Assessing Disaster Preparedness Among Select Children’s Summer Camps in the United States and Canada

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Objective: Children’s summer camps are at risk for multiple pediatric casualties during a disaster. The degree to which summer camps have instituted disaster preparedness is unknown. We assessed disaster preparedness among selected camps nationally for a range of disasters.

Methods: We partnered with a national, web-based electronic health records system to send camp leadership of 315 camp organizations a 14-question online survey of disaster preparedness. One response from each camp was selected in the following order of importance: owner, director, physician, nurse, medical technician, office staff, and other. The results were analyzed using descriptive statistics.

Results: A total of 181 camps responses were received, 169 of which were complete. Camp types were overnight (60%), day (21%), special/medical needs (14%), and other (5%). Survey respondents were directors (52%), nurses (14%), office staff (10%), physicians (5%), owners (5%), emergency medical technicians (2%), and other (12%). Almost 18% of camps were located >20 mi from a major medical center, and 36% were >5 mi from police/fire departments. Many camps were missing emergency supplies: car/booster seats for evacuation (68%), shelter (35%), vehicles for evacuation (26%), quarantine isolation areas (21%), or emergency supplies of extra water (20%) or food (17%). Plans were unavailable for the following: power outages (23%); lockdowns (15%); illness outbreaks (15%); tornados (11%); evacuation for fire, flood, or chemical spill (9%); and other severe weather (8%). Many camps did not have online emergency plans (53%), plans for children with special/medical needs (38%), methods to rapidly communicate information to parents (25%), or methods to identify children for evacuation/reunification with parents (40%). Respondents reported that staff participation in disaster drills varied for weather (58%), evacuations (46%), and lockdowns (36%). The majority (75%) of respondents had not collaborated with medical organizations for planning.

Conclusions: A substantial proportion of camps were missing critical components of disaster planning. Future interventions must focus on developing summer camp-specific disaster plans, increasing partnerships, and reassessing national disaster plans to include summer camps.

Key Words: disaster preparedness, emergency preparedness, pediatrics, special/medical needs children, summer camps

Children are estimated to represent almost 50% of those affected during manmade and natural disasters. During disasters, children are at greater risk for harm secondary to developmental vulnerabilities, limiting their ability to escape or protect themselves. Children also possess unique physiologic characteristics, leaving them vulnerable to natural elements, chemical spills, and biological disasters. Media reports on both national and international disasters such as 2005’s Hurricane Katrina and the Indian Ocean tsunami of 2004 led to a growing awareness of the importance of pediatric disaster preparedness and its shortcomings. Studies consistently demonstrate deficiencies in the care of children with special/medical needs who may not have access to medications for chronic illness or medically necessary devices during disasters.

Summer camps are supervised programs for children and adolescents that cater to different interests, populations, and

Key Points
- The majority of summer camps lacked key components of disaster preparedness to provide safe care of children during a disaster.
- Disaster plans often failed to account for children with special/medical needs and did not have methods for the safe reunification of campers and caregivers.
- The majority of camps did not coordinate with expert local and national disaster organizations in attempts to formulate disaster plans.
age groups. Camps are designed to have significant effects on boosting self-esteem, improving peer relationships, promoting independence and leadership, and increasing exposure to natural environments. The American Camp Association (ACA) estimates that >14 million children and camp employees in the United States attend approximately 14,000 summer camps yearly and comprise an $18 billion industry.\textsuperscript{14} Summer camps provide care for both healthy children and children with special/medical needs, with almost 50% of camps now offering specialized programs for individuals with disabilities.\textsuperscript{14} In disaster situations, children attending summer camps are at particular risk for significant harm, disability, or even death. Summer camps often are located in settings located far from emergency medical services (EMS), fire and police, and hospital care. Camps may have limited cellular telephone service or Internet capability and few evacuation routes.

