



Ensuring the Health of Children in Disasters

DISASTER PREPAREDNESS ADVISORY COUNCIL, COMMITTEE ON PEDIATRIC EMERGENCY MEDICINE

Infants, children, adolescents, and young adults have unique physical, mental, behavioral, developmental, communication, therapeutic, and social needs that must be addressed and met in all aspects of disaster preparedness, response, and recovery. Pediatricians, including primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists, have key roles to play in preparing and treating families in cases of disasters. Pediatricians should attend to the continuity of practice operations to provide services in time of need and stay abreast of disaster and public health developments to be active participants in community planning efforts. Federal, state, tribal, local, and regional institutions and agencies that serve children should collaborate with pediatricians to ensure the health and well-being of children in disasters.

abstract

Although disasters have long caused destruction and suffering, events such as the 9/11 terrorist attacks, the 2004 Indian Ocean tsunami, Hurricane Katrina in 2005, the 2009 H1N1 influenza pandemic, the 2010 Haiti earthquake, Superstorm Sandy in 2012, the 2014 Ebola epidemic, and others show how citizens and responders continue to be surprised by the character and scope of such incidents. What all disasters have in common and what sets them apart from other emergencies are their precipitous nature and overwhelming effects on a community's response system. Disasters are unpredictable and generally cannot be prevented from occurring. Nevertheless, pediatricians and others involved in the care and well-being of children can prepare for and mitigate their effects, encourage preparedness and resiliency among children and families and within communities, and ensure that children's needs, including those of children and youth with special health care needs, are not neglected in planning, response, and recovery efforts.

CHILDREN HAVE UNIQUE NEEDS

The unique needs of children mandate specialized and appropriate planning for disasters. Children differ from adults in physiology, developing organ systems, behavior, emotional and developmental understanding of and response to traumatic events, and dependence on others for basic needs. Children's rapid minute ventilation, large surface

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area relative to body mass, more permeable skin, and proximity to the ground increase their risk of adverse outcomes from exposure to environmental hazards such as particulates or droplets, whether from debris or biological or chemical threats.¹ Children are in a critical period of development when toxic exposures can have profound negative effects. Exposure to carcinogens and radiation can damage DNA and increase children's lifetime cancer risk because of increased division of cells and longer remaining life span. Children may lack the developmental ability to flee hazards, or they may even approach them out of curiosity or inadequate comprehension of risk. Limited ability to understand the nature of the disaster can also lead to stress, fear, anxiety, inability to cope, and exaggerated response to media exposure. All of these responses can manifest as developmental regression, withdrawal, clinginess, tantrums, enuresis, or somatic complaints, among other symptoms. Infants and young children cannot care for themselves and require age-appropriate foods (including human milk) as well as assistance in feeding, toileting, and clothing.² Safe housing and safety in shelters are also critical. Equipment, medical or otherwise, must be appropriately sized; and medications must exist in formulations for appropriate dosing and administration to children.

Failing to address children's unique needs in advance of a disaster may put children in harm's way, resulting in morbidity and physical and emotional stress for them as well as for their caregivers. Local, state, and federal representatives involved in disaster planning and response have an obligation to prepare for meeting the needs of the whole community, including the unique needs of children.³ Children represent approximately 25% of the US population, and the large majority of adults share a common concern in

ensuring children's health and well-being.^{4,5} Not all planners and responders in emergency and disaster response systems may be optimally familiar with the needs of children, and especially of children and youth with special health care needs. Pediatricians can educate emergency and disaster response teams and advocate for children to be appropriately served with regard to evacuation, sheltering, family reunification, medical needs, mental health, nutrition, and safety.

RETURN TO A DISASTER-AFFECTED AREA

To ensure their safety and protection, children of all ages should be directly supervised during and after a disaster. Disrupted, limited, or absent child care, schooling, clean water, and medical care can negatively affect the well-being of children as well as the ability of caregivers to carry out their own immediate postdisaster tasks. Before returning to a disaster-affected area, a family needs to consider the roles and capabilities of children as well as the services and care available for them. For instance, clean-up efforts may present dangers to young children that would preclude their participation. In general, children should be among the last individuals to return to areas affected by flooding or other disasters.¹ Public health officials and pediatricians are encouraged to jointly determine and announce when the environment is safe for children to return.

