



# Project Pediatric Preparedness Final Report

*Unique Requirements, Goals, Capabilities and Gaps in Pediatric  
Emergency Preparation and Response*

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“Any opinions, findings, and conclusion or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Department of Homeland Security.”



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## Acknowledgements

First and foremost, the genesis of this project arose when looking at the needs, requirements and capabilities for emergency responders in general, it became apparent that a special needs population was being left out, namely children. Protecting those who cannot protect themselves is an important area that needs to be considered in emergency preparation and response. It is hoped that Project Pediatric Preparedness will help enlighten that consideration.

We would also like to thank the parents of two of the Oklahoma City Murrah Building bombing victims, for taking the time to travel to Washington to give us their personal perspectives on dealing with that terrorist act and the loss and injury of a child. No parent should ever have to go through that process, and we thank them very much for showing us their reality.

We would also like to thank members of the responder, medical, academic, and government communities from across the country who took the time to discuss these issues with us, or participate in the main workshop or Senior Advisory Group sessions in Washington.

We also thank Georgetown University's Biosecurity Institute for their support on the project. They kindly hosted the workshop in their facilities, and provided expert personnel and advice. Georgetown University's Law Center's Harrison Institute for Public Law was also a major help to this project.

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We know that there are interested and dedicated people out there in all parts of the community nationwide who can lend their knowledge to debating the hard problems of pediatric emergency preparation and response.

Finally, this report is dedicated simply to the children.

## Executive Summary

Emergency preparedness and response planning, technology investments, and training frequently do not consider the unique requirements of responding to pediatric victims of a larger scale terrorist attack. Children have unique physiologies (size, weight, age, respiratory system, organ capacity and strength, etc.) and psychologies that create unique needs in capabilities and protocols for the use of medical procedures, equipment, drugs, decontamination, mortuary affairs, psychological treatment, and legal authorities. Homeland security planning must account for, and invest in capabilities to meet, these needs.

This report explains these unique needs and gaps, and provides a foundation for homeland security planning for pediatric victims of terrorism. This report describes the minimum capabilities essential for emergency response to pediatric victims. The report lays out fifteen Functional Areas for pediatric response – general areas describing functions, tasks, and missions of emergency response (in priority order):

1. Emergency Medicine
2. Emergency Medical Services / Triage
3. Awareness: Prevention and Pre-emption
4. Crisis Management
5. Incident Management
6. Early Warning / Epidemiological Surveillance
7. Isolation
8. Quarantine
9. Post-Emergency and Acute Hospital Medicine / Health Care
10. Public Affairs
11. Mental Health Care (Urgent)
12. Mental Health Care (Long-Term)
13. Mortuary Affairs for Children in Mass Casualties
14. Decontamination
15. Mass Prophylaxis of Children

The report also lays out six Capability Areas – general categories of capabilities used to perform functions, tasks, and missions, and support each of the Functional Areas. These Capability Areas are:

1. Equipment and Resource Management;
2. Legal / Authorities
3. Training, Techniques, and Procedures;
4. Pharmaceuticals (including trials and dosages);
5. Surge Capacity; and
6. Data Collection and Information Management

Different challenges persist across the functional and capability areas. However, several cross-cutting issues emerged in research and discussion with over 50 emergency responders and pediatric professionals. These cross-cutting issues reflect challenges in pediatric response **capabilities, policy and planning, training and awareness, and legal authorities.**

**Capabilities** for pediatric response must recognize the unique needs of children. A completely separate system for pediatric emergency response and preparation is not necessary, but a complementary system that does not rely on simply adapting adult practices is needed. The focus of pediatrics in emergency preparation and response has not been specifically addressed in depth, (e.g., technical, legal, operational, policy, etc.) but instead has been subsumed under general preparedness and response.

