The following commentary is an appendix to the Commentary: Disaster Preparedness and Pediatrics: What's Next?

The Youngest Victims: Disaster Preparedness to Meet Children's Needs

The American Academy of Pediatrics (AAP) Disaster Preparedness Advisory Council has identified a variety of guiding principles or key messages that AAP members and child advocates can use to guide decision-making and support the implementation of new public policy, effective community/state planning, and appropriate education and training.

Children Have Unique Needs

In 2006, there were 73.7 million children under age 18 years in the United States, constituting more than one quarter of the United States population. When discussing disaster preparedness, the nation's children are often combined with many other diverse populations under the rubric of "special needs." Use of a generic catch-all term (at-risk, special needs, special populations) for diverse populations with very different needs obscures our duty to examine each of these groups and their needs individually. With children, it is important to highlight the various needs of children of different ages and developmental stages (infants, preverbal toddlers, preschool-age children, school-age children, adolescents, young adults, children with low English proficiency, children of different cultures, and so on) so their needs are anticipated during assessment and planned for accordingly. Use of these generic terms has resulted in combining children, pregnant women, the elderly, and even pets into one group, and this practice sends an unhelpful message regarding the unique needs of each of these populations. Governmental agencies should anticipate that a disaster may overwhelm a state's ability to serve these groups, particularly children, and be prepared to address this issue proactively by designating aid specifically for children and describing how this aid can be accessed.

Children are not little adults. Their developing minds and bodies place them at increased risk in a number of specific ways. Children have important physical, physiologic, developmental, and mental differences from adults that can and must be anticipated in the disaster planning process. Plans must ensure that health care facilities and medical providers are prepared to meet the medical needs of children of all ages and developmental stages.

Children are particularly vulnerable to aerosolized biologic or chemical agents because they normally breathe more times per minute than adults, meaning they would be exposed to larger doses in the same period of time. Also, because some agents (eg, sarin and chlorine) are heavier than air, they accumulate close to the ground – right in the breathing zone of children. Children are also more vulnerable to agents that act on or through the skin because their skin is thinner and they have a larger skin surface-to-body mass ratio than adults.

Children are more vulnerable to the effects of agents that produce vomiting or diarrhea because they have less body fluid reserve than adults do, and this characteristic increases their risk for rapid dehydration. Further, children have smaller circulating blood volumes than adults; so, without rapid intervention, relatively small amounts of blood loss can quickly tip the physiologic scale from reversible shock to profound irreversible shock or death.

Children have significant developmental vulnerabilities not shared by adults. Infants, toddlers, and young children do not have the motor skills to escape from the site of a chemical, biologic, or other terrorist incident. Even if they are able to walk, young children may not have the cognitive ability to figure out how to flee from danger or follow directions from others. Also, they may not know when they need help or may not be able to tell others about their symptoms.

Just as children's developing bodies affect their response to physical trauma, ***children's ongoing cognitive and social development poses unique challenges to providing quality mental health care.*** In general, a child's reaction to a new situation varies greatly, depending on their developmental level, temperament, experience, and skills. When children are exposed to circumstances that are beyond the usual scope of human experience (eg, a terrorist attack or violence), they may develop a range of symptoms related to post traumatic stress disorders. Exposure to media (on television) or being interviewed by the media would traumatize children further. Efforts should be made to protect children from these experiences.

Children have ongoing needs that must be addressed by their parents or other caregivers. They require direct supervision, assistance with feeding, and protection from hazards. When children are separated from their caregivers (whether because of displacement or medical evacuation), they require priority assistance. Children are highly influenced by the emotional state of their caregivers. When the family or another caretaker is psychologically harmed by the events around them, it is likely to affect the psychological well-being of the child.

Counselors should be trained to recognize the signs of distress in children and to help parents and caregivers

address children's needs at varying levels of development. Techniques used in assisting adults may be ineffective or even counterproductive with children.

Children are a highly vulnerable population during a food or agriculture incident. Children consume proportionately more food and drink than adults. Children are more vulnerable to the effects of agents that produce vomiting or diarrhea because they have smaller body fluid reserves than adults, increasing the risk of rapid progression to dehydration or shock. Young children may need to be breastfed or fed by adults. Planning should acknowledge the unique vulnerabilities of children and the fact that they could represent a disproportionately high percentage of victims in a food or agriculture incident.