PREPARING TO SERVE CHILDREN IN A DISASTER

Pediatricians should be ready to provide care for patients even when normal operations are disrupted. Advance preparedness planning can mitigate risk, reduce material and operational losses, improve financial stability, strengthen the medical home, and help promote the health of the children in the community.⁶

Inpatient, outpatient, and emergency services should develop operational preparedness and resiliency planning, both individually and collaboratively, to continue providing care for children during and after disasters. Enhancing the capacity to meet the everyday needs of children is one way to increase operational resiliency for more severe, large-scale, or surge events. For example, the services and coordination used every day in the pediatric medical home become even more crucial in effectively addressing the heightened needs and potential loss of resources resulting from disaster.⁷ Many aspects of continuity of operations planning are common to all businesses or medical practices, such as hazard insurance, staffing, supplies, and internal and external communications.⁸ Pediatric practices face additional unique and significant needs, such as the preservation of vaccines, potential readjustment of service capabilities (eg, reducing or delaying well-child visits to accommodate more acute visits), and communicating with families who may have suffered devastating losses. The American Academy of Pediatrics (AAP) and other organizations have developed resources to help both hospitals and practices in all-hazards preparedness planning.⁹⁻¹¹ Pediatricians are also advised to undertake personal and family preparedness and to encourage coworkers and staff to do the same so they are better able to perform their professional responsibilities during a disaster.

PREPARING FAMILIES FOR DISASTER

Families view primary care physicians, such as pediatricians, as one of the most trusted sources of information about disasters.^{12,13} Experiences during the 2009 H1N1 influenza pandemic showed that pediatricians must be prepared for a surge in communications with patients and families as well as with other health care and public health

agencies during disasters.¹⁴ Part of this preparedness, planning, and response involves information management, such as knowing where to receive trustworthy, efficient, and relevant information. Pediatricians are encouraged to sign up for Health Alert Network notifications through the Centers for Disease Control and Prevention (CDC) and local and/or state health departments.¹⁵ Pediatricians can also provide anticipatory guidance to help children and families prepare themselves before a disaster as part of ongoing preventive health care (see Table 1). Such guidance has been documented to be helpful and effective.¹⁶ Children and youth with special health care

needs, including those with limited English proficiency, warrant particular targeting for preparedness because of their enhanced vulnerability and the challenges they may experience related to additional needs for medications, equipment, or specialized care during a disaster.¹⁷ The Emergency Information Form, a validated resource developed by the AAP, the American College of Emergency Physicians, and the Emergency Medical Services for Children program, may be helpful in identifying the specific needs of children in this category.¹⁸ Preparedness for families of children and youth with special health care needs may involve multiple aspects of

care and should include all members of the care team: primary care pediatrician, specialists, therapists, case managers, home care agencies, pharmacists, suppliers of durable medical equipment, and payors.

WHEN CHILDREN ARE AWAY FROM PARENTS OR CAREGIVERS

A majority of children spend time during the day away from their parents or guardians, in school or in child care.¹⁹ Emergency planning should include an assessment of local hazard vulnerability and community assets; this assessment should consider places where children congregate, such as schools, child care