- Full capability for the unique needs of pediatric response is unequally distributed across the country, but is not consistent nationally. Geography is a mitigating factor in capability across the country.
- Existing children's health care networks such as the National Association of Children's Hospitals and Related Institutions (NACHRI) should be leveraged to promote capabilities in emergency response.
- There is a need for more studies on infectious disease outbreaks and how they affect children as they may offer possible solutions for treating children in both deliberate and naturally occurring disease outbreaks. Children tend to be the least studied group for bioterrorism agents and most antidotes, as vaccines or prophylaxis is geared towards adults.
- Although there is now more research being conducted and incentives given for manufacturers to produce drugs specifically for children, not enough attention is being paid to specific drugs for a chemical, biological, radiological, or nuclear (CBRN) attack. More research funding and incentives should be put in place for pediatric CBRN drug development.

- Mental health issues for children are often the most neglected and under-considered, and this is especially true for long term-care. A system to pre-identify and credential professionals such as counselors and social workers for age appropriate tasking would be very useful in a crisis situation so that the right people are matched to children in distress.
- The capability for data collection and information management is insufficient for any function that deals with decision-making.

**Policy and Planning** for pediatric response is a frequently overlooked aspect of emergency response planning.

- Pediatrics should be an important consideration in emergency planning and preparation because it can directly affect response.
- Planners cannot use “adult X1/2” as a planning assumption, especially for equipment and pharmaceuticals. Most importantly, there should be a requirement for a pediatric annex for all emergency response plans.
- The system cannot bear new unfunded or understaffed mandates.
- To ensure funding is available for pediatric specific initiatives, and so that they are not overshadowed in general emergency response and Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) funding, one possible solution is to have specific Congressional earmarks or federal agency funding designated for pediatric emergency preparation and response.
- There is a need to look at the impact of, and responses to, natural disasters both domestic and overseas on children as they present concrete, real-world examples of how to respond to a mass casualty incident, what contingencies need to be planned for, and what capabilities would be overwhelmed.
- Schools are improving their ability to integrate into response plans, although other child congregate centers have not. Schools must integrate more fully into the community response infrastructure and the community response infrastructure in turn needs to include or further include schools and other child congregation centers in their planning.

- Many schools do not have a mandate to do public health monitoring and many do not even have a school nurse or a focal point of contact.

**Training and Awareness** for pediatric response requires understanding and familiarity with the unique needs of child victims, and the role meeting these needs plays in overall emergency response.

- Pediatric preparedness and response has not been tested as an express element of large-scale national exercises and tabletops (such as TOPOFF). As such, the pediatric issue needs to be incorporated into these exercises so that policymakers, planners and operators alike are familiar with the unique problems they will encounter in dealing with a catastrophe that includes many child victims, parents, and the media.
- Special training to manage children is needed at all levels of community.
- More pediatric specialists, pediatric specialized teams, and pediatric specialized CBRNE training would also be imperative to building up capability.
- More specialized DMAT pediatric, detachable sub-groups and/or fully functional Pediatric DMATs, Pediatric DMORTS, and Pediatric Mental Health DMATs would augment specialized response capabilities.
- There is a definitive need to look at best practices and lessons learned (both domestically and internationally) in order to adapt best practices on a wider basis, plan for contingencies, and to fulfill current gaps where applicable. Capability that exists for pediatric emergency response practices has never been examined in a cohesive and comprehensive manner.

**Legal Issues** in pediatric response pose unique legal challenges, may require new legal authorities for response, and demonstrate a need for training emergency responders in awareness of existing legal authorities for responding to pediatric victims.

- Pediatric victims of terrorism may be medically uninsurable into adulthood even though they will require a lifetime of care. Provisions should be made for these children to be provided health insurance and coverage.
- Many emergency responders are unaware of their specific legal authorities and limitations for responding to pediatric victims of catastrophes.



- Public health planners cannot assume that adult model laws will work for pediatrics especially in the realm of bioterrorism and, as a result, pediatric-specific model laws may need to be developed and implemented.

In addition to cross-cutting challenges described above, each of the 15 Functional Areas has a number of challenges and needs unique to pediatric response.

