Pediatric Care in Disasters

Natural and man-made disasters bring harm to children throughout the world on a regular yet unpredictable basis. Dr. Rothstein describes the nature of such disasters and how we can prepare to meet the challenges of providing medical assistance. As pediatricians, we know children have unique vulnerabilities and will have more optimal outcomes when we are attentive to systematic approaches that recognize those needs. In recent years, there has been significant progress in our understanding of how to prepare to intervene on behalf of children. The American Academy of Pediatrics Disaster Preparedness Advisory Council has served to mobilize efforts related to pediatric preparedness planning and response. The Council has recommended that children's issues be addressed early on in the development of disaster preparedness programs and activities, encouraging community planners to include pediatric experts in all levels of disaster planning and response.

—Jay E. Berkelhammer, MD, FAAP
Section Editor

In an internally displaced persons camp in war-torn eastern Democratic Republic of Congo, hundreds of refugee children run around in torn clothes and mismatched flip-flops, their fragmented health care administered by multiple non-governmental organizations (NGOs). The Haiti earthquake of 2010 killed more than 220,000 people and displaced more than a million, nearly half of whom were children.1 Houston received hundreds of pediatric patients in the days after Hurricane Katrina, straining medical care providers and facilities alike. In Beijing, air quality is so dismal that pediatric rates of respiratory infections and inflammatory diseases are skyrocketing.2 In Chicago, scores of children are victims of street violence each year. These natural and man-made disasters are only a few examples from the past decade that have challenged health care professionals and systems alike. They share common themes and have individual nuances, representing typical and perhaps non-typical ideas of what a disaster is and how difficult it can be to take care of children affected thereby.

Disasters are broadly defined as man-made or natural causes that traumatize a population, exceeding its capacity to deal with that trauma.5 There is often a change in provider-to-patient ratios that proves overwhelming. The archetypal disaster is a natural one, such as an earthquake, tsunami, or flood. But war and civil conflict, pollution and environmental changes, famine and urban violence each precipitate marked changes in how children receive maintenance and emergency care. The extremes of perturbation are felt most by vulnerable populations in vulnerable times.

WHERE TO BEGIN

Multiple NGOs and transnational organizations have defined priorities in initial disaster response (Table 1). These can be generalized to all populations, but pediatric patients have specific needs that require additional care. Fifty percent of victims in man-made and natural disasters are children.4 In low- and middle-income countries, where 95% of disasters occur, children are particularly vulnerable, subjected to high rates of malnutrition and susceptibility to communicable diseases, psychological frailty, and risk for disrupted family environments. By some estimates close to 200 million children per year are affected by disasters.5

In addition to responding to immediate needs (usually traumatic injuries) specific to a given disaster, providers of pediatric care must address major causes of pediatric morbidity and mortality, which include diarrheal diseases, acute respiratory tract infections, measles, malaria, severe bacterial infections, malnutrition and micronutrient deficiencies, injuries, burns, and poisoning.6,7 Children born during disasters require attention and their needs are...
easily ignored or underappreciated in the midst of a crisis.8,9 Adapting to local disease prevalence, providers may also discover the need to prevent and treat meningococcal meningitis, yellow fever, hemorrhagic fever, typhoid fever, leishmaniasis, trypanosomiasis, and plague.6,7,10 Because external emergency responders are often poorly versed in care of tropical and, to the resource-rich provider’s eyes, “atypical” diseases, coordination with local health care providers and ministries of health is essential, albeit difficult, owing to disruptions inherent to disaster environments. Lastly, pediatric patients are singularly vulnerable to exploitation, abuse, and trafficking, particularly when they are separated from families.

LESSONS LEARNED

The past 2 decades have seen increasing amounts of medical literature dedicated to analyses of disaster response, with several themes emerging.

- Coordination: Well-intended but unorganized responses can do more harm than good. Although there can be no monopoly on good intentions, careful coordination between volunteer groups is essential to prevent duplication of resources and minimize strains placed by an influx of providers. This coordination is particularly important between large NGOs, international relief agencies, and local authorities.11 Inclusion of a hospital administrator has been cited as a key element of response coordination.12

- Involvement of local resources: Although local resources and providers are often eliminated or displaced by the disaster itself, their contribution can be invaluable.

