

## Reducing Risks for Young Children: Indicators Research Can Guide Disaster Preparedness of the Early Childhood Sector

Elizabeth F. Shores · Cathy Grace · Erin Barbaro ·  
Michelle Flenner · Michael C. Barbaro

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**Abstract** A major initiative to rebuild child care facilities damaged by Hurricane Katrina of 2005 uncovered significant gaps in disaster preparedness of the early childhood sector. A series of four studies of the disaster risks of the sector found wide variety in specific threats to the sector at the county level and in elements of preparedness in state policies. The studies yielded a set of ten indicators of risk and a model of interagency early childhood disaster preparedness, with periodic indicators research a key feature of the model.

**Keywords** Emergency preparedness · Disaster preparedness · Vulnerability analysis · Early childhood sector · Child care

Hurricane Katrina of 2005 dramatized that child care facilities were vulnerable to disasters because of ambiguous state and federal policies about post-disaster financing. With structural damages and no clear contingency plans or adequate financial aid, child care businesses that operated on thin economic margins could be unable to reopen, reducing the overall capacity of licensed child care in a disaster area and adding another insult to children already suffering from severe dislocations of home and family. In short, the Katrina experience suggested that a resilient early childhood sector could be a protective factor for young children's social-emotional development as well as for the economy in a disaster area.

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E. F. Shores · C. Grace  
Early Childhood Institute, Mississippi State University, Starkville, MS, USA

E. Barbaro · M. Flenner · M. C. Barbaro  
Center for Applied Research and Environmental Systems, University of Missouri, Columbia, MO, USA

E. F. Shores (✉)  
601 McAdoo St., Little Rock, Little Rock, AR 72205, USA  
e-mail: efshores@swbell.net

Indicators research can identify the least resilient or most vulnerable pockets of child care facilities as well as the interventions to improve preparedness that will have the greatest impact. This article describes the development of indicators through three studies of disaster vulnerability of the early childhood sector and in a model for interagency collaboration to improve the preparedness of the sector.

## 1 Background

The Rebuilding After Katrina Initiative, coordinated by the Mississippi State University Early Childhood Institute (ECI), helped 267 early care and education programs in Mississippi with a combined capacity of 15,178 children to reopen within a year of Hurricane Katrina. The initiative was a complicated project with numerous governmental, nongovernmental, and corporate partners, many sources of revenue, and an array of material contributions and forms of technical assistance allocated on the basis of needs assessments (Mississippi State University Early Childhood Institute 2006). ECI used a spatially enabled database and map-making tools to quickly assess the storm's impact on the early childhood sector in Mississippi and Orleans Parish, Louisiana (Shores et al. 2006). As the Rebuilding After Katrina Initiative gained momentum, representatives of many associations concerned with early care and education contacted ECI to offer help. They often asked how they could reduce the threat of major disasters to early childhood services in their own areas. Beginning with a forum in Mobile, Alabama in December 2005, the institute took a series of steps to foster improvements in emergency preparedness for the early childhood sector and to continue the discussion of this important topic (National Center for Rural Early Childhood Learning Initiatives 2006).

## 2 Method

Having benefited from readily available, spatially enabled data about early childhood services in planning restoration of Mississippi's child care facilities, we wanted to determine the capacity in other states for data-sharing among state child care agencies and between state child care and emergency management agencies. In our first study, we reviewed data-sharing practices of early childhood and emergency preparedness agencies in 12 states with areas at significant risk of hurricanes or earthquakes, concluding that established data-sharing was an indicator of a state's emphasis on preparedness of the early childhood sector.

Our second study was the development of nine more indicators of the vulnerability of the early childhood sector and the application of those indicators in a survey of 11 states. The foundation of this study was a geographic analysis of four major natural disaster risk factors. To those indicators we added three categories of early childhood services indicators, for a total of ten specific indicators:

### I. Presence of Disaster Risk Factors

1. Hurricane
2. Earthquake

3. Tornado
  4. Volcano
- II. Inadequate State Policies on Disaster Preparedness
5. No Required Data-Sharing by Early Childhood and Emergency Preparedness Agencies
  6. No Required Off-Site Evacuation Planning by Child Care Facilities
- III. High Need for Child Care
7. High Child Poverty
  8. Low Access to Child Care
- IV. Lack of Early Childhood Sector Infrastructure for Preparedness
9. No Local Child Care Resource and Referral Agency
  10. No State Child Care Quality Rating System

For some of these indicators, data were readily available. For other indicators, it was necessary to obtain and geocode location data and then sort the data in order to arrive at relative degrees of need or risk, and for still others it was necessary to survey state agencies that provide early childhood services.

