



Eastern Great Lakes Pediatric Consortium for Disaster Response

Education Workgroup

Table of Contents

Section	Page Number
• Executive Summary	1
• Background	1
• Pediatric Disaster Education Concept of Operations	3
• Pediatric Disaster Education Gaps	7
• Pediatric Disaster Core Competencies	15
• Pediatric Disaster Education Programs	19
• Pediatric Readiness Expectations	29
• Pediatric Disaster Education Design Thinking	32
• Pediatric Disaster Training Literature	45
• National Pediatric Disaster Competency Survey	56
• Children and Youth with Disabilities and Medical Needs	63
• Federal Training Assessment Reviews	77
• EMSC Innovation, Improvement, and Disaster	82
• Operationalizing Pediatric Disaster Education: What Works?	88
• COVID Pediatric Disaster Education Response	99
• What Have We Learned?	112
• Appendices	117
• References	120

Executive Summary

The Education Workgroup of the Eastern Great Lakes Pediatric Consortium for Disaster Response (EGLPCDR) focused on mission-critical educational content and just-in-time health care professional education resources to promote professional competency. Gaps in pediatric disaster education are multi-factorial, contribute to an overall lack of preparedness, and impact operational capability. The Workgroup's efforts to address these gaps included:

- Conducting a systematic literature review of multi-discipline pediatric disaster education and curriculum
- Evaluating the impact of prior pediatric disaster educational initiatives.
- Identifying best practices.
- Offering strategic recommendations for improvement and engagement.
- Developing an overarching framework across disciplines and communities to promote and engage partners and communities in pediatric disaster education.

The effort deployed key resources and learnings to support a national virtual pediatric disaster exercise. Resources were utilized to create the standardized curriculum for the EMS for Children Pediatric Disaster Domain and training programs of ASPR TRACIE and Western Regional Alliance for Pediatric Emergency Management (WRAPEM) through virtual webinars.

During the grant period, the COVID-19 pandemic struck, creating unprecedented challenges. It also, however, provided opportunities to observe and capture—in real-time—interdisciplinary efforts to support and coordinate “whole community” pediatric pandemic education, guidance, protocols, competency, training, and response.

Background

In early November 2019, each Pediatric Disaster Center of Excellence's (PDCOE) Education Workgroup collaborated to begin exploring gaps in pediatric disaster education that impact the ability to mitigate, respond, recover, and support resilient regional pediatric capabilities. The Education Workgroup partnered with the Western Regional Alliance for Pediatric Emergency Management (WRAPEM) through virtual meetings to identify resources, develop and conduct a national survey, and support shared educational PDCOE goals and objectives.

Education Workgroup members are subject matter experts who are experienced in hospital, EMS, critical care, and community disaster operations. Many of these members have specialties in educational programming, including simulation, multi-media, quality, and development of professional standards. (See Appendix A.)

Each of the Centers' Workgroup had both “center-specific” and “collaborative” deliverables associated with their respective grants. Core collaborative activities included discussion, information-sharing, subject matter expert content review, exercise educational support, and virtual learning sessions. PDCOE deliverables included the development of hazard-specific educational materials to support grant exercises and other focus groups. (The deliverables

described below align with Activity A (Strategy 2); Activity B (Strategy 1); Activity C (Strategy 1 and 3); and Activity D (Strategies 1, 2, and 3).

Workgroup activities included:

- Development of a pediatric disaster education Concept of Operations to provide a framework for addressing educational gaps aligned with whole community all hazards' operations.
- Environmental scan and literature review of pediatric disaster education gaps across disciplines.
- Systematic literature review of pediatric disaster education and curricula recommendations.
- Review and development of an all-hazards compendium of Just-In-Time (JIT) pediatric disaster resources and literature to inform WRAP-EM and EMS for Children Innovation and Improvement Center (EIIC) activities.
- Distribution of curated educational literature and best practices to inform pediatric disaster Centers of Excellence Workgroup activities.
- Educational support for regional health care coalitions in their pediatric disaster annex activities as part of the EGL/EIIC Pediatric Readiness Disaster Domain Quality Collaborative.
- Identification of best practices and lessons learned associated with pediatric disaster education and curricula during COVID-19.
- Educational liaison networking with public-private entities supporting JIT education to address real-world world events (COVID-19).
- A real-time compilation of pediatric, neonatal, and community-based COVID-19 web-based resources, literature, and toolkits to respond to JIT information needs.
- National multi-discipline provider-level survey of pediatric disaster competency expectations.
- Survey of EMS for Children program familiarity and engagement across disciplines.
- Exploration of design thinking and convergence of best practices to mitigate gaps in pediatric readiness throughout all phases of a disaster.
- Review and promotion of vetted JIT pediatric disaster education and training resources through utilizing Twitter, Facebook, and Linked-In.
- Evaluation of education and training JIT resources for Children and Youth with Disabilities and Complex Medical Needs.
- Design and production of best practice "Be Ready" disaster preparedness materials for Families with children and youth with disabilities and complex medical needs.
- Disaster preparedness checklist and guidance for health providers who care for families with children and youth with disabilities and complex medical needs.





Pediatric



Disaster



Education



Concept of



Operations

Pediatric Disaster Education Concept of Operations (CONOPS)

Concept of Operations (CONOPS) documents are integral to disaster and emergency management, providing a systems-based framework for practical strategies and interventions to achieve a common goal. In this case, the proposed Pediatric Disaster Education CONOPS framework is designed to position pediatric disaster education as a valued-based vehicle to connect and empower all disciplines with confidence in the care of children during disaster. A Pediatric Disaster Education CONOPS would provide a common operating picture for decision support, information-sharing, and asset management inclusive of children. Adoption of a Pediatric Disaster Education CONOPS model has the potential to create a whole community ecosystem of pediatric disaster readiness. Such a framework would create opportunities for cross-discipline stakeholders to work in a highly collaborative, non-competitive, and productive manner focused on the common purpose.

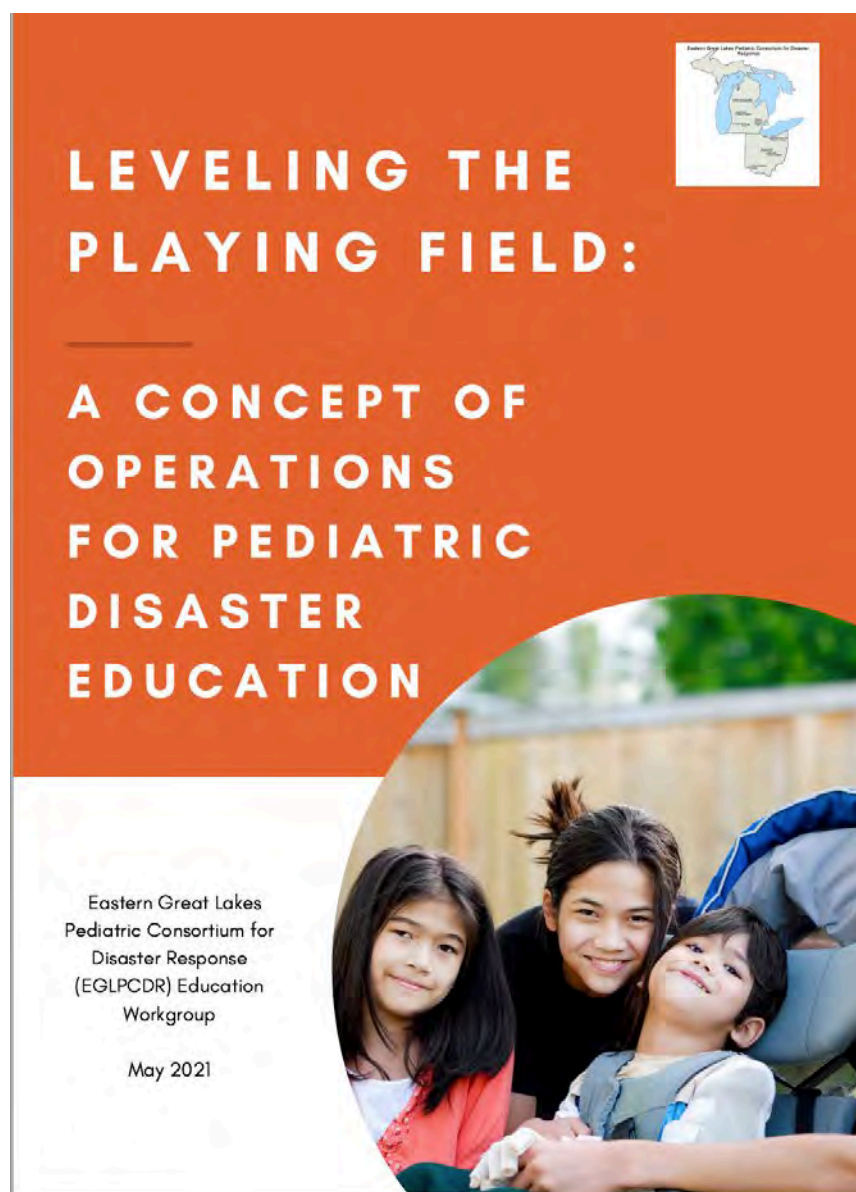
A common operating picture that would strive to assure there is a level playing field for children as part of *Whole Community* disaster readiness. This could be achieved by reducing barriers using shared and integrated virtual and low-cost simulation education and training. Pediatric disaster education is designed to be sustainable, open access, and positioned to be adopted across local, regional, and state pediatric disaster training stakeholders. A Pediatric Disaster Education CONOPS would anchor organizations to the National EMS for Children Innovation and Improvement Center (EMSC-EIIC) programs, partnerships, and initiatives.

The model is illustrated as follows:



The PDCOE Workgroup found an exceptional array of neonatal, pediatric, and perinatal disaster

educational resources that are useful for disaster readiness JIT training, as well as on-boarding disciplines to pediatric disaster care and emergency management. However, the resources are not evenly distributed across provider groups, nor are they utilized as part of entry-level health workforce core curriculums. In fact, many highly vetted materials were unfamiliar to pediatric emergency and disaster subject matter experts. This demonstrates that the gaps due less to lack of availability of pediatric content than to lack of awareness, process, utilization, and deployment. (See Appendix B for a link to the full CONOPS report.)



Public-private partnerships exist to strategically mobilize a systematic and sustainable effort to provide open access, highly reliable pediatric disaster education. In the case of children, however, many of these partnerships not only experience competing priorities but also continue to view children as a “niche” population. This plays out in a myriad of ways when

champions for children are not at the table across key sectors or when an organization's priorities to redesign itself do not focus on pediatric disaster readiness.

The most recent unintentional example of this is illustrated by the re-organization of the NIH National Library of Medicine's (NLM) Network of Library of Medicine website, a trusted source for disaster resources. During the 2020-2021 grant period, a number of useful NNLM pediatric disaster webpages sunset. These websites included:

- A consolidated web page featuring vetted disaster mobile applications inclusive of children; and
- A consolidated web page of resources that listed hazards and their corresponding community impact that were inclusive of children.

Trusted disaster website upgrades are not always kind to children. During the grant period, several key reports and resources also sunset; these resources had previously been hosted on both the National Center for Disaster Medicine and Public Health, and the American Academy of Pediatrics (AAP) websites.

A Pediatric Disaster Education CONOPS that is focused on the inclusion of children throughout the disaster cycle is designed to level the playing field for all children—especially those who rely daily on community services for food, housing, childcare, and access to health services. Normalizing the inclusion of children across disciplines and disaster planning creates a common operating picture that can position communities and their responders on the front lines for success. It achieves these goals and objectives by both respecting and leveraging the wealth of multi-sector local, regional, state, and federal cross-disciplinary education contributions.

This report's findings and the observations support the need for a Pediatric Disaster Education CONOPS. This would create a strategic approach that provides an environment of open and peer-to-peer access to learning aligned with a shared operating picture. The anticipated result would foster unprecedented engagement across disciplines, reducing variability in pediatric disaster knowledge, skills, and abilities that are essential to disaster emergency management.

In summary, a wealth of pediatric disaster ready resources exist to better prepare communities and workforce. What is lacking is strategic curation, consolidation, and deployment of open source, multi-disciplinary, cross-sector disaster education. The Pediatric Disaster Education CONOPS and Workgroup findings were used to strategically inform 2021 [Regional Pediatric Pandemic Network](#) grant application. It is the vision of the Workgroup that the broad socialization of the Pediatric Education Concept of Operations can mobilize unprecedented collaboration, dissemination and adoption of best practices supporting pediatric readiness in both normal and disaster conditions.



Pediatric



Disaster



Education



Gaps

Pediatric Disaster Education Gaps

Pediatric disaster readiness relies on a reliable foundation of general pediatric education and training. In a disaster, pediatric prehospital patient outcomes depend upon opportunity, familiarity, and competency in the care for children. Yet, the literature is full of surveys and studies, conducted by various disciplines, that identify critical gaps in pediatric care, pediatric emergency medicine, and pediatric disaster education. In many cases—especially in the prehospital setting—gaps in basic pediatric education contributes to gaps in pediatric disaster readiness.

One example is the findings from the [Children’s Safety Initiative](#), which conducted a national three-phase Delphi survey among prehospital service providers.¹ The study found significant deficits and the need for expanded pediatric training in general pediatric knowledge as well as emergency care that were part of day-to-day operations. The survey found that efforts to improve EMS pediatric care needed to prioritize pediatric airway management, patient assessment, decision-making, and mitigating anxiety. The recommendations, however, left it up to medical directors and educators to use the findings to improve education and training. The recommendations failed to call out the need for “systemic change” to successfully address education and training vulnerabilities.

Disaster Education Gaps and Multidisciplinary Emergency Preparedness and Response

Pediatric disaster education gaps are tied to gaps in overall emergency preparedness. Opportunities to improve pediatric disaster capability depend on the engagement of allied health providers; these stakeholders are essential to pediatric disaster response operational teams, yet there is a lack of cross-sector education and training is standardized to support this level of response.

In 2011, the [Yale New Haven Center for Emergency Preparedness and Response](#) conducted a [“Study to Determine the Current State of Disaster Medicine and Public Health Education and Training and Determine Long-term Expectations of Competencies.”](#)² The study was designed to define disaster competencies by specialty for specific target groups (see chart, below), including accrediting bodies. This exhaustive study established a working panel and hosted six workshops involving multiple, diverse, and un-integrated networks that included both military and civilian leaders. (See Appendix C for a link to this resource.)

APRNs	Dentists	LPNs	Physicians
Behavioral Health Professionals	Diagnostic Medical Sonographers	Medical and Clinical Laboratory Technologists	Physician Assistants
Cardiovascular Technologists & Technicians	Emergency Medical Technicians and Paramedics	Pharmacists	RNs
Veterinarians	Respiratory Therapists	Radiologic Technologists and Technicians	

To its credit, the working group included representatives from the EMS for Children Program, the National Advisory Committee for Children and Disaster, the National Association of Children's Hospitals, Children's National Medical Center (Washington, DC), and the National Commission for Children and Disaster. These entities participated in and helped to inform the study.

The resulting 408-page report, however, had only a *single reference* related to children, which came in response to the following post-conference survey question:

- **Question:** Are there any topics that you would have liked to have been covered, but were not?
- **Response:** *Panel on what non-government entities are doing at the community level. Recognition on day 1 about how the issues of children and disaster are different for adult populations*

Although children were not the integrated into the working group analysis, the Yale New Haven study identified significant opportunities and systemic barriers to achieving disaster education competency, which directly impact national pediatric disaster readiness efforts to this day.

The barriers impeding integration were identified as systemic and primarily process barriers that interfere with efforts to transform process into practice. They include:

- Multiple, diverse and un-integrated networks among military and civilian healthcare responders.
- Mandates, regulations, or standards for civilian preparedness that differ from those of military responders.
- Organizational barriers that prevent effective communication and decision-making.
- Lack of a common vocabulary among civilian and military medical responders.
- Civilian responder jurisdictional control.
- Lack of a comprehensive listing of related medical response research topics.

- Lack of coordination efforts for medical response curriculum requirements, training, and tracking

The results of the Yale New Haven study produced the following framework, which illustrates long-term, national goals of competency development and evaluation:³

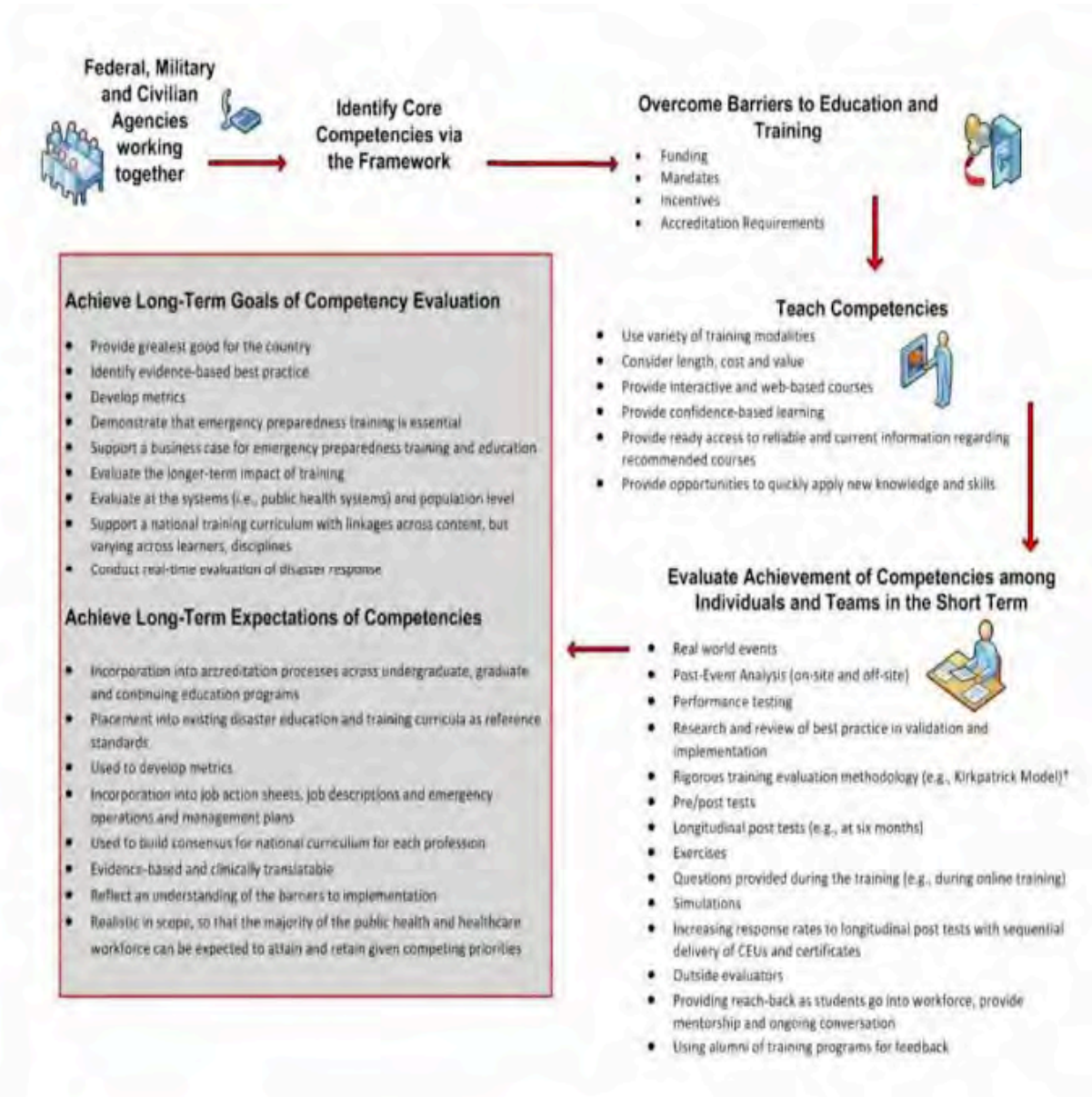


Illustration: Yale New Haven Center for Emergency Preparedness and Disaster Response Report (Nov, 2011)

The study identified, more than 10 years ago, systemic barriers and opportunities to creating disaster competency. Moreover, the study's after-action laid the groundwork for the National

Center for Disaster Medical and Public Health workshop in 2011, which subsequently provided [Curriculum Recommendations for Disaster Health Professionals The Pediatric Population](#).⁴

Pediatric Disaster Education Gap Analysis: “It depends on your discipline, operational, and organizational experience & priorities.”

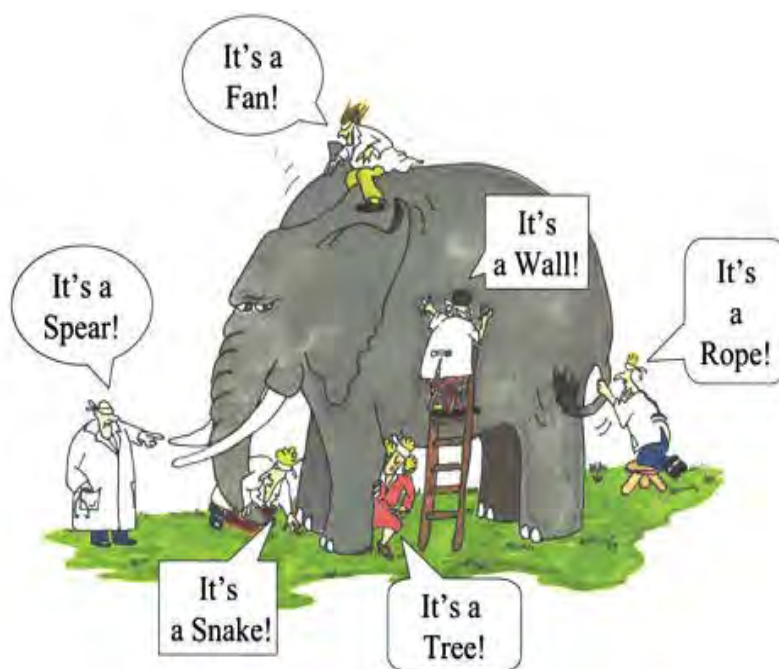


Illustration: <https://bit.ly/354fz1x>

It is vital that disaster leaders stop seeing pediatrics as a niche capability and start promoting pediatric disaster readiness in their communities. Education is a dynamic process that consists of many dimensions, the most crucial being relaying actionable knowledge, skills, and abilities (KSAs) to create capability and confidence. While there are no uniform KSAs for Pediatric Disaster readiness, there are clear systemic pediatric disaster education vulnerabilities that can be found in the literature. These systemic gaps fall into the following categories: content, workflow, workforce, knowledge, standards, policies, structural, and experience gaps (see chart below).

Content Gaps:	Workflow Gaps:	Workforce Gaps:	Knowledge Gaps:
A lack of evidence or training information exists to create an educational program	A lack of systems to continuously assure reliable quality education and training including time and space	A lack of personnel to participate or conduct training or individuals with the knowledge, skills, and abilities to lead educational activities.	A lack of availability to education and training clinical or operational knowledge driven by inadequate science or opportunity.

Standards Gaps:	Policy Gaps:	Structural Gaps:	Experience Gaps:
A lack of a consensus in local or national standards or common aims for training various disciplines within a community	A lack of policy or regulatory guidance established by and with institutional or governmental entities	A lack of equipment, space, time, or materials to conduct or practice knowledge, skills, and abilities	A lack of practical hands-on experience that requires the integration of psychomotor and critical thinking.

Operationally, education should be designed to engage learners in the essential KSAs that promote confidence and capability when dealing with children during disaster events. The knowledge, skills, and abilities taught or relayed to learners are dependent on the individual’s discipline, role, operational and organizational experience, and priorities during the event. There should be reliable methods to ensure that appropriate education is effectively delivered *and* received by learners.

Collaborative leadership and resources are required to successfully create systemic change. Content gaps associated with pediatric disaster competency are the easiest to address—but these efforts must be coupled with systems for content review and effective delivery. In contrast, gaps in experience are more difficult to resolve because doing so relies on mitigating other, systemic educational barriers. Pediatric disaster educational activities are commonly the domain of academic, scientific, or professional organizations that have the funding and capability to produce high-quality disaster training. Unfortunately, these exceptional resources are often not connected to local and regional whole-community mitigation, preparedness, response, and recovery efforts.

Calls for improvements in pediatric education across disciplines as part of health provider entry to practice to address pediatric education gaps have been made for decades. The process of updating established curriculums is seen as laborious and costly, however. Wide variation exists in amount of time each discipline dedicates to pediatric training. For example, Emergency Medical Technician- (EMT) level providers receive only approximately four hours of pediatric content as part of their 120-hour certification training. Yet, EMTs are expected to be competent in pediatric patient movement; trauma; triage; and Chemical, Biologic, Radiologic, Nuclear and Explosives (CBRNE). Similarly, it is rare to see initial Nursing, Medical, and Allied Health provider basic training that equips these providers to address children's care in disaster. This lack of inclusion leads to downstream impacts, such as the common perception that the sole responsibility for pediatric emergency care rests with pediatric regional hospitals and specialists.

This systemic lack of introduction to whole-population disaster concepts is contrary to the tenets promoted in the [National Response Framework](#),⁵ which places great importance on a collaborative, coordinated preparedness efforts that emphasize “whole population” and “whole community” approaches to capability as part of [Emergency Support Function #6](#)⁶ (Mass Care, Emergency Assistance, Temporary Housing and Human Services Annex) and [Emergency Support](#)

Function #8⁷ (Public Health and Medical Services Annex).

Health care providers do participate in continuing education activities after graduation in order to qualify for license renewal and/or as part of organizational or accreditation mandates. Requirements vary between states and jurisdictions, however, and the organization and individual bear the time and cost of continuing education activities. Adding pediatric disaster continuing education requirements as part of mandatory education continues to be perceived as both challenging and costly.

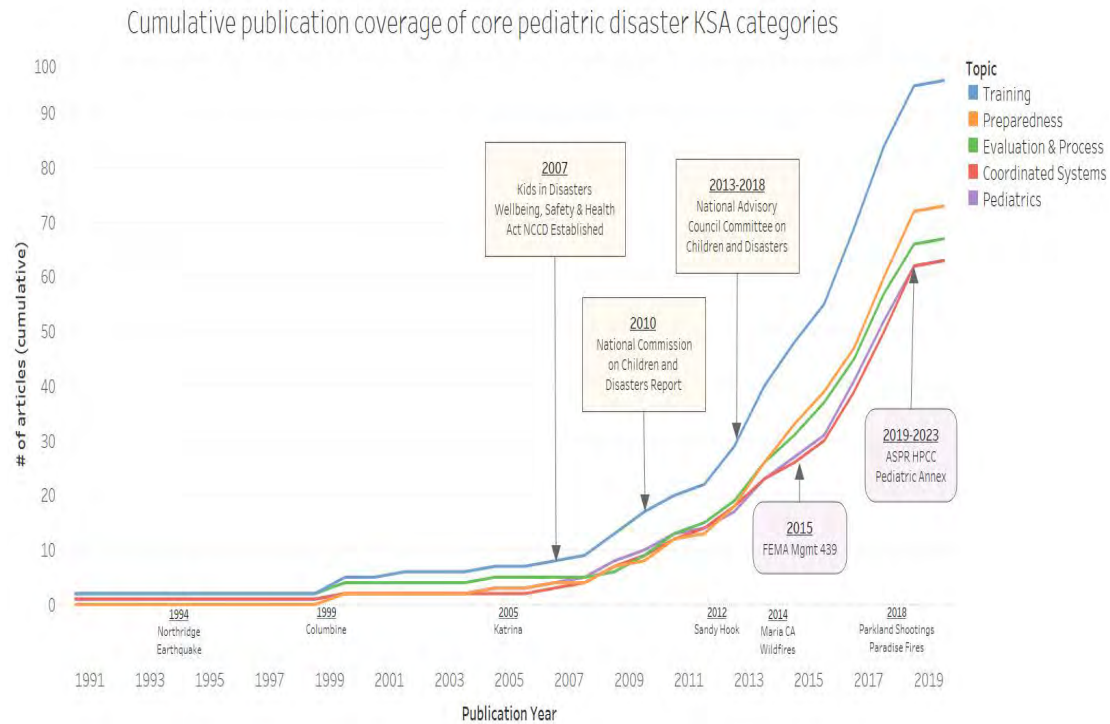
Pediatric disaster education gaps are highly variable; this makes it difficult to implement a one-solution approach. How the gaps manifest themselves is strongly influenced by an individual's discipline, operational and organizational experience, and priorities. There are, however, consistent themes that highlight the challenges posed by a lack of awareness, an inability to effectively access training solutions, and anxiety and fear on the part of providers who are not experienced in pediatrics of "getting it wrong."

The Role of Funding in Creating Pediatric Disaster Education Solutions

Every gap analysis conducted in disaster education and training has addressed the important role of federal funding to support capability. Funding is a powerful incentive to increase interdisciplinary engagement and collaboration. Funding has successfully closed many of the "content gaps" associated with pediatric disaster education; it should now pivot to close the systemic operational gaps that persist at the local, regional, and state levels.

The EGLPCDR education workgroup conducted a systematic pediatric disaster literature review and found that federal policies and funding in response to real-world events are strongly aligned with pediatric disaster education. Unfortunately, it was common to find that, without sustainable funding, pediatric disaster content efforts were disrupted; the result was of resources "dying on the vine" with no continuity of operations or plan for review, update, and/or deployment. Given the amount of effort, time, and advocacy required, future federal grant incentives should promote up-to-date sustainable, open-source, systems of multi-discipline deployable pediatric disaster education.

The illustration below represents a timeline of the volume of pediatric and disaster core curriculum publications and major, high-profile disaster incidents between 1991 and 2019. The timeline illustrates the establishment of federally-funded pediatric disaster national commissions and initiatives, and the volume of pediatric and disaster core curriculum literature. The clear association of high-profile disaster incidents and core curriculum publications focused on top KSAs strongly suggests that such crisis events are powerful drivers of guidance. In this limited review, the core curriculum literature's top KSAs were most associated with training, preparedness, evaluation and process, coordinated systems, and pediatrics.



Summary & Recommendations

Numerous gaps in pediatric disaster education and training persist due to the focus on content rather than on systemic improvement. Future funding on the part of HHS/ASPR should promote sustainable systems of pediatric disaster education and training on the local, regional, and state leadership levels.



Pediatric



Disaster



Core



Competencies

Pediatric Disaster Core Competencies

In 2012, the National Center for Disaster Medicine and Public Health (NCDMPH) published [Core Competencies for Disaster Medicine and Public Health](#) (see Table 1, below).⁸ The NCDMPH competencies were created under the umbrella of public health and focused on the whole community—inclusive of the most vulnerable populations, including children, individuals who have functional and access needs, and seniors. The core competency curriculum findings were informed by an extensive effort involving public-private, state, and federal entities.

Table 1. Core Competencies for Disaster Medicine and Public Health	
1	Demonstrate personal and family preparedness for disasters and public health emergencies
2	Demonstrate knowledge of one's expected role(s) in organizational and community response plans activated during a disaster or public health emergency
3	Demonstrate situational awareness of actual/potential health hazards before, during, and after a disaster or public health emergency
4	Communicate effectively with others in a disaster or public health emergency
5	Demonstrate knowledge of personal safety measures that can be implemented in a disaster or public health emergency
6	Demonstrate knowledge of surge capacity assets, consistent with one's role in organizational, agency, and/or community response plans
7	Demonstrate knowledge of principles and practices for the clinical management of all ages and populations affected by a disaster or public health emergencies, in accordance with professional scope of practice
8	Demonstrate knowledge of public health principles and practices for the management of all ages and populations affected by a disaster or public health emergency
9	Demonstrate knowledge of ethical principles to protect the health and safety of all ages, populations, and communities affected by a disaster or public health emergency
10	Demonstrate knowledge of legal principles to protect the health and safety of all ages, populations, and communities affected by a disaster or public health emergency
11	Demonstrate knowledge of short-term and long-term considerations for recovery of all ages, populations, and communities affected by a disaster or public health emergency

The NCDMPH further defined a hierarchical learning framework of competency sets in disaster medicine and public health, which can be applied to all populations including children, as

illustrated below.

