to the need for teachers to do more while simultaneously highlighting the fact that they are overworked and exhausted. This is also true of the parents and community members who partner with schools, the literature suggests.

Ultimately, the findings highlight that most of the concerns and recommendations in the literature are focused at the individual and school levels. There is significant research pointing out how individuals and schools can do more, but only limited recommendations about how society and governments at large can combat the challenge of educating during disease emergencies. For example, Domain 1 includes both community participation and coordination; while there is discussion in the literature of community involvement, there is little discussion of coordination, which is a natural place for government to step in. Shah et al. (2020) forewarned that the responsibility for resilience in providing education in emergencies should focus not on the individual but on the ecology. Focusing on individual resilience limits the discursive space for policymakers and leaders to engage in structural solutions to endemic emergencies. Resilience should instead be conceptualized as a process and should be approached from the organizational and societal levels. This means that teachers should be well paid, and that nations should ensure that they have an adequate number of teachers to respond in an emergency (Domain 4). Additionally, conversations in the literature about access to education (Domain 2) are mentioned as if it were a new problem, when in fact there has long been a gap between the rates at which wealthy and poor students access education. Instead of looking for one-time solutions, like radio programming, or finding ways to get cheap technology to students, nations perhaps should seek to create education systems that provide all students with the tools they need to succeed. Schwartzman (2020) argues that metastatic capitalism is partly to blame, as gaps in the education governments provide often are filled by wealthy individuals and countries with for-profit services, leaving the poor to fall farther behind. While we often shower praise on companies that offer free internet services or give out low-cost laptops, if these same companies were not receiving large tax breaks, money might be available to build the infrastructure that would enable all families to have wireless internet access or to fund schools adequately from the beginning. If we as a global community were to address the major social ills, there would be significantly fewer challenges during emergencies. This is where education policy (Domain 5) can clearly help solve some of these problems, like that of the Nordic

countries that emphasizes social services and education, thereby modeling for the world how to approach and prioritize national spending.

The literature revealed other important gaps besides the lack of policy guidance. Few articles referred to the wider community being involved in providing effective education, or to including the voices of vulnerable populations in key conversations. There also was no discussion of the LGBTQ+ populations' access to education in disease emergencies. We also found few articles about the effects of MERS, perhaps because that research was published in languages other than English, as the virus was confined to one region. Only a few articles referenced educating in emergency experiences during disease outbreaks in South America.

It is important to note that, while many examples of successes and failures were found in the literature, all policies and practices should be implemented with the contextual nuances of each location in mind. This will ensure that poor and rural students in wealthy nations are not forgotten, and remind us that the low-tech, low-cost solutions successful in poor and low-resourced communities can also be implemented in high-resource contexts. This review also highlights the importance of planning for future epidemics and pandemics, and for other emergencies, while also working to address longstanding inequalities so that fewer people are in a truly desperate situation when the next emergencies arrive.

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