We used key national datasets to identify counties within the natural disaster risk areas. Due to ever-changing weather patterns and ocean temperatures, hurricane prediction is an inexact science, so we considered all Atlantic and Gulf Coast counties in the United States Landfalling Hurricane Probability Project to be at high risk for hurricanes (Tropical Meteorology Research Project 2007). We considered any county that has experienced one or more tornado touchdowns with a Fujita Scale rating of F1 or greater during the period 1950–2004 to be at high risk for tornadoes (National Atlas of the United States n.d.). To identify counties are at risk for potential damage from earthquakes, we relied upon the National Seismic Hazard Map of the U.S. Geological Survey (Frankel et al. 2002). To define areas at a high risk for volcanoes, we drew circular boundaries at a 20-mile radius around locations of known active volcanoes as reported by the USGS Global Volcanism project (National Atlas of the United States n.d.). The 20-mile radius is based upon the Federal Emergency Management Agency's (2006) approximation of the radius around which damage can be expected.

Concerning state policies on preparedness, our previous study had established that the practice of data-sharing by early childhood and emergency management agencies was one indicator of a state's preparedness. To this indicator we added child care licensing requirements for plans for off-site relocation by child care facilities. To identify states with such requirements, we consulted a 2005 survey of state child care regulations (National Association for Regulatory Administration and National Child Care Information and Technical Assistance Center 2006).

Concerning high need for child care, we selected counties in the top third of young child poverty rates in their respective states. In scoring counties' degrees of risk, we gave this indicator twice the weight of other factors, because children in poverty are more likely than other children to need access to child care in order for their parents to work and for the children to receive the benefits of early learning experiences. Next, we calculated ratios of access based upon the maximum capacity

of licensed and registered child care facilities in each county and the number of children ages 0–4 years in each county. Thus, a county with 50 slots and 100 children had a ratio of one slot for every two children, expressed as 1:2. (For family child care homes with missing capacity data, we assumed enrollment was the maximum permitted under relevant state regulations (Lemoine and Azer *n.d.*).

For the indicators of early childhood sector infrastructure, we obtained lists of counties served by child care resource and referral agencies from the National Association of Child Care Resource and Referral Agencies and compiled a list of states with existing quality rating systems (National Child Care Information and Technical Assistance Center 2007; National Association for the Education of Young Children 2006). (Quality rating systems typically offer incentives to licensed child care facilities that meet additional standards, with greater incentives available for meeting progressively higher standards.)

After ranking counties on the basis of these risk indicators, we drilled deeper to determine which types of child care facilities were at particular risk in individual highly vulnerable counties. We examined five types of child care providers: licensed and registered; subsidy-participating; food program-participating; state-funded pre-kindergarten; and Head Start and Early Head Start. We displayed our findings in a series of tables and maps. The Early Childhood Disaster Risk Index is available at <http://www.earlychildhood.msstate.edu/disaster-risk>.

In our third study, we attempted to refine our selection of state policy indicators. We reviewed minimum requirements for licensing of child care facilities in each of the 50 states and the District of Columbia and the graduated criteria for quality ratings in 21 states that currently have child care quality rating systems at some stage of development. The first steps in the search for documents were the highly useful online directories of licensing agencies and quality rating agencies maintained by the National Child Care Information and Technical Assistance Center. After identifying all existing state requirements related to emergency preparedness of the early childhood sector, we categorized the requirements as indicating minimum, adequate, or high protection to young children in child care settings.

From these three analyses of selected indicators of the vulnerability to disasters of the early childhood sector, we turned in our fourth study to the potential for mitigation, or reduction, of risk for children under school-age, developing a model for state action to improve the security of young children in congregate care.

### 3 Findings

In our first study, we found that little data-sharing occurred within or between the two sectors. By adding the maximum capacities of known child care facilities in those states, we calculated that at least 2 million children under school-age were at risk of being overlooked in disaster response as well as state economic recovery plans. We concluded that improved data-sharing is crucial for targeting disaster preparedness measures to early childhood sites in high-risk areas, for including young children among vulnerable populations that receive top priority in first response, and for including child care facilities in economic redevelopment after major disasters (Shores et al. 2007).