### **Emergency Medicine**

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- Pediatric injury/illness is low-volume/high-risk, which has implications for emergency medicine preparedness (treatment, training, equipment, etc.).
- Surge capacity will be invoked and reached more quickly in this environment because of unfamiliarity and unique needs of pediatric patients.
- Private transport to hospitals might be more common with pediatrics and this will result in victims delivered to hospitals not according to plan or to informed decisions.
- Injured children are a greater potential threat to EDs, because treatment decisions may not meet the perceived needs of family members and, as a result, there should be more psycho-social support for family members.
- Hospitals diversion is hard to plan around, especially with the addition of the pediatrics issue.
- Children generally need more care in an emergency setting and certain procedures such as X-rays, CT scans, and possibly MRIs are more of a challenge to frightened, excitable children.

### **Emergency Medical Services/Triage**

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- The Emergency Medical Technician (EMT) will need to know the location and capability of pediatric centers/specialists/etc.
- Point of entry plans and transportation for pediatrics is different.
- Early notification to hospitals is a higher priority for pediatric response—hospitals need more time to marshal resources and staff, Public Information Officers (PIOs), etc.

- EMS and triage is an inexact science already, and the pediatric issue only complicates this capability.
- A pediatric victim population will bring triage straight to surge capacity.
- Delayed EMS triage because of crisis management protocols (e.g., a suicide bomber or a secondary device) will conflict with compressed timelines and urgent triage needs for children.
- There are many equipment/treatment issues to take into account for pediatric needs when starting treatment at the scene.
- For chemical and radiological operational environment areas, absorption and toxicity levels will differ and require different treatment/triage.
- Sometimes arriving units will be unaware that a pediatric congregation/caregiver facility is part of the incident.
- Identification and tracking of victims/patients is difficult because some children will not be able to identify themselves.

### **Awareness: Prevention and Pre-emption**

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- Awareness does not only concern schools but other child congregate care settings such as the YMCA, daycare, church groups, camps, clubs or other large groups of children in congregate settings.
- Many child congregate facilities are underfunded and understaffed with high turnover rates, making it difficult to institute the proper training for awareness.
- Child congregate settings are usually not hardened and access control is usually weak.
- Since these facilities are not normally focused on these types of security threats, it would be difficult to mandate any new requirements without funding.

## **Crisis Management**

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- Due to their infrequency, there is limited experience in handling children's crises, which has led to underlying assumptions that may no longer be valid.
- Adult protocols for a CBRNE attacks do not necessarily apply to children in a crisis situation, which can impact the management of a crisis.
- Many child-surveying agencies have limited resources to train and implement pediatric emergency preparedness plans and goals.
- Most state response plans do not currently have a pediatric specific annex.
- Communications becomes crucial when parents are separated from or otherwise not with their children.
- It is also important that children who do not normally carry identification be immediately identified so that both responders and parents know where they are.
- Whole families may be affected by an incident and end up at different hospitals, further adding to confusion in a crisis situation.
- Personnel needed to assist in a pediatric crisis will be greater in numbers.

## **Incident Management**

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- Crisis communication is more difficult when large numbers of children are involved.
- Small children in general require extra care, and especially those with special needs.
- Emergency responder incident commanders needs to be aware of *all* the different issues raised in pediatric response, across the board. Pre-planning will have to account for all these issues.
- Parents and neighborhood citizens will more likely self-refer in a pediatric event, and will need to be kept (or managed) out of the perimeter.

- Relaying timely information to and establishing a communication system with parents is also part of the incident management structure; the challenge is finding the best method to do so.

## **Early Warning and Epi-Surveillance**

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- Schools are unique and often primary sources of indicators of naturally occurring disease, although for intentional bioterrorism events they may not be as unique.
- Communications and indicators are more complex depending on the child's age and are often reliant on third parties for information when dealing with very young children.
- Many schools do not have the mandate, the resources or the willingness to monitor public health issues.

## **Isolation**

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- Cascading issues develop when children are subjected to isolation measures.
- Capacity issues for children in isolation would also be prevalent.
- Isolation is resource and time intensive, especially when dealing with equipment.
- Psychological element will affect both caregivers and victims.

## **Quarantine**

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- There are two sets of people that are affected by quarantine when children are involved.
- Home Quarantine will have different psychological effects than being isolated in a hospital.
- In high profile incidents, a large amount of law enforcement will be needed to secure a school if children are being quarantined in place.

- It is currently unclear how the psychological and public safety risk/benefit analysis would be measured in order to allow parents into a quarantine situation.