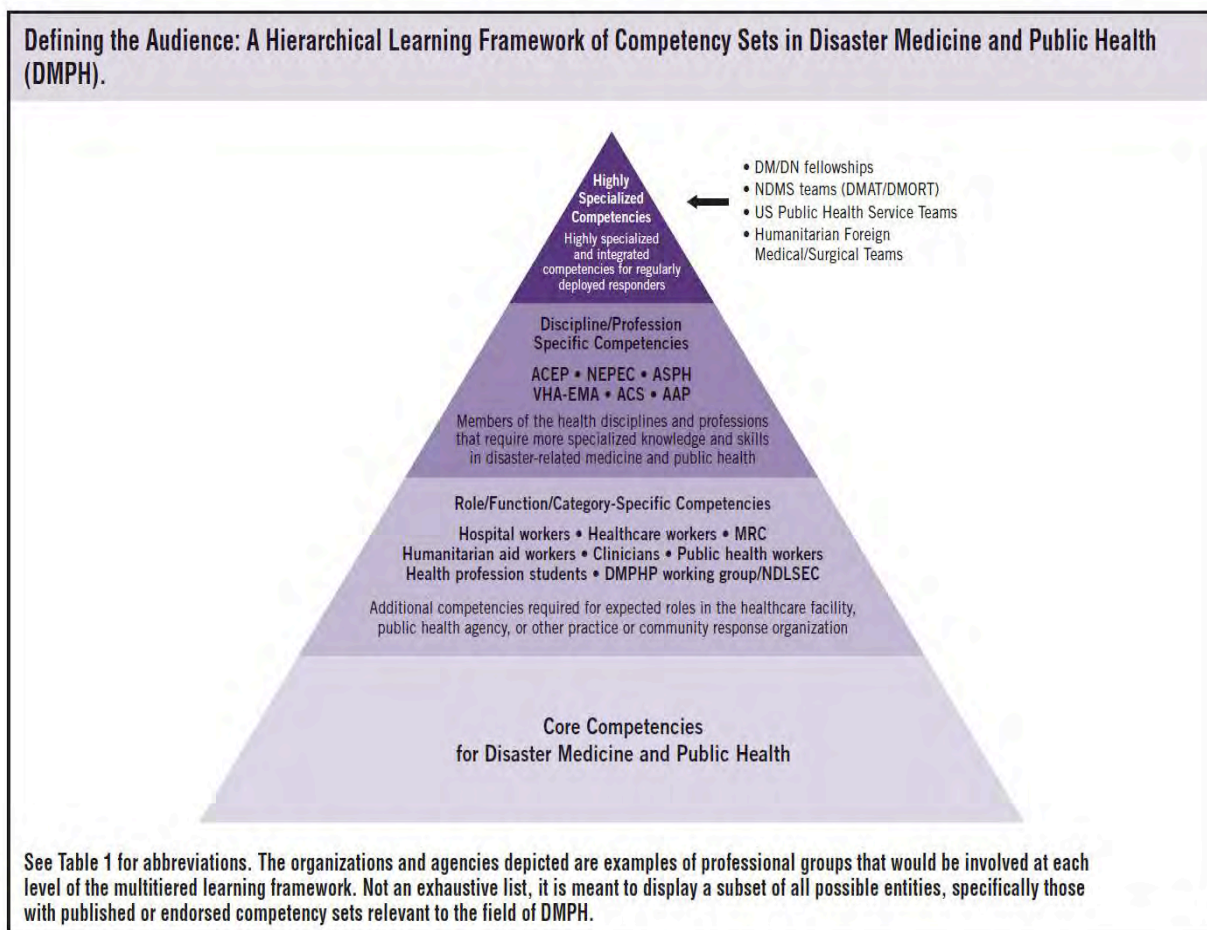


Illustration: [Core Competencies for Disaster Medicine and Public Health](#)

Subsequent to this effort, the NCDMPH used this system design approach to develop [Curriculum Recommendations for Disaster Health Professionals The Pediatric Population](#). This document recommended processes to respond to pediatric educational needs and compiled a comprehensive table of recommended learning objectives and resources based on each phase of the disaster cycle (e.g., Mitigation, Preparedness, Response, and Recovery / Reconstruction / Evaluation).

The [2010 National Commission Children and Disasters Report](#)⁹ informed the project and, in March 2011, NCDMPH facilitated the [Pediatric Disaster Preparedness Curriculum Development Conference](#).¹⁰ The 2011 NCDMPH pediatric conference’s vision was to establish a comprehensive disaster curriculum that would address all providers' needs and support those competencies with a model of online education that is responsive to providers' needs and hazard types. At the conference's conclusion, pediatric disaster competency “expectations” were captured for each “discipline” (EMS, Hospital, Ambulatory, Public Health, and CBRNE).

The design process diagram, below, illustrates NCDMPH’s proposed system for producing

quality pediatric disaster education and training.

Figure 1: Design Process Diagram

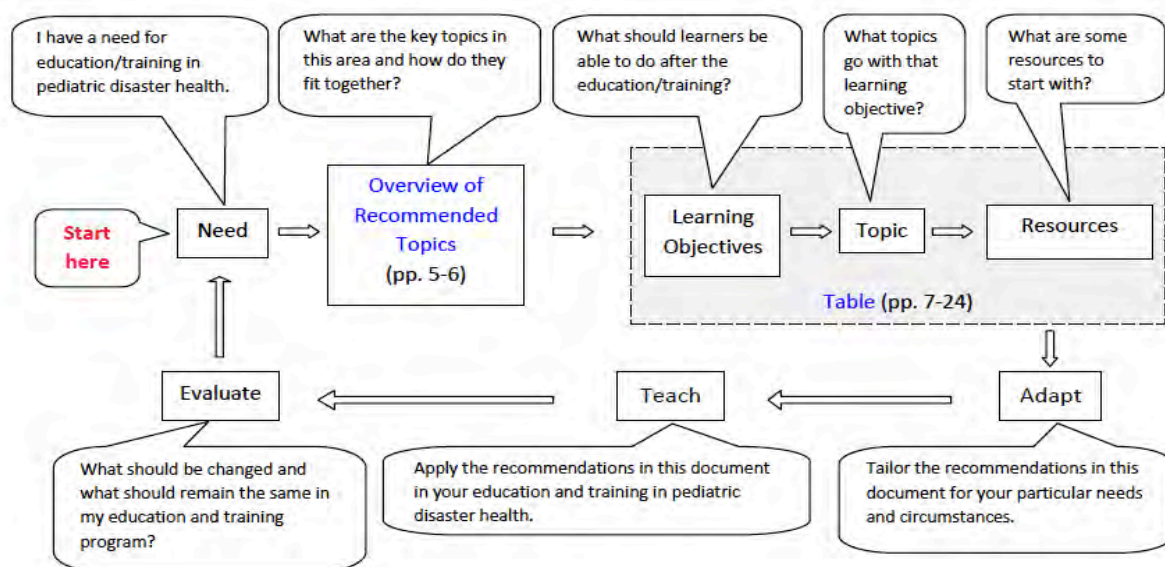


Illustration: [Core Competencies for Disaster Medicine and Public Health](#)

Unfortunately, the NCDMPH conference’s vision of developing a comprehensive pediatric disaster multi-disciplinary curriculum was never realized—due to lack of funding. NCDMPH subsequently produced three open-source pediatric disaster online trainings, however. The NCDMPH trainings are accessible on the website and include [Pediatric Tracking/Reunification](#), [Radiation Disaster Issues in Children](#), and [Psychosocial Impacts of Disasters on Children](#). These topics were developed in response to educational needs identified by the 2010 National Commission report.¹¹ The NCDMPH reports that, over the last three years, each course has been accessed through the NCDMPH website 100 times annually. The course is also accessible via ASPR TRACIE and the CDC TRAIN websites.

Summary

The NCDMPH core curriculum model informs the development of pediatric disaster education core competencies. NCDMPH’s 2011 efforts and subsequent conference proceedings are foundational to addressing pediatric disaster competency across disciplines.



Pediatric Disaster Education Programs

While many grassroots and academic pediatric disaster education programs, exist the Workgroup explored three specific pediatric disaster education program efforts that were established to be accessible to all disaster response disciplines and aligned with recommendations from the National Commission for Children and Disaster. These efforts, each described below, are:

- FEMA's IS-366 A: Planning for the Needs of Children in Disasters
- FEMA's New Community Preparedness: Integrating the Needs of Children
- FEMA Management (Mgt) #439: The Pediatric Disaster Response and Emergency Preparedness Course
- Pediatrics in Disasters Global Training Program

FEMA's "Whole Community" Initiative and Children

In December 2011, FEMA launched the [Whole Community Approach to Emergency Management: Principles, Themes and Pathways for Action](#).¹² The "whole community" concept is a way for community and emergency management leaders to collectively understand and assess the needs of their respective communities, and determine the best ways to organize and strengthen their assets, capacities, and interests. The approach promotes the benefits of shared understanding of community needs, community empowerment, and engagement; a stronger social infrastructure and connections across all phases of the disaster cycle; along with increased individual and collective preparedness and resilience. The needs of vulnerable populations and children are mentioned numerous times in the FEMA document.

In general pediatric disaster education and training efforts have not been emphasized in as part of Whole Community Readiness. While disaster preparedness education and training of health care coalitions' public-private partners frequently requires awareness level training [Introduction to the Incident Command System Basic Training](#) (ICS-C 100) no such requirement or practice is in place for children. Many health care providers and coalitions are unaware of the importance of early integration of children in emergency management efforts.

While [IS-366.A: Planning for the Needs of Children in Disasters](#)¹³ launched on December 9th, 2015 has provided an great example of an awareness level course for all disciplines the course was limited in its impact. In response FEMA has updated the program [Community Preparedness: Integrating the Needs of Children](#), released in October 2021. This new FEMA developed training is designed to empower Emergency Managers in local communities to bring the needs of children to the forefront of their local disaster planning and preparedness efforts.

What is reported on the real world effort to include children in Whole Community readiness is that it requires health care coalitions and community hospital executive leadership to engage and participate in the process. Operationally, however, the level of engagement between health care coalitions and community disaster preparedness is inconsistent across communities. Common assumptions found in both real-world discussions and the literature

include:

- The health care organization has been dealing with children for years, so no change or other effort is needed.
- The cost of training for a perceived “unlikely” need is not a priority. Health system leaders may view pediatric mass casualty of surge as a “black swan” event that is unlikely to occur; alternatively, they may view such an event as so overwhelming that it is simply not feasible to address it proactively.
- The current acuity and volume of children requiring health care services has not demonstrated that any change is needed.
- The necessary equipment and training are perceived as time-consuming and expensive.
- The health facility’s day-to-day role is limited to stabilizing patients and transporting them to their regional pediatric center; hence, there is a perception that more readiness is not required.

These assumptions exist in community hospitals, large academic settings, and critical access facilities. Pediatric disaster engagement is strongly influenced by the local population served, and by funding streams that do not sustainably incentivize the inclusion of children in planning and/or preparedness efforts.

Children Are Largely Absent in Whole-Community Emergency Management Planning

Although the “whole community” concept was adopted by FEMA years ago and is designed to include all ages, most operational areas do not include children in their threat and hazard identification and risk assessments. Recently, progress has been made, as a result of ASPR’s Public Health Preparedness and Health Care Coalition requirement that communities establish a Health Care Coalition Pediatric Annex. National and state emergency operation plans and guidance have only recently begun to routinely include the words “children,” “infants,” or “pregnant women” in their planning and disaster guidance documents.

HHS-funded programs that promote pediatric disaster readiness engagement through State EMS for Children’s Program, EIIC Disaster Quality Collaborative, National Pediatric Readiness Program, Health Care Coalition Public Health Emergency Program, and the Pediatric Disaster Centers of Excellence Pilot Program have kept children at the table. Sustainable relationships are needed, however, to engage the Public Safety disciplines of fire, law and emergency management in whole community disaster readiness.

Several comprehensive pediatric disaster training programs are available to multiple disciplines at either nominal or no cost. Each program is unique in its focus and opportunities for peer-to-peer learning and engagement. The educational content and available course impact data described below were obtained from the sponsoring agency, which also provided with appropriate permission to share as part of this report.

FEMA IS-366-A: Planning for the Needs of Children in Disasters and new Community Preparedness Integrating the Needs of Children Training

FEMA has been a leader in disaster online and in person disaster training across disciplines and community sectors for decades through their [Emergency Management Institute](#). Courses are provided online or in partnership with various training centers across the nation free of charge to participants. One such course is FEMA’s [IS-366.A: Planning for the Needs of Children in Disasters](#),¹⁴ which has been available on the FEMA Emergency Management Institute website since 2015. While in March of 2021, FEMA reported that the agency intended to update the IS-366.A course and expand it to a community-level workshop, it is important to look at the history and impact of IS-366.A (see chart below). The training was a no-cost, six-hour online course that was launched on December 9th, 2015, as part of FEMA’s core curriculum guidance for Emergency Managers and those involved in children’s programs. The online training approach is commonly used by FEMA as awareness-level training.

Year	Completions
2021 (YTD Jan-Mar)	811
2020	4,965
2019	2,832
2018	2,462
2017	2,289
2016	2,123
2015	2,363
2014	2,477
2013	2,103
2012	2,102
2011	1,943
2010	2,742

IS-366.A purpose was to prepare participants to be able to create, update, or revise an Emergency Operations Plan for their community or organization in order to effectively address children’s unique needs during disasters. The target audience is local and state emergency managers and planners. Other individuals or groups who may benefit from the course include those who are directly involved with meeting children’s’ needs, such as:

- Judges and other members of the State, county, and local governmental legal system
- Voluntary Organizations Active in Disasters (VOADs), faith-based organizations, and other non-profits
- Child service agencies
- Child-care providers
- Schools

Much of the IS.366.A course content is based upon the document, [“The Unique Needs of Children in Emergencies: A Guide for the Inclusion of Children in Emergency Operations Plans,”](#) which was published by Save the Children in 2007.¹⁵ The online training itself included the

following modules:

- Lesson 1: Course Overview
- Lesson 2: Unique Needs of Children in Disasters
- Lesson 3: Critical Components of a Child's World
- Lesson 4: Mitigation
- Lesson 5: Preparedness
- Lesson 6: Response
- Lesson 7: Recovery
- Resources Toolkit: a downloadable PDF

It is unclear if FEMA's online course, [IS-366.A: Planning for the Needs of Children in Disasters](#),¹⁶ will continue to be available on the FEMA Emergency Management Institute website when replaced with the new workshop based program ["Community Preparedness: Integrating the Needs of Children"](#). The course was limited in its utilization and impact based on the data provided by FEMA who recognized the need to re-design the course for a better result.

FEMA's new Community Preparedness: Integrating the Needs of Children course is designed to promote engagement using a workshop approach and be led by local Emergency Managers to facilitate engagement of their whole community in the process of integrating the needs of children across the disaster continuum.¹⁷ The course builds on the concept that "it takes a village" and seeks to engage a board range of community representatives. Downloadable workshop materials including an instructor and participant guide, slide set and additional resources are designed to be used as part of either a one, two or three day in-person or virtual workshop series.

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community.fema.gov/PreparednessCommunity/s/communitypreparedness

Image Source:

[Community Preparedness: Integrating the Needs of Children Workshop Flyer](#)

While it is premature to evaluate this new training programs impact the timing of the launch of offers a unique opportunity for the pediatric community to support whole community pediatric disaster education. Emergency Managers should be encouraged to reach out to the pediatric community to participate workshop collaborators.

FEMA Management (Mgt) #439: The Pediatric Disaster Response and Emergency Preparedness Course

The Pediatric Disaster Response and Emergency Preparedness Course includes a high level of in-person engagement as part of an operational area training program bringing together multiple disciplines that would work with each other during an actual event. This approach creates unique opportunities to support real-world operations and ensure children are included in all aspects of disaster preparedness. The 16-hour training prepares stakeholders to effectively and safely plan and respond to a disaster incident involving children, and to address pediatric patients' specific needs in the event of a community based-incident.

The course was developed and launched by the Texas A&M Engineering Extension Services (TEEX) in 2014. The curriculum is focused on the filling the gaps in knowledge, skills, and abilities as benchmarked and recommended by the National Commission on Children and Disasters (NCCD). This national curriculum evolved concurrently with ASPR healthcare coalition initiatives. A course update is conducted every five years as part of a rigorous evaluation process. The course is offered to jurisdictions at no cost for materials or faculty. The requesting organization is required to provide an appropriate training location and course registration. Course attendance requires a minimum of 30 registrants and can accommodate up to 60 individuals.

The TEEX Mgt #439 course covers high-value pediatric disaster all-hazards content including: children with functional and access needs, sheltering, reunification, decontamination, triage, surge, transport and evacuation, and behavioral health. The teaching methods used include lecture, multi-media, small group scenario-based discussions, and peer-to-peer sharing of experiences.

According to data obtained from the TEEX Emergency Services Training Institute (ESTI), 8,239 individuals were trained between August, 2014 and December, 2019. These participants were associated with more than 21 diverse disciplines, with over 50% in healthcare and emergency services sectors, as illustrated in the chart below.

Discipline	# of Students
Agricultural Safety (Pre- and Post-Harvest)	1

Animal Emergency Services	3
Citizen/Community Volunteer	193
Education	15
Emergency Management	833
Emergency Medical Services	1341
Fire Service	367
Governmental Administrative	58
Hazardous Materials	16
Healthcare	3573
Information Technology	12
Law Enforcement	288
Other	542
Private Sector/Corp. Security & Safety Professions	64
Private Sector/Corporate Security and Safety	18
Public Health	861
Public Safety Communications	14
Public Works	10
Search and Rescue	26
Transportation Security (Air, Water, Ground, Port)	4
Total Unique Students	8239

In 2017, TEEX conducted a comprehensive post-course needs survey in preparation to updating the curriculum. The needs assessment garnered 610 responses from 47 states and 2 US territories. Almost all respondents (96%) indicated that the class met their training needs and recommended that it be offered as a national level training course for first responders, first receivers, public health practitioners, and emergency managers. The survey further revealed that only 57% of the respondents had existing plans to integrate children into their all-hazards plans.

Course evaluations from 7,400 participants from 240 classes held between December 4, 2013, through November 6, 2019 consistently demonstrated a high value of the content; participants reported post-attendance growth at the organizational level, as follows:

Post Attendance Participant Reported Growth at Organizational Level¹⁸	
Senior administrative awareness increased	10.9%

Pediatric Disaster Plans were developed	5.2%
Drills involving Children were planned or occurred	16.1%
Policies/procedures address children were developed	10.7%
Increased coordination with other agencies to address the needs of children	11%
Recognition of greater responsibility in planning for the needs of children in disasters	17.5%
Encouragement directed towards employees to develop family disaster plans	11.2%

Participant Reports of Enhancement of Pediatric Disaster Knowledge, Skills and Abilities (KSAs)¹⁹	
Catastrophic Health Planning	51.3%
Children with Function and Access Needs	66.8%
Sheltering	56.1%
Reunification	56.3%
Decontamination	43.2%
Pediatric Triage	55.1%
Transport and Evacuation of Children	48.5%
Mental Health Needs of Children	48.7%

In a subsequent TEEC 6-month post-course surveys conducted in November 2019, 87% of participants indicated that they “agreed” or “strongly agreed” that the course was valuable in supporting their operational mission; 92% responded that the training was valuable in supporting their response mission.

This course effectively serves as an in-person, comprehensive, cross-sector, non-clinical relationship-building disaster training experience that can jumpstart local, regional, and state pediatric disaster preparedness and response readiness. The new course update received its final FEMA and Department of Homeland Security approval in 2021.

Pediatrics in Disasters Global Training Program

The [Pediatrics in Disaster](#) Global Training Program is one of the first pediatric disaster programs that was created to address gaps in pediatric disaster knowledge, skills, and abilities. The training was developed by a joint [American Academy of Pediatrics \(AAP\)](#) and [Johnson and Johnson Leadership Institute](#) task force that was formed in 2004. The course was designed with input from the World Health Organization (WHO), Save the Children, and the United Nations

High Commission on Refugees (UNHCR). The curriculum targets the needs of low and middle-class countries, with the initial program designed for pediatric providers in Latin American and the Caribbean.

The course aims are reported as:

1. Motivate pediatric health professionals to participate in pediatric disaster planning and response activities for their communities by providing training that they consider to be useful and valuable.
2. Establish a global international cooperative for pediatric disaster training centers to disseminate the training throughout the country, especially in areas prone to natural events.
3. Facilitate collaboration for the training among professional societies, hospitals, medical schools, and governmental agencies in order to improve coordination related to pediatric disaster preparedness planning and response.

Ten course modules are available as stand-alone resources and guidance for download from the [AAP](#).²⁰ [Pediatric Education in Disasters Materials](#) by module and topic are as follows:

- Module 1: Disasters and Their Effects on the Population: Key Concepts
- Module 2: Preventive Medicine in Humanitarian Emergencies
- Module 3: Planning and Triage in the Disaster Scenario
- Module 4: Pediatric Trauma
- Module 5: Management of Prevalent Infections in Children Following a Disaster
- Module 6: Diarrhea and Dehydration
- Module 7: Delivery and Immediate Neonatal Care
- Module 8: Recognition and Management of Malnutrition
- Module 9: The Emotional Impact of Disaster on Children and Families
- Module 10: Toxic Exposures

The University of Colorado School of Public Health has administered the didactic program annually since 2008; the last update was conducted in collaboration with the AAP in 2016. The 2016 curriculum update focused on countries with displaced populations, Ebola, malaria, and malnutrition, and was conducted in collaboration with the AAP/WHO's partnership program ["Helping Babies Breathe."](#)

The Colorado Pediatrics in Disasters Global Training Program was offered in 23 countries. It is estimated that the in-person program trained approximately 690 to 920 professionals annually. The program administrators note that students consistently rate the course as valuable and high-quality (no statistics are available, however). The course has had at least partial success in accomplishing the training's three aims (see above), as noted in the 2014 document, ["Pediatrics in Disasters: Evaluation of a Global Training Program."](#)²¹ This study estimated that the course would take several years to reach a critical mass of pediatricians and other physicians, and that stronger support from governmental agencies would be necessary to achieve that goal.

In 2020, the training program moved to a virtual platform in order to increase accessibility and reduce cost as a barrier to participation. The online course is now offered regardless of discipline at a nominal cost of \$25 if no certificate of completion is required, or \$100 if a certificate is required. As of June 2021, the ASPR Pediatric Disaster Center of Excellence WRAP-EM is exploring efforts to update the curriculum as a no-cost training to providers. This comprehensive course for pediatric providers and clinicians who are active in real world disaster response has a strong focus on pediatric clinical treatment and activities. The course [published](#) its evaluation of its three primary aims in 2014, with results as summarized in the table below.²²

Program Aim	Evaluation Results
Motivate pediatric health professionals to engage in disaster planning and response.	Pretesting and post-testing demonstrated cognitive gains and course satisfaction. The course trained 730 health professionals in 8 counties between 2008-2013.
Establish Pediatrics in Disasters training centers internationally.	12 training centers were established between 2008-2013 offering a minimum of 1 course a year. Barriers of cost and availability of instructors impacted course continuity in several countries. Course availability was adversely impacted when centers did not have government funding.
Facilitate collaborative training to improve coordination between multi-discipline partners.	The process of organizing courses with and between professional societies, hospitals, medical schools, and governmental agencies stimulated engagement.

Summary & Recommendations

There are current curricula that are available and should be included in pediatric disaster education across disciplines immediately. Low-lying fruit that align with this effort include:

- In partnership with FEMA explore the opportunity to develop an short online awareness level course similar to the recently sunset FEMA Emergency Management Institute IS-366.A Course “Planning for the Needs of Children in Disasters” that could be used as an minimum requirement for on-boarding public safety, prehospital, emergency managers, and health providers including pharmacists, respiratory therapists and other allied health providers. Creating an awareness-level training would further support integrating children into “whole community” emergency management.
 - Entities that are currently required to take ICS-100 that would benefit from an awareness level pediatric disaster course are nursing, medical school, prehospital, and allied health training programs. Such a course could be provided as part of that disciplines pediatric entry-level training as online training.
 - A pediatric disaster level awareness online course should be updated no less than every three to five years to remain relevant.

- Collaborate with FEMA on the launch of the new Community Preparedness: Integrating the Needs of Children creating a pathway for community emergency managers to teach with the support of local or regional pediatric disaster subject matter experts.
- Of the standardized trainings reviewed, the FEMA Mgt 439 course has the strongest profile of efficacy and support for regional cross-discipline engagement, based on the program's needs survey and evaluation practices. Impactful pediatric disaster educational programs clearly benefit from strong systems of course evaluation to inform and improve their content.
- The [Pediatrics in Disaster](#) Global Training Program is as a robust training program for clinicians and could be positioned to serve a broader audience in order to assist communities in orienting those with clinical care responsibilities in caring for children.



Pediatric



Readiness



Expectations

Pediatric Disaster Readiness Expectations

Standards for pediatric training and education vary between states and disciplines. For example, prehospital training programs limit pediatric training to a few hours at the most basic scope of practice. This provides a limited introduction to pediatric prehospital care and is not designed to foster competency. Industry literature, as well as EMS provider self-reports, consistently describe a lack of confidence among EMS personnel in caring for children.^{23, 24}

The 2013 National Association of State Emergency Medical Services Officials (NASEMSO) [Pediatric Considerations Gap Analysis](#) of prehospital personnel lists the following barriers to effective pediatric education:²⁵

1. Most programs have not allocated sufficient time to pediatric-related didactic content, labs, or clinical experiences.
2. EMS Programs often rely heavily on instructor-centered teaching methods and do not gain the benefit of simulations (high fidelity or low tech) or contact with "real" children or clinical time in a pediatric care setting.
3. It is unclear to many instructors how to design lesson plans and educational strategies that fully address the needed depth and breadth of instruction.
4. Educator time may be very limited for curriculum development, especially if it involves sophisticated simulations and/or AV aids.
5. Adult students have different learning styles and are more motivated to accept responsibility for learning when convinced of the need for knowing the information.

Source: [NASEMSO: Pediatric Considerations Gap Analysis](#)

Prepared with a handful of hours of formal instruction associated with their entry-level training programs, prehospital personnel are expected to achieve both clinical and professional competency through continuing education mechanism on the local level, and through national life-support programs such as the AHA's Pediatric Advanced Life Support (PALS) Program. Systemic resources simply do not exist to reliably ensure that all prehospital providers benefit from pediatric continuing education opportunities to achieve competency commensurate with their scope of practice.

Nursing and medical training programs have more formula expectations and longer periods of both didactic and clinical training to qualify for entry into practice. Pediatric content varies depending on the quality of the clinical rotations, however, with limited or no introduction to content about how disasters affect vulnerable populations such as children. Competency is a "use it or lose it" proposition; provider capability is adversely impacted when there is a lack of routine effective training and clinical experiences. The current system and training expectations

associated with health provider entry into practice and continuing education result in pediatric disaster readiness being learned haphazardly “on the job,” or as learning gained “the hard way,” as a consequence of real-world events.

Today, families and their children are exposed and disproportionately impacted by multiple and concurrent disasters associated with climate change and health system disparities. Yet, there is no standard content for pediatric disaster awareness across health care disciplines and communities. The concept of “whole community disaster readiness,” inclusive of disaster readiness for children, continues to be an aspiration and is not part of the emergency management culture in the United States.

There are opportunities to build a culture of preparedness through engagement with programs targeting youth (such as the [FEMA Youth Preparedness Council](#) at the elementary or high school level). To be effective, these programs should be made part of every school district and community emergency management effort. According to a 2019 [Harris poll](#), 61% of Americans believe that they will be “personally impacted” by disaster in the next 3-5 years; yet, most communities exist in disaster readiness “deserts.”²⁶

An overwhelming array of well-vetted, free or low-cost pediatric emergency and disaster education and training exist on the Internet but, without curation, these resources are difficult to deploy as JIT education. This is a result of a failure to fully plan to connect learners to content and to utilize well-designed pediatric disaster training for disaster education across not only disciplines but also communities.

Some community Emergency Department organizations and leaders characterize training in PALS, Neonatal Resuscitation Program (NRP), or Advanced Pediatric Life Support (APLS) as “[merit badges](#)” and describe such requirements as being of low-value. In some cases, that perspective may be accurate if the course content is low-quality and/or out-of-date, or if the provider regularly engages in disaster operations as part of its practice or organizational culture.²⁷ In contrast, hospital-based education that is required of nurses, allied health, and prehospital workforce are tied to requirements that are instituted by the Joint Commission and federal Centers for Medicare and Medicaid (CMS). Yet, under normal conditions, most community hospitals see relatively few critically ill pediatric patients. Hence, the ability to “sustain” day-to-day competency is problem-prone, as evidenced by participant feedback to the [National Pediatric Readiness Project](#)’s surveys and collaboratives.

Summary & Recommendations

Whole community initiatives that include children should provide the foundation to support future health-system- and provider-level pediatric disaster capabilities. The opportunity exists for disaster leaders to move away from seeing pediatrics as a niche capability and to set consistent expectations for pediatric disaster capacity both early and often.



Pediatric



Disaster



Education





Design



Thinking

Pediatric Disaster Education and Design Thinking

Education is a dynamic and ever-evolving process with the goal of moving toward increased operational area capability. The Homeland Security Exercise and Evaluation Program (HSEEP) framework helps with this and serves as the standard work emergency managers use to track and improve disaster readiness and capability. HSEEP replicates a Plan-Do-Study-Act (PDSA) model and is aligned with Design Thinking focused on effective and scalable solutions to meet the community and health system needs in both day-to-day and disaster incidents.

HSEEP 2020 ^{28 29}	DESIGN THINKING ³⁰
 <p>The diagram shows a circular 'Preparedness Cycle' with five segments: Organize/Equip (top), Train (right), Exercise (bottom right), Evaluate/Improve (bottom left), and Plan (left). In the center, a star-like shape contains the text 'Threats, Hazards, and Risks' and 'Preparedness Priorities'.</p>	 <p>The diagram illustrates the 'DBE DESIGN THINKING PROCESS' as a circular flow of six steps: 1. DEFINE (with insight), 2. BRAINSTORM (with imagination), 3. PLAN (with agility), 4. CREATE (with impact), 5. IMPROVE (with excellence), and 6. INFORM (with passion). The cycle is framed by the questions 'HOW?' and 'WHY?' and the acronym 'WHYHM' at the bottom.</p>
<p>HSEEP Fundamental Principles</p> <p>The following principles frame the common approach to HSEEP</p> <ul style="list-style-type: none"> • Guided by senior leaders. • Informed by risk. • Capability-based, objective-driven. • Progressive exercise planning approach. • Common methodology; and • Whole Community integration. <p>FEMA established the Homeland Security Exercise and Evaluation Program to support a standard work to support systematic improvement. HSEEP is not only an evaluation process but a system-level tool that ensures continuous improvement.</p>	<p>Design Thinking Fundamental Principles</p> <ul style="list-style-type: none"> • A solutions-based approach to solving problems. • An iterative, non-linear process. • A way of thinking and working. • Supported by a collection of strategies and methods. • Develop empathy and understand the needs of the people solutions are designed for. • Define problems and opportunities for designing solutions. • Generate and visualize creative ideas. • Develop prototypes. • Test solutions and seek feedback. <p>Design Thinking has emerged a method to promote "Whole Community" Engagement more recently to support Emergency Management consensus and sustainable outcomes</p>

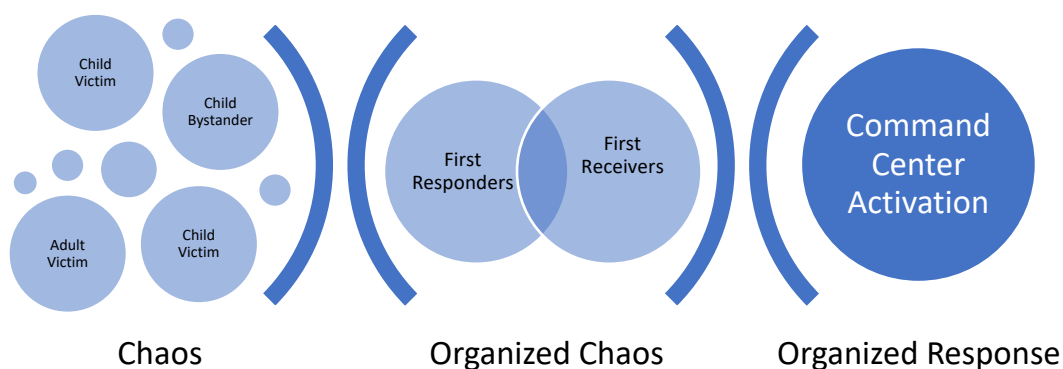
Designing Just-In-Time (JIT) Learning Experiences, Exercises, and Systems

Emergency management concepts and experience support the value of disaster provider education that is focused on producing high-functioning operational teams. These concepts apply to pediatrics, children with disabilities, neonates, and pregnant women. Learning and retention to achieve competency and improve performance is known to require a variety of

teaching methods. Over the last 20-plus years, pediatric and neonatal simulation interventions have been incorporated into design thinking solutions that advance the quality of provider experiences.