Children are particularly vulnerable to rapid spread of infectious disease and exposure to toxic substances. Young children, especially infants and toddlers, have a natural curiosity (that leads to frequent and wide-ranging handling of objects and surfaces) and a tendency to put their hands and objects in their mouths without washing first. Since their immune systems are still developing and because children are smaller than adults, they often have a more pronounced reaction to infections and other substances. Increased attention to infection control measures (eg, immunizations, hand washing, routine cleaning, disinfection, and sanitization) can reduce the spread of infectious diseases. In pandemic situations, child care and school closure along with social distancing may be recommended.

Evacuation plans should specifically address children, particularly in schools and other places where children gather in large numbers. Child care programs, schools, and before and after school programs must be prepared to evacuate children, take them to a safe place, notify parents, and reunite children with their families.

A disaster may disrupt community child care services and leave first responders and other providers of vital services without a safe place for their children. This disruption could result in a need for accessible child care facilities to care for more children than they typically do, or for establishment of temporary child care programs. The special challenges of providing such care during disaster situations should be identified. Guidelines for these situations should be flexible, depending on the need. Minimum health and safety standards should be followed; yet some guidelines (need for immunization records, confidentiality when discussing health information, the maximum number of children cared for) may need to be adjusted or waived.

When children are cared for in shelters or other temporary care situations, child-specific supplies must be provided, including cribs, children's clothing of various sizes, formula and bottles, water, baby food, feeding utensils, etc.

Feeding plans or guidelines should stress the special needs of infants and young children for breast milk, formula, and baby food. Plans must describe how clean water, bottles, and other necessary feeding equipment will be provided.

Communities Can Best Care for Children by Focusing on Family-centered Care

The importance of family-centered care is critical given the likely unwillingness of many parents to be separated from their children in a disaster, even if both the parent and child are injured and in need of medical care.

Children frequently receive more appropriate and more effective care when they are accompanied by a parent or other caregiver. Children should not be separated from their families or caregivers to the maximum extent possible during evacuation, transport, sheltering, or the delivery of other services. If separation was unavoidable, children should be reunited with their families or caregivers as soon as possible.

In particular, children must be transported with at least one parent or caregiver during evacuation of medical facilities. In addition, this transportation and care must be coordinated so patients are moved to facilities with appropriate pediatric resources, whether they are evacuated from field providers, inpatient units, or specialized advanced facilities (such as pediatric or neonatal intensive care units). Communications must be maintained between medical providers and patients' families or guardians if they are not together. Child passenger safety recommendations should be followed.

During a no-notice or mass evacuation, children will likely be gathered in large numbers away from their parents, whether at schools, child care facilities, summer camps, hospitals, or other locations. Plans must account for their safe transportation and reunification with caregivers. Child-specific supplies, such as clothing, food, water, formula, and diapers must be present at evacuation sites and en route, with the assumption that large numbers of children may be transported together.

States and other entities need to determine how to subsidize and provide quality care for children whose caregivers may be killed, ill, injured, missing, quarantined, or otherwise incapacitated for lengthy periods of time. Legal and other issues must be addressed when these children are taken into the care of the state. Special consideration must also be given to those children who are already wards of the state, either through the foster care or the judicial system. Preemptive planning and creation of a system to identify, monitor, and care for these children will help to ensure their needs are met at a time when they may not otherwise be supported or protected.

Children may be at increased risk for

being abducted, abused, or neglected during a disaster or times when their parents or caregivers are experiencing unusual stress. If there is a disaster or emergency situation, adults should take care to ensure that children are supervised by sight and sound at all times, reinforce safety rules, and talk to children about what they should do if they need help. Also, professionals who assist with rescue and recovery should recognize that children involved in a disaster may exhibit signs and symptoms similar to those who have been maltreated, and they should consider whether each child may have been victimized or abused. Because most abuse occurs within the family or by someone known to the child, an emergency or disaster can cause increased stress to the family or a child, and children may choose that time to disclose that they have been maltreated. Reports by children of any form of abuse or neglect should be taken seriously and pursued in an appropriate manner. Lastly, disaster planning efforts should include methods for tracking sexual and other adult predators, especially during evacuations or times when children may need to be housed in a shelter or other communal area.

Children Require Appropriate Pediatric Care

As defined by the AAP, the purview of pediatrics includes infants, children, adolescents, and young adults through and, in certain circumstances, beyond 21 years of age. Children must be cared for properly in the event of a disaster, whether by their parents, families, caregivers, or teachers. Limiting pediatric services to specific age groups—eg, "children under 8 years old"—is not advisable or adequate. The needs of *all* children must be addressed, from infants to young adults. Necessary resources need to be provided to make this possible.