### **Post-Emergency & Acute Hospital Medicine/Health Care**

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- There are varied levels of personnel needed to manage these pediatric crises as well as different types of equipment and challenges to overcome.
- Specialized equipment and resources are needed that are pediatric specialized.
- While facilities may have a pediatrics capability, generally speaking, in facilities without Pediatric Intensive Care Units (PICUs) there are problems with pediatric equipment and resources.
- Appropriately trained staff with pediatric rotations or specialties can be lacking.
- There is a lack of CBRNE training aimed at the special needs of the pediatric population.
- Children may require more transportation options.
- Different age groups, cultures, and languages of both children and parent/guardian, and possible documentation issues all can have an impact on children receiving the appropriate care.

### **Public Affairs**

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- There is a need for a tiered public affairs system that is responsive to the victims, the families of victims, the general public and the nation.
- The media can be a positive public affairs tool and partner in several different ways.
- It should always be remembered that the media is not there to convey a particular position and has its own motivations for reporting information.
- Conveying accurate and timely information can be more difficult with children because of victim identification.

- Children must be reunited with parent/guardian as soon as possible and, in the interim, there is a need for someone to act *in loco parentis*.
- Terrorists also use the media to spread the terror. If messaging to the media is simple, clear and consistent, the media can be a conduit of communication instead of a tool of terror.
- It is important that one entity be the “voice” of public affairs.
- Pre-communication is almost as important as communication in a crisis.

### **Mental Health Care (Urgent)**

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- There is enough difference between short-term and long-term mental health needs to necessitate each to be broken out separately; there are different systems in place to deal with each.
- Children, parents/families, and responders may have different mental health needs.
- The type of mental health intervention needed depends on time and length of exposure (direct or indirect), type of incident, and child’s history.
- Children’s cognitive and developmental levels, age, cultural and religious background can all impact on their socio-emotional responses.
- It is not always possible to honor parents’ wishes in a traumatic situation.
- Parents want to be with their children and this can impact mental health well-being.
- While first responders need to focus their training and real-life efforts on the task at hand, there needs to be some sort of balance between practicality and dealing with children and their emotions.

### **Mental Health Care (Long-Term)**

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- Language, culture, costs and availability can be barriers to effective long-term mental health needs of children and families in the community.

- Stigma about seeking mental health care can prevent the parent/guardian from allowing the child to get help.
- Under normal circumstances, there is already a treatment shortage, only 20 % of children gain access to the mental health care they need.
- There is not enough understanding of how to handle mass mental health needs.
- Parents, teachers and pediatricians need to be able to recognize the signs of what constitutes a delayed mental health reaction.

### **Mortuary Affairs for Children in Mass Casualties**

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- Mortuary issues in general are difficult to deal with and can be exacerbated by any perceived lack of sensibility or preparation.
- Most pressing challenge would be rapid identification of child, which can be difficult in a mass casualty situation as responders' priorities are to move quickly and save as many lives as possible.
- Management of adults in a mortuary situation is clear, but methods and processes for a child are probably not as well known or would rely on adult protocols.
- Transportation and storage of mass casualties, especially when children are involved, can be even more traumatic if not handled with sensitivity.
- There are cultural and religious issues as to how a child's body is handled that need to be known and followed.
- Closure is also needed for the parent/guardian if at all possible, for example, being allowed to hold the child's body.
- It will always be a difficult choice as to who should be identified first in a mass casualty situation. Should it be adults or children?
- When working with children, work hours must be regulated.
- There is always political pressure to wrap up a crisis.

## **Decontamination**

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- Children have physiological and psychological differences that should be considered in the decontamination process.
- Timelines are usually compressed for pediatrics because of vulnerabilities based on toxic exposure rates, and susceptibility to agents.
- Communication and direction is more difficult with younger or special-needs children.
- A contaminated child is more likely to be a multiplier of casualties than a contaminated adult.
- Parents will tend to be skeptical that an environment is sufficiently clean for their children.
- Materials and measurements commonly used for adults may require some “tweaking” for children.
- Most equipment is geared towards adult sizes and not children.