Regardless of the quality of the educational intervention, leadership commitment must exist to promote inclusion of children. Leadership is key to engagement and building organizational and community resiliency. Efforts launched by community hospitals and the ambulatory care sectors (where children receive over 69% of their day-to-day care) suffer from high turnover in both staff and executive leadership. This produces competency efforts that wax and wane, leading to variation in the delivery of pediatric care that impacts both surge and disaster events.³¹

The existence of a pediatric physician and nurse champion who has is empowered to facilitate regular exercises is known to be essential to creating sustainable improvement. Community providers—regardless of their discipline—may not consider child emergency preparedness as part of their daily work but, when they are empowered by pediatric emergency care coordinators (PECC), improvement is possible. Pediatric day-to-day operations can be scaled during an incident to move from chaos to an organized response, as illustrated in the graphic below.



The exemplar culture exists in the practices of Fire/EMS-based service providers. These providers routinely utilize the Incident Command System (ICS) in day-to-day non-disaster operations to the point that doing so becomes second nature. The result is that the workforce performs with more confidence, calm, and less confusion to manage an incident.

Lessons learned from both disaster exercises and real-world events demonstrate that simple activities—such as orientation to the department operation center, warm-up time, and workstation orientation—promote capability and also position the entire workforce to work as a coordinated unit. In such an environment, the right person will be assigned to the right position and have the right training to be effective.

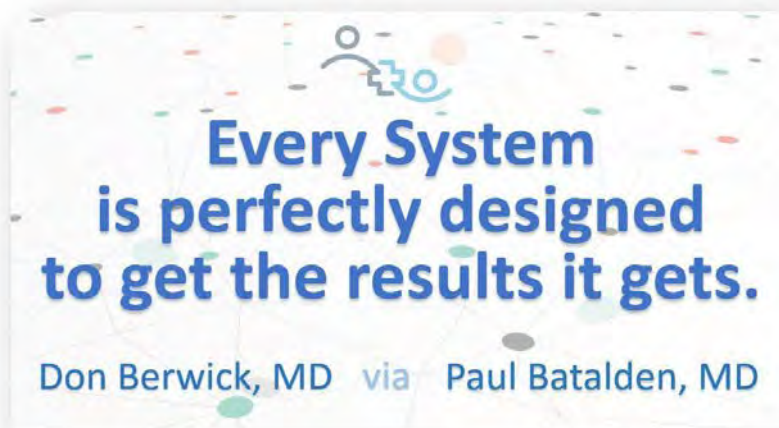


Illustration ³²

Nationwide, rural and urban communities and health care systems have benefited from participation in [“systems of care”](#) for cardiac arrest, stroke, myocardial infarction (STEMI) and trauma in order to improve outcomes.³³ Systems of care programs have been used to support community engagement between bystanders, first responders, community hospitals, and specialty centers in order to improve outcomes. Communities that adopt systems of care for children create incentives to engage in pediatric day-to-day care and disaster readiness.

A systems design approach to improve operations is part of the health care safety and improvement culture that is promoted by the Institute of Health Care Improvement (IHI) and is core to the [EICC Quality Collaborative Initiatives](#), including the [Disaster Domain](#).^{34 35}



The EMS for Children Program and National Pediatric Disaster Readiness Initiative has long provided a model to promote a system of pediatric disaster education and training. A few examples of FEMA's whole community system for pediatric disaster education include the following:

- Bystander training focused on families, schools and childcare
 - CPR and AED
 - Stop-The-Bleed
 - PsySTART
- Prehospital and Emergency Department pediatric equipment and medication
 - Pediatric Triage (e.g., JumpSTART, SALT)
 - Age-appropriate pediatric reference charts
 - Length-based weight estimation
 - Vascular access and airway management checklists
- Evidenced-based prehospital protocols
 - Management of cardiac arrest
 - Management of respiratory distress
 - Management of trauma, sepsis, and seizures
 - Hazardous materials exposure and decontamination
- Scenario-driven psychomotor practice with improvement-focused feedback
 - Shared cross-discipline training that promotes team relationships
 - Situation-Background-Assessment-Recommendation (SBAR) Communication
- Situational awareness of local pediatric medical health assets
 - Emergency Department Pediatric Readiness Scores
 - Pediatric and neonatal bed capacity
 - Pediatric prehospital provider readiness and training
- Access to open-source virtual pediatric education supporting continuous learning.
 - Webinars and podcasts
 - Smartphone clinical and triage decision support applications
 - Virtual exercises
 - Video grand rounds
 - Online simulation

Systemic Approaches to Developing Capability

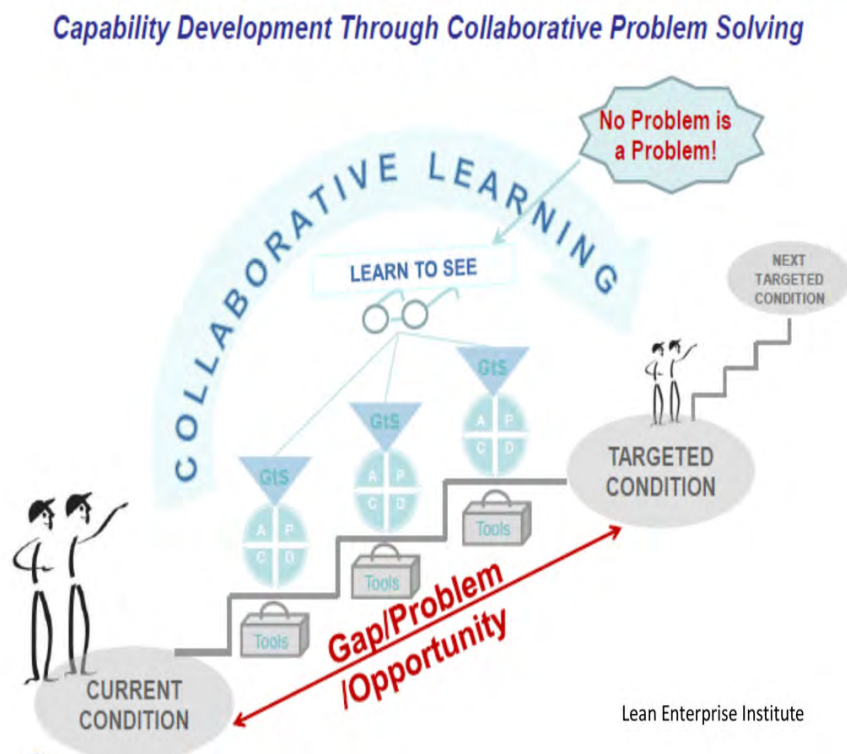
Over the last decade, disaster readiness has been highly influenced by process improvement concepts focusing on “what matters.” Disaster concepts like ICS and whole community readiness are, however, not part of entry-level training in medicine, nursing, public health, prehospital, or allied health programs; they are reserved for post-graduate or special electives.

Nationally, there is a growing consensus and recognition among disaster disciplines that critical knowledge, skills, and abilities *must* be combined with design-thinking and process improvement to achieve whole community preparedness, workforce competency, and

operational area resiliency.

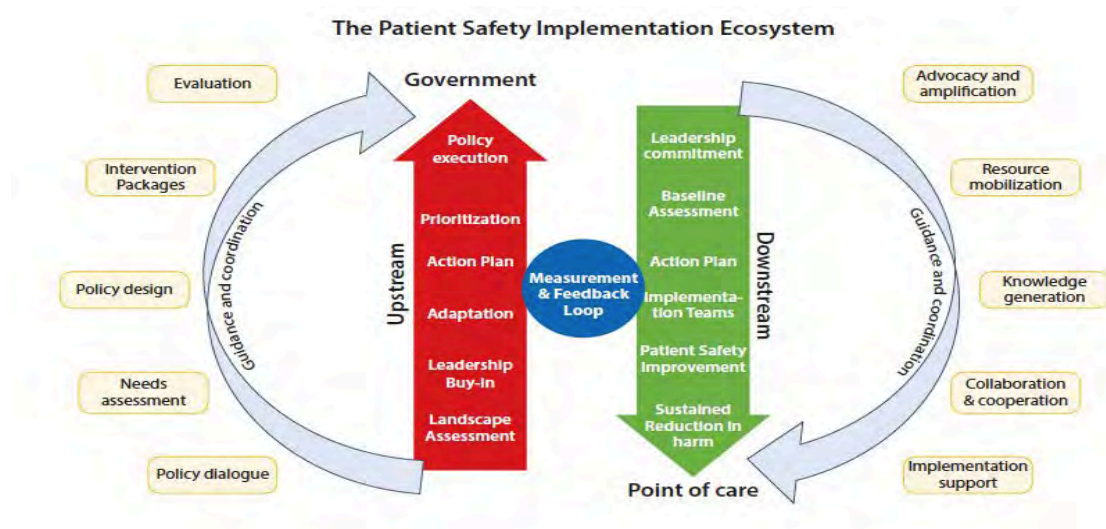
Whole population disaster readiness requires over-arching levels of effort; collaboration to reduce barriers; support of the workforce; and engagement of the community. The following are examples that illustrate how a systematic learning approach is essential to building capability

- In May 2017, Chief Medical Officer Dr. John Anderson gave a grand rounds presentation on Community and Family Medicine on transforming primary care.³⁶ During the presentation, he presented the following illustration on “capability development.” This illustration is an example of the challenges that are common to health care that requires a team approach with leadership in support of a collaborative learning environment in order to improve.



Collaborative Learning: Illustration Source³⁷

- In August 2020 the WHO posted the first draft of its Global Patient Safety Action Plan, a transformational document to create a shared global vision for patient safety.³⁸ In that document, the following graphic illustrates the essential components of a global ecosystem of patient safety implementation. Such a model is inclusive of children in both normal and disaster conditions.



Global Patient Safety Action Plan: Illustration Source.³⁹

- Another model that calls for integration was found in a recent commentary entitled [Connected Communities of Care in Times of Crisis](#), which advocated for unprecedented cooperation and a system of care.⁴⁰ The real-world events of COVID-19 reinforce the need for collaboration and reduction of barriers to providing appropriate access to care, information, and safety-net services held together by key anchor organizations and their partners.

Connected Communities of Care Model Schematic Including Centralized Governance Structure

The figure shows the organization of a typical Connected Community of Care (CCC) made up of a ring of various community-based organizations that provide essential social services along with an array of health care entities ranging from individual hospitals or health systems to clinicians' offices, mental health facilities, and Federally Qualified Health Centers (FQHC). At the heart of the CCC model lies the governance structure that, like the network participants, can vary from CCC to CCC. However, all CCCs include one or two lead Anchor Organizations, typically major philanthropic or social service entities, and a number of Key Partners, such as health care providers, social support providers, and faith-based organizations, that together set policy and direction for the CCC.



Source: Parkland Center for Clinical Innovation
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

Designing Pediatric Disaster Education Systems for Convergence

In 2014, the National Institute of Health (NIH) published [Convergence: Facilitating Transdisciplinary Integration of Life Sciences, Physical Sciences, Engineering, and Beyond](#). The document called upon on life sciences to facilitate transdisciplinary integration as a key strategy to tackle complex challenges and establish “inclusive” innovative solutions.⁴² The approach requires strategies and practices to facilitate public and professional awareness; coordination of effort, including the re-design of education; and training programs to foster convergence. The report was developed by the NIH’s vision-setting body that included funders of science and technology innovation, academic leaders, community, government, industry, medical and regulatory parties.

Convergence is a problem-solving approach that “cuts across” disciplinary boundaries.⁴³ The process requires the commitment of leadership at all levels, a goal-oriented vision, a collaborative culture of support, and resources that promotes knowledge-sharing and fosters understanding across disciplines. The approach is intended to create an overall “ecosystem” of supporting technical and logistical partnerships.

Fast-forward to 2020, and the concept of design-thinking and convergence has been adopted as a best practice in numerous sectors. It is also aligned with high-value programs such as Lean Six Sigma, whose focus is not just continuous improvement but the elimination of variation and waste. An example of how convergence influenced the emergency management community is the [Impact360 Alliance](#) initiative, which provides open-source convergence training, toolkits, and networking for interdisciplinary researchers, practitioners, and communities to reduce the consequences of natural hazards and disaster through inclusive problem-solving.

Impact360 Alliance focuses on facilitating “convergence” to bridge gaps between stakeholders through the use of integrative approaches between university, government and private sector organizations, and professionals in order to reduce the impacts of natural hazards and disasters. The initiative aligned numerous disaster academic centers with the National Oceanic and Atmospheric Administration (NOAA), thereby facilitating collaborations between the disaster disciplines of environmental engineering, meteorological studies, and social/public policy. Although it is not affiliated with healthcare disaster management, the framework reinforces the need for disaster readiness integrative solutions and active collaboration in order to be successful.



Convergence Illustration Source: [Impact360 Alliance](#)

Highly-networked collaborations such as Impact360 Alliance, Institute for Healthcare Improvement, and many others play an important role in supporting national preparedness initiatives. These professional and service-based organizations create the opportunity to bring a large network expertise to the table when incentives are aligned to support collaboration.

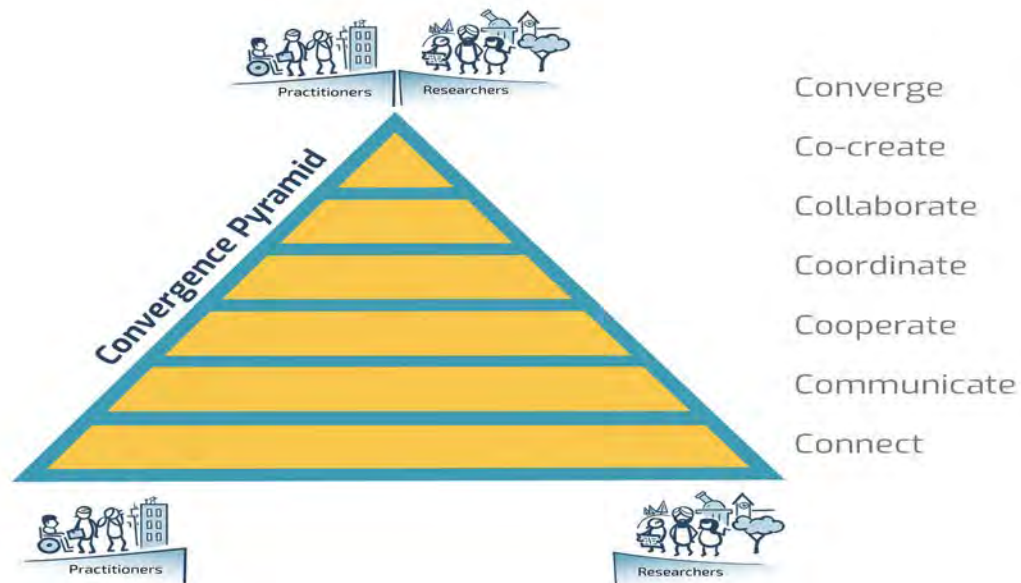
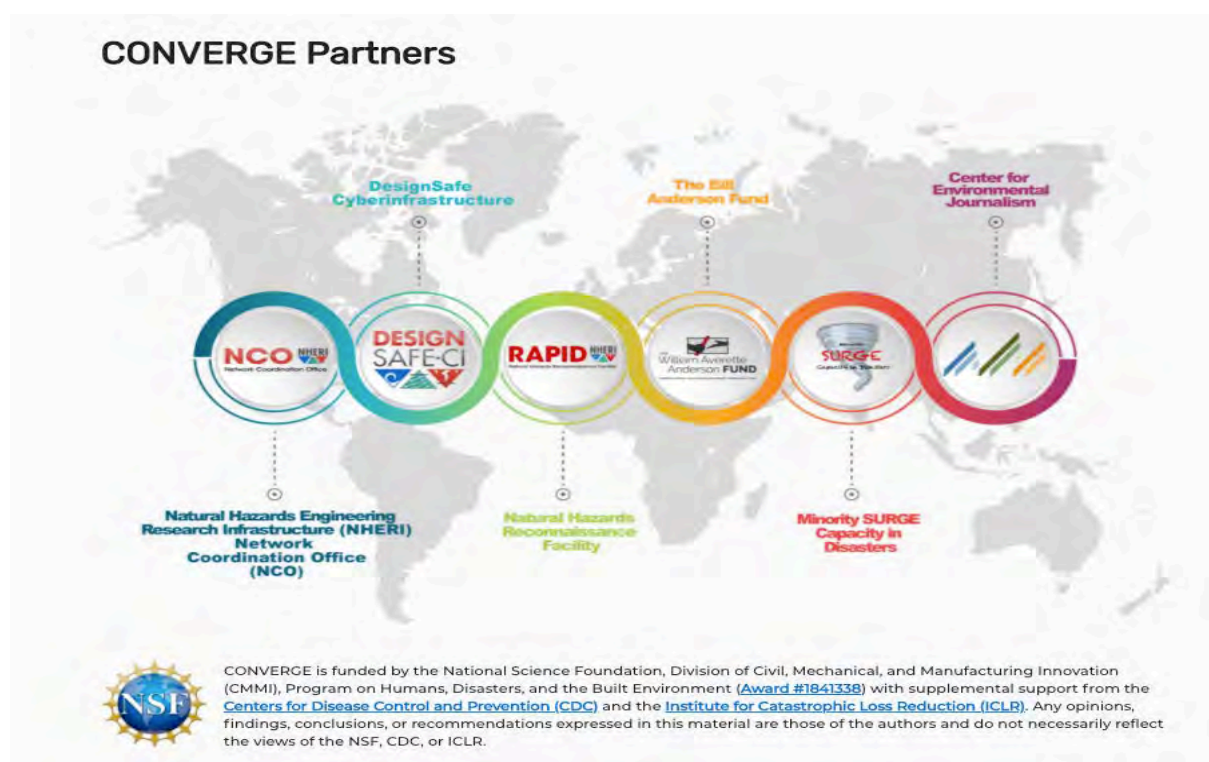


Illustration Source: [Impact360 Alliance](#)

Impact360 Alliance has created a Toolkit360 (a set of 12 tools) for facilitating inclusive problem-solving between researchers and practitioners. These tools can serve as process models to address capability gaps associated with caring for children during a disaster.

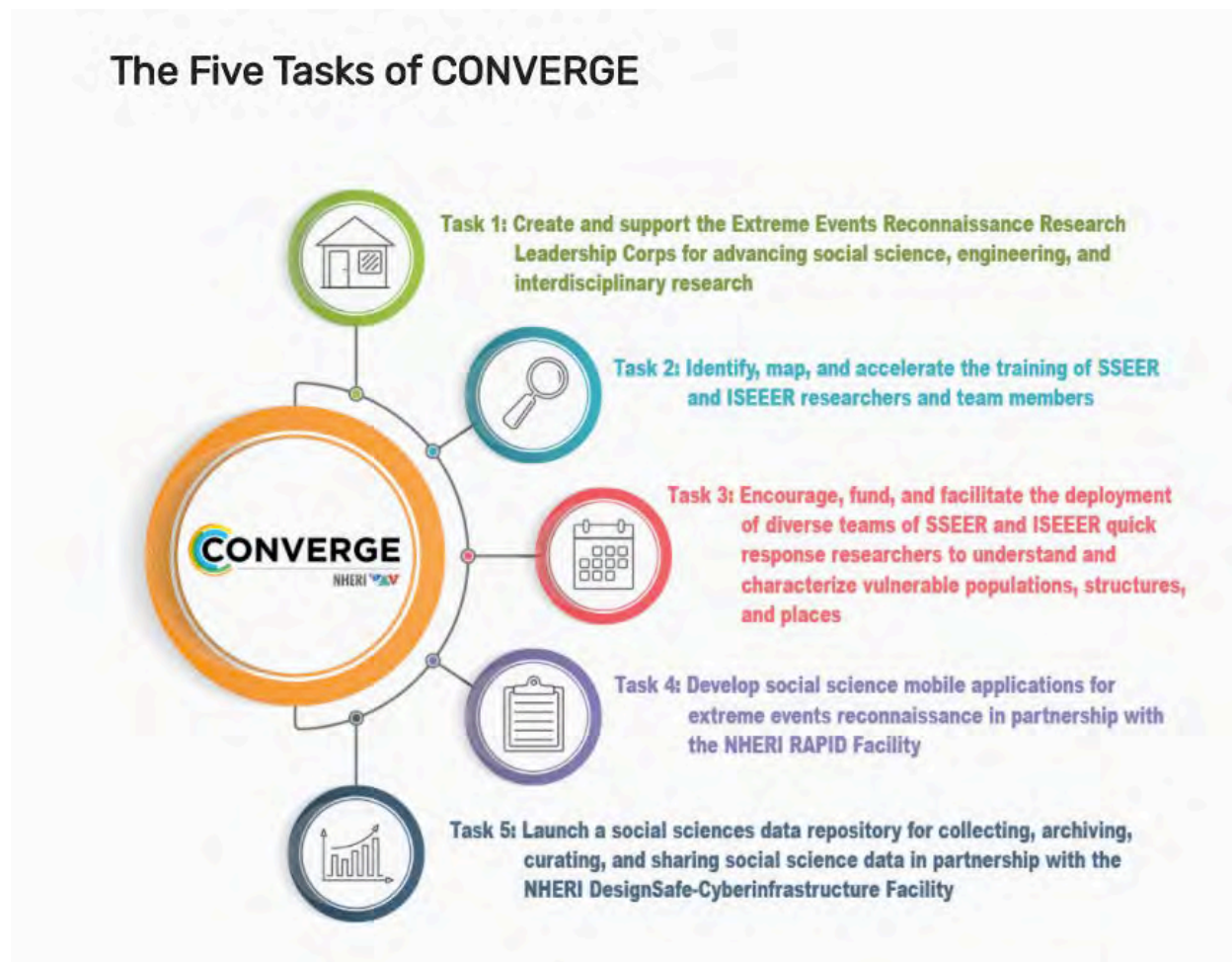
On November 2, 2020, the Impact360 Alliance Program sunset due to lack of grant funding. The sunset of programs like Impact360 illustrates the challenges faced by disaster training programs to evolve into sustainable programs. Fortunately the concept of “Convergence” is, now, a predominate theme in the social science emergency management sector and evolving to be integral in cross sector disaster readiness collaboration

In 2018, the National Science Foundation (NSF) funded another CONVERGE: Coordinated Social Science, Engineering and Interdisciplinary Extreme Events Reconnaissance Research. CONVERGE is part of the Natural Hazards Engineering Research Infrastructure (NHERI) for the nation. Its funding stream is unique; structurally, it is focused on engineering, data integration, infrastructure, cyber, and natural hazards research. COVERGE seeks to reduce vulnerabilities to natural hazards while promoting the collective well-being.



While it is primarily focused on the social sciences and is not exclusive to health care, disaster leaders in this space are highly engaged in community resiliency and partner efforts to support disaster resiliency in children at the community level. The COVERGE project and its partners offer [robust training resources](#) related to social vulnerability, disaster, mental health, and policy. These resources have been created outside of pediatric disaster health care systems and provide an example (and opportunity) of strong efforts and emergency management initiatives to achieve highly coordinated and collaborative capability. COVERGE’s five primary tasks align to support child disaster resiliency in partnership with other national pediatric disaster readiness efforts. The framework focuses on creating the systems

environment to produce an evidence-base of research—inclusive of children—to drive community resiliency. COVERGE works with social scientists, public health, emergency managers, and volunteer agencies that are active in disaster and whole community-based disaster and resilience advocates.



The [CONVERGE initiative](#) is headquartered at the [Natural Hazards Center](#) at the [University of Colorado Boulder](#), which hosts research, webinars, and resources on children and disasters. These include:

- [The Natural Hazards Center Children and Disaster Special Collections](#): This robust collection of research and educational resources was published in 2019, and puts children front and center as a central figure in disaster and community resiliency. The collection covers 18 topics as part of the [Research Counts Topic Collection](#).⁴⁴
 - Introduction: Children Count in Disaster
 - From the Ground Up: Building Child-Focused Community Resilience
 - The Role of Children in Creating Culturally Sensitive Disaster Management
 - The 4P Framework: A Principled Approach for Engaging Youth in Risk Reduction and Resilience.

- Kid Power: Involving Youth in Building Community Disaster Resilience
 - Teens in Toxic Environment: Lessons from the 2010 Deepwater Horizon Oil Spill.
 - New School: A Modern Approach to Disaster Risk Reduction and Resilience Education for Children.
 - On the Road to Routine: Disruption and Recovery After Hurricanes.
 - Lessons Learned? Helping Students and School Personnel Recover from Disaster.
 - Educational Continuity: The Role of Schools in Facilitating Disaster Recovery.
 - Kids First: Children as Bellwethers of Recovery.
 - Evacuating Under Fire: Children with Special Health Care Needs in Disaster.
 - Safe Spaces: Creating a Culture to Support Infant Feeding in Shelters.
 - Who Needs Help the Most? Focusing Child Mental Health Resources After Disaster.
 - How Parent Mental Health Can Affect Children After Disaster.
 - Thriving After Disaster: A New Way to Think about Support Programs for Kids.
 - Children, Distress and Disaster: How Adults Can Help.
 - Supporting Children in All Spheres of Their Lives: Lessons from Katrina.
- [Resilient Children/Resilient Communities](#) (RCRC) Initiative: This initiative is another example of a convergence-related collaborative effort that aligns strongly with pediatric disaster education and readiness. The initiative partners include National Center for Disaster Preparedness and Save the Children with grant-funding from Glaxo Smith Klein. The RCRC Initiative pilot began in 2015 and was developed as a model of child-focused and community resilience—inclusive of disaster planning, education, and awareness. In 2019-2020, the Initiative produced a national report and an [RCRC Toolbox](#) of resources focused on child-serving organizations, community emergency planners, individuals, families, and policymakers. In response to COVID-19, RCRC added a [COVID-19 Toolbox Catalog of Resources](#), which is available in both English and Spanish.

Summary & Recommendations

This chapter reviewed frameworks for integrating pediatrics into a shared mental model. Real-world experiences and lessons learned associated with concurrent and complex disasters demonstrate the need for systemic change. Systems thinking and process improvement are highly aligned with HSEEP capability improvement processes that are designed to promote continuous improvement. Of these frameworks, “Convergence Models” are gaining dominance in emergency management due to their cross-sector appeal and emphasis on collaboration, which produces measurable engagement and results that are more likely to be sustainable.

Pediatric Disaster Education readiness should embrace and integrate convergence methodology to enhance national efforts and ensure that children are not left behind. Federal dollars are critical to incentivizing collaborative efforts. Grant requirements should specify that pediatric disaster champions are part of grantees’ advisory and subject matter expert workgroups. Establishing workflows across disciplines, organizations, and communities not only builds resiliency but also promotes a shared operating picture to care for children in disaster.

Frameworks such as convergence support multi-disciplinary and multi-sector collaborations that promote foundational pediatric disaster education and build awareness, competency, and resilience.



Pediatric

Disaster

Training

Literature

Pediatric Disaster Training Literature

In November 2019, the Eastern Great Lakes Consortium for Pediatric Disaster Response (EGLCPDR), in collaboration with the Western Regional Alliance for Pediatric Emergency Management (WRAP-EM), began to meet weekly to discuss the educational gaps associated with pediatric disaster education and training. In order to identify the gaps in the literature associated with disaster education, an environmental scan of pediatric education resources and literature was conducted using a PubMed and Google search using Identical search terms.

The PubMed search was undertaken and completed between November 1, 2019 and December 13, 2019. The Google search was conducted on June 8, 2020, over a single day and represented the “common person’s” approach to finding resources and information on pediatric disaster education and best practices. The environmental scan consisted of a simple count of resources responsive to the search terms. The scan did not control for duplicates during the Google search. The key search terms were focused on, and selected in order to, capture the diversity of disciplines associated with health care pediatric disaster education availability (see chart below).

Key Search Terms Utilized for PubMed and Google Search		
Pediatric disaster competencies	Neonatal disaster competencies	Pediatric disaster
Neonatal disaster	Pediatric disaster competencies & nurses	Neonatal disaster competencies & nurses
Nurse disaster competencies	Disaster preparedness and children	Pediatric disaster medicine education
Pediatric disaster medicine & pediatricians	Pediatric disaster medicine and first responders	Pediatric disaster education and nursing students
Disaster preparedness competencies	Disaster preparedness competencies & prehospital	Disaster preparedness competencies and allied health
Pediatric disaster preparedness competencies and allied health	Disaster preparedness competencies and pharmacy	Prehospital disaster competencies
Disaster and pediatricians	Disaster readiness	Disaster readiness and nurses
Disaster readiness and prehospital	Disaster readiness and medical students	Disaster readiness and physicians
Disaster readiness and hospitals	Disaster readiness and pharmacists	Pediatric mass casualty competencies
Pediatric CBRNE training	Pediatric pandemic competencies	Pediatric and disaster and transport
Neonatal and disaster and transport	Pediatric Burn Competency	Pediatric Disaster Training

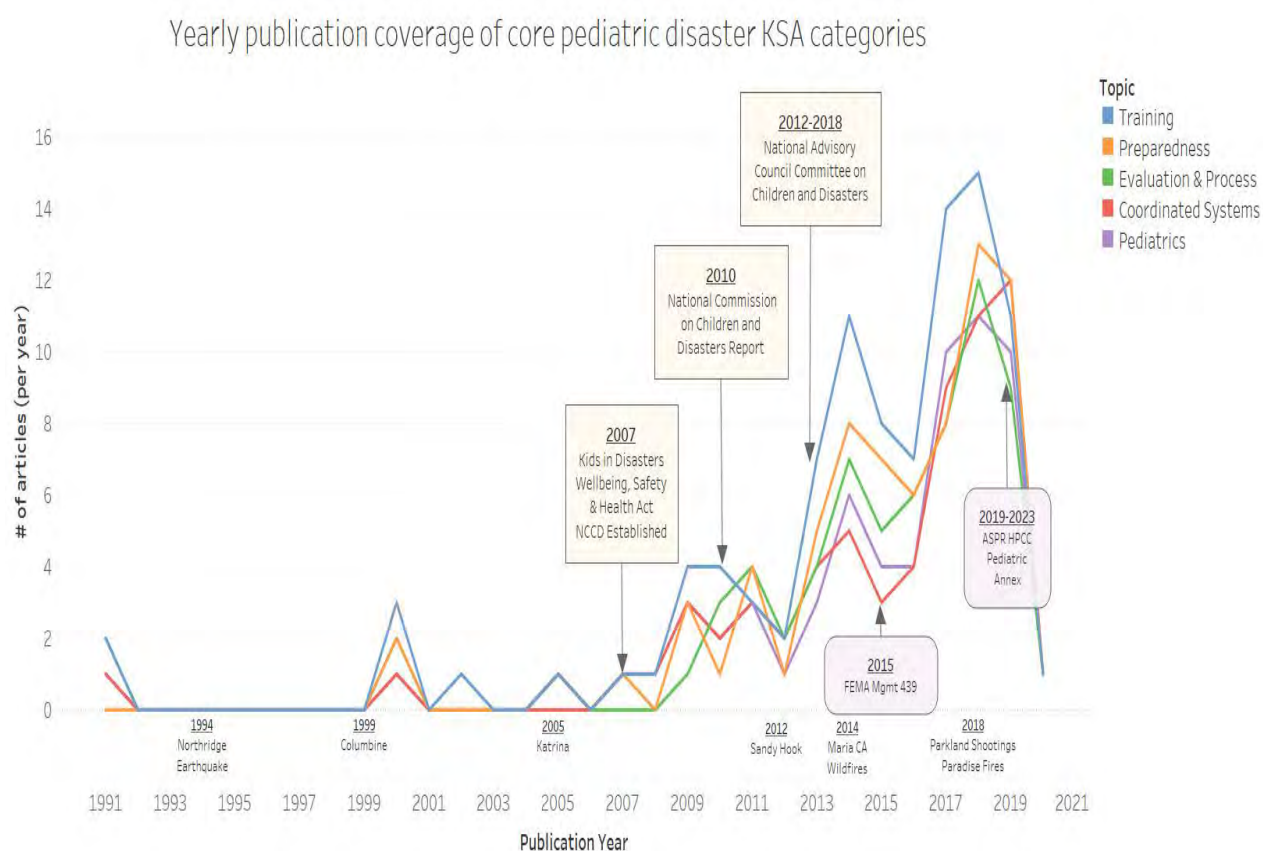
The environmental scan found a paucity of pediatric disaster competency academic and grey

literature and guidance for allied health personnel (Respiratory Therapy and Pharmacy).