Our second study, the analysis of 11 states on the basis of the ten indicators of vulnerability, was incomplete because of the very lack of data-sharing we established

in our initial study. However, our second study did quantify the numbers of licensed child care slots, and thus the potential number of children, that were in counties at greatest risk in those 11 states. The proportion of highly vulnerable child care slots in the 11 states varied from 17.44% in Missouri to 100% in South Carolina. Our “drill-down” examination of the most vulnerable counties revealed wide variation in emergency preparedness needs (Mississippi State University Early Childhood Institute 2007).

Our third study, the review of states’ licensing and rating criteria for child care, provided the basis for a new indicator of the priority a state places on disaster preparedness for the early childhood sector. A continuum of priority can be considered to have three zones: *minimum*, *adequate*, and *high*. (See Fig. 1). Minimum standards require specific written procedures for each significant disaster risk. Adequate standards fully address the possibility of off-site relocation of children. High standards require staff training on child protection in each likely type of disaster, on promotion of emotional resilience in young children, and on financial planning for post-disaster recovery of child care businesses. (Requirements for financial planning that include risk management would provide some security that a community struck by disaster would not lose its entire child care infrastructure, helping assure that normal life could resume for young children and their families.) There are counties in all 50 states and the District of Columbia that are at relatively high risk for hurricanes, earthquakes or tornadoes. Yet while all states require periodic evacuation drills (appropriate for fires) and a large majority requires general written emergency procedures, few set standards for preparing for these quite different kinds of major natural disasters. (See Fig. 2). We found only one state, Pennsylvania, with any of the three standards designated here as high. (That

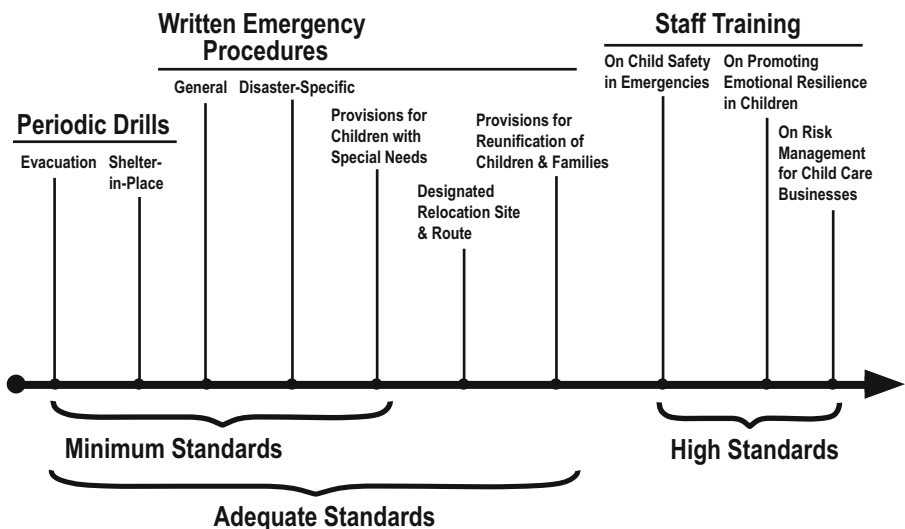
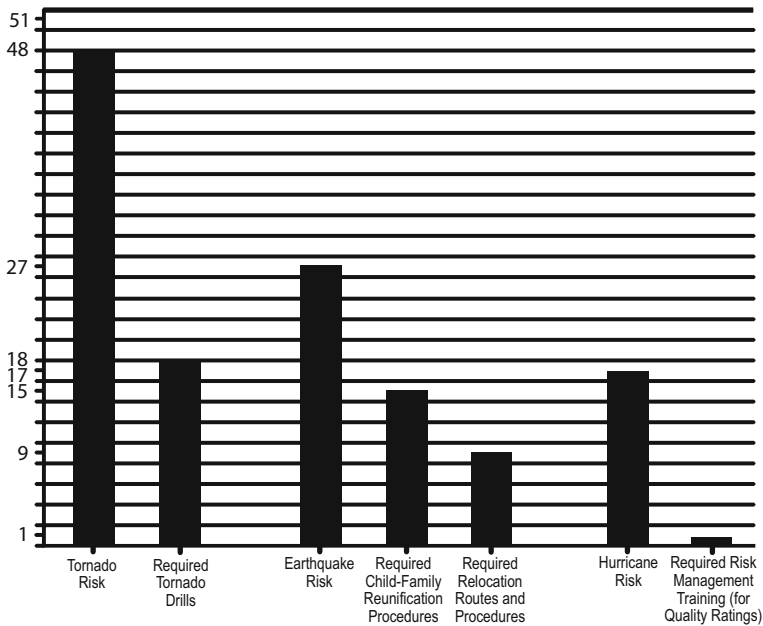