Media reports provide examples of morbidity and mortality from disasters in camps. In 2008, 4 people were killed and 48 injured when a tornado struck an Iowa Boy Scout camp.\textsuperscript{13} In 2016, Colorado’s Hayden Pass fire came near the Rainbow Trail Lutheran Camp, requiring the emergency evacuation of 118 campers and 65 staff members.\textsuperscript{16} The camp counselor workforce can comprise people who are young, from out-of-state, or from international locations, with little exposure to local disaster training and little or no familiarity with local disasters and evacuation routes. In 2016, flash floods triggered by sudden massive storms killed a boy at a large Boy Scout camp in New Mexico.\textsuperscript{17} The counselor assigned to the Scout team was a college-age, first-year camp ranger who noted that he had not seriously considered flash flooding despite weather warnings. As this example illustrates, with youth comes inexperience and sometimes the inability to recognize danger or have the best judgment to escape or seek shelter despite available rigorous standards or plans can have tragic consequences. Although camps may have national certification standards and training plans, camp staff with inexperience who are new to the region or are not intimately familiar with local hazards would benefit from additional just-in-time training that may mitigate indecision, poor insight, and mistakes.

Summer camps also are potential “soft” targets because of the minimal security at camp sites, making campers more vulnerable in the event of an active shooter. This risk was highlighted by the tragic 2011 mass shooting at a summer camp in Utoya, Norway, that killed 69 people, mostly teenagers.\textsuperscript{18} Camps with religious affiliations also are potential targets for those seeking to do harm. In January 2017 the ACA president issued a security e-mail briefing asking all camps to review security protocols because of threats made against Jewish community centers, which sponsor summer camps and youth programs nationally.\textsuperscript{19}

In 2011, the American Academy of Pediatrics (AAP) published recommendations for providing safe and healthy care to camp attendees, with a focus on creating disaster plans, establishing relationships with local EMS and health professionals, designing management plans for outbreaks of infectious diseases, and training responders at the campsite. A study in 2015 by Olympia et al, however, found discrepancies in compliance for training and called for improvements in disaster protocols and coordination of care with local EMS and healthcare providers.\textsuperscript{20,21}

There is wide variability among states in their requirements for camp accreditation. Although the ACA has put forth a set of standards for camp accreditation that includes recommendations for emergency preparedness, not all states have adopted these guidelines, and in fact many do not even require licensing.\textsuperscript{22} Of the states that do require the ACA guidelines, there is inconsistency in how guidelines are implemented.\textsuperscript{23} Given such discrepancies, the degree of disaster preparedness at summer camps is difficult to assess and is therefore unknown. Furthermore, much of the focus of pediatric disaster preparedness research to date has been in primary and secondary schools and not summer camps, which often are privately operated and separate from school systems.\textsuperscript{5,24–26} Disaster preparedness research in summer camps nationally has been limited by the lack of access to camp leadership and the unavailability of a uniform electronic records and database system.

To address this need, our study was the first to collaborate with CampDoc.com (DocNetwork LLC, Ann Arbor, MI) to directly access camp leadership and administration. CampDoc.com is an electronic health record system for summer camps in the United States and Canada and was designed by camp doctors, nurses, and directors. CampDoc.com assists in managing health forms, allergies, medications, and illness and injury tracking for camps and is designed to provide camp healthcare staff instant access to vital medical information. Our primary objective was to survey camp administration to assess the degree of disaster preparedness among summer camps for a range of manmade and natural disaster situations. Secondary objectives were to assess camps’ site-specific disaster plans on key components of disaster management: rapid dissemination of information to parents; reunification plans; camper and parent identification; specific protocols for manmade and natural disasters; and the degree of collaboration with the ACA, Association of Camp Nurses (ACN) or local state or national expert groups such as the pediatric disaster sections of the AAP and the American College of Emergency Physicians, the American Red Cross, the Federal Emergency Management Agency, the Centers for Disease Control and Prevention, and Save the Children.