Events, Incentives, and Pediatric Disaster Education

The results of the environmental scan highlighted that real-world events were a key driver of the development of pediatric disaster education, curriculum guidance, and recommendations. When tracked over time, the cumulative literature steadily expanded as national policy groups prioritized disaster readiness for children. This body of pediatric disaster literature reflected knowledge, skills and abilities (KSAs) that addressed both pediatric disaster content and educational processes—with the academic literature stressing the importance of skillsets to support training, preparedness, evaluation, and coordinated systems.

When the PubMed academic articles were mapped based on year of publication, the publication timeline captured “bursts” of pediatric disaster guidance and research following real-world disasters that disproportionately affected children and communities (see graphic below).



*“You **never let a serious crisis go to waste**. And what I mean by that it's an opportunity to do things you think you could not do before”*

Rahm Emanuel, Chief of Staff to President Obama, November 19, 2008⁴⁵

The count of pediatric disaster education academic publications appeared to be strongly aligned with periods of increased federal funding focused on children. During the same periods, high-value educational resources associated with local, regional, and state coalition preparedness activities were prevalent in the “grey literature,” and were referenced in pediatric disaster education and operational guidance.

The literature review focused on the efficacy of health care pediatric disaster education. The results demonstrate that pediatric disaster educational gaps can be effectively addressed by training using psychomotor skills-based activities that support critical thinking. The literature review had the following key findings.

- The workforce, regardless of discipline, benefits from a variety of educational interventions (e.g., tabletop, simulation, and self-study).
- When the education and training was provided at routine intervals (e.g., quarterly or monthly), skills were substantially retained and individual’s operational confidence and performance improved.
- Effective communication between the instructor and learner during training improved the quality of the learning experience—emphasizing the importance of instructor capability.
- Allowing providers time was associated with an organizational commitment to supporting pediatric competency and capability. This was seen as an essential ingredient to achieving competency and a sense of readiness.
- Disaster knowledge, skills, and abilities associated with children are not routinely integrated into early training programs.
- Health care providers who were given the time, organizational support and funding improved in their pediatric disaster knowledge, skills and abilities.

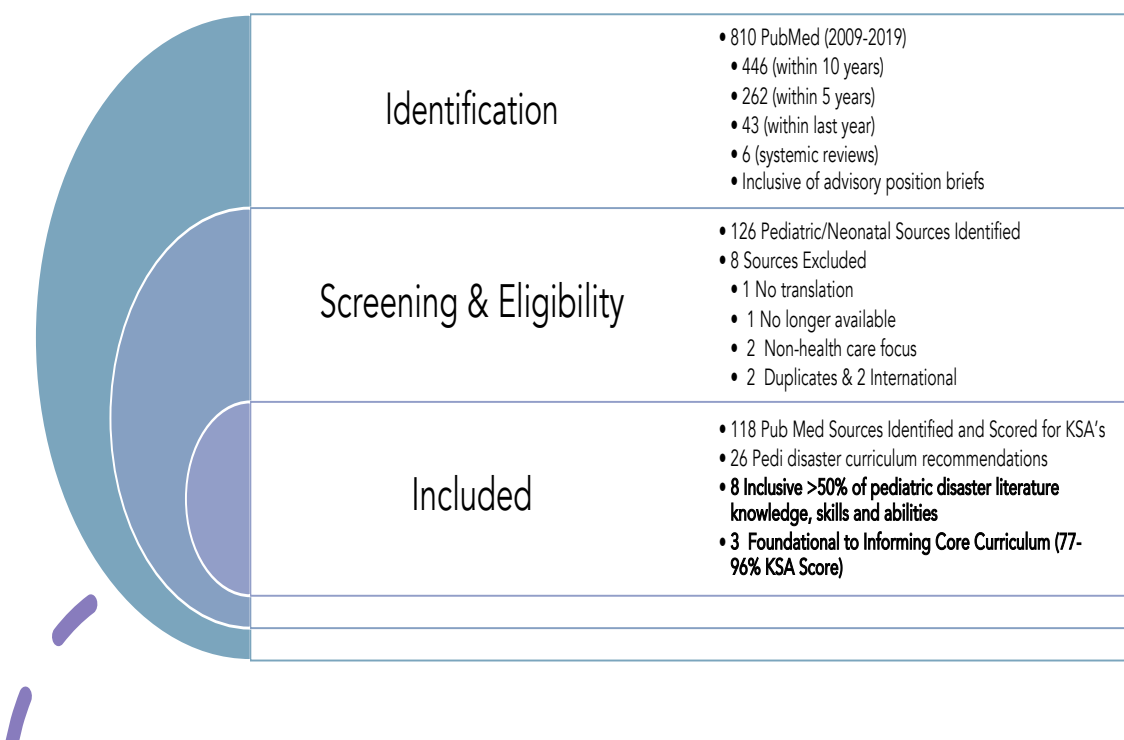
Pediatric Disaster Education Curriculum and Training Literature Review

A systematic literature review was conducted of materials, including key national pediatric disaster research; advisory reports from the National Commission for Children and Disasters; the National Center for Disaster Medicine and Public Health; the APA; ASPR TRACIE; the National Association of State EMS Officials (NASEMO); the Government Accountability Office

(GAO) ; and the EMSC-EIIC.

Pediatric Disaster Education Systematic Review of Gaps

Literature Search Conducted Between November 1, 2019 thru December 30, 2020



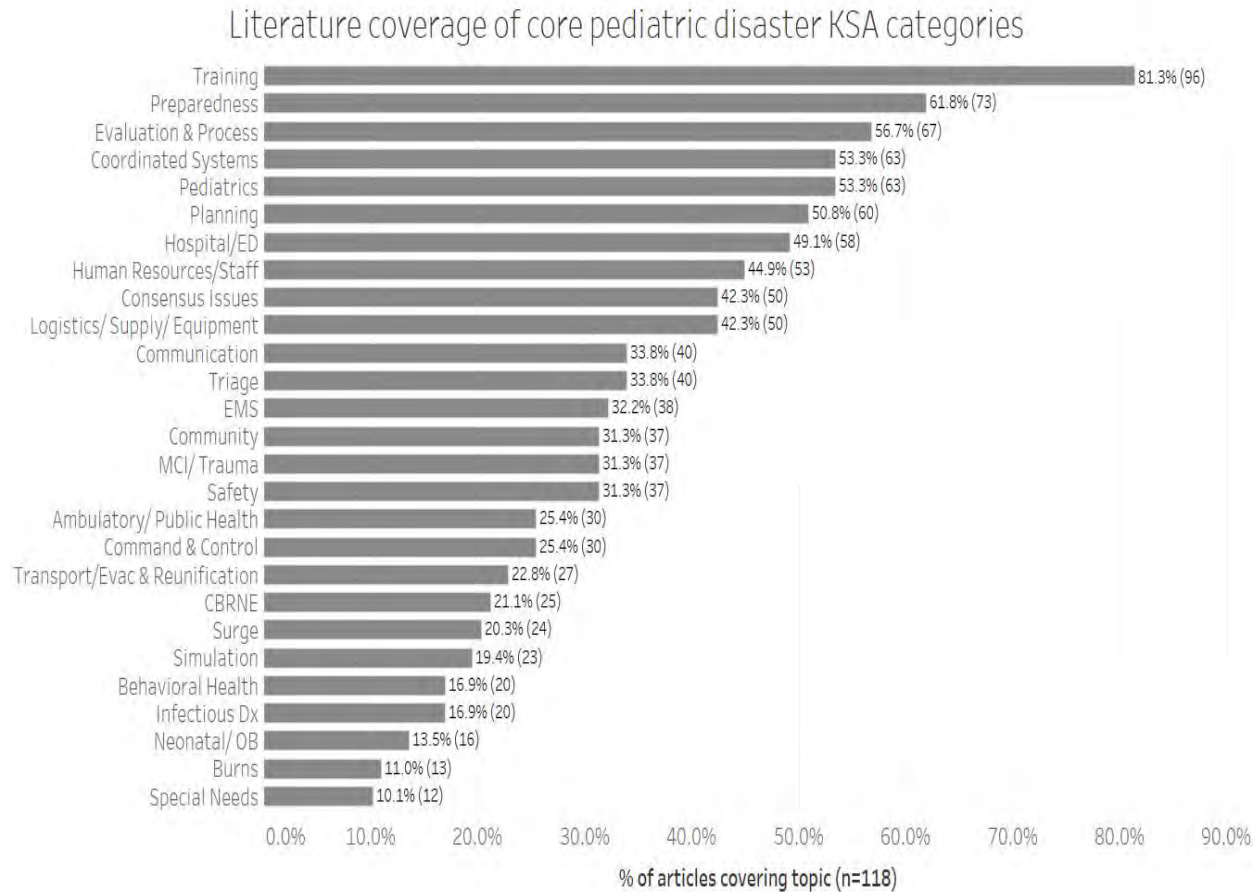
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The literature search from the last 10 years identified 118 publications for analysis, and included 26 pediatric disaster curriculum recommendations. The literature gap survey analysis found 27 themes that are central to core pediatric disaster knowledge, skills, and abilities (KSAs) categories.

Core Literature Themes Associated with Pediatric Disaster Knowledge, Skills, and Abilities (KSA)		
Training	Preparedness	Evaluation & Process
Coordinated Systems	Pediatrics	Planning
Hospital/ED	Human Resources/Staff	Consensus Building
Logistics/Supply & Equipment	Communication	Triage
EMS	Community	MCI Trauma

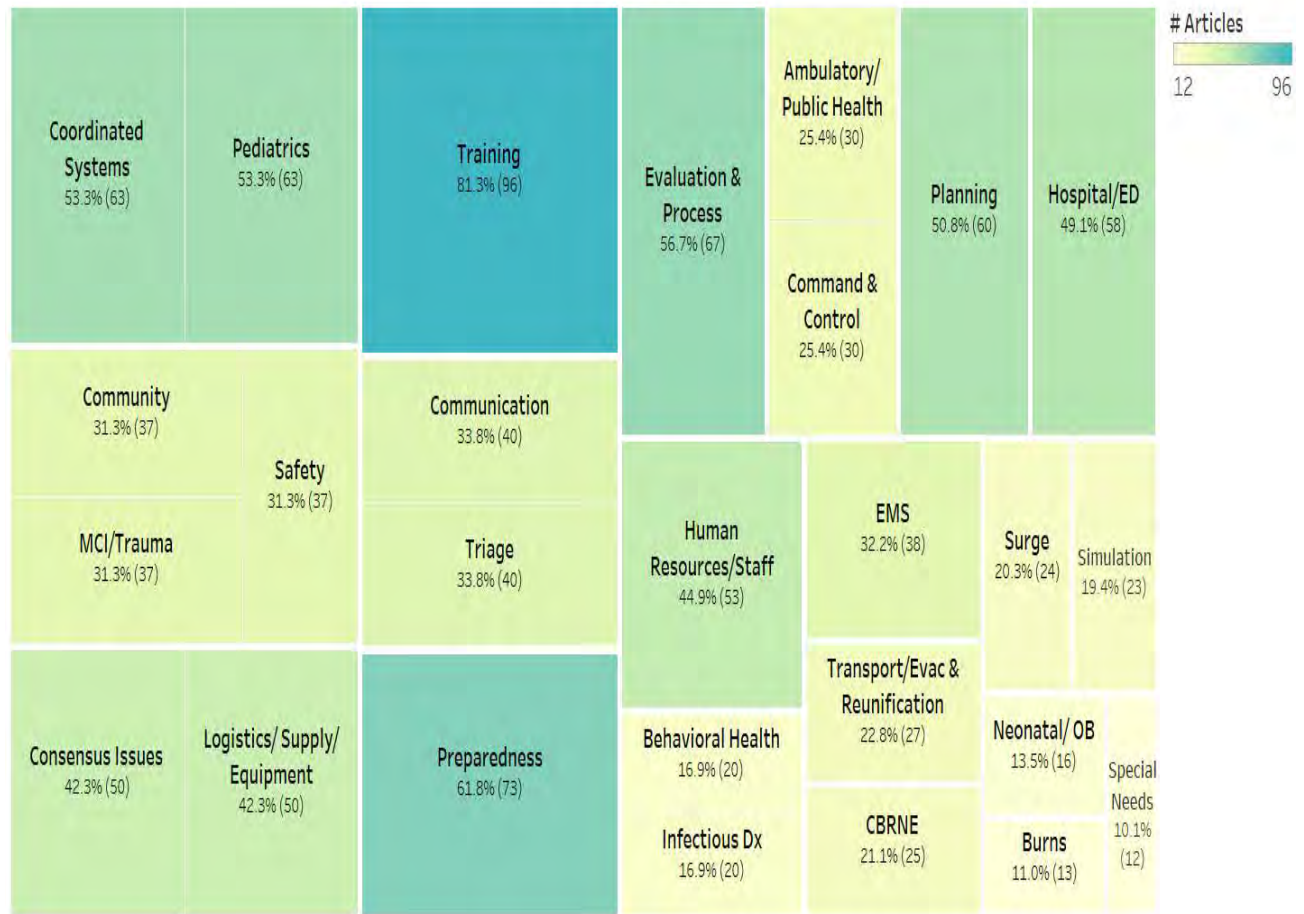
Safety	Ambulatory Care & Public Health	Command and Control
CBRNE	Transport/Evacuation & Reunification	Surge
Simulation	Behavioral Health	Infectious Disease
Neonatal/OB	Burns	Special Needs

Subsequently, each of the 118 articles was re-examined and scored based on the number of KSAs addressed in the publication. The results were as follows:

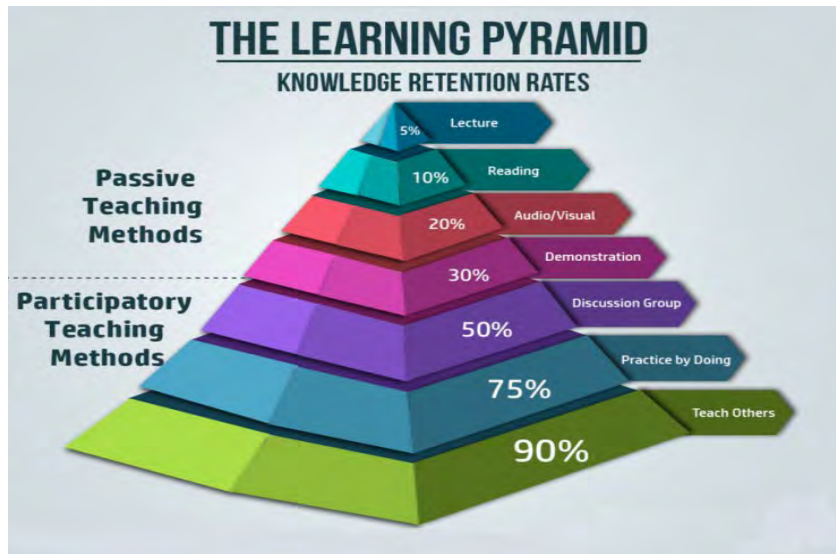




Topic Coverage--All Articles

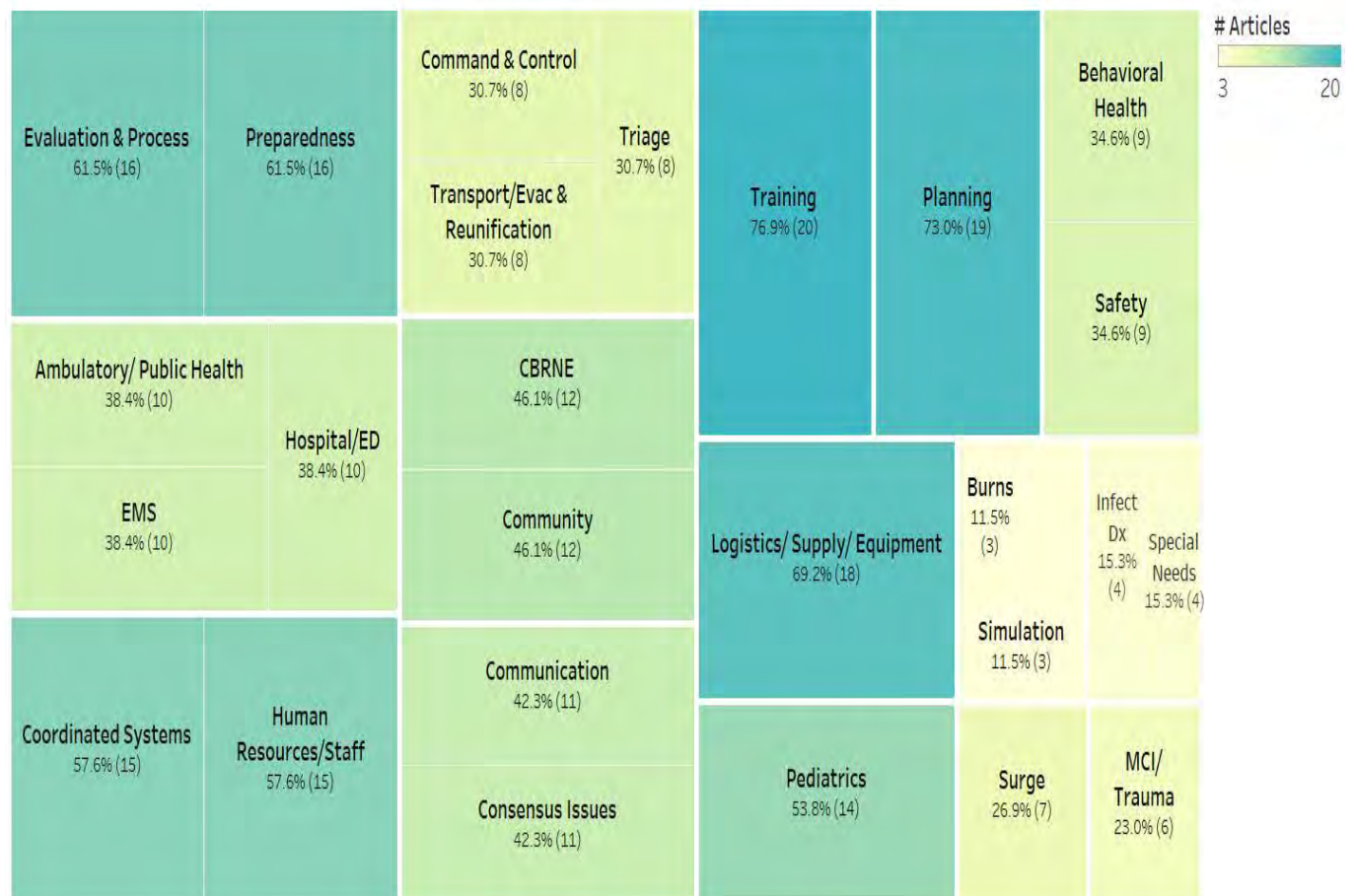


All publications directly or indirectly addressed the need for systemic change in educational processes, methods, and techniques. Perhaps the most important finding of the literature review was the focus on preparedness training. Universally, pediatric disaster education literature demonstrates that, when providers are given the time to participate in pediatric disaster education training, learning not only occurs but also is retained—especially when opportunities for review are provided. However, pediatric disaster KSA gaps re-occurred within 3-4 months education was not combined with practice opportunities and/or clinical experiences. This is not surprising, since both repetition and participatory teaching methods are critical to retention (see graphic, below).



The Learning Pyramid Source: <https://tofasakademi.com/wp-content/uploads/2019/08/Learnin-Pyramid-740x642.png>

Topic Coverage--Starred Articles



Of the 26 articles with the highest KSA scores, 8 had pediatric disaster curriculum recommendations. The KSA score for each of these publications was reviewed and findings summarized in the chart “Top Eight Pediatric Disaster Curriculum Related Publications” (below). The three curriculum documents with KSA scores of greater than 75% were:

- National Center for Disaster Medicine: 96%
- National Commission on Children and Disasters Report: 92%
- Public Health and the National Association of State EMS Officials: 77%

Top Eight Pediatric Disaster Curriculum Related Publications	Education Findings & Recommendations	Percent KSAs topics
<u>NCDMPH Pediatric Disaster Preparedness Curriculum Development Conference Report June 13, 2011</u>	The National Center for Disaster Medicine and Public Health comprehensive recommendations towards establishing a role-specific, competency-based, pediatric disaster preparedness education and training program utilizing pediatric community SMEs as part of a conference conducted March 8-9, 2011 based on the National Commission recommendations.	96%
<u>National Commission on Children and Disaster 210 Report to the President and Congress October 2010</u>	The Commission reports specific findings, conclusions, and recommendations relating to 1) child physical health, mental health, and trauma; 2) childcare in all settings; 3) child welfare; 4) elementary and secondary education; 5) sheltering, temporary housing, and affordable housing; 6) transportation; 7) juvenile justice; 8) evacuation; and 9) relevant activities in emergency management.	92%
<u>National Association of State EMS Officials (NASEMSO) Checklist Tool for Pediatric Disaster Preparedness 2014</u>	The Pediatric Emergency Care Council (PECC) of the National Association of State EMS Officials (NASEMSO) discerned a need for a simple tool to help State EMS Offices identify where possible gaps might still exist in the area of pediatric disaster preparedness. The report of the National Commission on Children and Disasters was used as a guide in developing checklist items that might assist in identifying potential gaps and educating State EMS Office personnel in the area of disaster planning.	77%
<u>Healthcare Preparedness for Children in Disasters: A Report of the NACCD Healthcare</u>	Summary of Recommendations examining the structure, function, and constituents that make up the “ideal” pediatric collation, workforce	62%

Preparedness Working Group November 13, 2015	development, and medical countermeasures, including partnerships and coalition building.	
Lyle KC, Milton J, Fagbuyi D, et al. Pediatric disaster preparedness and response and the nation's children's hospitals. Am J Disaster Med. 2015;10(2):83-91. doi:10.5055/ajdm.2015.0193	Little commonality exists among children's hospitals in approaches to disaster preparedness and response. Universally, respondents can identify a disaster response plan and routinely participate in drills, but the scale and scope of these plans and drills vary substantially.	58%
Final Report: Exploring Approaches and Strategies for Human Services and Child-Serving Institutions to Promote Resiliency and Recovery for Children and Youth Affected by Natural Disasters A Report of the National Advisory Committee on Children and Disasters September 7, 2017	Cross-cutting recommendations in public policy, funding and research made to federal, state, tribe, territory, and local levels of government, and child-serving organizations before during and after disaster. It is essential that the recommendations are integrated and leveraged through partnerships across all levels of government and organizations to be successful in advancing and supporting family and community resilience and activities, policies, funding, and research that effectively promote a more rapid and equitable recovery of children and their families affected by disasters.	54%
National Survey of Institutional Pediatric Disaster Preparedness 2018	Study of 120 hospitals addressing how pediatric patients are included in disaster preparedness plans. Those hospitals with an individual designated for pediatric disaster planning were more likely to specifically address the care of pediatric patients in their institutional disaster plan including exercises, pediatric decontamination and children with special healthcare needs.	54%
Study to Determine the Current State of Disaster Medicine and Public Health Education and Training and Determine Long-term Expectations of Competencies Yale New Haven Center for Emergency Preparedness and Disaster Response November 30, 2011	Civilian, military, and federal members of the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) profession workshop laying out a revised framework across disciplines and phases of disaster to support a system of disaster competency-based education. Complete document available through the National Center for Disaster Medicine and Public Health.	50%

Summary & Recommendations

The three documents focused on making education and training recommendations for children's needs during disaster. They capture the foundational education training and curriculum recommendations needed to create reliable "systems" of multi-discipline pediatric disaster education training as part of "whole community" preparedness. The documents are:

1. National Center for Disaster Medicine: KSA score of 96%
2. The National Commission on Children and Disasters Report: KSA score of 92%
3. Public Health and the National Association of State EMS Officials: KSA score of 77%

It is recommended that future pediatric disaster education curricula should align with the framework established by the 2011 NCDMPH Disaster Medical and Public Health Core Competency developed to address all populations, all disciplines, and all communities. In addition, multidisciplinary recommendations from NCDMPH's pediatric disaster curriculum 2011 conference report should be considered when assigning competency levels across health care provider groups.



National



Pediatric



Disaster



Competency



Survey

National Pediatric Disaster Competency Survey

Since 2009, there have been several efforts to establish pediatric disaster core competencies and curricula. One of the most robust efforts was led by the National Center for Disaster Medicine and Public Health (NCDMPH). In 2010, the NCDMPH established the following Public Health and Medical Disaster Core Competencies as a model core competency framework. The competencies were inclusive of all disciplines, all hazards, all communities, and all populations.

CORE COMPETENCIES FOR DISASTER PUBLIC HEALTH AND MEDICINE ALL DISCIPLINES, ALL HAZARDS, ALL COMMUNITY, ALL POPULATIONS

- Maintain **personal and family preparedness**
- Demonstrated **knowledge of one's expected role(s)** in organizational and community response plans
- Maintain **situational awareness**
- **Communicate effectively** with others
- Demonstrate knowledge of **personal safety** measures that can be implemented
- Demonstrate knowledge of **surge capacity assets, consistent with one's role** in organizational, agency and/or community response plans
- Demonstrate knowledge of **principles and practices for the clinical management** of all ages and populations affected by disaster and PH emergencies, in accordance with scope of practice
- Demonstrate knowledge of **PH principles and practices** for all affected ages and populations
- Demonstrate knowledge of **ethical principles to protect** the health and safety of all affected ages, populations and communities.
- Demonstrate knowledge of **legal principles to protect** the health and safety of all affected, ages populations and communities
- Demonstrated knowledge of **short and long-term considerations for recovery** of all affected ages, populations and communities

Adapted*: <https://www.usuhs.edu/sites/default/files/media/ncdmph/pdf/core-competencies.pdf>

In 2011, the NCDMPH hosted a conference that engaged 85 pediatric disaster subject matter experts (SMEs). Using a modified Delphi approach, these SMEs were placed into focus groups by discipline, and asked to assign levels of competency with pediatrics knowledge, skills, and abilities.

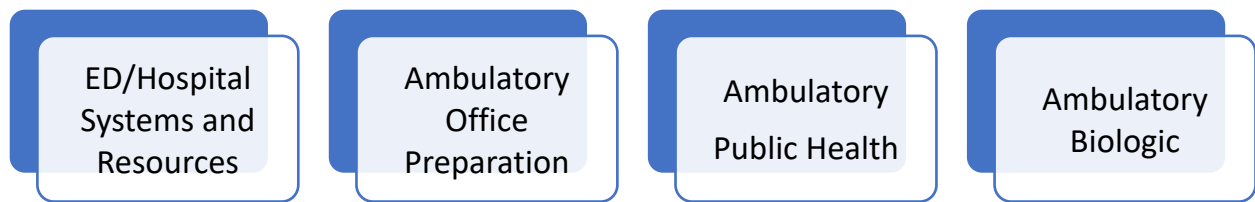
F: Foundational (overview)

A: Aware (understanding concepts)

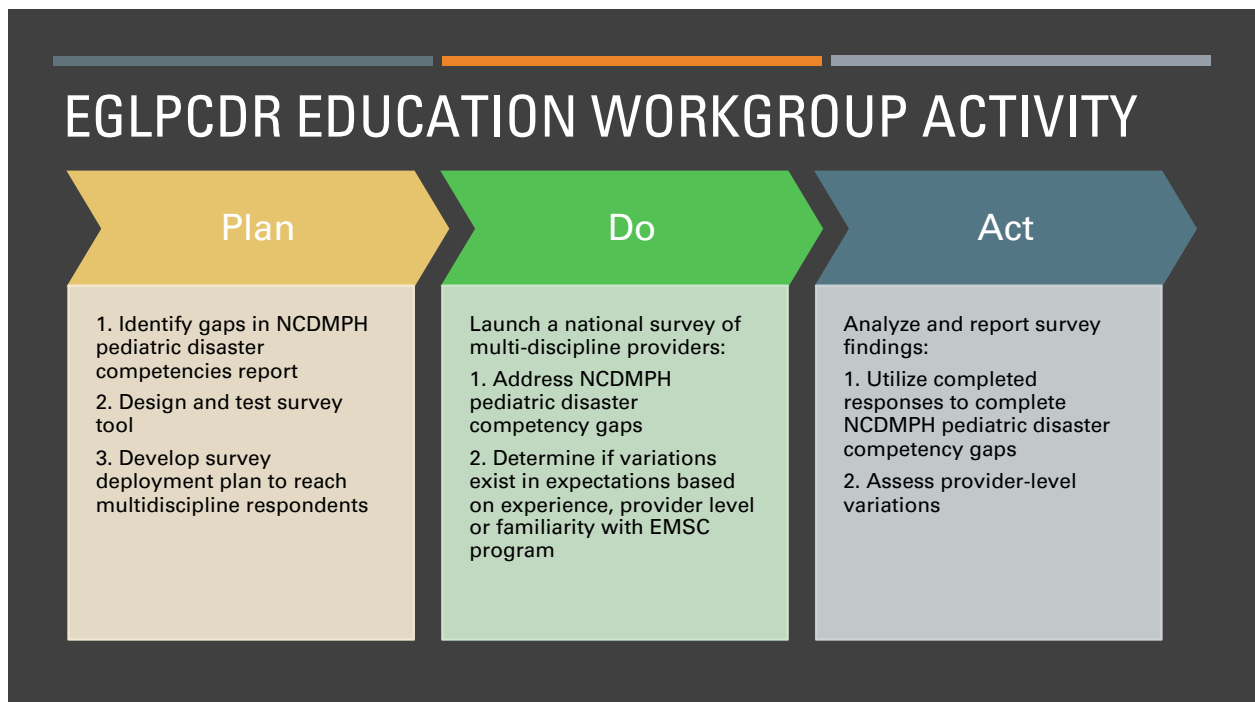
P: Proficient (capable of performing tasks)

E: Expert (Subject Matter Expert)

Over the two-day conference, the focus groups reached consensus and assigned competency recommendations in many areas. According to the [post-conference report](#), however, four areas were left unaddressed due to lack of time.⁴⁶



The conference resulted in a report focused on defining the unmet educational and training needs of medical responders in disaster.⁴⁷ The EGLPCDR and WRAP-EM Education workgroups reviewed the conference findings and developed a Qualtrics survey to complete the four unaddressed areas.