## **Mass Prophylaxis of Children**

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- Pharmaceutical guidelines and stockpiles are not well established for pediatrics.
- Children often dislike or are unable to tolerate the act of physically swallowing a pill, it would be advantageous to have alternate formulations available.
- Parental consent will be required or assumed for some plans and capabilities.
- In the event of crisis, the time to act and respond to pediatric victims is often much shorter than with adult victims based on differences in physiology.



## Conclusion

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More emphasis and a specific focus on the pediatric element in emergency preparation and response is needed across all functional areas. Solutions to improve pediatric emergency preparation and response capability can build upon existing capabilities and also are balanced between materiel and non-materiel improvements. Most technological improvements can be made in pharmaceuticals and equipment, but improving pediatric response also depends on improved training, and planning and integrating the pediatric element into the way we view emergency response in general. Yet, there is often the argument that neither the Federal government or the local jurisdictions have the resources to do everything, and that we must choose wisely where we invest our resources and efforts. Improved capability for pediatric emergency preparation will take some time to build, but the problem, is what happens in the interim? In a major casualty incident, some sort of graded capability may be a possible stopgap measure.

This report highlights needs and gaps in capability and potential goals to improve capability. What is needed is some sort of assessment of capabilities and standards. A capabilities assessment should be addressed at the local and state level. A “National Assessment of Capabilities” can become politicized very quickly. More importantly, the local and state communities know both their needs and their capabilities to fulfill them better than anyone else, and therefore are in a better position to assess them. In terms of defining standards, a single focal point should be tasked to develop and define these standards. A number of organizations could be delegated to do this such as the InterAgency Board for Equipment Standardization and InterOperability (IAB), the Department of Homeland Security (DHS), or an entity that is already a pediatric stakeholder such as the American Academy of Pediatrics (AAP). This list is only suggestive, but it is crucial that one entity/organization take the mantle for standards. Because there is such a variation in capability depending on location, perhaps minimum essential standards would help to balance capability.



## Section 1: Introduction

Children in large groups have been victims of terrorist attacks, whether coincidentally--as in the 1995 truck bombing of the Murrah Building in Oklahoma City--or intentionally--as in the 2004 siege of a school in Beslan, Russia, by Chechen terrorists. It is reasonable to presume that child populations will remain exposed and vulnerable to terrorist attacks, including catastrophic attacks using weapons of mass destruction. It is critical that planners account for the unique needs of children when preparing plans and investments for homeland security, especially in the area of emergency preparedness and response.

### **The Problem**

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Children are especially vulnerable to the physical and psychological effects of terrorist attacks. However, planning, technology investments, and training for emergency preparedness and response frequently do not consider the unique requirements of responding to pediatric victims of a larger scale terrorist attack. Children have unique physiologies (size, weight, age, respiratory system, organ capacity and strength, etc.) and psychologies that require different capabilities and protocols for the use of medical procedures, equipment, drugs, decontamination, mortuary affairs, psychological treatment, and legal authorities. These responder capabilities and protocols differ from standard responses to adult victims of a catastrophic terrorist attack. Many hospitals, (especially those without pediatric units), Emergency Medical Technicians (EMTs), and fire personnel may not have the equipment, procedures, legal authorities, or training to deal with a large scale incident involving pediatric victims. Responders need the proper knowledge, capabilities, training, and authorities to deal with the unique requirements of pediatric victims of terrorism. Homeland security planning must account for, and invest in capabilities to meet, these needs.

### **Solving the Problem**

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This report provides a foundation for understanding these needs in order to support homeland security planning for pediatric victims of terrorism. It identifies and explains unique requirements and gaps for pediatric emergency preparedness and response. It also identifies potential opportunities and strategies to mitigate or close these gaps, and provides recommendations for future study or investment.

It is expected that planners and practitioners in state and local emergency response organizations, Federal agencies (especially the Departments of Homeland Security and Health and Human Services), and the Congress will find this report useful for long-term planning. Toward that end, this project seeks to identify and educate national leaders, responders, and caregivers about the capabilities required to address the unique needs of children in the event of a high consequence terrorist event using chemical, biological, radiological, nuclear, or high-explosive incendiary devices.