Methods

Study Design, Setting, and Population

In June 2015, we designed and sent a 14-question survey of disaster preparedness to CampDoc.com. The organization created an online survey that was sent to camp leadership using the CampDoc.com network of contacts. At the time of the survey, CampDoc.com had enrolled a total of 315 available camp organizations in its program. Survey questions (Appendix, http://links.lww.com/SMJ/A71) were focused on whether camps had
specific disaster plans in place for manmade and natural disasters such as prolonged power outage (>24 hours), evacuation (caused by fire, flood or chemical spill), a tornado or high wind event, other environmental disaster or severe weather, a lockdown stemming from a crisis or violent situation nearby or at the camp, and a medical emergency (eg, large illness outbreak, need for quarantine) scenarios. We also asked camp leadership whether camps’ disaster plans addressed several critical aspects of disaster preparedness, including care for children with special/medical needs (eg, asthma, diabetes mellitus, food allergies requiring epinephrine autoinjectors, hearing/speech impairment, developmental or cognitive delay, mobility issues, medical devices requiring electricity), presence of emergency supplies (eg, autonomous power source, battery-operated radio, bunker/shelter, extra car seats, extra vehicles, food, water, first aid kits), family reunification plans, and emergency evacuation and transportation. Lastly, we asked whether camps had coordinated with local EMS/fire and state-based organizations for disaster planning. Camp leadership was defined as camp directors, nurses, emergency medical technicians, and camp owners. One response from each camp was selected a priori in the following order if multiple responses from the camp were obtained: owner, director, physician, nurse, medical technician, office staff, and other.

Deidentified data were collected and organized by CampDoc.com and sent to authors in deidentified format in an Excel spreadsheet. Descriptive statistics were used for all of the responses. We received an exception to informed consent from the university hospital’s institutional review board. Data analyses were performed using SAS version 9.1 (SAS Institute, Cary, NC).

Results
We received responses from 181 of 315 available camp organizations, with complete responses from 169 camps for a response rate of 53% after CampDoc.com sent 2 subsequent e-mail reminders to camp leadership. Survey respondent demographics are shown in the Table. Types of summer camp were overnight (60%), day (21%), medical/special needs (14%), and other (5%). The percentage of camp respondents by geographic region based upon US Census Bureau designation is shown in the Figure.

Camp Leadership Perspective on Disasters
Overall, camp leadership reported being “very confident” in its camp’s ability to handle emergencies of extended power outage (68%), other severe weather (67%), evacuation (65%), tornado/high wind events (55%), medical emergency (54%), and lockdown (49%). Survey respondents also reported having experienced disasters at camp: 36% experienced severe weather, 23% had experienced tornado/high wind events, 23% had experienced other severe weather, 20% had experienced a large illness/outbreak, 14% had experienced a significant power outage, 4% had to evacuate because of an emergency, and 3.5% had experienced a lockdown for a violent situation in the community.

| Table. Survey respondent demographics (n = 169) |
| % |
| Camp role |
| Director | 52 |
| Nurse | 14 |
| Other | 12 |
| Office staff | 10 |
| Owner | 5 |
| Doctor | 5 |
| EMT | 2 |
| Experience in current role, y |
| 2–5 | 28 |
| 5–10 | 23 |
| < 2 | 21 |
| > 10 | 28 |
| Total experience, y |
| 2–5 | 20 |
| 5–10 | 25 |
| < 2 | 5 |
| > 10 | 50 |

EMT, emergency medical technician.

Formal Disaster Plan
The majority of camp respondents reported that their camps lacked specific plans or were not sure of any existing plans for specific emergency situations such as a prolonged power outage (68%); a lockdown for crisis situation (45%); a medical emergency such as an outbreak requiring quarantine (35%); a tornado/high wind event (23.6%); an evacuation because of fire, flood, or chemical spill (20.7%); and other environmental emergencies/severe weather (19.5%). Approximately 18% of camps reported being located >20 mi from the nearest medical center, 33% of camps reported being located >5 mi from the nearest fire or police station, and 4% of camps reported being located >20 mi from the nearest fire or police station.

Emergency Supplies and Equipment
Although 99% of respondents reported that their camps had first aid supplies, many reported being without vital emergency supplies and equipment including extra car seats for evacuation (68%), an autonomous power source (eg, generators; 40%), a bunker/shelter (35%), extra vehicles for evacuation (26%), an isolation area for quarantine (21%), emergency supplies of extra water (20%) or food (17%), and battery-operated radios (17%).