The survey was designed to mimic the NCDMPH conference methodology with the following exceptions:

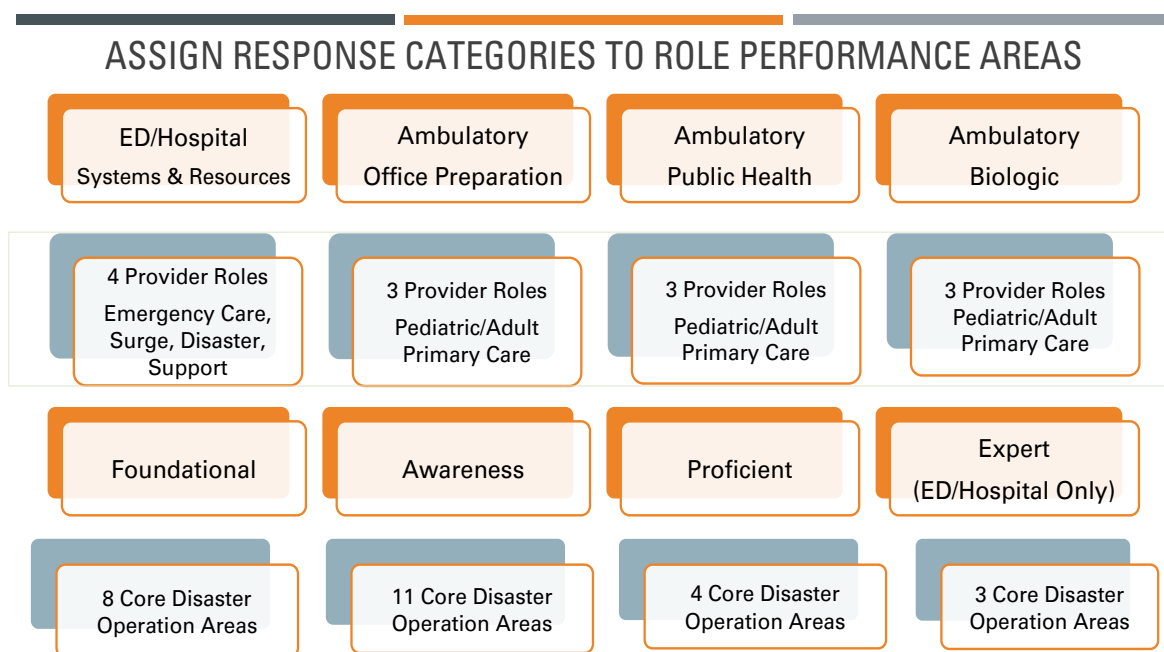
- The survey's target population focused on a national audience of multi-discipline providers, regardless of their pediatric and/or disaster experience.
- The survey was disseminated widely in order to capture as many disciplines as possible.
- The goal was to solicit responses based on providers' "real world" experience and peer expectations, and to determine if there were any significant differences based on respondents' discipline or experience.

Participants were asked to anonymously describe their overall professional experience,

pediatric and disaster experience, years of experience, discipline, and places of employment. In addition, respondents were surveyed about their experience with the EMS for Children (EMSC) Program. Respondent demographic characteristics and experience with EMSC were collected at the beginning of the survey. The survey analysis looked for variations between disciplines but found little variation between provider group recommendations for pediatric disaster competency.

Methodology

The survey design was tested and revised several times prior to release. The participants were asked to respond to the four NCDMPH areas that had not been addressed in 2011. Respondents were asked to assign levels of competency based on setting, provider role, and disaster operation areas (as illustrated below). For example, in the area of ED/Hospital Systems & Resources, respondents were asked to assign competency levels (foundational to expert) to four different provider types in emergency care, surge, and disaster support tasks covering eight core disaster operational areas.



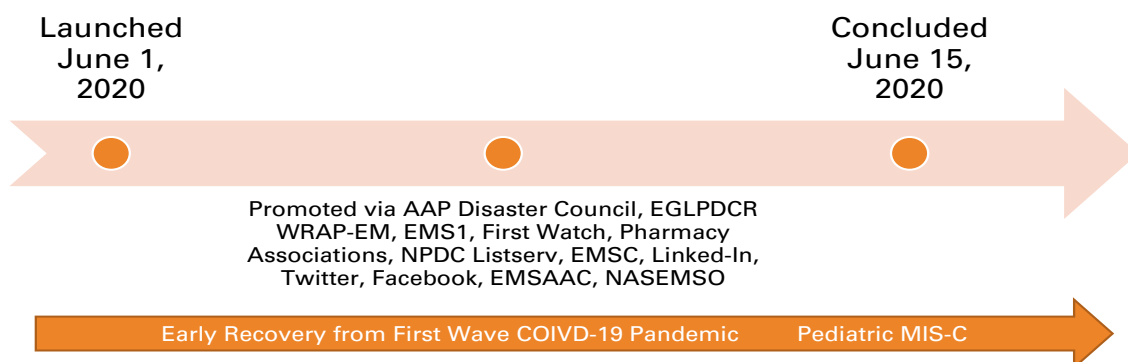
National Survey Deployment Outreach and Timeline

Significant outreach was conducted inviting survey participation via the AAP's Disaster Council; Pediatric Disaster Centers of Excellence SMEs; industry leaders in EMS and disaster, including pharmacy associations, the National Pediatric Disaster Coalition, and NASEMO. The survey was also featured and promoted through social media. Members of EMS-1 (a prehospital industry news and educational publication) promoted the survey to the publication's 246,000 members. In addition, it is estimated that the survey was distributed to more than 4,000 individuals through various listservs and distribution lists.

The survey was launched over a 15-day period. This period was concurrent with the early recovery from the first wave of COVID-19 and the emergence of Pediatric MIS-C. It is unknown how the fact that the survey was conducted during the COVID-19 pandemic and the emergence of Pediatric MIS-C influenced participation and/or responses.

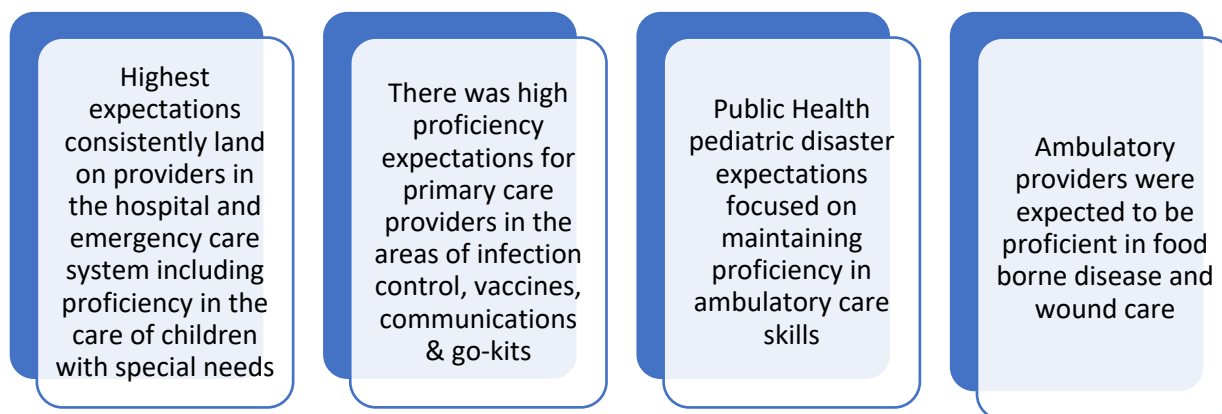
QUALTRICS SURVEY RESPONSE TIMELINE

439 RESPONDENTS 51% (N=226) SURVEY COMPLETION RATE



National Survey Findings

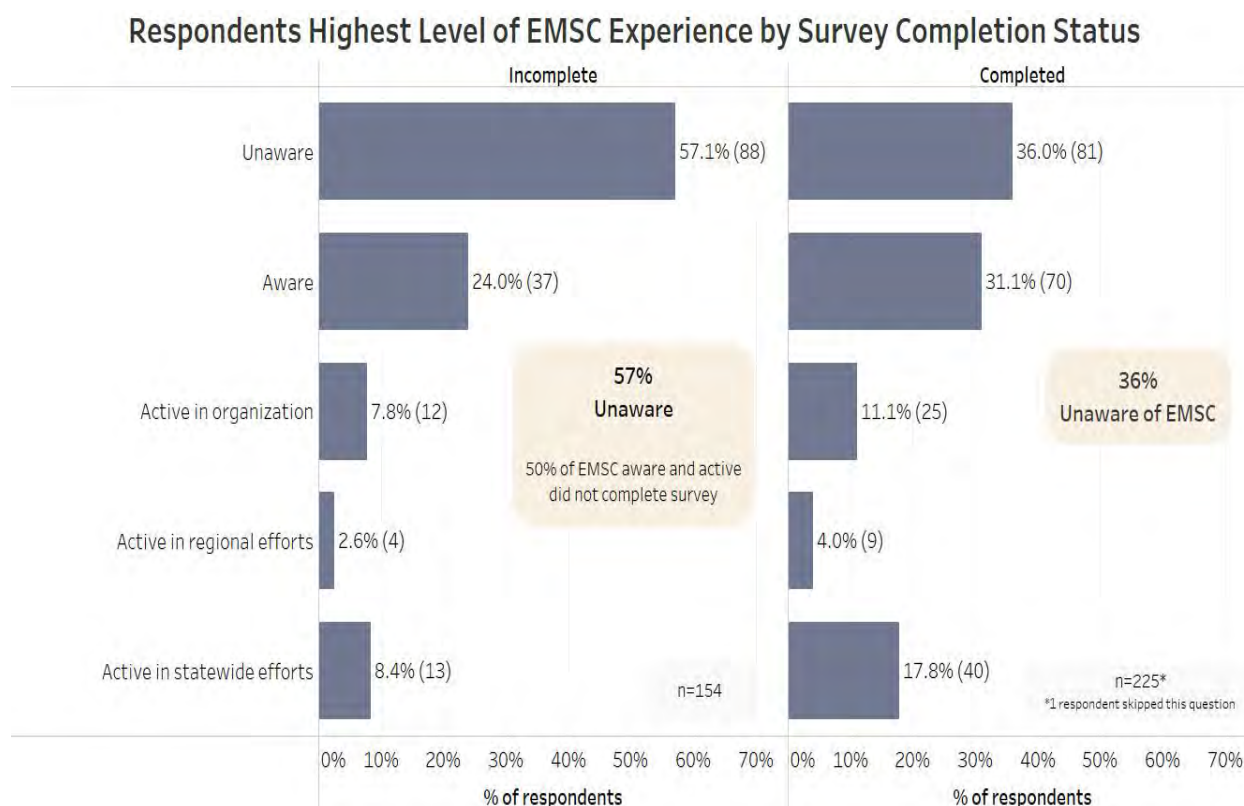
Of the 226 respondents who completed the survey, there was little variation in pediatric disaster competency level recommendations associated with professional experience, discipline, or pediatric experience. Proficiency level expectations were consistently assigned to hospital and emergency providers, as follows:



The finding that cross-discipline providers expect “proficiency” in the care of pediatrics during disaster suggests a significant disconnect between provider expectations and real-world pediatric capability to achieve proficiency at the expected scale.

EMS for Children Program Experience

One of the most significant findings of the national survey was a general lack of awareness about the EMS for Children Program. This finding was significant, regardless of whether the respondent completed the entire survey or not.



Summary & Recommendations

This national survey results were surprising in that it appeared to reveal that providers expect a lot from each other, especially when it comes to children. The results illustrate that significant assumptions are at play and gaps exist across disciplines. It also reveals the importance of opportunities to engage providers, communities, policy makers and disaster leaders in EMSC Innovation and Improvement and National Pediatric Readiness Programs.

The EGLPCDR infographic summarizes the findings of the national pediatric disaster competency survey and is posted on the [EIIC website](#). Gaps in pediatric disaster expectations across disciplines must be addressed to support the collaborative and coordinated operations required of a disaster that disproportionately impacts children.



Eastern Great Lakes Pediatric Consortium for Disaster Response

July 2020

PEDIATRIC DISASTER EDUCATION GAP ANALYSIS

Recommendations From A National Health Provider Survey

Research conducted from June 1, 2020-June 15, 2020



Survey: What Level Of Pediatric Disaster Competency?

Respondents asked to assign the level of pediatric disaster training for multi-disciplinary health care providers.



Performance Scoring Choices for Pediatric Disaster Provider Training

Foundational: (overview)
Aware: (understanding concepts)
Proficient: (capable of performing tasks)
Expert: (subject matter expert)



Who Responded: 226/439 multi-disciplinary providers (51% completion rate)

34 states including Puerto Rico & Washington DC



Professional Experience: 65% Acute Care; 56% EMS
47% Education; 33% Emergency Mgt; 29% Govt.
23% Quality; 17% Ambulatory & Community Care
13% Executive; 11% Researcher

Pediatric Experience: 28.5% > 15 years; 10.8% 1-5 years
7.7% 10-15 years; 7.4% 5-10 years; 5% <1 year



Finding: Emergency/Hospital Providers

PROFICIENCY (able to perform tasks)
recommended in pediatric disaster care including children with functional and access needs



Finding: Primary Care Providers

PROFICIENCY (able to perform tasks)
recommended in infections control, vaccines, communications and go-kits



Finding: Public Health Providers

PROFICIENCY (able to perform tasks)
recommended in pediatric ambulatory care clinical skills



Finding: Ambulatory Care Providers

PROFICIENCY (able to perform tasks)
recommended in wound care and food borne disease



Finding: EMS for Children Program Awareness

57% of non-respondents were unaware
36% of respondents were unaware

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Children
and Youth



With



Disabilities



and Medical



Needs

Children and Youth with Disabilities and Medical Needs

According to the [CDC](#), one in five U.S. children has a special health care need.⁴⁸ Children and Youth with Disabilities and Medical Needs (CYDMN) are children who "have or are at increased risk for chronic physical, developmental, behavioral or emotional conditions and also require health and related services of a type or amount beyond that required by children generally."⁴⁹

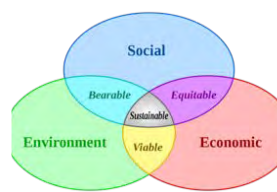
These children rely on the ability of their parents and caretakers to assure they have access to health care, medications, food, water, shelter, durable medical equipment and transportation in the event of a disaster. They face a multitude of challenges as part of routine care that are exacerbated when disaster strikes. A recent national statistical brief prepared by [Child Trends](#) reported CYDMN experience the following at higher rates than their peers.⁵⁰



Family Poverty



Disparities in
Accessing a Medical
Home



Gaps in Economic
Resources



1 in 34 Have No
Insurance



Child Care Difficulties



Miss School & Repeat
Grades

In 2018, the [National Advisory Committee on Children and Disasters \(NACCD\)](#) stated that the care of children with disabilities (identified as children and youth with special health care needs [CYSHCN] in the report) were a high priority during disasters, but were subject to numerous gaps in provider- and community-level disaster readiness training.⁵¹ The report called for a whole-community educational campaign that not only emphasized basic preparedness but also taught parents and other providers (e.g. teachers, childcare staff, hospital staff, first responders, shelter workers, etc.) how to emotionally support children in a disaster and when they should seek assistance.

Three years later, in 2021, the Eastern Great Lakes Pediatric Consortium for Disaster Response (EGLPCDR), conducted a pediatric disaster competency survey. The findings indicate that health care providers—regardless of discipline—expect Emergency Department and hospital providers be “proficient” in the care of CYDMN, which were defined as Children with Functional and Access Needs (CFAN) in the survey.⁵²

High expectations of competency are clearly a challenge, given that community hospital emergency care providers have little collective contact or experience with CYDMN. In addition, CYDMN families disproportionately rely on their pediatric regional center specialists for much of their routine care.⁵³ The numerous disaster education gaps associated with CYDMN require further exploration in order to assess the state of disaster readiness education among CYDMN families and providers.

EGLPCDR Pediatric Disaster Competency Survey Results

Survey Results: ED/Hospital Systems and Resources Emergencies (N=226 Completed Surveys)

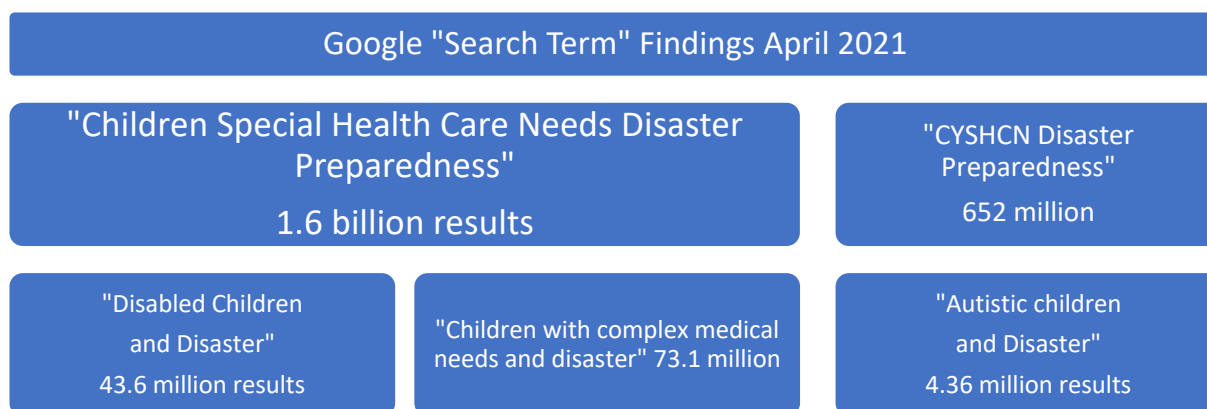
Core Disaster Operations	Emergency Care Providers	Surge Providers	Disaster Leadership	Support Provider
Diagnostic/Treatment	P	P	P	A
Surge Related	P	P	P	A
Identification/Tracking	P	P	P	A
Regionalization	A	A	P	A
Evacuation/Transport	P	P	P	A
Children (CFAN)	P	P	A	A
PH Orgs	P	A	P	A
Roles and Responsibilities	A	A	P	A

Chart Legend: A = Awareness; P = Proficient; CFAN = Children with Functional and Access Needs; PH Orgs = Public Health Organizations.

Exploring the Gaps in Current Disaster Education Resources for CYDMN

In January 2021, complex care subject matter experts and advisors from the EMSC/EIIC's Family Advisory Network were added to the Workgroup to assist in the effort to evaluate the current state of CYDMN disaster educational resources for families and providers.

A simple Google search approach to assess the scope of public, non-profit, and academic educational content available to communities. The findings are summarized in the chart below:



The search yielded a voluminous array of information. Yet, a deeper dive of the first 50 results for each search term revealed that most of the links consistently referred back to trusted sources such as Federal Emergency Management Agency (FEMA), the Red Cross, the Center for Disease Control and Prevention (CDC), and the AAP.

The group also reviewed unique content that was produced and curated by family and child disabilities advocates. This provided a rich source of practical, real-world lessons learned that often included peer testimonials; tips on community engagement; information about how to navigate services and deal with specific hazards using social media (i.e., Instagram, TikTok, Twitter); and online videos and recorded webinars available via YouTube.

Overall, individuals who are seeking information, guidance, or training about disaster readiness for families of CYDMN will experience the following:

- An overwhelming amount of information that is difficult to navigate.
- Broken resource links to materials, requiring additional online searches.
- Content that is clearly out-of-date or no longer supported.
- Lack of methods and frequency in evaluating the quality of training the materials.
- Lack of consistent content creation dates and updates.
- Lack of transparency about how often resources were viewed or accessed.
- Portal registration requirements that impede access to the content.
- Proprietary tools and resources that require purchase without the ability to preview them.

Provider CYDMN Disaster Education and Training Resources

Few trainings exist that target health care coalitions and cross-sector disciplines inclusive of CYDMN. The exception is the two-day [FEMA Mgt-439 Course](#): Pediatric Disaster Response and Emergency Preparedness. The course content covers CYDMN disaster planning and operational content, and draws on real world people and events with an emphasis on sheltering, durable equipment, power failures, and family preparedness. Attendees reported a 66.8% improvement in their occupational knowledge, skills, and activities in the area of CYDMN.⁵⁴

In contrast just-in-time (JIT) provider educational content is focused on developing and troubleshooting hands-on clinical skills in the care of gastrostomies, feeding tubes, tracheostomies, and other medical devices that providers encounter in normal or disaster conditions.

The Workgroup SMEs identified, reviewed, and compiled 273 focused articles, publications, websites, templates (including toolkits), and multi-media training resources for CYDMN as suitable for JIT disaster education. Of these, 123 all-hazard and 150 COVID-19 disaster resources were compiled. Each resource was categorized by content quality, date created, medium used (e.g., video, webpage, template), target audience, level of training, length of

time, and condition specificity (e.g., autism). As vetted materials were identified, they were published to the [EIIC Children and Youth with Special Health Care Needs Disaster Webpage](#) for use by other stakeholders.

Critical Gaps of CYDMN Family Disaster Readiness

Nothing teaches like real-world disasters and, in the midst of the COVID-19 pandemic, the nation also experienced the [February 2021 Texas](#) winter storm and subsequent devastating power failure.⁵⁵ The Texas storm was a once-in-a-century severe weather incident that caused disaster conditions and resulted in the loss of power, water, and access to health services for a large portion of the state—including numerous CYDMN children. Colleagues at Texas Children’s reported that families with CYDMN used their hospital as a safe haven and were generally unaware of their family responsibility in ensuring disaster readiness for their child.

This incident illustrates that, when families are not disaster-ready, pediatric regional centers and community hospitals become the default safety net. This finding is supported by the results of a 2020 national survey of American families, which found that, although most families believe that they will be impacted by a natural disaster in the next 3-5 years, more than one-quarter ([27%](#)) have not taken *any* steps to prepare for such disasters.⁵⁶ CYDMN families are part of this national statistic, despite the fact that they are at significantly higher risk for adverse outcomes compared to the general population.^{57 58}

As a result of this lesson learned, the need for JIT materials to serve these families became one of the project team’s key focuses. Workgroup efforts to this end began with an exploration of disaster preparedness content for CYDMN, including a review of trusted resources to identify best practices. Links to informational websites, podcasts, videos, checklists, and guidance prioritizing AFN families and children were identified, compiled, and reviewed. Resources were reviewed from trusted sources that included FEMA, the Red Cross, the AAP, the CDC, pediatric regional specialty centers, pediatric complex care clinics, and AFN advocacy groups such as [Family Voices](#) and [Complex Child](#).

A review of disaster readiness instructional videos on YouTube identified variations in quality, content delivery, ADA compliance, and viewing time. View counts and view rates by year (calculated as total views divided by number of years on YouTube) strongly suggest that the content has limited engagement, with only two videos dedicated to a CYDMN focus. Findings are summarized in the table below.

Functional/Access Needs Preparedness	Source	Year Created	View Time	Number of Views ⁵⁹	Views by year	ADA	Focus on CYDMN
Emergency Disaster Preparedness	FEMA/Ad Council	2017	2 min	10,924	2,731	ENG CC Voice	No

Emergency Preparedness for Families of Children with Disabilities	Navigate Texas Life	2015	5 min	142	24	ENG CC Voice	Yes
Disaster Preparation for the Disabled Community of Washington	Washington State	2021	1 min	10	10	ENG Voice CC	No
County of Santa Cruz: Get 72 Hour Ready	FEMA	2013	5 min	24,834	3,104	ASL Voice	No
Emergency Preparedness in the Home	Mountain Star Health	2016	5 min	566	113	ENG Voice	No
How to Prepare for a Disaster	AAP	2020	30 sec	798	399	ENG Voice	No
American Red Cross Disaster Preparedness for People with Disabilities	Red Cross	2013	10 min	7,484	935	ENG Voice	No
Disability Inclusive Disaster Risk Reduction-Social Cause Video	YourVideoz	2016	3 min	715	143	ENG Voice	No
Emergency Preparedness for Families of Children with Special Health Care Needs	Family Voices Massachusetts	2017	31 min	280	70	ENG Voice	Yes
Emergency Preparedness for People with Disabilities	New Jersey Dept of Health	2016	<3 min	1,024	205	ENG Voice	No
Preparedness Tips for People with Disabilities	NWS New Mexico	2020	<4 min	77	77	ENG Voice CC	No
Disaster Readiness for People with Paralysis and Other Disabilities	World Institute on Disability	2019	13 min	403	200	ENG Voice	No
Family Emergency Preparedness Tools Instructional Video	NCMEC	2019	10 min	2223	1111	ENG Voice	No
How People With Disabilities Can Prepare for an Emergency 	Now This	2020	5 min	2034	2034	ENG ASL CC	No

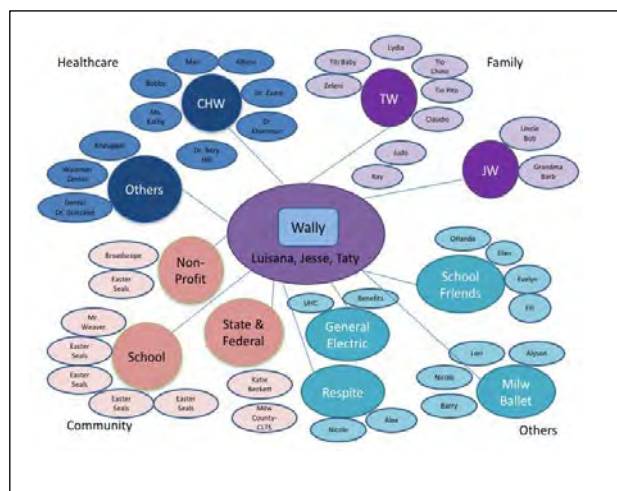
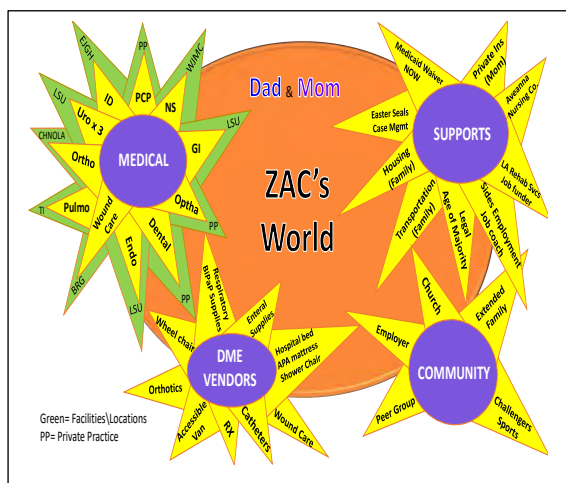
Legend: ENG: English. CC: Closed Captioned ASL: American Sign Language

Educational Gaps in Situation Awareness Associated with CYDMN

Emergency managers and health care coalitions may not be aware of how many CYDMN exist in their communities. One tool that is gaining traction to help providers understand the needs of CYDMN and their families is [Care Mapping](#) (see below for examples).⁶⁰ Care mapping is used by

families with disabled and complex medical needs children. It provides a comprehensive snapshot of a family's needs and is used by families and providers to coordinate complex care services. Care maps can be instrumental in helping the family anticipate what services are likely to be disrupted in disaster. Care mapping should be used by providers and families to anticipate and mitigate worst case scenarios if disruptions occur in needed specialty care, supply chain, support personnel, or community services.⁶¹

Care Mapping Examples



Educational Gaps Associated with Disability and Disaster Legislation

Disaster education and training of providers to meet the needs of the disabled community is strongly associated with numerous legislative mandates. Those mandates facilitate the inclusiveness in the [National Disaster Recovery Framework](#) and are fully integrated into FEMA's whole community guidance. While legislatively CYDMN are part of a broader disabled population and families with disabled children are benefit from of the rights and advantages conferred by disability legislation. Disability legislation creates the regulatory framework and jurisdictional to impose education and training requirements for local, regional, and state stakeholders who receive federal funds and assures accessible services across the disaster continuum. This legislation, which relies on informed advocates to operationalize, includes:

- The Individuals with Disabilities Education Act (IDEA), which makes free and appropriate public education to [eligible children with disabilities](#) throughout the nation and ensures special education and related services are provided to those children.
- The [U.S. Department of Education's Office for Civil Rights](#) (OCR), which provides additional resources of interest for individuals with disabilities and their families.
- The [Rehabilitation Act of 1973, Section 504](#), which is a federal law designed to protect the rights of individuals with disabilities from being excluded from any programs or activities that receive federal funds.

- Title II of the [Americans with Disabilities Act of 1990](#), which extends protection against discrimination to the full range of state and local government services, programs, and activities—including public schools—regardless of whether they receive any federal financial assistance.
- [2019 Pandemic and All-Hazards Preparedness and Advancing Innovation Act](#), which strengthens provisions for children and other at-risk populations during disasters.

Educational Gaps in Health Care Coalitions Associated with CYDMN

While this significant body of legislation sets the stage to support CYDMN's inclusion in disaster readiness, the primary authority for AFN disaster readiness and training may sit with local Public Safety Office of Emergency Services (OES), rather than with regional health care coalitions. Gaps in collaboration and education between the regional OES departments and health care coalitions can impede situation awareness, information-sharing, and opportunities to conduct medical health preparedness exercises.

Health care coalitions benefit from education and training on the economic, educational, and community services that CYDMN receive outside of the hospital and health care system. These services include food assistance and in-home services supporting activities of daily living for all access and functional needs populations. The services help coalitions leverage partnerships with schools, regional disability centers, and local transport authorities.

Disaster preparedness, response, and recovery disproportionately relies on CYDMN caregivers to provide JIT education and training to disaster responders regarding their child's special needs and serve as part of their own response community. Disaster readiness guidance generated from the AFN and CYDMN community has a strong emphasis on redundant back-up plans and networks of friends, caregivers, and services that can be at the ready to meet any hazard.

Examples of gaps in CYDMN disaster preparedness that could be mitigated with normalizing CYDMN disaster preparedness include: ⁶²

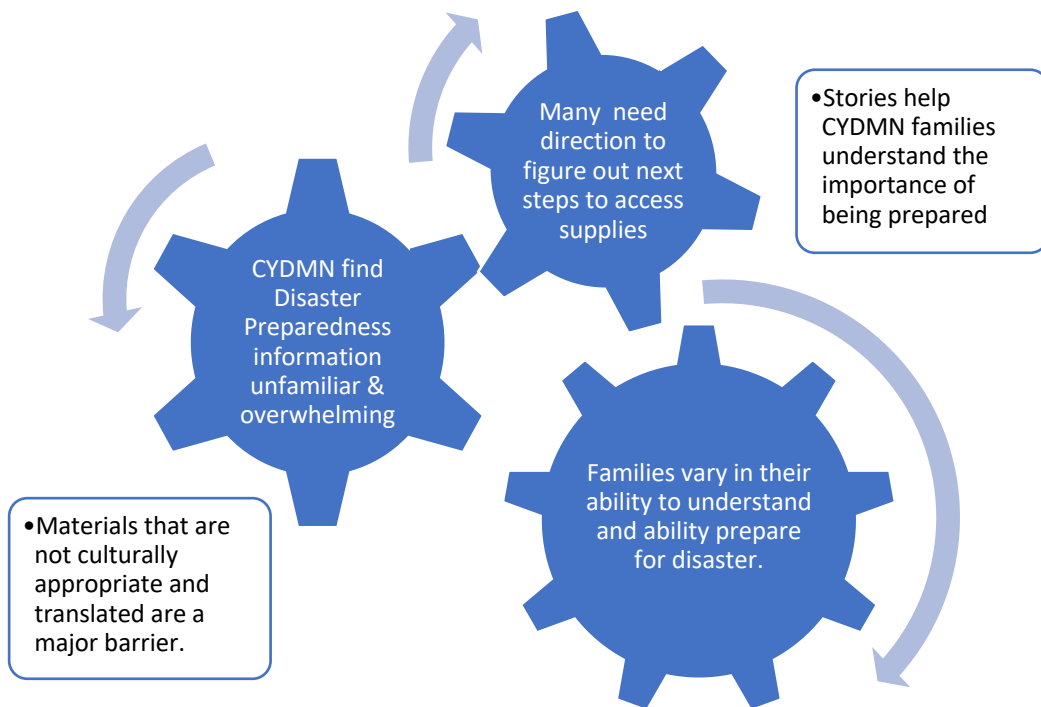
- Inadequate or disrupted power supply for families with children with disabilities, especially those who are technologically dependent seeking shelter or power at local emergency departments and hospitals.
- Families without backup power for medical devices, infusion pumps, or ventilators.
- School bus accidents involving children with disabilities who lack identification or medical alert bracelets, delaying identification of victims and complicating reunification.
- CYDMN families who are unable to evacuate due to lack of accessible transportation.
- Non-accessible shelters during disaster, resulting in delays in the ability to evacuate.
- CYDMN without extra supplies (e.g., gastrostomy or tracheostomy).
- Youth with wheelchairs who become stranded on upper floors without evacuation assistance.