Once children are critically ill or injured, their bodies will respond differently than adults in similar medical crises. Consequently, pediatric treatment needs are unique in a number of different ways.

Children need different dosages of medicine than adults – not only because they are smaller, but also because certain drugs and agents may have effects on developing children that are not of concern for adults.

Children need different sized equipment than adults. Because children have smaller bodies, they require smaller equipment. From needles and tubing to oxygen masks and ventilators, to imaging and laboratory technology, children need equipment that has been specifically designed for them.

Children demand special consideration during decontamination efforts. Because children lose body heat more quickly than adults, skin contamination showers that are safe for adults may result in hypothermia in children unless heating lamps or other warming equipment is provided.

Plans that describe care for children must have a specific pediatric component. Pediatricians should be direct participants in the teams that develop this advice, and appropriate guidelines will almost certainly be different for children than for adults. Pediatricians must be included in the primary notification process. The signs and symptoms of exposure and methods of treatment are different for children than they are for adults. Families and health care providers will need customized information and guidelines to respond appropriately.

Pediatric-specific capabilities must be present at all points of operation. Health care and mental health providers with adequate pediatric training will be required to provide appropriate care.

It may not be reasonable to expect strict confidentiality practices to be maintained during a disaster. In particular, attention must be paid to medical care for unaccompanied minors in a mass casualty situation when there are reunification issues. There are special challenges when providing care during disaster situations and waivers related to confidentiality and the Health Insurance Portability and Accountability Act (HIPAA) may be requested and granted.

Customize Disaster Planning to Meet Children's Needs

Federal, state, and local disaster plans should include specific protocols for management of pediatric casualties and should include pediatricians in planning at every organizational level. Further, local disaster teams should include pediatricians and other personnel skilled at evaluating and treating children.

Children must be cared for properly in the event of a disaster, whether by their parents, families, caregivers, or teachers. The needs of *all* children must be addressed, from infants to young adults. Adults in charge of children, including caregivers and teachers, should have a plan for providing first aid and further care for children until they are reunited with a family member who can meet their needs. Appropriate resources must be provided to make this care possible.

Government agencies should work to ensure that adequate supplies of antibiotics, antidotes, and vaccines are available for children; that these agents are safe and efficacious; and that pediatric doses are established. Resource allocation plans should ensure that these agents are readily available to pediatric health care sites and other locations where children may congregate.

Many individuals have lost their lives during hurricanes and other disasters because they would not evacuate without their pets. In addition, separating children from their pets without appropriate preparation can have nega-

tive consequences. Children are very close to their pets, and family and community disaster preparedness plans must take pets into account. Consideration must also be given to safety issues in designing shelter plans that allow pets to remain with their owners. The cramped quarters and high-stress nature of shelters pose unique challenges in preventing injuries among children from animals unknown to them.

AAP Resources

Pediatric Terrorism and Disaster Preparedness: A Resource for Pediatricians

This comprehensive 350-page report and its summary serve as practical resources that pediatricians can consult when planning for and responding to natural disasters and bioterrorist events. The report was published in 2006 and was prepared by the American Academy of Pediatrics for the Agency for Healthcare Research and Quality.

Pandemic Influenza: Warning Children at Risk!

This 34-page issue brief was published in 2007 and was prepared by Trust For America's Health and the American Academy of Pediatrics.

A Disaster Preparedness Plan for Pediatricians

This 21-page booklet developed by a practicing pediatrician and an AAP Chapter describes the steps that pediatricians need to take to prepare their office practices for a disaster.

Infant Nutrition During a Disaster: Breastfeeding and Other Options

This 2-page fact sheet includes recommendations and a flow chart to help guide decision-making regarding infant feeding during and after a disaster.

The Pediatrician and Disaster Preparedness

The American Academy of Pediatrics has developed a policy statement and technical report that complement each other and include recommendations regarding the pediatrician's role in disaster preparedness and recovery.

These and other key resources can be found on the AAP Children and Disasters Web site at: http://www.aap.org/disasters/index.cfm

If you have questions or wish to join the AAP Disaster Preparedness Contact Network, please send an e-mail describing your interest or involvement in disaster preparedness initiatives to DisasterReady@aap.org.