Evacuation, Family–Child Reunification Plans, and Disaster Planning and Training
Many respondents (57%) were unaware or unsure whether there was a designated evacuation site for meeting parents if an evacuation was needed. Twenty percent of camps made emergency
plans available online for parents, and 48% of camps had identification methods for children in case of evacuation. More than 25% of camps did not discuss emergency plans with parents and another 25% of camps did not have a method in place to rapidly communicate information to parents. Survey respondents also reported whether staff participated in disaster drills related to weather (58%), evacuation (46%), and lockdown (36%). Most camps (75%) had not participated in meetings with local or national medical organizations. Only 45% of camps had met with the ACA and 16% of camps had consulted with the ACN for disaster preparedness, respectively.

Campers with Special/Medical Needs
Reports from camp leadership regarding whether their camps cared for children with special/medical needs included the following: food allergies requiring epinephrine autoinjectors (83%), asthma (66%), diabetes mellitus requiring medication administration (57%), behavioral or cognitive delay (35%), hearing or speech impairment (28%), children with mobility issues (27%), and children with medical devices requiring electricity (14%). Despite the high proportion of camps caring for campers with special/medical needs, only 38% of respondents surveyed had instituted a disaster plan accounting for this population.

Discussion
Our findings demonstrate that although a majority of camp leaders were confident in their camp’s ability to handle disaster situations, a substantial proportion of respondents reported that camps were missing critical components of disaster planning, including plans for specific disasters, children with special/medical needs, emergency supplies, and collaboration with local experts. Our study suggests a discordance in the camp leadership’s confidence in their ability to handle disasters and their reported level of disaster preparedness. We advocate strongly for a national unified approach by stakeholders to create comprehensive disaster standards for use in the accreditation and licensing of camps. The following components are critical to the safe care of children during disaster situations in camps.

Emergency Disaster Planning
Preparedness for all types of disasters (all-hazards preparedness) may be challenging for camps given their generally remote locations, large camper-to-staff ratios, and lack of proximity to local emergency support and hospitals. Camps can use the all-hazards approach for initial assessment and planning and then focus on the most substantial needs that address the types of disasters that are most likely to occur regionally. Specific plans tailored toward emergency evacuation can ensure adequate equipment

Fig. Percentage of summer camp respondents by geographic region using US Census Bureau designations.
such as car seats or carriers, appropriate number of evacuation vehicles, alternate evacuation routes, and parents who are informed of specific reunification sites. Weather-specific plans can focus on adequate food and medication reserves, as well as backup equipment to run both medical supplies and communication equipment. Camps must partner with local first responders to coordinate safe and timely responses when children require medical attention.

**Children with Special/Medical Needs**

Camps have expanded to include more children with special/medical needs, including children with cancer, hemophilia, ventilator dependence, cerebral palsy, and Down syndrome. Children with special/medical needs are particularly vulnerable during disasters, so early reunification of campers with special/medical needs with parents becomes increasingly important. Having a plan in place that accounts for campers’ food allergies, medications, transportation needs, and communication requirements during emergency events becomes paramount to keep children with special/medical needs safe. The American College of Emergency Physicians and the AAP have jointly developed the Emergency Information Form, which can be downloaded by parents at no cost. The Emergency Information Form is used to record critical information about children with special/medical needs that can then be used by EMS professionals and emergency departments to provide children with appropriate medical care during disasters or emergencies.