- Shelters without quiet rooms or spaces for children who are subject to overstimulation and high stress environments (e.g., autism).

Lessons Learned from CYDMN Disaster Preparedness Interventions

In June, 2015 the AAP and Family Voices conducted a pilot-test of educational handouts, entitled: *Starting the Preparedness Conversation with Pediatricians and Families*. This educational pilot program created handouts designed to be used by pediatricians and CYDMN families to promote disaster preparedness discussions and information-sharing. The pilot revealed the following important findings:⁶³

Starting the Preparedness Conversation with Pediatricians and Families



Best Practices in CYDMN Disaster Readiness

Providing materials in formats that are accessible to all CYDMN families requires that the materials are not only ADA compliant but reflect the cultural diversity of the disabled community. A review of established resources for disabled community and CYDMN families from FEMA, the Red Cross, AAP, and the CDC found that most materials for CYDMN families were primarily in English, and rarely translated in other languages (e.g., Spanish). While some websites Most instructional videos were created between 2013 and 2020, and a number of them are not fully consistent with principles of [Universal Design](#) or the American Disabilities Act (ADA), which promote the use of Closed Captioning (CC), and American Sign Language (ASL). This is important because:

- “Universal Design” is recognized by the WHO as the design of products, environments, programs, and services so they are usable by all people, to the greatest extent possible, without the need for adaptation or specialized design; it does not exclude assistive devices for particular groups of persons with disabilities where this is needed.⁶⁴
- American Sign Language is known to be vital, especially for children who are medically fragile and non-verbal—as told in newsletters and blogs.⁶⁵
- Closed Captioning is the process of displaying text on a television, video screen, or other visual display in order to provide additional or interpretive information through text.

Storytelling is a powerful educational strategy for engaging families in disaster readiness.⁶⁶ The CYDMN advocacy group [Complex Child](#) created a number of story-telling blogs using the Family-to-Family Approach; in this approach, peer parents create care tips for emergencies or disrupted services. In contrast, materials prepared by health care providers and organizations may not include examples of real-world experience or lessons learned from AFN peers. The Family-to-Family approach is highly valued among AFN and CYDMN groups and aligns with [FEMA’s three disaster ready themes](#): 1) Being Informed; 2) Building a kit; and 3) Making a plan.

Finally, CYDMN families benefit from mentoring; assistance with problem-solving; and consistent, gentle, non-intimidating messaging—especially when language barriers, time, and economic constraints exist.^{67 68}

Disaster Ready Web-based Resources for CYDMN Families:

The following is an annotated list of resources that reflect the breadth of information, guidance and research in this area. Substantial contributions have been made to inform families with disabled or medically complex children and the health care providers of disaster impacts to this vulnerable community. These served as part of the source material for the workgroup’s “Be Ready...Tips for Families of Children and Youth with Disabilities and Medical Needs.”

Annotated List of Disaster Ready Web-based Resources for CYDMN Families
Special Needs Alliance Emphasis on establishing a personal support network; completing a personal risk assessment. Preparing a disaster supply kit. Enrolling in a special needs registry and performing advance financial planning.
Natural Hazards Center Research Counts: Children and Disasters Special Collections A series of original briefs, toolkits and resources from experts in public health, medicine, psychology, sociology, urban planning and other disciplines. The brief “Evacuating Under Fire” provides a series of links to toolkits covering the ACEP Emergency information Form for Children with Special Health Care Needs CDC Checklist for Emergency Kit for CYDMN and the Rand Getting to Outcomes Interactive Tool : A user friendly process for comprehensive planning, implementation guidance and evaluation of programs and community initiatives.

<p>CDC: Safety and Children with Disabilities Emergency Preparedness This website provides the essential CYDMN guidance in line with FEMA's Get a Kit. Make A Plan. Be Informed. The site has a link that translates the information into Spanish and refers to other CDC linked resources as well as Ready.gov</p>
<p>Care Connection for Children Readiness focuses on guidance to Think Ahead: Types of Emergencies and Disasters, Resources. Emergency Planning and Preparation: Emergency Supply Kits, Develop an emergency plan for your child, family and neighborhood. Response and Recovery: Evacuation, What to Do When Disaster Strikes, Tips to Help Families Support Their Children Disaster Checklist, Emergency Information List and Special Equipment List.</p>
<p>AAP Children and Disasters: Children and Youth with Special Needs Written Plans. Disaster Supply Kit (Medications, Power Supply, Food and Supplies, Transportation. Coping and Adjustment. Additional guidance and links to other vetted resources. (The AAP is in the process of updating the organizational website; hence, no link is available at this time.)</p>
<p>Disaster Preparedness Toolkit for Families with Children with Special Health Care Needs Drexel University School of Public Health. Separate Checklists for Families with Physical Disabilities, Intellectual or Developmental Disabilities, Hearing or Vision Loss, Emergency Evacuation Shelter FAQ, Local Resource Guide, Checklist of Pediatric Medical Practices.</p>
<p>State of Alaska Disaster Preparedness for families of children and youth with special health care needs. This 24-page document, in English promotes thinking ahead, planning and preparation, response and recovery, resources for families with templates. The toolkit recommends CYDMN families prepare to be self-supporting for up to 10 days and includes checklists and recommends a number of web resources.</p>
<p>Ready Now! An Emergency Preparedness Tool Kit for People with Disabilities. This 156 page "Ready Now!" toolkit from the Oregon Office on Disability and Health is for people with disabilities and emphasizes independence, allowing each person to address his or her specific needs. 10 step emergency preparedness, what emergencies to expect, personal ability self-assessment, how to develop a personal support network, emergency contact list, emergency papers, tips for specific disabilities, should I stay, or should I go, Go-Kits and 72-hour supply, service animals, Emergency evacuation plans and summary checklist.</p>
<p>Preparing for Disaster for People with Disabilities and other Special Needs. This 20-page booklet from FEMA and the American Red Cross helps people with disabilities prepare for all kinds of emergencies. Why Prepare. Create a Personal Support Network. Complete a Personal Assessment: Daily Living, Getting Around. Evacuation, Get informed, Make a Plan, Action Checklist, Assemble Disaster Supply Kit.</p>
<p>Surviving a Power Outage with Complex Medical Needs Complex Child Tips and recommendations from CYDMN families to families with CYDMN covering challenges associated with power outages and how to pre-plan and mitigate these events.</p>
<p>EIIIC: Children and Youth with Special Health Care Needs An extensive compilation of CYDMN education and training resources for policy makers, health care provider, emergency managers and families covering both clinical conditions and disaster information from vetted resources created as part of the EGLPCDR Education Workgroup.</p>
<p>Oregon Family to Family Health Information Center Tip Sheets and Toolkits This site offers</p>

comprehensive resource toolkits in pdf formats for CYDMN families covering all aspects of day-to-day and disaster readiness by families for families. Special Education Toolkits, Grandparent toolkits, Social and Emotional Health and Condition specific toolkits with robust resources from Autism Speaks, United Cerebral Palsy, Diabetes, Downs Syndrome, Epilepsy, Tube Feedings and Safety plans.

[American Red Cross Disaster Safety for People with Disabilities](#). The site uses the “Be Red Cross Ready” national, standardized program to help people understand, prepare for and respond appropriately to disaster and fire. The website offers extensive online guidance with an emphasis on planning ahead, having a back-up plan and an evacuation plan. Videos on the site are closed caption and ASL compliant. The Red Cross Free emergency app is promoted on the site.

[Disaster Planning for Children & Youth with Special Health Care Needs](#) Website sponsored by Family Network on Disabilities guidance on need to plan, CYDMN checklist and care planning.

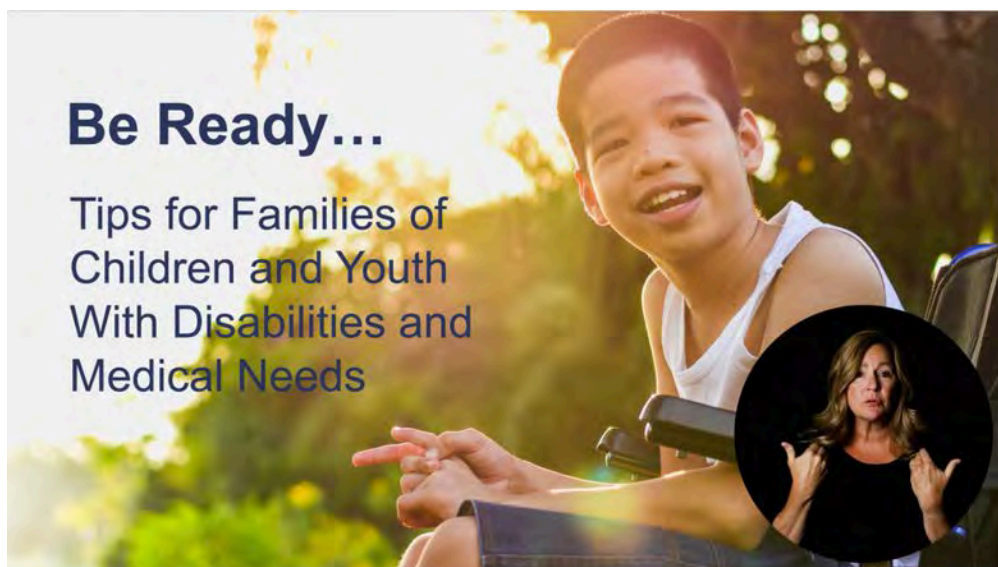
The “Be Ready - Tips for Families of CYDMN” Project Design

Informed by the review of best practices, lessons learned, and available disaster preparedness materials, the Workgroup conducted a brainstorming session to inform content design. By the end of the brainstorming session, the team had agreed on the development of a deployable toolkit for on-boarding CYDMN families to disaster readiness. The toolkit features will include:

- Flexible content for use across community, public safety, health care, and emergency management sectors.
- Alignment with best practices and disaster messaging used by FEMA, the Red Cross, the CDC, the AAP, AFN Advocacy & Family Advisory Groups.
- Content format that is compatible for use in a variety of settings such as classrooms, virtual instruction, self-study, conference presentations, disaster skills and exercise opportunities, and patient teaching in medical offices.
- Materials that are accessible, downloadable, web-based, open-source, and offered as no cost materials and just-in-time guidance.
- Short video length (no more than 5-15 minutes) suitable for JIT deployment.
- Companion infographics that cover all aspects of disaster readiness and can be used separately or as a package.
- ADA-compliant video content and formats.
- Offered in multiple languages.

The final work product is in development. It will consist of a six-minute video aligned with the best practices described above. The video content and companion infographics were vetted by Workgroup members, CYDMN subject matter experts, and EMSC/EIIC family advisory members. Next steps include modifying the training materials to be ADA compliant and translating in multiple languages. The Workgroup is creating a “Be Ready: Tips for Families of Children with

Special Healthcare Needs” toolkit dissemination plan with methods to measure impact.



Summary & Recommendations

Educational content, resources and training opportunities exist to support CYDMN disaster-ready engagement. Nonetheless, CYDMN families and their providers experience numerous systemic education, access and supply chain barriers that are critical to family disaster readiness.

Because of the void in emergency preparedness education and support for CYDMN and their families, it is critical for disaster readiness to be normalized and expand to ensure that families are informed, educated, and feel confident in responding to and caring for their CYDMN during a disaster.

The following recommendations are targeted in addressing the systemic and structural barriers associated with disaster readiness for CYDMN.

- Normalize disaster readiness in the CYDMN population by engaging health care coalitions and pediatric regional centers to create processes to successfully orient families to the basic principles of disaster readiness.
- Fully integrate disaster readiness for CYDMN as part of complex care coordination standards.
- Routinely engage CYDMN family representatives in disaster readiness exercises and planning.

- Include disaster readiness as part of routine anticipatory guidance and the use of [low-cost educational disaster supply starter](#) kits across disciplines to bridge the disaster readiness gaps experienced by CYDMN families.⁶⁹
- Ensure that disaster ready education materials for AFN are compliant with ADA requirements (i.e., voice, sound, closed captioning) and available in multiple languages.
- Include emergency and disaster readiness in the new [National Care Coordination Standards for Children and Youth with Special Health Care Needs](#). Disaster readiness for CYDMN relies on a strong foundation of care coordination. In a national survey of families of children with special needs responded, over 72% required care coordination assistance under routine normal conditions.⁷⁰
- Stakeholders and policy leaders should create reliable systems that reduce barriers to disaster readiness for the CYDMN community aligned with Pediatric Disaster Education Concept of Operations.
- Care mapping should be used as a tool for situational awareness to help families mitigate disruptions in essential services anticipated in a disaster.
- Stakeholders should be engaged in the dissemination of the “Be Ready: Tips for Families of Children with Special Healthcare Needs” toolkit with methods to measure impact.



Federal



Training



Assessment



Reviews

Federal Training Assessment Reviews

In the middle of the first year of the COVID-19 pandemic, the US Government Accountability Office ([GAO](#)) issued a report to Congressional Committees on Public Health Preparedness. The report, published on June 18, 2020, was entitled: [“HHS Should Take Actions to Ensure It has an Adequate Number of Effectively Trained Responders \(GAO-25-525\)”](#)⁷¹ The report addressed disaster workforce shortages on the part of medical personnel who are enrolled in the National Disaster Medical System (NDMS).

The GAO found that HHS did not know whether a sufficient number of these responders had the critical skills and competencies needed to respond during either the COVID-19 pandemic or future disaster emergencies. While the report primarily focused on NDMS requirements, the core principles of readiness associated with children’s needs has been a long-standing concern among pediatric disaster subject matter experts, as noted above.

The report examined NDMS responder workforce planning practices and training associated with public health emergencies and surge capacity. The report also identified that, while there are five NDMS responder teams (e.g., Disaster Medical Assistance Teams [DMAT], Trauma, Mortuary, Victim Information, and Veterinary), there is a paucity of types of responders and training to care for at-risk individuals, including children, pregnant women, and populations with special needs. The identified that HHS had created several online modules and planning for future education requirements, but noted that the topic of pediatric training was not addressed in these materials.

The GAO offered five-key NDMS recommendations to HHS and ASPR in order to develop systemic strategies to close gaps in workforce knowledge, skills, and abilities (see chart below, left-hand column). HHS concurred with all of the GAO report’s recommendations, including adopting GAO-identified key practices into training evaluation; HHS noted that funding was the fundamental limitation to implementing change.

The Workgroup generated solutions that are focused on pediatric disaster readiness to address GAO’s five recommendations (see chart below, right-hand column). These solutions will leverage the expertise of the ASPR Pediatric Disaster Centers of Excellence, National EMSC Readiness, and the EMSC/EIIC. These entities have a vital role in “minding the gap” for children and providing sorely-needed regional technical and operational pediatric capability. In response to the GAO recommendations, Pediatric Disaster Centers of Excellence are positioned to provide Health Care Coalition Education and Training Solutions.

GAO Recommendations for Executive Action (Source: GAO, June 18, 2020)	Proposed ASPR Pediatric Disaster Centers of Excellence (PDCOE) Education and Training Solutions
ASPR should develop an NDMS responder workforce target that aligns with the goals and objectives in ASPR’s forthcoming	ASPR PDCOE are positioned to collaborate with health system and public health partners to standardize evaluation of first responder

strategic plan	workforce pediatric education and training based on goals and objectives ASPRs and EMSC program strategic plans
ASPR should develop an NDMS responder workforce target that accounts for the critical skills and competencies that are needed to meet current and future programmatic results such as a workforce target	ASPR PDCOE in collaboration with the EMSC-II are a comprehensive source of subject matter experts positioned to contribute to workforce critical skills and competencies to meet current and future programmatic targets
ASPR should develop strategies to fill gaps to achieve it revised workforce target.	ASPR PDCOE are positioned to fulfill systemic gaps in the pediatric disaster workforce through collaboration and coordination of resources and JIT education
ASPR should develop a process to evaluate the web-based and in-person training provided to NDMS responders using GAO-identified key practices for evaluating training	ASPR PDCOE, in collaboration with EMSC-II, have the tools and expertise to evaluate and enhance sources of web-based and in-person training to support key practices in pediatric disaster training
ASPR should develop a process or approach to prioritize in-person trainings for NDMS responders	ASPR PDCOE, in collaboration with EMSC-II and ASPR TRACIE, have broad collaborative resources to support reliable processes to promote, deliver and sustain pediatric disaster training and best practices for NDMS and Health Care Coalitions

A Call for Strategic Training and Development

In 2004, the GAO published a Report to Congressional Requests on [Human Capital: Selected Agencies' Experiences and Lessons Learned in Designing Training and Development Programs](#).⁷² This guidance document was intended to serve as a national model for strategic workforce planning.

The core characteristics of the strategic training and development process align with the gaps consistently experienced in the area of pediatric disaster education, and are summarized in the figure below: Core Characteristics of a Strategic Training and Development Process (source, GAO).

Figure. Core Characteristics of a Strategic Training and Development Process

Strategic alignment. Clear linkages exist between the agency's mission, goals, and culture and its training and development efforts. The agency's mission and goals drive a strategic training and development approach and help ensure that the agency takes full advantage of an optimal mix of strategies to improve performance and enhance capacity to meet new and emerging challenges.

Leadership commitment and communication Agency leaders and managers consistently demonstrate that they support and value continuous learning, are receptive to and use feedback from employees on developmental needs and training results, and set the expectation that fair and effective training and development practices will improve individual and organizational performance.

Stakeholder involvement. Agency stakeholders are involved throughout the training and development process to help ensure that different perspectives are taken into account and contribute to effective training and development programs. Stakeholders' views are incorporated in identifying needed performance enhancements, developing and effectively implementing well-thought-out strategies, and helping to conceptualize and use balanced measures that accurately reflect the extent to which training and development efforts contribute toward achieving results.

Accountability and recognition. Appropriate accountability mechanisms, such as performance management systems, are in place to hold managers and employees responsible for learning and working in new ways. Appropriate rewards and incentives exist and are used fairly and equitably to encourage innovation, reinforce changed behaviors, and enhance performance.

Effective resource allocation. The agency provides an appropriate level of funding and other tools and resources, along with external expertise and assistance when needed, to ensure that its training and development programs reflect the importance of its investment in human capital to achieving its mission and goals.

Partnerships and learning from others. Coordination within and among agencies achieves economies of scale and limits duplication of efforts. In addition to benchmarking high-performing organizations, these efforts allow an agency to keep abreast of current practices, enhance efficiency, and increase the effectiveness of its training and development programs.

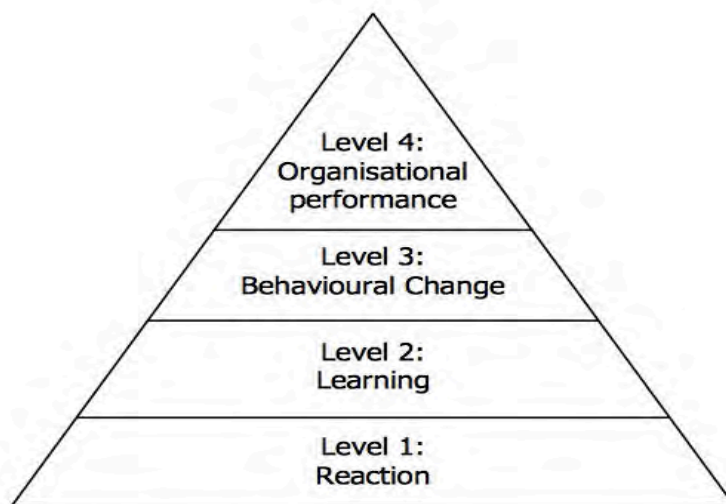
Data quality assurance. The agency has established policies and procedures that recognize and support the importance of quality data and of evaluating the quality and effectiveness of training and development efforts. It establishes valid measures and validated systems to provide reliable and relevant information that is useful in improving the agency's training and development efforts.

Continuous performance improvement. The agency practices and policies foster a culture of continuous improvement and optimal organizational performance regarding training and other activities. Stakeholders rely on and use program performance information and other data to assess and refine ongoing training and development efforts; target new initiatives to improve performance; and design, develop, and implement new approaches to train and develop employees.

Well-established recommendations have existed for decades to evaluate disaster education and readiness; however, they have been inconsistently applied to pediatric disaster workforce education. Although evidenced-based tools exist, the inconsistent use of evaluation methods to measure educational outcomes creates unnecessary variations.

The GAO recommended evaluating the effectiveness and value of training using the [Kirkpatrick Model](#) developed in the 1950s.⁷³ This methodology has been consistently recommended by GAO and is used by Homeland Security TEEX ESTI, the CDC, and Preparedness and Emergency Response Learning Centers to evaluate in-person courses and curricula since 2014. Results of evaluation should produce results that improve organizational performance.

The model has four levels (see graphics, below): 1.) Evaluating participants' *reaction*; 2) Gauging the increase in participants' *Learning*, with respect to improving their skills, knowledge, and attitudes; 3) Determining how the learning was applied to foster a *Behavior* change at work; 4) With cumulative *Results* demonstrating the training produced a sustainable value to the organization, such as in improved outcomes, quality, or efficiency, or in lower costs?



Source: from Kirkpatrick, 1996

Summary & Recommendations

Pediatric disaster educational products benefit from a uniform standard of evaluation. Educational resource utilization and impact data should be transparent and drive continuous improvement. Funding requirements should specify that the Kirkpatrick standard be used to evaluate educational and training outcomes.



EMSC



Innovation,



Improvement,



and



Disaster

EMSC Innovation, Improvement, and Disaster

EMSC strives to building a culture of Continuous Improvement, following the saying: “You cannot improve what you cannot measure.” The [EIIC’s Pediatric Readiness Quality Collaborative](#) (PRQC) aligned with improvement principles from the Institute of Healthcare Improvement (IHI) provide key examples of the significant engagement and level of effort it takes to support change and promote competency within an organization.

The 2018 PRQC Collaborative offered four improvement bundles, including a Pediatric Disaster Preparedness Bundle (see chart, below). Seventeen 17 improvement teams participated in the Collaborative, organized in a hub-and-spoke model and partnered with a pediatric regional center in their team’s state.

Bundle Selection	1st Choice (Percent of sites)	2nd Choice (Percent of sites)
1 – Weight in Kilograms	30%	28%
2 – Abnormal Vital Signs	58%	41%
3 – Interfacility Transfer	5%	14%
4 – Pediatric Disaster Preparedness	7%	17%

Key lessons learned from the 2018 PRQC collaborative include:

- It takes up to 4-5 Plan-Do-Study-Act (PDSA) cycles to see improvement; hence, it is important to take the long view. Improvement requires persistence and is not a “one-and-done” effort.
- Physician leadership was critical to soliciting Chief Executive support. Data-driven improvement was challenged by those in charge of allocating time and resources when an immediate return on investment is hard to demonstrate.
- Establishing a sustainable organizational role that is responsible for coordinating pediatric-improvement-specific activities, such as a [Pediatric Emergency Care Coordinator](#) (PECC), was essential to achieving organizational success.⁷⁴

Connecting Pediatric Disaster Education Novices and Experts

Accessing and evaluating online pediatric disaster guidance and educational resources can be overwhelming for both novice and expert alike. While [PECCs](#) are positioned to be content leaders in the area of pediatric disaster readiness, they need sufficient on-boarding and introductions to pediatric disaster SME networks. PECCs are best able to “translate guidance into practice” when they are backed by a stable network of colleagues and pediatric disaster thought leaders. PECCs are positioned to be pediatric disaster leaders and should be virtually connected to support networks associated with EMSC-II, PDCOE, Pediatric Disaster Coalition,

EMSC IIC

Emergency Medical Services
for Children

Innovation &
Improvement Center

KNOWLEDGE MANAGEMENT DOMAIN





SYNTHESIS
of existing evidence into best
practices that will inform the



Baylor
Chumpitazi



CREATION
of clinical and educational
tools that will lead to



Lundquist
Saidinejad



DISSEMINATION
to all EMSC personas free
of charge that aim to



Yale
Auerbach

IMPROVE THE OUTCOMES FOR
CHILDREN IN EMERGENT AND
URGENT CARE SETTINGS




and the AAP.

The EMSC-EIIC National Pediatric Quality Collaborative Model and Team Structure is already in place to support the PECC community. In July , 2020 the EIIC launched a new [Knowledge Management](#) (KM) Domain that pulled together a team of pediatric emergency medicine SMEs from three national centers to support the recruitment and onboarding of PECCs.

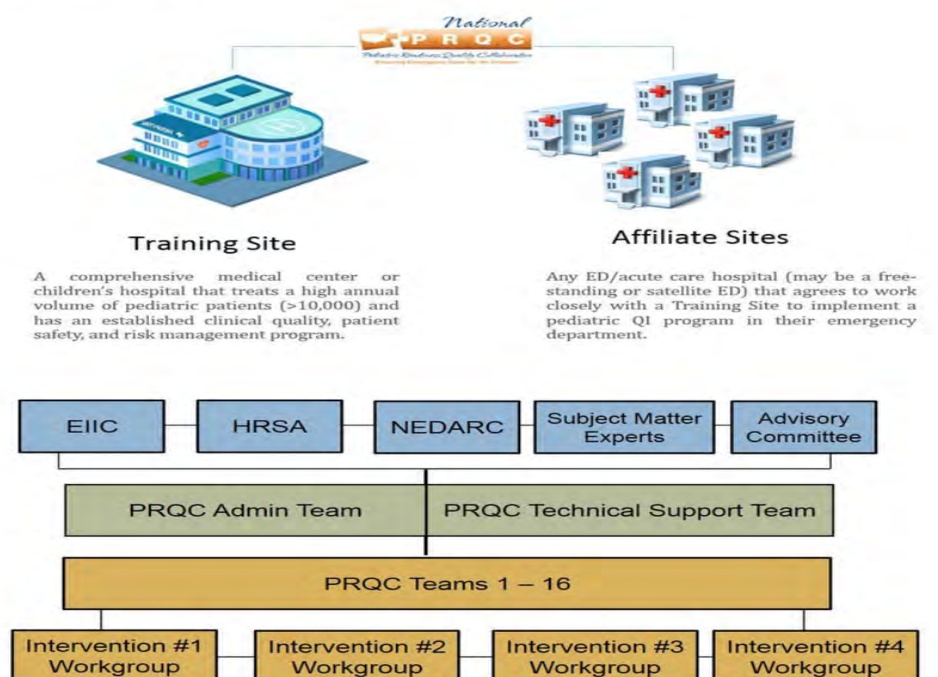
The EMSC/EIIC knowledge management domain is well positioned to integrate pediatric disaster education and training as part of the overall EIIC pediatric readiness effort. By mobilizing day-to-day PECC's and onboarding them to pediatric disaster will improve disaster capability for children. PECC's act as "go-to" people for guidance advocating for children in disaster.

The mission to empower and sustain local and regional pediatric readiness efforts takes a village. The EIIC Knowledge Management Domain fills that novice to expert consultative, education and training gap by creating a cadre of pediatric subject matter experts to promote a multi-discipline collaborative learning environment.

EMSC Innovation and Improvement Center (EIIC) and Pediatric Disaster Domain

System change relies on leadership; the [Emergency Medical Services for Children Innovation and Improvement Center](#) (EIIC) program's recent pivot to address the need for systemic change has been piloted as part of the [PDPQC](#). This is an important step in achieving regional pediatric disaster capability and building a critical pool of PECCs and pediatric disaster champions who can advocate both within their organizations and local jurisdictions.

Team Structure



In 2019, the EIIC partnered with the [Eastern Great Lakes Pediatric Consortium for Disaster Response](#) to conduct a free Pediatric Disaster Preparedness Quality Collaborative. The collaborative's mission was to enhance the ability of hospitals to receive and treat children in response to a disaster. All types of hospitals were recruited for the collaborative regardless of their location, patient volume, inpatient capabilities, or pediatric expertise. Institutions were asked to identify at least 1 pediatric champion who could commit 1-2 hours per week for a total of 20 weeks, or 40 hours total. Hospital leadership was required to sign a letter of commitment to promote executive support. Approximately 90 individuals from 39 hospitals across 16 states, Puerto Rico, and Ontario (Canada) participated in the collaborative.

An all-hazards approach to disaster preparedness began with a set of questions (environmental scan) to assess participant's overall pediatric disaster preparedness. Participants were then guided through a series of 9, 2-week modules broadly grouped into 3 focus areas: a) internal coordination, b) regional coalition building, and c) patient tracking and family reunification.

Each focus area was introduced during a Learning Session conducted via teleconference that was led by a national pediatric disaster preparedness expert. Each module had corresponding activities designed to support important disaster related relationships within the community, such as regional children's hospitals, EMS agencies, public health, and emergency managers.

Many of the collaborative participants and SMEs were integral members of their hospital's emergency operations. For this reason, EIC project leads chose to delay the collaborative's launch from April to July 2020, in response to COVID-19 surges. Throughout the collaborative participants, were continually challenged to find sufficient time to devote to EIC collaborative activities, given that they were frequently called upon to help solve the ever-changing challenges of the real-world pandemic. The pandemic also challenged their ability to engage hospital stakeholders in the collaborative effort.

Other participants—despite having an interest in pediatrics or pediatric expertise—were not positioned within their hospital to be well-versed in hospital disaster resources or external disaster-related relationships (e.g., engagement with their regional healthcare coalition). This was especially true for participants at large, well-resourced hospitals and those in large hospital networks; in these facilities, it was often difficult to identify specific individuals who were responsible for various disaster preparedness components. This challenge was further compounded by the high rate of staff furloughs and turnover during the COVID-19 pandemic. Similarly, individuals at these large institutions or networks felt less empowered to affect change than they might otherwise have been.

As was continually noted through the EIC-led quality improvement collaboratives, leadership engagement is one—if not *the*—primary driver of change within a hospital. Thus, while the pandemic presented unique challenges for the participants, it also brought disaster planning to forefront of hospital priorities. Many participants reported high levels of support and engagement from frontline staff, adult counterparts, ED management team, ancillary services, and quality teams. Engagement included hospitals that established a pediatric disaster committee or developed a strong relationship with the pediatric outreach coordinator (or similar individual) at their local children's hospital/pediatric center.

Although challenged by the COVID-19 pandemic, the participants found the collaborative useful to identify gaps in the inclusion of pediatric considerations in their hospital disaster plan; they also found the resources provided and access to subject matter expertise to be valuable. In fact, the participants requested an additional “bonus” pediatric patient tracking and family reunification virtual tabletop exercise to test and receive SME input on their patient-tracking and family-reunification plans. At the time that this white paper was being prepared, EIC reported that 25 hospitals and more than 100 individuals had registered for this virtual exercise.

To sustain the collaborative's efforts, EIC plans to convert the disaster domain modules and learning sessions into an online, self-paced program that will be accessible free-of-cost on the EIC's website. Quarterly office hours with national pediatric disaster planning subject matter

experts are also planned to support the online participants as is an annual virtual tabletop exercise. The material from this collaborative will also serve as part of the basis for a national pediatric disaster preparedness assessment (similar to the [National Pediatric Readiness Assessment](#)) to be rolled out nationally in 2023.