- Planning for changing patient demographics: The evolution of injury patterns and patient needs is predictable. The Haiti earthquake, Indian Ocean tsunami, and others showed that initial waves of injured patients are soon followed by patients with medical problems typical for the local region, exacerbated by delays to care and further fragmented health care systems.12–17

- Planning for transition and aftercare: Paradoxically, initial health care response is no more important than planning for aftercare and transition. What happens when external providers leave? When donated resources fade away? Who is responsible for long-term care of patients operated on during an emergency? Who will care for patients newly burdened with post-traumatic stress disorder and exacerbations of pre-existing conditions? These are difficult questions with complex answers.

- Disease surveillance and quality control: The rush to treat immediate victims of major disasters can obscure the need to set up disease surveillance systems to identify outbreaks (particularly important for measles, dysentery, cholera, and meningitis), as well as to persist with efforts to maintain quality control, by standardizing diagnostic and treatment protocols, providing essential drugs, and providing staff training and monitoring.

- Welling et al, in writing about medical volunteerism in 2010, described “seven sins of humanitarian medicine” to be avoided.18 These are no less apropos in disaster situations (Table 2).

FUTURE DIRECTIONS

The events of Hurricane Katrina and the World Trade Center bombings brought a sense of urgency and clarity to the need for disaster preparedness in the United States.19 The Helping the Children Taskforce of the American Academy of Pediatrics recently adopted a Pediatrics in Disasters course that provides teaching modules to help train pediatricians and specialists in disaster relief.20

Along with greater recognition of the global needs specific to pediatric disaster victims and greater resources marshaled by governments and NGOs alike comes greater responsibility. Good intention or action is necessary, but not sufficient. Just as providers seek quality assurance and improvement in their own institutions, they have an obligation to do the same in resource-poor areas and even in the midst of disaster zones.21,22 This serves not only a moral purpose, but allows reflection on improvement initiatives for the future.

Information technology has played an ever-increasing role in disaster management, from cell phone-based social networking as a means to identify victims and danger zones, to computerization of records, to image-based tools to help reunite families with missing children.23–25 Reflections by responders to recent disasters have spawned many recommendations for simulation exercises, national deployment teams, and responder certification.12,16,21,26–28

### TABLE 1 Top 10 Priorities in the Emergency Phase

| 1. | Initial assessment |
| 2. | Measles immunization |
| 3. | Water and sanitation |
| 4. | Food and nutrition planning |
| 5. | Shelter and site planning |
| 6. | Health care in emergency phase |
| 7. | Control of communicable diseases and epidemics |
| 8. | Public health surveillance |
| 9. | Human resources and training |
| 10. | Coordination |

### TABLE 2 The 7 Sins of Humanitarian Medicine

1. Leaving a mess behind
2. Failing to match technology to local needs
3. Failure of NGOs to cooperate with each other
4. Failing to have a follow-up plan
5. Allowing politics or training to trump service
6. Going where we are not wanted or needed
7. Doing the right thing for the wrong reason
With regional instabilities rampant and climate change predicted to increase the number of natural disasters worldwide, the United Nations Children's Fund and the Office for Disaster Risk Reduction have focused on disaster risk reduction through educational campaigns principally in counties and regions with high risks for disaster. They have also advocated for the inclusion of children's voices in planning, in an effort to fulfill the United Nations mandate for patient independence.

More work, lastly, is needed in the arena of ethics. Early responders are faced with unusually difficult decisions regarding allocation of resources, often in a manner they have never faced in their own countries. Pediatric-specific triage systems are being developed that may simplify this task, but only to an extent, and can only serve to inform difficult decision-making.

CONCLUSIONS

The most important task of medical response in pediatric disaster care is to provide a framework whereby order can be made out of disorder, and normative care can be restored as quickly as possible. Although first responders are usually tasked with providing extraordinary care for the extraordinarily injured, this demand is usually transient and quickly replaced by the more pressing need to provide care that mimics as fully and rapidly that of children in times of peace and safety. Disasters often occur suddenly but end excretingly slowly, and careful coordination between aid agencies, emergency medical responders and local authorities, and medical infrastructures is critical in treating disaster victims, both the immediate trauma phase and the longer-term recovery phase.

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*Pediatrics* 2013;132;25; originally published online September 2, 2013;
DOI: 10.1542/peds.2013-1691

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*Pediatrics* 2013;132;25; originally published online September 2, 2013;
DOI: 10.1542/peds.2013-1691

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