TABLE 1 Select Resources to Help Families and Communities Prepare for Disaster

Resource	Description	Link
AAP		
Family Readiness Kit	Family readiness materials and disaster-specific fact sheets for families	www2.aap.org/family/frk/aapfrkfull.pdf
How to Prepare for Disasters	AAP information to help families prepare a written disaster plan	www.healthychildren.org/English/safety-prevention/at-home/Pages/How-to-Prepare-for-Disasters.aspx
Emergency Information Form	AAP emergency information form template for children and youth with special health care needs	www2.aap.org/advocacy/blankform.pdf
Family Disaster Supplies List	AAP information and a list of important supplies to keep in a disaster supplies kit	www.healthychildren.org/English/safety-prevention/at-home/Pages/Family-Disaster-Supplies-List.aspx
Four Steps to Prepare Your Family for a Disaster	AAP information to help families prepare for a disaster	www2.aap.org/family/frk/F0urstepsFRK.pdf
Getting Your Family Prepared for a Disaster	AAP information; tips to prepare a family for a disaster	www.healthychildren.org/English/safety-prevention/at-home/Pages/Getting-Your-Family-Prepared-for-a-Disaster.aspx
Talking to Children About Disasters	AAP information; tips for talking to children about disasters	www.healthychildren.org/English/safety-prevention/at-home/Pages/Talking-to-Children-About-Disasters.aspx
Talking to Children About Tragedies and Other News Events	AAP information; how to talk to children of various ages about disasters and tragedies	www.healthychildren.org/English/family-life/Media/Pages/Talking-To-Children-About-Tragedies-and-Other-News-Events.aspx
American Red Cross		
Pets	Information to address the needs of pets in disaster planning	www.redcross.org/prepare/location/home-family/pets
Prepare Your Home and Family	Resources to help families prepare for a disaster	www.redcross.org/prepare/location/home-family
ASPCA		
Pet Care: Disaster Preparedness	Information to address the needs of pets in disaster planning	www.aspc.org/pet-care/disaster-preparedness
CDC Health Departments		
FEMA	State or territorial health department locator	www.cdc.gov/mmwr/international/relres.html
Emergency Shelter Information	Information to assist families to find a nearby shelter during a disaster	www.disasterassistance.gov/information/immediate-needs
Family Emergency Plan	Family emergency plan template	www.ready.gov/sites/default/files/documents/files/Family_Emergency_Plan.pdf
Ready Kids	Web site with information and materials for children to access directly	www.ready.gov/kids
State Offices and Agencies of Emergency Management	State offices and agencies of emergency management locator	www.fema.gov/state-offices-and-agencies-emergency-management

ASPCA, American Society for the Prevention of Cruelty to Animals.

facilities, community centers, after-school programs, camps, and playgrounds. Various resources are available to help pediatricians partner with schools and child care facilities in disaster planning.^{20,21} Families, institutions, and planners must prepare for the possible separation of children from their usual caregivers in a sudden disaster. Children need to be identified and tracked, with protocols and provisions for temporary care in case parents or guardians cannot be located or reunited with their children.²² Children and youth in foster care or the juvenile justice system need special consideration as well. Reunification should occur as quickly as feasible, with procedures to verify identity and to ensure safety. Unless strictly contraindicated because of medical needs, children should not be separated from their families or caregivers, to the extent possible, during evacuation, transport, sheltering, or the delivery of other services (eg, decontamination and quarantine).²³ Resources concerning reunification strategies are available, and reunification can be facilitated by organizations such as the Red Cross and the National Center for Missing and Exploited Children.^{24–26}

PREPARING FOR PEDIATRIC SURGE EVENTS

All medical institutions need to be prepared for an influx of pediatric injuries and casualties in a disaster.²⁷ Even in everyday care in the United States, the majority of pediatric emergencies are handled by adult-oriented responders and within community hospitals, not specialized children's hospitals.^{28–30} The National Pediatric Readiness Project, under the auspices of the Emergency Medical Services for Children program, seeks to improve pediatric emergency readiness for both routine and disaster situations.^{31–34} Initial analysis of the 2013 Pediatric Readiness Assessment indicated that