Summary & Recommendations

There are enormous untapped opportunities to expand the National Pediatric Quality Collaborative Model and Team Structure to connect local, regional, and state private/public stakeholders across disciplines. It is recommended that ongoing partnerships with the ASPR's Pediatric Disaster Centers of Excellence be established to foster a larger community of pediatric disaster and emergency care champions.



Operationalizing



Pediatric



Disaster



Education:



What Works?

Operationalizing Pediatric Disaster Education: What Works?

Establishing Required Education Standards Works

The American Heart Association (AHA) and American Academy of Pediatrics (AAP) support educational programs that are essential to neonatal and pediatric emergency care. These programs include the [neonatal resuscitation program](#) (NRP), [pediatric basic life support](#) (PBLS) and [pediatric advanced life support](#) (PALS).⁷⁵

PALS is an example of a training requirement associated with pediatric emergency care that is ubiquitous across the United States. In many communities, organizationally-required courses like PALS, Advanced Pediatric Life Support (APLS), and Pediatric Education for Prehospital Professionals (PEPP) may represent the only routine pediatric emergency care training that nurses and prehospital personnel receive.

Over the last 10 years, the PALS content has expanded to include evidence-based updates for pediatric cardiac arrest associated with life-threatening bleeding, septic shock, drowning, and opioid-related emergencies. The AHA updates emphasize the importance of both evidenced-based learning; the use of simulation and assistive educational technology devices; and systematic reviews to improve resuscitation skill quality and competency.⁷⁶ In particular, the 2020 AHA recommendations promote the need for “spaced learning” that distributes training into several sessions as an alternative to traditional, large-group classroom instruction.⁷⁷

Leadership Works

The decision to assign educational resources and workforce to support education and training to include children and children in disaster requires leadership. Currently, the inclusion of children in disaster plans and efforts is not a regular part of organizational operations. While incentives and mandates appear to be the key driver, leadership buy-in is essential to whole community pediatric disaster readiness. When communities see children as “everyone’s” business, schools, child-care, parents, and health system providers are more likely to collaborate. Activities that normalize the inclusion of children in day-to-day disaster readiness are presented in the chart, below.

Opportunities to Normalize the Inclusion of Children in Readiness Operations	
<i>Activity</i>	<i>Rationale</i>
Youth Community Emergency Response Team (CERT) Programs as part of Community CERT activities	Expands self-responder pool and develops future pediatric champions. Children are known to save lives when they know what to do.
CPR in Schools	Expands self-responder pool. Studies have shown that children as young as 7-9 years old can perform and retain CPR training.
Use of 911	Children as young as 4 should be taught how to call 911 and what 911 is for.

Family Communication Drills	Create the opportunity to practice routines that are essential during a disaster
Public Access Defibrillation / Automated External Defibrillator (AED) Program	Expands self-responder pool. Many communities may avoid placing AEDs in schools due to liability fears.
Child Injury Dashboards	Transparent reporting of child injury data helps communities reduce risk and promotes prevention
Children and Youth with Special Healthcare Needs (CYDMN)	Flagging CYDMN households in public safety dispatch centers informs providers prior to arrival.
Badge Buddies	Providing JIT information on the back of wearable identification creates a quick reference
Pediatric mobile application as a reference tool	Numerous pediatric disaster and emergency mobile applications can provide guidance and decision support.
Pediatric Emergency Care Coordinator (PECC)	Assigning individuals as champions and points of contact supports organizational capability
Pediatric Provider and Community Recognition	Pediatric Ready Provider/Community recognition create standards for the whole community
Community Threat Assessments	Routinely include the numbers of children and their ages enhances all-hazards planning
EMSC Pediatric Readiness Assessment	Tracking local community hospital readiness scores supports operational area improvement
Stop-the-Bleed Initiative	Expands self-responder pool. Children can save lives when they know what to do.
Pillow-Case Project (Red Cross)	Disaster go-bag readiness engages families in home preparedness
FEMA National Preparedness Month	Creates opportunities for the whole community to participate in preparedness.

Flexibility Works

There are many ways to meet disaster readiness capabilities, and rigid training requirements may limit both participation and innovation. An example of the level of flexibility that may be required to foster success was seen in the [waiver](#) from the National Registry of Emergency Medical Technicians (NREMT) accrediting body for prehospital entry to practice, which was issued on August 24, 2020 in response to the COVID-19 pandemic.⁷⁸ In order to mitigate anticipated pandemic workforce shortages associated with lapses in licensure, the NREMT modified its requirement for in-person continuing education through September 2022.

At times, legislated and statutory requirements can result in unintentional impacts that stifle innovation or disproportionately create barriers for first line responders' efforts to comply with requirements for in-person education and training. For example, during COVID-19, licensed childcare providers in California were required to have in-person CPR training. Childcare

providers seeking license renewal faced the potential loss of their license due to the pandemic. Although the in-person CPR practice is important to teach and evaluate, such requirements may create barriers to learning due to cost, transportation, language, or in-person instruction. These factors adversely impact opportunities for front-line responders in the childcare, prehospital, school, and rural settings to be exposed to concepts and JIT information that supports capability.

There are numerous methods to effectively teach pediatric disaster knowledge, skills, and abilities. Pediatric disaster education providers should consider creating more than one option to deliver training.

Low Cost and No-Cost Pediatric Disaster Training Works

Although there are numerous examples of high-quality no- or low-cost pediatric disaster education, training cost is consistently perceived by many organizations and policy leaders as a major barrier to practicing pediatric day-to-day and disaster readiness. The more limited the resources within an organization, the more often cost is viewed as a major barrier to engagement.

Cost encompasses a variety of factors, including employers' costs of non-productive time, fees for education compliance and tracking systems, and a myriad of other program and partnership fees. Cost is also barrier to low-wage responders, and disproportionately impacts rural and other communities that are impacted by economic hardship. The chart below presents examples of educational costs that are commonly faced by individuals and organizations.

Pediatric Disaster Education Costs Impacting Engagement		
Non-productive time for training	Instructor prep and training time (4 hours per one hour on content)	Educational equipment and technology costs
Fees for educational compliance and tracking systems	Fees for continuing education (CE) provider certification from regulatory agencies	Administrative costs for educational materials, record keeping and CE certificate production and distribution costs.
Fee based Continuing Education	Professional organization fees	Online course fees
Proprietary Service fees	Consultative fees	Accreditation fees

When key front-line providers are not given the time, resources, and/or incentives to access pediatric disaster education, achieving competency is simply left to the individual. Pediatric disaster and readiness education is perceived as complex, expensive, and out-of-reach. These perceptions influence organizations' and policy makers' decisions to engage in (and support) pediatric disaster readiness efforts. When an organization prioritizes pediatric competence, daily workflow opportunities can incorporate short, routine periods of dedicated time to

practice what are perceived to be low-frequency / high-risk skills. An investment of 20 hours over a period of time is sufficient to achieve initial proficiency in most cases, and can be reinforced by short periodic reviews and activities to sustain capability. The chart below presents practice requirements for various capability levels.

Example: Disaster Capability Level			
<i>Level</i>	<i>Practice Requirement</i>	<i>Active Learning</i>	<i>Result Needed</i>
Expert (subject matter expert)	100 hours	4-5 hours/day For 20 days	Capable of establishing and leading an incident command
Proficient (Capable of performing tasks)	20 hours	45 min/day for 30 days	Able to fulfill an ICS role. Review may be required every 4-6 months if not a routine task.
Awareness (Understands concepts)	Estimated to be 2-4 hours	Annual	Capable of explaining what ICS is to another person
Foundational (Overview)	1-2 hours online	Once	Orientation/Onboarding e.g., FEMA ICS 100

Established pediatric academic centers and public private partners are highly effective in mobilizing SMEs and community experts to create pediatric disaster educational content. During the COVID-19 pandemic, these groups were highly successful in responding to operational information and educational needs by using virtual educational webinars and peer-to-peer learning. Educational webinars were easily accessible on mobile devices and open to multiple disciplines at no cost. Quality pediatric disaster and emergency care content was responsive to JIT support of disaster public health and medical operations.

In a query the EGLPCDR conducted in March, 2020, 528 records were returned from a search on the key words “pediatric disaster;” another 423 records were associated with the clinical care of neonates and pregnant women. The courses were predominately free, with some low-cost exceptions. Examples of effective no and low cost open-access multidiscipline training supporting virtual pediatric all-hazards disaster training follow:

CDC TRAIN Learning Network

The [CDC TRAIN Learning Network](#) is an easy-to-use portal to search for pertinent public health and health system resources for health provider training. The portal includes children and provides pediatric disaster online web-based training; self-study; archived webcast; and podcasts that draw upon training and informational resources developed by the CDC, FEMA, ASPR, IDPH, the AAP, and other sources.

CDC TRAIN is a no cost service for learners and supported by the Public Health Foundation. It is not restricted to health care providers. According to its webpage, the CDC TRAIN site provides access to more than 1,000 courses developed by CDC programs, grantees, and other CDC-funded partners.

The CDC TRAIN website also serves as a portal to gain access to the National Center for Disaster Medicine and Public Health Response (NCDMPH) framework for core competencies for Disaster Medicine and Public Health, and to recommended courses based on the NCDMPH curriculum model. During COVID, CDC TRAIN re-emerged and re-branded itself as a go-to resource to support local demands for JIT medical and public health provider education and training. On [PHE e-News](#) reported CDC TRAIN had reached more than 3 million users and counting.

OPENPediatrics

[OPEN Pediatrics](#) was launched in 2012 and is described as a “free, global, open-access, and peer-reviewed knowledge-exchange platform for clinicians from all resource settings involved in the care of sick children.”

The website is supported and maintained by the Harvard Medical School and Boston Children’s Hospital and uses collaboration tools and high-quality content to create virtual classrooms that use technology and simulation to connect professionals with learning. While there are some modest fees associated with continuing education credits, all of the content is available at no-cost without credit. The training center distinguishes itself in creating premier content using videos, simulators, and podcasts. The landing page reports more than 60,000 registered users from every country and territory worldwide; videos have been viewed over 11 million times.

In October 2020, OPENPediatrics collaborated with the New England Emergency Medical Services for Children Program to create a virtual online course of short five-to-seven-minute modules to on-board local PECCs to necessary knowledge, skills, and abilities. (See graphic below.) The virtual training breaks down the “how, what, and why” of pediatric readiness and provides a foundation on simulation, critical debriefing, safe handoffs, and medication safety practices. The course is a model example in how to curate and foster connections featuring Pediatric Disaster and Pediatric Readiness Leaders.

Foundations of Pediatric Preparedness



SPONSORED BY
NEW ENGLAND EMSC
EMERGENCY MEDICAL SERVICES FOR CHILDREN

Now a Pre-Recorded Virtual Forum
in collaboration with OPENPediatrics
(content only accessible from QR code)



Simulation

This workshop will help you increase frequency and accessibility of simulation training without the cost burden of commercially-available high fidelity simulation models. Simulation training can improve pediatric care and Pediatric Readiness but equipment prices are often restrictively high. Come learn how you can create/acquire your own low fidelity simulation equipment and integrate psychomotor skills training (including IV/IO, airway, & stopcocks for medications) for your agencies/institutions at a nominal cost.

Critical Debriefing

Team debriefing after an episode of care can serve as a powerful educational and quality tool and lead to improved team effectiveness and patient outcomes. Debriefing after an event is recommended by the American Heart Association, Institute for Healthcare Improvement, and American Academy of Pediatrics. In this workshop, we will introduce debriefing, how to structure a debriefing session, and practice using a structured debriefing tool.

Safe Handoffs: Preventing Medical Errors

Handoffs are potentially high risk events that can lead to medical errors. Using a standardized method for communicating during handoffs can help decrease these medical errors. In this workshop, we will review why structured handoffs are important, review and practice the MIST handoff tool and review a transfer checklist to help make transitions of care safer for patients and overall improve ED and EMS care.

About This Forum

The New England Region is working together to be prepared for pediatric emergencies! There are an estimated 30 million annual emergency department visits by children under the age of 18 in the United States, and more than 80% of these patients present to a general emergency department or urgent care center for care. This forum aims to provide practical skills and easy-to-use tools to enhance pediatric preparedness in both the prehospital and emergency department settings. Additionally, the day will allow for meeting with others looking to improve pediatric care throughout the New England, hearing success stories of colleagues, and networking with participants and experts. Main highlights of the forum workshops include learning do-it-yourself simulation training of pediatric skills and procedures, leading and teaching debriefing in the clinical environment, and standardizing patient handoff between prehospital and emergency department providers to enhance care.

Virtual Peer to Peer Learning: Project ECHO

Project ECHO (Extension for Community Healthcare Outcomes) is a peer-to-peer model platform with a mission to address the needs of the most vulnerable populations by equipping communities with the right knowledge, at the right place, at the right time. According to the website, the program started as a health care initiative at the University of New Mexico that provide a free educational model and mentored community providers across the state who were treating Hepatitis C patients. “A study published in the [New England Journal of Medicine](#) found that hepatitis C care provided by Project ECHO trained community providers was as good as care provided by specialists at a university.”⁷⁹

Project ECHO has evolved into a multi-discipline global community learning model focused on four key “ABCD” principles that are applied in a learning community to support an “All-Teach and All-Learn” system of JIT education and collaboration. The four principles are:

1. **A**mplification using technology to leverage scarce resources
2. **B**est Practices sharing to reduce disparities
3. **C**ase-Based learning to master complexity
4. **D**atabase (web-based) to monitor outcomes

Project ECHO has a proven track record of supporting continuous learning and collaboration that is essential to sustaining quality education and training. From July 2006 through the beginning of March 2021, Project ECHO reported the following statistics on its activities and reach associated with pediatrics (see graphic below).

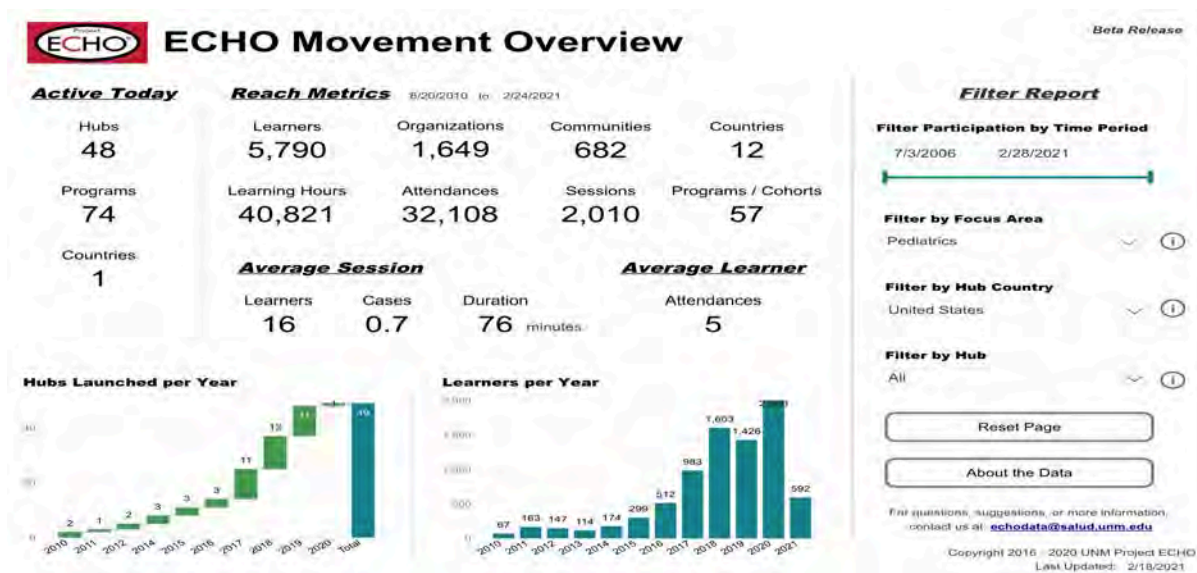


Illustration: Project ECHO Online Impact Data Source <https://echo.unm.edu/data/movement>

The [AAP](#) is a Project ECHO Pediatric Super-hub, offering continuing medical education (CME) credits on a variety of pediatric-specific conditions. The AAP super-hub has trained more than 50 organizations and launched more than 20 topical pediatric ECHO programs.⁸⁰ The AAP's Project ECHO is a "tele-mentoring program designed to create communities of learners by bringing together health care providers and experts in topical areas using didactic and case-based presentations, fostering an all learn, all teach approach."⁸¹ The [AAP's ECHO programs](#) that align with pediatric disaster readiness provider education include Trauma and Resilience, Environmental Health, and Zika.^{82 83 84}



Image source: <https://www.aap.org/en-us/professional-resources/practice-transformation/echo/Pages/default.aspx>

Mobile Technology and Pediatric Disaster Decision Support: “There’s an App for That”

Mobile Technology has played a critical role in access to real time pediatric decision support tools and JIT patient care resources in both normal and disaster conditions. Prior to COVID-19, the workgroup conducted a search for free or low-cost online mobile and smartphone disaster-related applications. The search identified 74 mobile applications about disasters that included pediatric content, including those from the National Library of Medicine, CDC, SMASHA, FEMA, REMM, the Red Cross, WHO, and numerous other entities (see chart, below).

Type of Disaster Application	# of Apps	Mobile App Link
CBRNE and Hazardous Substances	8	WISER
Pediatric Point of Care Resource	4	Harriet Lane
Situation Awareness/Alert Applications	16	Disaster Alert
Family Preparedness	10	Red Cross Emergency
Behavioral Health	18	PTSD Coach
Disaster Response Health and Safety	2	CDC Mobile App
Infectious Disease and Medical Reference	12	The Redbook
Clinical Simulation Application	1	AAP Vitals

Providers should be encouraged to download decision support mobile applications for reference and decision support. In 2021 the US National Library of Medicine Disaster Information Management Research Center sunset and no longer supports landing page of mobile applications for first responders and emergency providers. As of September 2021, there is no single landing page that provides a complete list of recommended mobile applications for education, training, JIT references, and decision support.

Digital Toolkits for Pediatric Disaster Providers

In October 2020, the Education Workgroup created the an infographic highlighting key digital applications to support pediatric disaster operations (see next page). The infographic was introduced to the Ohio EMSC Pediatric Emergency Coordinators in November 2020, and shared with EMSC-II partners.

The selected applications feature pediatric disaster digital resources and mobile applications to assist in JIT training, decision support, clinical operations, simulation training and community preparedness.

Summary & Recommendations

Mobile devices have become ubiquitous and, as such, are a powerful tool connecting novice to expert content. Pediatric disaster digital applications for decision support and JIT pediatric emergency care should be systematically reviewed for quality and promoted across disciplines. Pediatric subject matter experts should actively participate in the review and development of these applications. Quality applications funded by federal dollars should be open-source. Application content should be updated appropriately in content and format to enhance end-user adoption.

PEDIATRIC DISASTER DIGITAL TOOLKITS



Top pediatric disaster mobile applications to assist in just-in-time training, decision support, clinical operations and community preparedness

1 STOP THE BLEED



IOS Android

Developed by the Uniformed Services University this app helps providers and bystanders learn techniques recommended by the Stop the Bleed campaign to control life-threatening bleeding.

2 AFN-TIPS



Link

This app is intended to support first responders who work with access and functional needs populations. It was developed by the Hawaii Emergency Preparedness System of Support Project at the Center on Disability Studies at the University of Hawaii

3 HELP KIDS COPE



IOS Android

A National Child Traumatic Stress Network app to help parents, caregivers, teachers, and emergency preparedness professionals talk with children about the disasters they may face and how to best support them before, during, and after an event.

4 MOBILE REMM



IOS Android

Radiation Emergency Medical Management (REMM) app provides just-in-time information about clinical diagnosis and treatment of radiation and nuclear emergencies for all populations including children. REMM was developed by the National Library of Medicine, ASPR, and HHS.

5 VITALTALK TIPS APP



IOS Android

Developed by the Vital Talk organization this app is designed to build communication skills for effective medical decision making with families and patients with serious illness.

6 PEDS VITALS



IOS Android

App developed by the American Academy of Pediatrics (AAP) to fill the need for a convenient simple pediatric simulator for education and training.

7 PEDIATRIC EMERGENCY GUIDE



IOS Android

A Children's National pediatric resuscitation dosing and equipment app developed by assist paramedics, emergency, urgent care physicians, and allied health providers in the care of critically ill children.

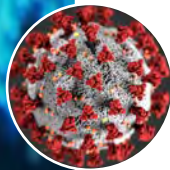
8 PEM (PEDIATRIC EMERGENCY MEDICINE) GUIDES



Link

An online toolkit developed by NYU Lagone Health and serves as a comprehensive resource for pediatric emergency care.

The COVID19 Effect



COVID



Pediatric



Disaster



Education



Response

COVID Pediatric Disaster Education Response

Certain disasters result in catastrophic consequences that disrupt traditional concepts of incident management. COVID-19 was one such catastrophe, and created unprecedented challenges and opportunities for the pediatric community. Early on, the PDCOE recognized that the crisis was an opportunity to advance inclusion of children in whole community and health care coalition disaster readiness.

Early in the COVID-19 pandemic, viral transmission data suggested that children were spared from infection, while adults suffered high rates of mortality and morbidity. Hospitals and communities were not prepared for the scale of the adult patient surge and the required rapid expansion of critical care beds and demands on workforce to support response. In response, PICUs were re-purposed as Adult ICUs, resulting in pediatric staff re-assignment to adult settings or furloughed. In New York and Boston, pediatric patients were sent into a single pediatric receiving facility so that acute care and critical care beds in community hospitals could be dedicated for adult care. In June 2020, [MMWR CDC](#) reported that COVID's impacts had produced a 42% reduction in ED volume; the biggest gaps occurred among children between 1 and 10 years of age.⁸⁵

Mandatory shelter-in-place orders resulted in reductions in pediatric Emergency Department utilization and disrupted routine and specialty pediatric care, causing some settings to [furlough](#) and lay off pediatric and facility support staff.⁸⁶ system and mental health of pediatric and prehospital providers.

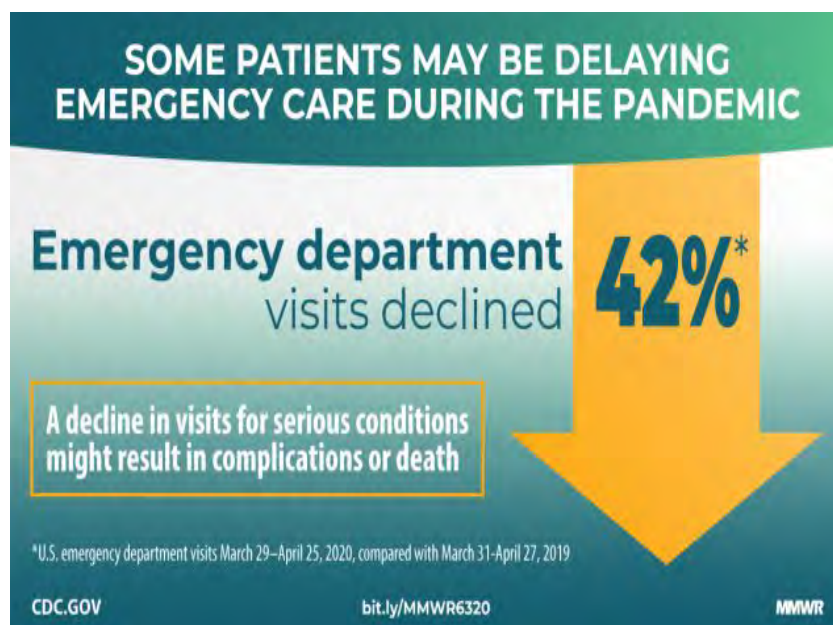


Image Source: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6923e1.htm#suggestedcitation>

Rural and tribal communities found themselves with limited “bench strength” to respond to the pandemic. A March 2020 brief prepared by the North Carolina Rural Health Research Program

reported that rural residents were bypassing their local hospitals and traveling to larger, more distant hospitals because they knew their community hospital had limited capacity to surge.⁸⁷ Nationwide, [EMS calls dropped 26%](#) during COVID-19, further reducing the opportunity for prehospital providers to maintain their pediatric skills.⁸⁸

EMS ACTIVATIONS IN THE US

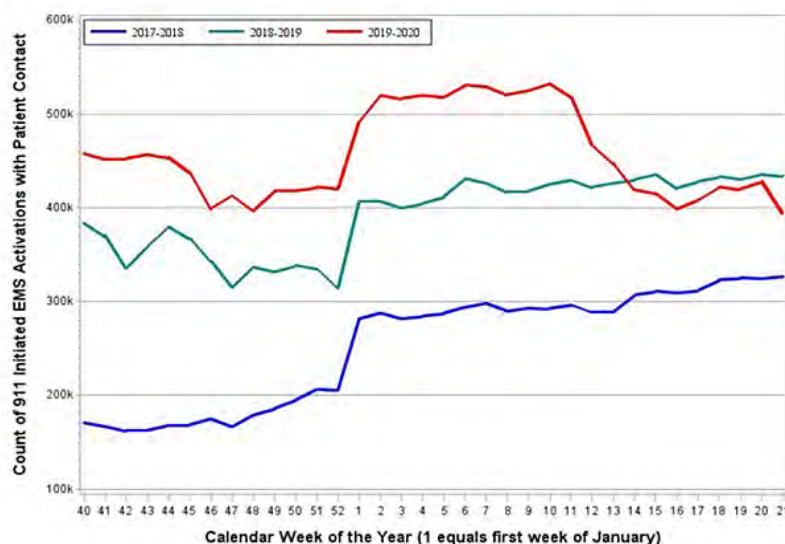


Illustration Source: <http://www.buffalo.edu/news/releases/2020/06/035.html>

Under normal conditions, hospitals receive [less than 5-7%](#) of their Emergency Department pediatric admissions via EMS.⁸⁹ As schools and childcare sites closed due to COVID-19 public health emergency orders, child abuse reporting by mandated reporters in schools, child-care was dropped an average of 40.6% in over 46 states.⁹⁰ Early in COVID, emergency 911 systems modified dispatch protocols for associated with routine and life threatening emergencies due to lack of Protective Provider Equipment (PPE).

Schools and child-care settings closed in response to COVID resulting in the disruption of education and access to school meals. The behavioral and mental health impacts of COVID adversely impacted all segments of society and the significant decrease in reports of child abuse associated with school and child-care settings.



Image Source: Cheng, T.L., Moon, M. & Artman, M. Shoring up the safety net for children in the COVID-19 pandemic. *Pediatr Res* **88**, 349–351 (2020). <https://doi.org/10.1038/s41390-020-1071-7>

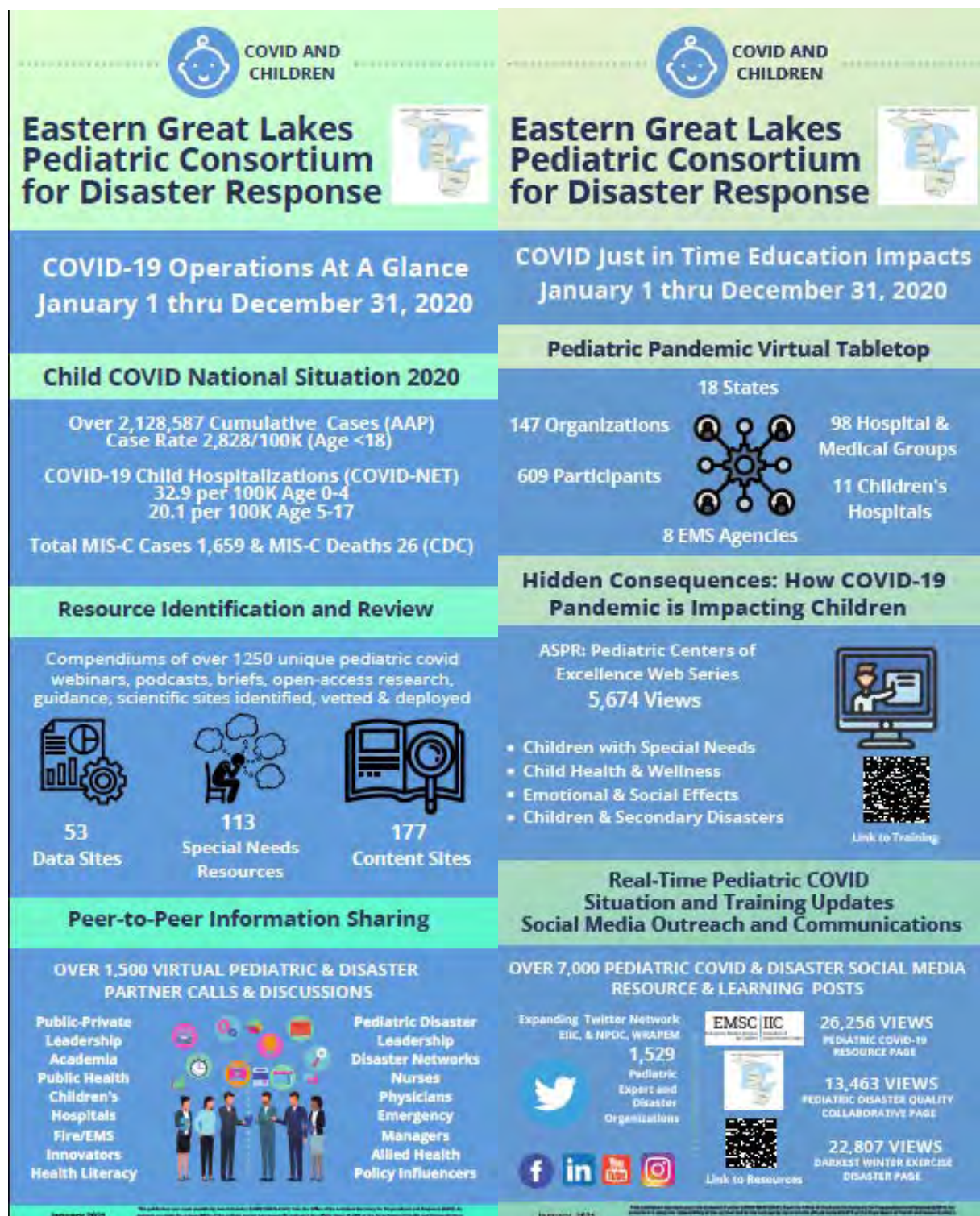
In December 2019, as pediatric and public health and infectious disease professional became increasingly engaged in the emerging COVID19 pandemic, PDCOE had to pivot and redirect pediatric disaster efforts to the support of whole community and hospital pandemic operations. Education workgroup activities focused on finding and deploying training resources to support pandemic medical health and community operations.

Pediatric Disaster Center of Excellence Education Workgroup’s COVID-19 Response

Beginning in December 2019, EGLPCDR established a pediatric COVID compendium compiled from over 84 listservs, academic, and informational websites and situation data dashboards. Compendium resources were reviewed and categorized by topic and type and then used to fulfill requests from other pediatric focus groups supporting COVID operations for Pediatric Disaster Centers of Excellence.

Covid Article Compendium Review Categories		
Title	Focus: Pediatric, OB-Perinatal, Childcare, School, MIS-C, Prehospital	Website link
Length of Time (minutes) to read or view	Type: Webinar, Video, Audio, Publication, Dashboard	Date

The curated COVID compendium served to fill information resource requests and included over 400 unique webinars, podcasts, briefs, open access research, guidance and scientific commentary/media was compiled and shared as a resource between stakeholders including ASPR/TRACIE, EIIC, Western Regional Alliance for Emergency Management (WRAP-EM) and National Pediatric Disaster Coalition (NPDC). The compendium has grown to over 1400 pediatric related topics as of March 2021. The compendium was subsequently used to deploy over 1200 Pediatric COVID Social Media resource and learning posts resulting in over 22,000 views of EIIC Pediatric COVID resources across 42 public-private-professional social media partners.