Fig. 1 A continuum of standards for emergency preparedness of the early childhood sector



**Fig. 2** Numbers of states with selected disaster risks and with selected disaster-specific emergency preparedness standards for child care facilities

standard, for risk management practices, is part of the state’s child care quality rating system).<sup>1</sup>

#### 4 Discussion

These findings demonstrate that the early childhood sector is not uniformly vulnerable to major disasters. Thus, reducing the risks for young children in congregate care must involve a variety of targeted interventions to better prepare child care facilities to withstand and recover from disasters. States can use indicators research to target specific interventions for improved emergency preparedness where they would have the most impact. For example, the second study described here found that in Georgia three highly vulnerable counties had tornado, hurricane, *and* earthquake risk, but Chatham County

<sup>1</sup> Some states have multiple disaster risk factors and minimum standards, yet they *encourage* through preparedness by child care facilities or schools. For example, North Carolina awarded a “quality point” to some child care centers that prepare written emergency plans (North Carolina Division of Child Development, 2007, p. 144). As another example, a proposed child care licensing requirement for written, disaster-specific emergency plans was still under consideration in New Hampshire at the time of our study, yet the state already provided an excellent resource, the *Emergency Planning Guide for Child Care* (New Hampshire Department of Health and Human Services n.d.) for facilities that voluntarily develop emergency plans. That guide encourages providers to implement many of the standards we found in effect in various states.

had 542 licensed centers while the other two counties had a total of 66 centers. This clearly indicates where limited resources for disaster-specific preparedness measures could reduce vulnerability for the most children.

No single agency has the expertise, capacity, or authority to make systemic improvements across the early childhood sector. However, states—and the early childhood field—can, as a matter of policy, do a great deal to reduce the threats from major disasters for young children by identifying vulnerable areas and targeting particular emergency preparedness measures to early care and education programs in those areas. Why is this proposed policy important? Where early childhood programs can rapidly recover and reopen after major disasters, one important component of children’s familiar worlds can be restored. The *resilience of the early childhood sector* in disaster areas influences the *capacity of children under school-age* to rebound from disaster experiences.

Indicators research focused on vulnerability of the early childhood sector at the county level can be the basis for interagency collaboration to reduce disaster risks for young children. The linchpin of this model is data-sharing and the key strategy is indicators research or vulnerability analysis, as it is known in the emergency preparedness sector. The model has several features (Grace and Shores 2008, Recommendations for the Mississippi early childhood emergency preparedness project; A report to the Mississippi Head Start Collaboration Office. Mississippi State University):

- A facilitated system for sharing data about child care locations
- Annual vulnerability analyses of the early childhood sector to pinpoint needs for specific emergency preparedness measures
- Graduated emergency preparedness standards, encompassing licensing regulations and quality rating criteria, with basic standards reflecting a general or “all hazards” approach and other standards linked to local disaster risks
- Graduated training on emergency preparedness, again with some components reflecting a general or “all hazards” approach and other components linked to local disaster risks
- Rapid assessments of damages to the early childhood sector in disaster areas
- Rapid restoration of early childhood services in disaster areas

Indicators research in this arena can answer questions such as:

- Are children in tornado-risk counties with low third-grade reading proficiency rates at heightened risk because Head Start or high-quality slots are concentrated at a few sites?
- If half the child care facilities in a hurricane disaster area fail to reopen, will the remaining facilities be able to absorb the displaced children?
- Do counties contiguous to earthquake-risk areas have enough designated shelters to accommodate groups of children relocated from child care facilities?
- Is the need for emergency preparedness training on earthquake-resistant building standards a higher priority, in a particular state, for licensed centers or for license-exempt family child care homes?

This is an important time in the history of early care and education. Many forces are at work to make the early years safer and richer, in terms of caring relationships and learning experiences, for America's children:

- The movement in a majority of states to establish quality rating systems for child care programs
- The growing support for publicly funded early care and education
- The burgeoning child indicators movement in sociological and early childhood services research—a movement that should help governments at all levels make decisions about children on the basis of evidence

By collaborating to analyze vulnerable components of the early childhood sector, agencies and nongovernmental organizations can target efforts to reduce disaster risks, achieving progress beyond proclamations that planning for disasters is important and necessary.

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