less than half of all US hospitals had written disaster policies that addressed issues specific to the care of children.³⁵ In response, a national multidisciplinary workgroup was convened to create the Checklist of Essential Pediatric Domains and Considerations for Every Hospital's Disaster Preparedness Policies.³⁶ It is imperative that all hospital emergency departments and emergency medical services agencies have age- and size-appropriate equipment, staff, training, and policies to provide high-quality care for children.^{28,37} Hospitals should also have written pediatric interfacility transfer procedures.^{28,38} Community pediatricians are encouraged to work with their local hospitals to ensure adequate pediatric capabilities. Community institutions should include pediatric equipment and medicines in their local or regional stockpiles. The CDC Strategic National Stockpile contains many specialized pediatric resources but may take time to mobilize and distribute to the local level and still might not be sufficient to meet the needs of a large-scale event with significant numbers of pediatric victims.³⁹ Examples include the need for pediatric ventilators in the event of a respiratory pandemic or toxin or pediatric burn care after detonation of an explosive device. The problem of limited resources in the face of overwhelming need creates ethical dilemmas for utilization and allocation, which must be given careful consideration in planning ahead for disaster.^{40,41} For instance, a mass casualty event may require that triage systems switch from providing the best level of care for an individual to the optimum care for a population; resources are prioritized to those patients who have the best chance of survival with immediate care, not necessarily those who are the most critically ill.⁴² Most triage systems have been developed around adults and their physiology and vital signs. Pediatric mass triage

systems exist but are still in development and have been less rigorously tested than those designed for the general population.^{43–45} Further research and education of responders are needed to refine and improve mass triage for pediatric patients.

MEDICAL COUNTERMEASURES

Stockpiles such as the CDC Strategic National Stockpile currently do not reach parity between children's and adults' needs, as reflected in the limited relative availability of pediatric equipment and medications. Many pharmaceuticals for adults do not yet exist or are not stockpiled in age-appropriate delivery formulations, whereas others lack pediatric pharmacokinetic and dosing data or have adverse effects, limiting their use in children. The federal Public Health Emergency Medical Countermeasure Enterprise recognizes the need for research, development, procurement, strategy, and guidance in medical countermeasures for children.⁴⁶ The AAP policy statement "Medical Countermeasures for Children Exposed to Public Health Emergencies, Disasters, or Acts of Terrorism" outlines many of these concerns in further detail.⁴⁷ Ethical issues surrounding research on children must be considered appropriately but should not serve to deter countermeasures development.^{47–49} Such research and development may yield medication, devices, and equipment usable for the care of children in both disaster and everyday situations.

COLLABORATION AT FEDERAL, STATE, LOCAL, AND REGIONAL LEVELS

Federal agencies with primary responsibility for addressing children's needs in disasters include the US Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response, the CDC, the Department of Homeland Security/

Federal Emergency Management Agency (FEMA), and the Administration for Children and Families/Office of Human Services Emergency Preparedness and Response. Pediatricians and other child experts in government agencies, nongovernmental organizations, and the AAP Disaster Preparedness Advisory Council have advocated for and continue to ensure children's needs are properly and specifically addressed by national leaders and planning documents (www.aap.org/disasters). The National Commission on Children and Disasters issued a comprehensive set of recommendations in its 2010 report to the president and Congress.⁵⁰ The US Department of Health and Human Services National Advisory Committee on Children and Disasters will continue these awareness and implementation efforts.⁵¹

Government planners at the federal level are largely responsible for policy, guidance, and coordination; however, the implementation of plans addressing children's needs falls to state and local governments, tribal programs, and community organizations and collaborators. Emergency operations centers, activated during disasters, include representation from health care and public health; however, they may not have knowledge of, or advocate for, specific pediatric concerns. Many states and communities have developed coalitions to bring together the diverse government agencies, nonprofit organizations, health care providers, and other groups that collectively serve children. As experts in the health of children, it is imperative that pediatricians participate in such efforts and advise local and state officials. The AAP Pediatric Preparedness Resource Kit, created in conjunction with the CDC after the 2009 H1N1 pandemic, offers guidance on developing pediatric advisory councils or children's preparedness coalitions.¹⁴ Regional coalitions for pediatric care, building

on models for trauma care and neonatal care, can also help by enlisting greater coordination and access to limited pediatric resources.^{52,53} Resources that can be shared across regions include medical, surgical, and critical care equipment, beds, expertise, and staff as well as transportation and transfer of pediatric patients.⁵⁴