**Emergency Supplies**

Both day and resident camps should stock age-appropriate supplies to meet the basic needs of all campers, including non-perishable foods and bottled water and supplies to ensure safe evacuation from the camp, if required. Remote camps may rely exclusively on wells instead of city water or may require water purification systems, all of which could be compromised by a power failure. Summer camps may not necessarily stock large amounts of food supplies, having a “just-in-time” quantity of supplies on hand and during disasters, and shipments of food could be delayed substantially, placing children at risk. Some researchers have advocated for the use of prehospital toolkits, which may provide benefit in disaster situations in summer camps. The remote settings of many camps may limit the ability to easily access critical emergency supplies, so advanced preparation to acquire adequate supplies becomes crucially important, as does the need to have adequate vehicles and appropriate car safety devices to ensure safe evacuation from a disaster situation. In certain instances, sheltering in place may be the best or only option, and emergency provisions must be incorporated into such planning.

**Parents’ Access to Plans**

The communication of a camp’s disaster plan to parents becomes crucial in instances in which children must be reunited with their parents. Despite the availability of mobile devices, we found that almost 80% of camps did not have a mechanism for parents to access disaster plans online. Ideally, parents would have secure access to critical information, including the most up-to-date plans for reunification sites, evacuation plans, and a predetermined method of communication to prevent widespread panic and endangering caregivers who attempt to arrive on the scene of a disaster. Without a rapid means to communicate a child’s location and safety, parents are left in a state of panic, causing unnecessary telephone usage with calls to local EMS and hospitals, which diverts time and effort away from the care of injured or sick children. Caregivers also may drive toward the site of the disaster to obtain information about their children, placing themselves in harm’s way and further complicating the evacuation and depleting scarce resources.

**Reunification Plans**

The challenges of reuniting children with their parents were highlighted in the aftermath of Hurricanes Katrina and Rita. Previous work has emphasized the need for reunification plans. Our results demonstrate that the reunification process has not translated to camp settings. The ability of parents or caregivers to safely and rapidly identify their child is critically important during a disaster situation. Creation of child and parent identification cards, either physical or mobile-based, may allow quick identification during a disaster. By increasing use of portable electronic medical record systems by camps, one could envision a rapid mass information dispersion method sent directly to parents once their child has been identified via a unique identifier. Many electronic medical record systems at camps use this type of unique identifier or number, which can be linked to a text or patient portal accessible to caregivers; staff can then rapidly update this information during a disaster. This method also could be used in the disaster setting to identify victims rapidly.

**Community Involvement and Training**

Experts have long advocated for onsite disaster drills that involve children in preparation for disaster situations. Fewer than half of the camps in our study participate in regular drills for evacuation or lockdown situations, and more than half practice drills for severe weather situations. Given the increasing threats made against summer camps, drills that emphasize lockdown and intruder situations are particularly crucial for camps to practice. Medical organizations such as the AAP, the ACA, Save the Children, and the American Red Cross provide valuable resources for disaster training of personnel and parents. Targeted, routine training sessions in collaboration with local and national organizations for camp personnel strengthen preparedness in camps. These organizations are well versed in disaster planning and can provide invaluable resources and coordination of care to optimize care of children in crisis situations, and they continue...
to publish guidelines outlining evidence-based care during disasters.35–38

Study Limitations

Our study has potential limitations. First, similar to any survey, selection bias may exist. Respondents’ perspectives may differ for disaster preparedness at a particular camp, depending on background; however, office staff and emergency medical technicians made up only 12% of all respondents. “Yes” and “no” questions regarding the availability of emergency food and water supplies may not be as specific a measure as asking respondents to quantify food and water reserves. Given that almost 1 of every 5 camps reported “no” to making available any extra food or water supplies, we estimate that a significant amount of camps were without emergency food and water supplies. Our findings also do not reflect the actual feasibility of camps’ disaster plans or available online plans for parents. In addition, although our sampling of 181 camps is the largest sampling of summer camps for a disaster study to date, it may not be representative of other summer camps that did not respond to the survey within CampDoc.com’s system. We anticipate that with collaboration with the ACN and the ACA while leveraging the greater number of camps now enrolled in CampDoc.com system (approximately 1000 camps), we will be able to provide an even larger sampling size for future studies and surveys.

Conclusions

A substantial proportion of summer camps across the country are missing critical components of disaster planning. Future interventions should focus on developing camp-specific disaster standards that can be used in the state licensing and accreditation process.

References