## **Terminology**

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A note is warranted on terminology. The term “children” has many different meanings and connotations. Even the law, which has bright lines between adults and minors, applies definitions of “child” on a case-by-case basis. There are, however, common elements that characterize a child with respect to unique needs for emergency response. For the purposes of this report, “child” is considered to be persons up to the age of 18, with the caveat that there may be significant physiological and psychological differences between younger and older children, and sometimes even among children of the same age.

The term “responder” also has many different meanings and connotations. To be sure, emergency responders include traditional disciplines of fire services, law enforcement, EMTs, emergency managers, and public health officials. However, the people first on the scene of catastrophic terrorism involving children may go well beyond these disciplines. This project considers a “preparedness and response” matrix of persons from various professions who may be involved, or first on the scene, of a terrorist attack involving children. The important point is to consider how requirements differ and what capabilities will be needed, as persons from these professions find themselves in a crisis with pediatric victims present. This report considers this approach in evaluating requirements and capabilities for response to pediatric victims, and includes such people as:

- Fire and HAZMAT
- Law Enforcement
- Emergency Medical Services
- Emergency Room Physicians and Nurses
- Pediatric Medical Specialists
- Trauma Specialists
- Epidemiologists
- Public Health Officials and Health Departments (including Veterinarians)

- Hospital Administrators
- Long-Term Care Providers
- Mental Health Professionals (including Counselors to Responders)
- School Officials (Teachers, Administrators, Nurses)
- Day-Care Providers
- Transportation Providers (Buses)
- Family Practitioner
- Volunteer Organizations
- Parents

Parents are perhaps the most important category in the response matrix. Whether or not parents are present at the scene of an attack, they are an important element that must be considered when planning for capabilities, legal authorities, techniques, and training for emergency response. This “parent/child” dyad is an important, and sometimes challenging, element of every aspect of emergency preparedness and response for pediatric victims.

## Section 2: Background and Methodology

This report is a product of Project Pediatric Preparedness, an effort funded by the Department of Homeland Security through a grant to the Tulsa, Oklahoma, Metropolitan Medical Response System (MMRS). The Terrorism Research Center, in cooperation with the Tulsa MMRS and the Georgetown University Biosecurity Institute, executed Project Pediatric Preparedness. The project has incorporated both a study process to include a literature review, research, interviews, and expert analysis and review, as well as a structured participatory workshop involving emergency response planners and practitioners. This effort was also bracketed by two Senior Advisory Groups.

This project adopts a “capabilities-based” planning methodology in evaluating the needs of emergency responders. That is, rather than considering specific threat scenarios and deriving requirements unique to each scenario, this effort focused on the minimum capabilities essential for responders’ mission success with respect to catastrophic terrorist attacks involving children. This capabilities-based planning methodology also supports the “all-hazards” planning principle, focusing on capabilities that increase emergency responders’ overall ability to perform their jobs, whether the catastrophe is terrorist, natural, or accidental.

This report arrays in a matrix the minimum capabilities essential for emergency response to pediatric victims. One axis of the matrix describes Functional Areas for Pediatric Response. The second axis describes Capability Areas.

Functional Areas are general areas describing functions, tasks, and missions of emergency response. The 15 Functional Areas examined in this project form the main chapters of this report, and are (in order of descending priority):

- Emergency Medicine
- Emergency Medical Services / Triage
- Awareness: Prevention and Pre-emption
- Crisis Management
- Incident Management
- Early Warning / Epidemiological Surveillance
- Isolation
- Quarantine
- Post-Emergency and Acute Hospital Medicine / Health Care
- Public Affairs
- Mental Health Care (Urgent)

- Mental Health Care (Long-Term)
- Mortuary Affairs for Children in Mass Casualties
- Decontamination
- Mass Prophylaxis of Children\*<sup>1</sup>

Capability Areas enable and support the Functional Areas. Capability Areas are the general categories of capabilities used to perform functions, tasks, and missions. This project examined each Functional Area across six specific Capability Areas (described in detail below):

- Equipment and Resource Management;
- Legal / Authorities
- Training, Techniques, and Procedures;
- Pharmaceuticals (Trials, Dosages, etc.);
- Surge Capacity; and
- Data Collection and Information Management.