THE ROLE OF THE COMMUNITY PEDIATRICIAN

Because the majority of pediatric medical care is delivered in outpatient practice settings, pediatricians from these settings must be included and engaged in disaster preparedness and response efforts.⁵⁵⁻⁵⁷ Ideally, such cooperative, bidirectional relationships between pediatricians, nurses, other health care workers, public health agencies, emergency response planning teams, community hospitals, and nonprofit and community organizations would be established and grown in advance of any public health emergency or disaster. These collaborative efforts can also enhance routine care for children. Existing connections with public health programs and services, such as the Vaccines for Children program and disease surveillance, and partnerships with emergency medical services for office emergencies can serve as the starting points for collaboration. The expansion of existing outpatient capabilities can ease the burden on emergency departments and hospitals while providing more cost-effective care. Examples of outpatient roles in disaster include telephone triage or treatment, increased acute visit availability, distribution of countermeasures and vaccines, and long-term monitoring for psychological and physical effects.⁵⁸

ENHANCING EXPERIENCE AND EDUCATION

Community, state, and federal disaster exercises and drills should be

performed routinely and should include community pediatricians, pediatric casualties, and pediatric scenarios as part of a "whole community" effort. Although those typically involved in disaster planning and response may have little experience or comfort with children's issues, these exercises provide an opportunity for education and discovery of potential problems in advance of an actual event; the more realistic and inclusive the drill is, the better the preparedness experience will be.⁵⁹ The inclusion of families with children or youth with special health care needs or those who have limited English proficiency or limited communication abilities may require additional planning but will further enhance preparedness. Older children and adolescents should be included, not only as mock victims, but also as helpers and responders. Programs have been initiated to train youth in disaster preparedness and to help them develop customized peer, family, and community initiatives that are culturally sensitive and inclusive; examples include Teen Community Emergency Response Teams (Teen CERT) and the FEMA Youth Preparedness Council.^{60,61} The AAP has formally lent its support to the 2014 National Strategy for Youth Preparedness Education, developed by the FEMA, the US Department of Education, and the American Red Cross.⁶² According to the National Strategy, "the vision of the National Strategy is to create a nation of prepared youth. Youth will be empowered to prepare for and respond to disasters; educated as to specific actions they can take before and after a disaster occurs; and prepared with knowledge and skills that will make them more resilient when faced with disasters. Instilling preparedness knowledge and skills in youth also will help develop a future population of prepared adults."⁶³ Ideally, youth preparedness programs should have clear goals and strategies, activities

appropriate to age and development, and evaluation methods to provide evidence-based proof of effectiveness and absence of untoward effects.⁶⁴

In addition to educating others about pediatric needs in disaster, pediatricians should continually enhance their own education and engagement around these issues. Disaster education should be incorporated into curricula for medical students, residents, and fellowship trainees. Pediatricians are encouraged to register their credentials with their state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP), consider enrollment in a local medical reserve corps (MRC), or participate on a federal disaster medical assistance team (DMAT) or state medical assistance team (SMAT).⁶⁵⁻⁶⁷ Pediatricians should educate themselves about liability coverage, safety, risks, travel details, ground conditions, and provision of medical

care in austere environments before deciding to participate in any volunteer response. Participation on an MRC, DMAT, or SMAT offers the benefits of training and certain governmental liability protections. Familiarity with the Incident Command System, a common system for emergency command and coordination, will help pediatricians integrate into organized response efforts. FEMA offers free online courses on the Incident Command System, as well as more comprehensive in-person incident training for health professionals at the Center for Domestic Preparedness in Anniston, Alabama.^{68,69} Pediatricians also should take steps to remain informed by monitoring and participating in the CDC Clinician Outreach and Communication Activity, which provides free updates, webinars, and continuing medical education credit on emerging health threats and public health emergencies.⁷⁰ The AAP Children and Disasters Web site (www.aap.org/

disasters/educationandtraining) has links to many educational and training materials; Table 2 provides additional resources.