The COVID pandemic produced an immediate need for both pediatric and critical care cross-discipline and interdisciplinary problem-solving among experts across continents. To meet the extraordinary real time information demands the following changes in information sharing,

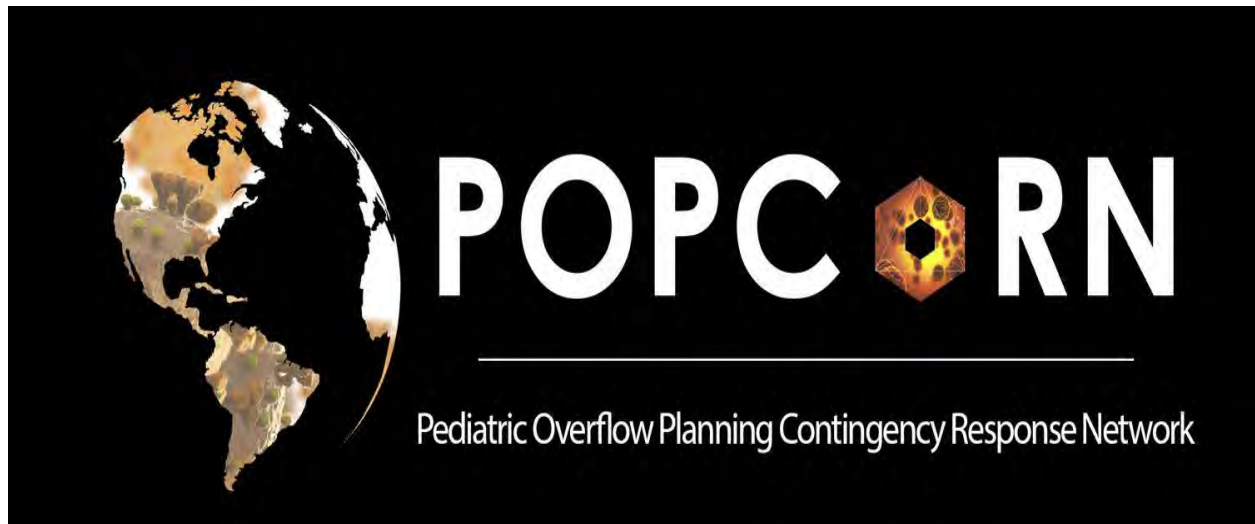
education and training deployment was noted:

- Education and training programs moved from in-person to virtual training overnight.
- Telemedicine was rapidly and universally adopted across health care systems due to social distancing requirements.
- Unprecedented real-time, multi-discipline public-private collaboration and research sharing became normalized.
- Barriers associated with pay to access education, training and scientific publications associated with professional membership or subscriptions were eliminated by numerous organizations and journals.
- Real-time situation awareness and data dashboards to inform the global community of transmission rates were created by organizations like IHME and WHO.
- Adult ICU capacity, PPE utilization calculators and clinical strategies and engineering hacks associated with patient care including the use of practices like proning, high flow nasal cannula vs mechanical ventilation, and infection control engineering measures were created by NETEC and other centers to fill immediate information needs.
- Local, regional and national jurisdictional incident response and problem solving became a daily occurrence.
- Individuals who had never collaborated before were compelled to come together in real-time to address supply chain shortages of PPE, develop environmental control protocols and address contingency and crisis care standards.
- Pandemic impacts that disproportionally impacting children exacerbated issues associated with food insecurity, homelessness, school disruption, behavioral health, child abuse and domestic violence.

Real World COVID Virtual Just-In-Time Pediatric and Disaster Education

Numerous partnerships were observed as being highly effective in deploying JIT learning during the pandemic response through real time collaboration. These include the following:

POPCoRN: [*Pediatric Overflow Planning Contingency Response Network*](#).



The [Popcorn network](#) evolved as a grassroots effort supported by residents in training virtually connected to real-world online support from dual boarded pediatric and adult critical care attendings directly involved in the adult COVID-19 surges into pediatric settings.⁹¹ The network welcomes all disciplines and levels of training across the globe. The network leadership is developing a working [white paper](#) detailing the scope of their operational activities.⁹²

POPCoRN Network lessons learned include the fact that the Network:

- Recognized the immediate need for education and training on adult critical care management.
- Used dual-boarded attendings in both adult and pediatric critical care to virtually coach pediatric providers in other settings.
- Recognized that COVID-19 was a forced opportunity that required providers at all levels to rethink day-to-day workflows.
- Developed quick one-page guidelines, based on lessons learned, for rapid dissemination.
- Recognized early on the toll that the pandemic was taking on staff, and used the Network to provide behavioral health mutual aid to support colleagues on the front lines by serving as a virtual “battle buddies.”

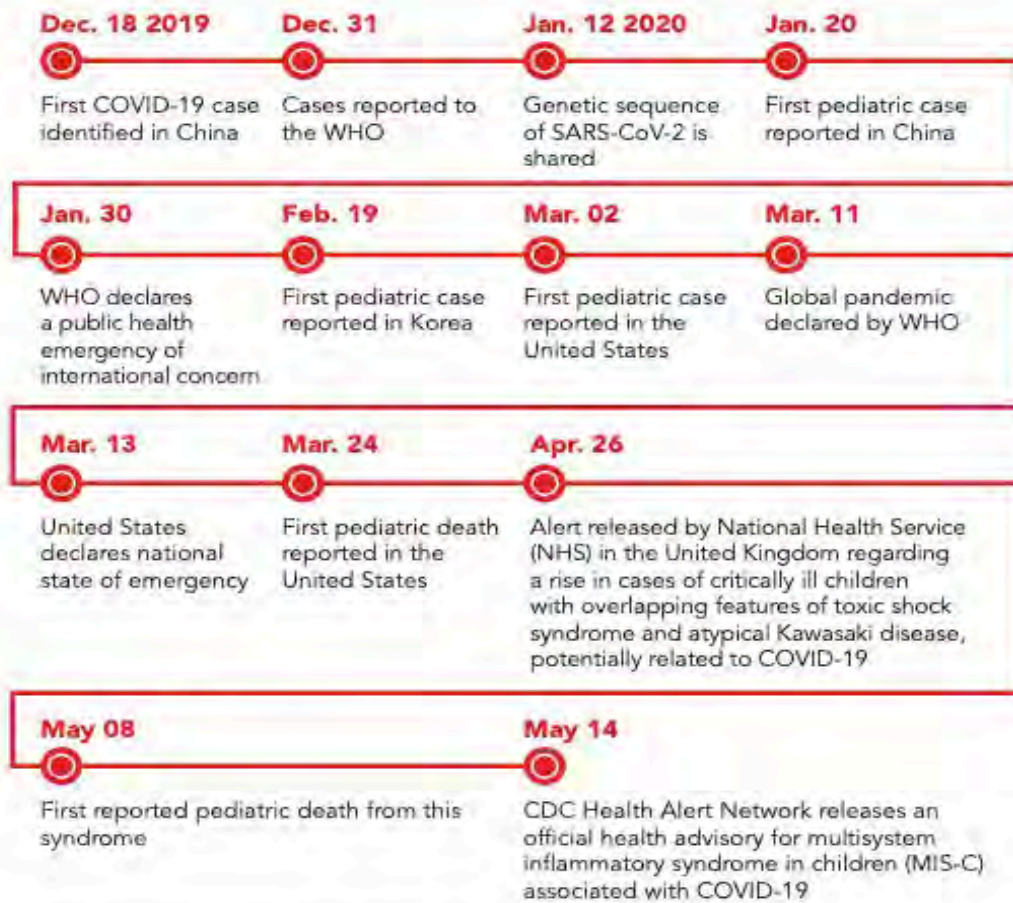
The network utilized improvement and design thinking approach while leveraging technology to achieve virtual engagement and model network participants to think in phases. Most importantly it promoted partnerships and connections that provide a community of learning under extraordinary conditions.

[HHS/ASPR COVID-19 Clinical Rounds](#)



Children were thought to be relatively unaffected early on in the pandemic. In April 2020, that assumption changed dramatically as reports from Italy, France, and England emerged describing life-threatening post-viral condition unique to children; this condition eventually became known as “Multisystem Inflammatory Syndrome in Children” (MIS-C). These reports raised alarm across the globe (see timeline, below).

Figure 1. Timeline of the Impact of the COVID-19 Pandemic on Pediatric Patients^{8,9}



Abbreviations: CDC, United States Centers for Disease Control and Prevention; COVID-19, coronavirus disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; WHO, World Health Organization.

www.ebmedicine.net

Image source: <https://www.ebmedicine.net/topics/infectious-disease/COVID-19-Peds>

In response, HHS-ASPR rapidly pulled together a clinical rounds special session that drew tremendous interest from across both nationally and internationally. Below are the illustrations created by the EGLPCDR from participant outreach data associated with the event. The event drew more than 527 multi-discipline participants from across the globe and continues to be available as an archived resource on the HHS/ASPR Clinical Rounds Website.

Number of Attendees by Geographic Region

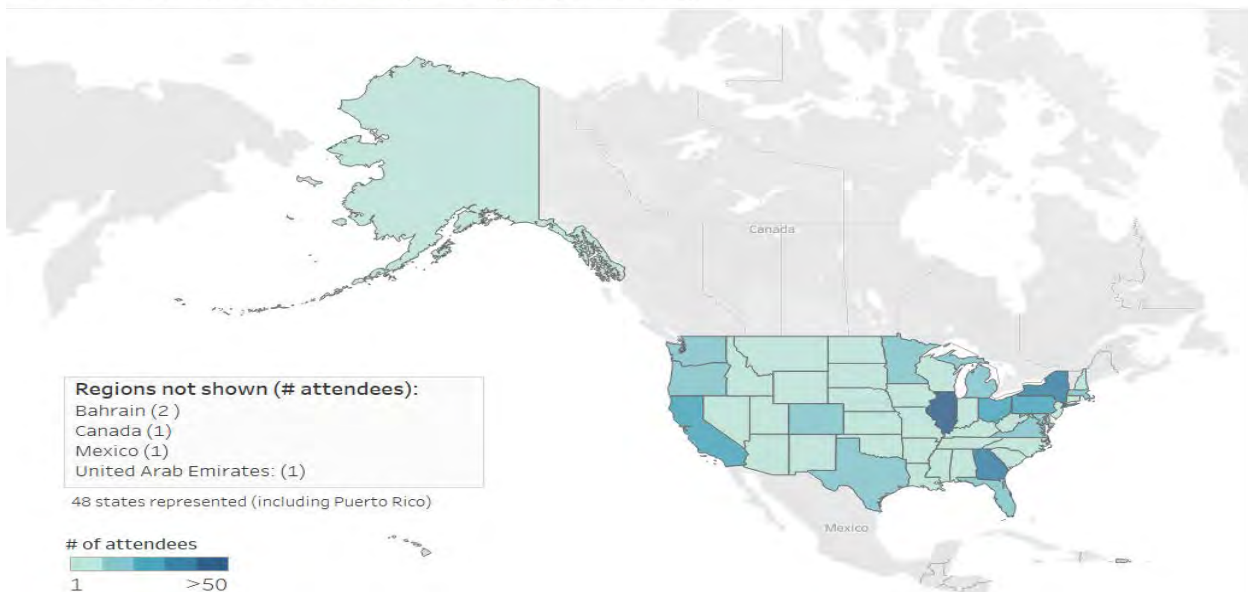


Illustration based on data collected received from HHS/ASPR May 22, 2020 [Clinical Rounds Special Session](#) -Pediatrics on Multisystem inflammatory syndrome in children and adolescents with COVID-19.

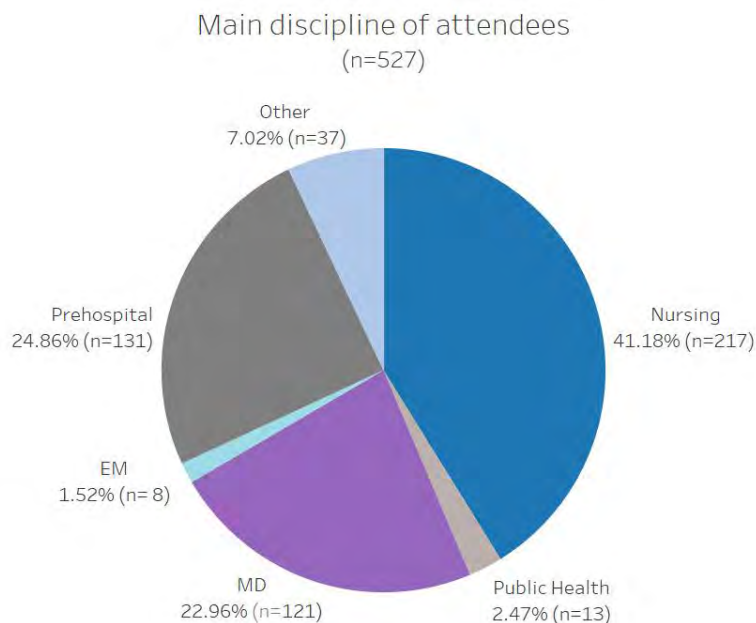


Illustration based on data collected received from HHS/ASPR May 22, 2020 [Clinical Rounds Special Session](#) -Pediatrics on Multisystem inflammatory syndrome in children and adolescents with COVID-19.

The HHS/ASPR Clinical Rounds (facilitated though Project ECHO Learning Platform) stood-up COVID peer-to-peer learning operations on March 24, 2020. Three weekly sessions supported involving 15 national professional organizations and subject matter clinical experts from across the nation including the National Emerging Special Pathogens Training and Education Center (NETEC). The session topics were:

1. Critical Care: Lifesaving Treatment and Operations
2. Emergency Department Patient Care and Clinical Operations and
3. EMS: Patient Care and Operations

During the COVID-19 pandemic, health care and professional educational networks pivoted and made remarkable changes to support unprecedented peer-to-peer research and clinical solutions across disciplines. The learning environment became “free-flowing” and overwhelming all at the same time. Scientific journals, media and news that previously had required costly subscriptions were free. Scientific journal publications were posted online prior to peer review and virtual online webinars featuring multi-center and global collaboration flooded the internet.

Although not dedicated to pediatrics, the HHS/ASPR clinical rounds educational reach was enormous. Online registration averaged up to 800 participants in the first few months of the program. In addition, each session was recorded and posted on the ASPR clinical rounds website creating a compendium of training to support providers across disciplines. This real-time information assisted health system leadership with key situation awareness and solutions to plan and prepare in areas where COVID had not yet surged in their communities. Learnings produced tools and resources to address supply chain disruptions, PPE conservation allowing many communities to move from reactive to proactive operations. Concurrently NETEC and Emory stood up their infectious disease centers of excellence education operations to facilitate best practices in infection control and producing virtual education that was both nimble and effective.

ASPR/TRACIE

The HHS ASPR Technical Resources, Assistance Center, and Information Exchange (TRACIE) is another example of educational resource supporting both PHEP and HCC requirements. It relies on a volunteer network of subject matter experts to inform and vet resources to support Healthcare Coalition Program deliverables. The TRACIE listserv is able to reach over 100,000 individuals. TRACIE’s regional staff provide vetted resources and operational guidance, playbooks and technical assistance serving all populations. As part of those resources, TRACIE has a large compendium of multi-discipline neonatal, perinatal and pediatric disaster educational resources.

In the fall of 2019, requests for pediatric resources were driven by the ASPR PHEP/HPP Health Care Coalition (HCC) requirement for each HCC to create a Pediatric Annex to their HCC Preparedness Plan. When the COVID surge finally hit the United States utilization of ASPR TRACIE Pediatric/Children resources decreased. HCC Pediatric Annex deadlines were flexed to support HCC pandemic response.

COVID response activities as previously described were focused largely on adults during the first three months of 2020. Pediatric education impact data provided by ASPR TRACIE demonstrated that online searches associated with Health Care Coalition Pediatric Surge Annex Preparation

dropped 70% while requests for pediatric technical assistance increased 26%.

ASPR TRACIE Pre-Post COVID Pediatric Topic and Technical Assistance Utilization	September 1, 2019-February 29, 2020	March 1, 2020-June 30, 2020
Technical Assistance	17	23
Pediatric Technical Assistance Online Resources Created in 2020 (non-COVID) <ul style="list-style-type: none"> ○ Healthcare Coalition Gap Analysis Resources for Pediatric Surge Planning ○ Pediatric Exercise Resources ○ Pediatric Patient Movement 		
	September 1, 2019-February 29, 2020	March 1, 2020-June 30, 2020
Visits to ASPR TRACIE Pediatric/Children Topic Collection	1,375	409
COVID-19 Resources with Pediatric Components <ul style="list-style-type: none"> ○ COVID-19 At-Risk Individuals Resources: Children ○ COVID-19 Clinical Experiences from the Field ○ COVID-19 Healthcare Delivery Impacts Tip Sheet ○ COVID-19 Visitation Guidance for Retirement Communities ○ Healthcare System Preparedness for Secondary Disasters during COVID-19 		

Source: Data provided by ASPR/TRACIE (July/Aug 2020)

COVID Web-based Collaborative Best Practice: OPENPediatrics

In response to COVID-19, the [OPENPediatric platform](#) mobilized pediatric educational videos featuring to assist providers in the knowledge, skills and abilities in pediatric assessment, COVID-19 airway management, mechanical ventilation and hemodialysis. In addition, its platform launched “International PICU-COVID-19 Collaboration” virtual meetings to support real time global collaboration on pediatric critical care and pandemic topics focused on children.



Image Source: <http://www.nephjc.com/news/2017/6/23/hemodialysis-simulator-by-openpediatrics>.

Summary & Recommendations

Beginning in April of 2021 the COVID Delta Variant took off across the world. The variant's transmission rate was akin to chicken pox studies and demonstrated that Delta was much easier to transmit via aerosol than previously. By July 2021, pediatric hospitals were exploring contingency and crisis care. Children's hospital's general care and pediatric critical care bed capacity was overwhelmed due to the increased numbers of children and gaps in nurse staffing associated with earlier furloughs and COVID's unrelenting mental health impact on all health care providers.

The COVID pandemic directly targeted children who could not yet be vaccinated with an approved vaccine. Return to school policies were in place with inconsistent use of masking, social distancing, environmental ventilation, filtration protections, and inconsistent testing for children. At the time of this report, the pediatric surge has just started and is not expected to peak until October, 2021.

COVID has created challenges that are well-known to those who understand the impact a global pandemic can have. What has played out in real world is that, when children are perceived as not being directly impacted by disasters, adults are prioritized and pediatric disaster capability is compromised. Coordinated collaborations between multi-discipline groups on the local, regional, state, and federal levels are needed to create essential tools and processes associated with pediatric disaster education and training. In every crisis, there is opportunity. In this crisis, there is an enormous potential to mobilize the larger pediatric community to strengthen response and capability using peer-to-peer technology to enhance virtual solutions.



What



Have



We



Learned?

What Have We Learned?

Disasters create unprecedented challenges for communities and their children. Today, disaster science has evolved into complex and sophisticated processes using an array of technology that demands data-driven metrics. The process of disaster readiness requires providers to rapidly learn new skills and methods in real time—especially when the disaster impacts children.

There is a critical need for a model to universally connect frontline workforce and communities with solutions that effectively address children’s need throughout the disaster cycle of mitigation, planning, preparedness, response, and recovery. Such a model would promote the establishment of regional pediatric disaster response systems, thereby reducing operational barriers across jurisdictions during real world events. Education would become a key driver to achieve collaboration, solve problems, and establish child-ready communities. Adopting a pediatric disaster education Concept of Operations would facilitate the integration of children into multi-discipline disaster education and serve as a vehicle to promote whole community resilience (see below for graphic of proposed CONOPS components).



Recommendations to Reduce Pediatric Disaster Educational Gaps

The following recommendations are inspired by the [Institute for Healthcare Improvement](#)⁹³ framework for spread. These approaches have the opportunity to “normalize” pediatric disaster readiness as part of emergency management. The strategies support creating systematic

solutions across health care systems, coalitions, public health, public safety and emergency management organizations.

Culture, Leadership, and Governance

- Ensure pediatric disaster readiness is a demonstrated core value.
- Assess capabilities and commit resources to advance pediatric disaster readiness
- Widely share information about disaster consequences to children to promote transparency.
- Implement foundational competency-based on-boarding focused on children in disaster across disciplines

Patient and Family Engagement

- Establish competencies for all health care professionals for the engagement of patients, families, and care partners.
- Engage patients, families, and care partners in disaster readiness.
- Ensure equitable engagement for all patients, families, and care partners.
- Promote a culture of trust and respect for patients, families, and care partners.

Learning System

- Facilitate both public/private organizational learning.
- Accelerate the development of pediatric emergency and disaster learning networks.
- Initiate and develop systems to facilitate interprofessional pediatric education and training
- Develop shared goals for pediatric disaster readiness across disciplines.
- Expedite regional multi-discipline coordination, collaboration, and cooperation.

Additional Opportunities & Recommendations

- **Improve child-centric situational awareness:** Most community, fire, EMS, and hospital leaders are not aware of what happens to children in disaster. Victimization, abduction, homelessness, behavioral health consequences and their long-term effects all increase children's risk of addiction, suicide, and workforce and economic decline. Awareness is the first step in creating engagement.
- **Practice inclusiveness:** Ensure that children's needs are addressed as part of the population and whole community guidance by using the word "children" in disaster plans. It is important to recognize children as a distinct part of the community in order to ensure that their needs are addressed. Disaster plans should not use the word "families" or "vulnerable populations" as a proxy for "children."
- **Think systems:** Promote pediatric system of care thinking across communities through collaboration. Establish talking points to dispel flawed thinking among organizational leaders who erroneously believe there is no need to do more than prepare to care for

children under normal conditions. Regardless of the setting, competency degrades when pediatric skills are not practiced and the skill subsequently become unfamiliar.

- **Use scenario-based training:** Simulation has been shown to be critical in promoting safety, mitigating risk, and improving competency in all settings regardless of their pediatric population. If barriers exist that hamper access to onsite simulation, facilities should seek out low-tech, low-cost, and virtual learning resources. Centers of simulation excellence should participate in community outreach in order to bridge the gaps between the simulation “haves” and “have nots.”
- **Create incentives:** Incentives for first responders and EMS providers should include the ability to count nursing continuing education hours as EMS continuing education. Requirements for up to 8 hours of pediatric readiness education and training every two years should also be adopted. Legislative action should be considered to set expectations to enhance front line personnel’s pediatric disaster capabilities.
- **Collaborate with child injury prevention initiatives:** Child-based injury prevention programs are well-established and long-standing public-private community partners including schools and childcare. Including disaster readiness as a part of local child injury prevention efforts creates opportunities to mitigate the risks associated with all-hazards. Collaboration is known to enhance whole community resilience.
- **Leverage all levels of government leadership (city, county, state, and federal):** All disasters begin as local or regional events. Health care coalition Leaders—in partnership with the AAP’s Council on Children and Disaster, Pediatric Centers of Excellence, and EMSC-EIIC—should leverage resources to support cross-discipline, integrated systems and appropriate use of open-source pediatric disaster education.
- **Reduce barriers to engagement:** Create partnerships between pediatric disaster champions with mentors. Improve portability of pediatric disaster continuing education across disciplines that is required for licensure and accreditation. Create online compendia to navigate pediatric disaster educational resources that are open-source, no-cost, and high-quality pediatric emergency and disaster education.
- **Address disparities:** Disaster content creators for pediatric regional centers should partner with low-resource disciplines and critical access communities in order to share high-quality pediatric education. Educational work products should use standardized processes to routinely measure, engage, promote, sustain, and update content.
- **Leverage grant partnerships:** Partner with the Homeland Security Assistance for Fire Fighter grant program to create a grant incentive for fire agencies to establish a PECC. Task the fire-based PECC to participate in local and state EMS for Children programs and serve as a public safety representative for children as part of operational area planning. Connect local champions with SMEs and other resources through virtual networking and

engagement.

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Illustrations and Graphics Not Referenced, Courtesy of Microsoft Word Stock Images & Opensource Online Photos

Appendices

- **Appendix A. Education Workgroup Members & Sites**
- **Appendix B. Leveling the Playing Field: A Concept of Operations for Pediatric Disaster Education (cover page and link)**
- **Appendix C. Yale / New Haven Health, Study to Determine the Current State of Disaster Medicine and Public Health Education and Training and Determine Long-term Expectations of Competence (cover page and link)**

Appendix A. Education Workgroup Members & Sites

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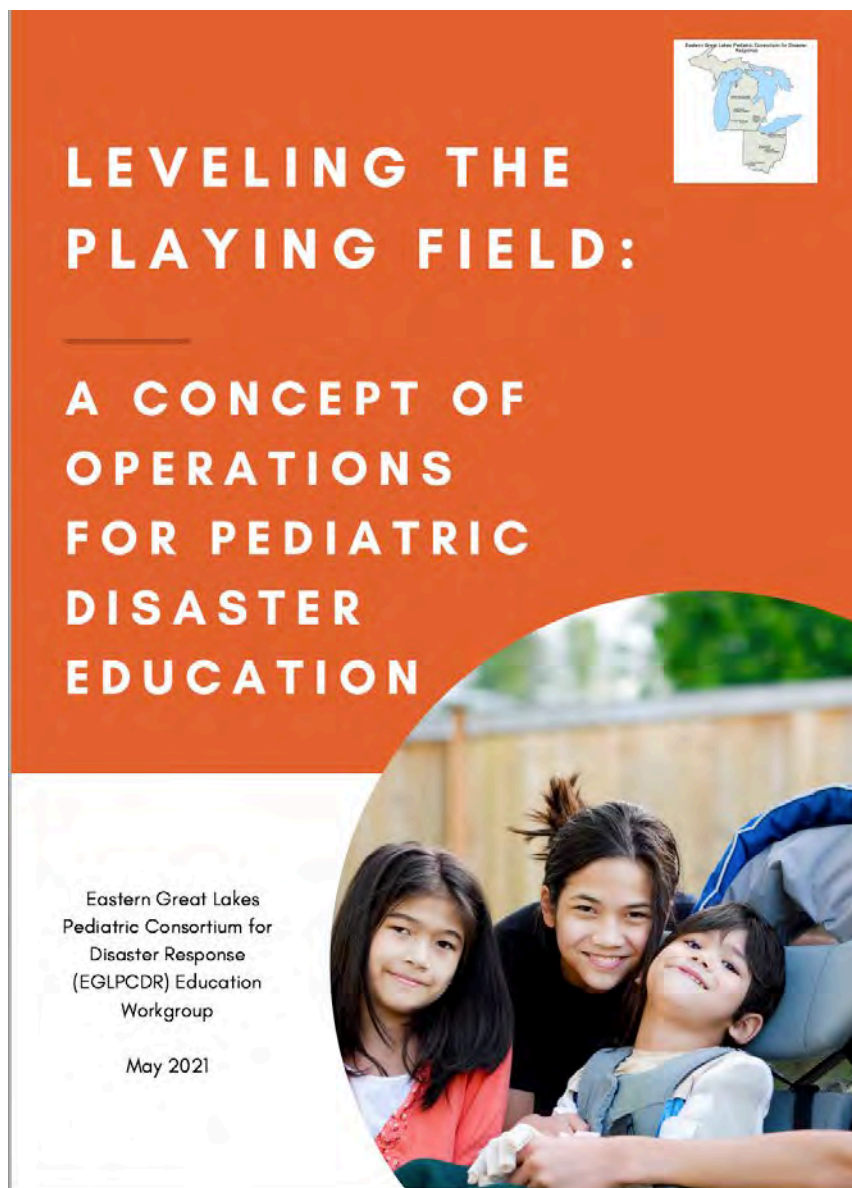
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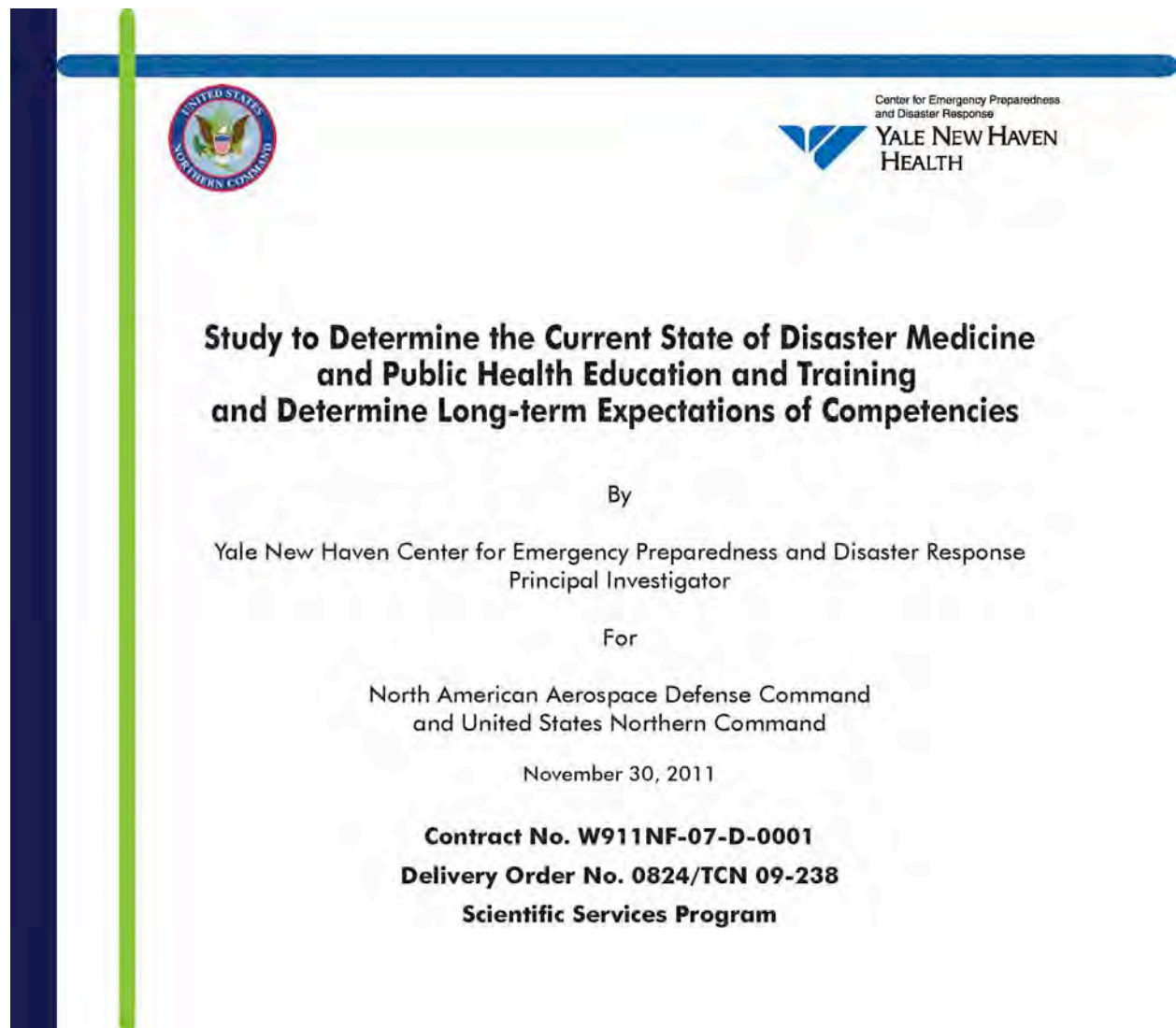
Appendix B. Leveling the Playing Field: A Concept of Operations for Pediatric Disaster Education



Available at: <https://emscimprovement.center/domains/preparedness/asprcoe/eglpdr/education/infographics/conops/>

Appendix C. Yale / New Haven Health, Study to Determine the Current State of Disaster Medicine and Public Health Education and Training and Determine Long-term Expectations of Competence

Download Yale/New Haven Health at: <https://drive.google.com/file/d/16VJ-vNlmJcjRrOs1nIV1Sj2lP-2GYjCx/view?usp=sharing>



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