The project dissected unique pediatric needs by arraying and analyzing the Functional and Capability Areas in a matrix, and applying a set of five research questions to this matrix. The questions were applied both in a staff research effort and in a structured workshop. The workshop consisted of nearly 40 emergency response planners and practitioners from all levels of government and the private sector and included parents of children both injured and killed in catastrophic terrorist attacks. *Figure 1* illustrates this matrix.

The five research questions that drove the analysis of emergency responders' functional and capability needs and gaps are:

- What are the unique requirements or challenges posed by pediatrics, for mission success in response to a high-consequence terrorist event using chemical, biological, radiological, nuclear, or high-explosive/incendiary weapons?
- What goals should be established for developing or increasing capabilities to meet these requirements or challenges?

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<sup>1</sup> Mass Prophylaxis of Children was examined after the workshop process, and therefore as a functional capability was not voted on in any priority order.

*Figure 1*

<b>CAPABILITY AREAS</b>						
<b>FUNCTIONAL AREAS</b>	<b>Equipment/ Resource Management</b>	<b>Legal/Authorities</b>	<b>Training, Techniques and Procedures</b>	<b>Pharmaceuticals (Trials, Dosages etc.)</b>	<b>Surge Capacity</b>	<b>Data Collection and Information Management</b>
Emergency Medicine						
Emergency Medical Services/Triage						
Awareness: Prevention and Pre-emption						
Crisis Management						
Incident Management						
Early Warning: Epi-Surveillance						
Isolation						
Quarantine						
Post-Emergency and Acute Hospital Medicine/ Health Care						
Public Affairs						
Mental Health Care (Urgent)						
Mental Health Care (Long-Term)						
Mortuary Affairs for Children in Mass Casualties						
Decontamination						
Mass Prophylaxis of Children						



- What is the state of current capabilities to meet these requirements or challenges (good/marginal/none)?
- What are the gaps between needed capabilities (i.e., goals) and current capabilities, and what is needed to close these gaps?
- Do these gaps vary by threat agent (chemical, biological, etc.) or geography (urban/rural, mountainous/flat, coastal/inland, cold/hot weather, etc.)? If so, how?

In the Responders' workshop, each Functional Area was examined one at a time; in this context, all five research questions were asked across the six Capability areas within each Functional Area.

The answers, accompanying discussion and analysis, and review among emergency response planners and practitioners form the content of the chapters below. In addition, participants were asked to rate the above matrix, a color pattern denotes if this capability exists as defined by the goals of the functional area. At the end of the workshop, participants were also asked to prioritize among the Functional Areas, based on which functions were most important to have soonest, in order to meet the goals described by the group.

## Section 3: Cross-Cutting Issues, Insights, and Recommendations

Different challenges persist across the functional and capability areas. However, several cross-cutting issues emerged in research and discussion with over 50 emergency responders and pediatric professionals. These cross-cutting issues reflect challenges in pediatric response **capabilities, policy and planning, training and awareness, and legal authorities.**

### 3.1.1: Capabilities

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**A completely separate system for pediatric emergency response and preparation is not necessary, but a complementary system that does not rely on simply adapting adult practices is needed. The focus of pediatrics in emergency preparation and response has not been specifically addressed in depth, (e.g., technical, legal, operational, policy, etc.) but instead has been subsumed under general preparedness and response.** Focus on special needs populations such as pediatric and geriatrics has often been neglected in favor of a cohesive, more generalized approach. It is difficult to measure pediatric preparedness since pediatric requirements have not been sufficiently examined and matched to current capabilities. Planning must take into account the demographics of the local and regional population. For example, even though most ambulance calls do not normally involve children, in a particular region there may be a large population of children who would have to be accounted for in planning. Another important step is to include professionals and personnel with pediatric specializations and representatives from the school age community on planning committees, workgroups, etc. for emergency response planning. To a certain extent, this is starting to happen in some communities, but more of it needs to be accomplished on a sustainable basis.