MENTAL HEALTH

After a disaster, children and families are likely to experience postevent adjustment reactions, including stress, depression, anxiety, regression, somatic symptoms, bereavement, exacerbation of preexisting conditions, or posttraumatic stress disorder.⁷¹ The provision of mental health support can build on the accepted principles of psychological first aid, usually administered by trained lay people after a disaster. The preexisting and longitudinal relationship between family and medical home, as well as the advanced clinical expertise of the pediatrician, can enhance the effectiveness of such efforts. Pediatricians, health care workers, and disaster assistance volunteers are encouraged to take time to ask

TABLE 2 Educational and Training Resources for Pediatricians

Resource	Description	Link
AAP		
Education and Training	Various education and training resources on disaster preparedness and response compiled by the AAP	www.aap.org/disasters/EducationAndTraining
Feelings Need Checkups Too	AAP toolkit for pediatricians who wish to help children with emotional distress related to disasters	www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Pages/Feelings-Need-Checkups-Too-Toolkit.aspx
Pediatric Education in Disasters (PEDS)	AAP course materials to train pediatric leaders in the management of international disaster relief, care, and rescue for children	www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Children-and-Disasters/Pages/Pediatric-Education-in-Disasters-Manual.aspx
AHRQ Public Health Emergency Preparedness FEMA Independent Study Program (ISP)	AHRQ emergency preparedness tools and resources Free self-paced courses designed for people who have emergency management responsibilities	archive.ahrq.gov/prep/training.fema.gov/IS/crslist.aspx
NCDMPH Knowledge and Learning	NCDMPH online learning resources	ncdmp.hhs.gov/KnowledgeLearning/KnowledgeLearning.htm
National Disaster Life Support Foundation Basic and Advanced Disaster Life Support Courses	Advanced disaster life support course	www.ndlsf.org/
NIH Disaster Information Management Research Center	NIH information resources and technology for disaster preparedness, response, and recovery	sis.nlm.nih.gov/dimrc.html
NIH Disaster Information Management Research Center: Health Resources on Children in Disasters and Emergencies	Compendium of resources related to medical and public health issues of children in disasters and emergencies	sis.nlm.nih.gov/dimrc/children.html
Hospital Guidelines for Pediatric Preparedness	Provides hospitals with useful, proactive strategies and tools for providing protection, treatment, and acute care for children during a disaster	www.nyc.gov/html/doh/downloads/pdf/bhpp/hepp-peds-childrendisasters-010709.pdf

AHRQ, Agency for Healthcare Research and Quality; NCDMPH, National Center for Disaster Medicine and Public Health; NIH, National Institutes of Health.

families how they are coping, provide reassurance and guidance, and refer patients to other mental health professionals as needed.^{10,72-74} Awareness of and partnership between pediatricians and other sources of mental health support, including psychiatrists, psychologists, social workers, school counselors, and clergy, are essential to optimizing community mental health. Ideally, these partnerships should be established in advance of a disaster. Pediatricians who may be hesitant or lacking confidence in their ability to provide disaster-related behavioral health services should remember that they already see and respond competently to other behavioral and mental health issues in daily practice.⁷⁵ Even a simple inquiry about a family's experiences demonstrates empathy and concern and reassures the family of the pediatrician's desire to help. Pediatricians and others who care for children should be aware that the need for mental health support does not fade once the acute disaster passes; secondary trauma, ongoing bereavement, anniversaries of the event, and physical and demographic changes in the community can affect children for months, years, or even a lifetime.⁷²

RECOVERY

Recovery after a disaster can be a prolonged and difficult process. Pediatricians can provide a crucial source of stability by quickly restoring access to routine and familiar medical care. The resumption of routine vaccinations will reduce the risk of secondary infectious disease outbreaks. Pediatricians can also serve as advisors and advocates for children's needs in the context of the greater community recovery efforts. Children and families benefit from the security and routine provided by the rapid reinstatement of child care, schools, and safe play

spaces. The continued provision of safe education and play activities also allows parents and caregivers to proceed with the many tasks they face in recovery and rebuilding. Public health officials should partner with pediatricians to monitor children's physical and mental health and access to services during this time.⁷⁶

PEDIATRICIANS' COPING WITH DISASTER

Finally, pediatricians should remember that they are not immune to the stress of disaster. Pediatricians may have experienced their own losses, yet they will still be tasked with delivering care in difficult environments, all the while hearing of others' tragic stories. Caregiver fatigue threatens the pediatrician's well-being, the ability to provide consistent, high-quality care to others, and the desire to continue serving the community.⁷⁷⁻⁷⁹ Although treatment of burnout is important, the preferred goal should be preventive and anticipatory promotion of physician health, wellness, and resiliency. Pediatricians within a disaster-affected area need to be mindful of their physical and mental health, taking steps to alleviate stress and reach out to their peers and colleagues. Pediatricians are also encouraged to monitor and support the well-being of colleagues, employees, friends, and family members affected by disaster. State AAP chapters can be an important resource in providing support to affected pediatricians. The AAP offers information on connecting with and becoming a member of the AAP chapter in each state.⁸⁰ States are encouraged to identify chapter contacts for disaster preparedness and response who can educate chapter members and leadership, promote the pediatrician's involvement in disaster issues, and coordinate chapter activities in preparedness and response.

RECOMMENDATIONS FOR ENSURING THE HEALTH OF CHILDREN IN DISASTERS

Recommendations and key considerations (main points) in ensuring the health of children in disasters include the following:

1. National, state, tribal, local, and regional disaster planning must address the unique physical, mental, behavioral, developmental, communication, therapeutic, and social needs of all children.
2. Pediatricians should participate in disaster planning, response, and recovery efforts as subject matter experts, agents of public health surveillance, health care providers, and representatives of practices or institutions.
3. Inpatient, outpatient, and emergency services facilities should develop operational preparedness and resiliency planning, both individually and collaboratively, to continue providing care for children during and after disasters.
4. Pediatricians should work collaboratively with local hospitals, public health agencies, emergency management teams, volunteer emergency responders, educators and school personnel, child care programs, foster care agencies and the juvenile justice system, medical societies, and behavioral health providers, as well as non-governmental organizations and other agencies that serve children, to effectively meet children's needs in the context of disaster.
5. Equipment, medications, and supplies for children should be available to meet children's needs during a disaster in parity with similar adult needs. Where parity does not exist, research, development, and procurement must be undertaken in a timely manner.
6. Federal, state, academic, and private institutions should conduct

more research on identifying gaps in knowledge of treatment of children in disasters and identifying best practices in addressing these deficiencies. Federal grants and funding support for such research need to increase accordingly. The federal government is encouraged to continue developing the infrastructure to facilitate ethical and timely research and data collection in a disaster environment.^{81,82}

7. Disaster exercises and drills need to include children as both victims and responders as appropriate to their age, development, and capability.
8. Mass casualty triage (and related educational efforts) should effectively address children's unique physiology and development.
9. Pediatricians are encouraged to educate children and families in emergency and disaster preparedness and to promote resiliency at individual, family, and community levels.⁸³
10. Pediatricians are encouraged to pursue ongoing postgraduate education on disaster issues. Pediatric trainees, nonpediatric health professionals, and first responders should be educated on children's physical and mental health needs in a disaster.
11. Pediatricians are encouraged to sign up for or engage with existing public health disaster response systems, such as Health Alert Network communications, CDC Clinician Outreach and Communication Activity announcements, Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) registries, MRC teams, SMATs, and DMATs.
12. Pediatricians are encouraged to recognize and attend to their own needs in disasters and take steps to avoid burnout and compassion

fatigue. The AAP, AAP chapters, medical societies, and state and federal government should also help pediatricians and pediatric practices survive and be resilient.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
CDC: Centers for Disease Control and Prevention
DMAT: disaster medical assistance team
FEMA: Federal Emergency Management Agency
MRC: Medical Reserve Corps
SMAT: state medical assistance team

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