**Full capability is unequally distributed across the country, but is not consistent nationally. Geography is a mitigating factor in capability across the country.** Some local and state jurisdictions may have developed capabilities in the various areas of emergency preparedness and response regarding children but it is not on a national scale. Interesting pilot programs and plans may be developed, but oftentimes they run out of money, fail to be adopted or are not enforced. There is a gross lack of infrastructure, capability and trained personnel across the country, especially when you leave major metropolitan areas. Rural areas and other regions outside major metropolitan areas simply do not have the resources for specialized pediatric care. Therefore, capability in pediatric emergency preparedness and response varies throughout the country especially in the medical field. Transportation issues also feed into capabilities

based on geography. While it is possible to bring in outside resources to a certain extent, it is also likely that some children will have to be transported to areas where they can receive the care they need.

**Existing children's health care networks such as the National Association of Children's Hospitals and Related Institutions (NACHRI) should be leveraged to promote capabilities in emergency response.** While pediatric stakeholders for the entire breadth of emergency preparation and response is as diverse as it is large, within the healthcare community, pediatrics tends to be a smaller community than adult health care perhaps making it more effective to actually get things done.

**There is a need for more studies on infectious disease outbreaks and how they affect children as they may offer possible solutions for treating children in both deliberate and naturally occurring disease outbreaks. Children tend to be the least studied group for bioterrorism agents and most antidotes, such as vaccines or prophylaxis is geared towards adults.** There are naturally occurring outbreaks in the world of diseases that could be used as instruments of bioterrorism, and these outbreaks present a unique opportunity for study in a real-world laboratory. Take for example, a recent outbreak of the Marburg virus in Angola, in which children were the initial victims. Why this occurred, how it affected children and how it was dealt would probably have some useful applications for the US's bioterrorism preparedness specifically aimed at children. The recent deaths of three siblings from the Avian flu in Turkey, and the sickening of other children there, as well as deaths in Asia potentially have important implications for understanding how certain diseases may affect children differently from adults. Once that knowledge is attained, treatment and treatment protocols can be established.

**Although there is now more research being conducted and incentives given for manufacturers to produce drugs specifically for children, not enough attention is being paid to specific drugs for a chemical, biological, radiological, or nuclear (CBRN) attack. More research funding and incentives should be put in place for pediatric CBRN drug development.** Regarding drugs to combat CBRN agents, steps have been made in improving pediatric preparations for adult drugs. However, the problem with pediatric drug development is safety testing is often limited or incomplete. In addition, most activity is focused on existing drugs rather than developing new ones. While a complete, separate, and well-tested for safety line of CBRN drugs for the pediatric population is probably not feasible at the present time, more improvements can be made to the current capabilities we have in this area today.

**Mental health issues for children are often the most neglected and under-considered, and this is especially true for long term-care.** Part of the problem is that the baseline is low

to begin with. While there is literature and information available on trauma to children from violence, catastrophes and conflict, actually having enough qualified mental health personnel on hand to adequately cover needs is problematic. Even without extraordinary circumstances and without the need to surge, there may not be enough personnel and services available to service the current mental health needs of children, especially for the long-term. Cost is also another factor, mental health care can be extremely expensive and when insurance or special funding runs out, so too will the care in most cases whether or not the child in question still needs more. The very nature of mental health makes it difficult to put firm parameters around to bound the extent and longevity of the problem in terms of a finite solution.

**A system to pre-identify and credential professionals such as counselors and social workers for age appropriate tasking would be very useful in a crisis situation so that the right people are matched to children in distress.** While there may not be enough child psychologists and services available, sometimes, in response to an incident, numerous counselors and other personnel inundate a situation. For example, after a high profile incident, counselors have often self-referred themselves to a site. The problem is that, in a crisis, it maybe difficult to figure out who is really qualified and how best to utilize their skills.

**The capability for data collection and information management is insufficient for any function that deals with decision-making.** The problem is that there is a lack of real-time information and knowledge bases that deal specifically with children. Children also pose a unique problem in just gaining information. The problem with children, especially young children, is that they may not always be able to tell you who they are and what is wrong with them. Children also do not normally carry ID with them, making identification difficult. They may be uncommunicative and may not be accompanied by a parent who can give the relevant information in an emergency situation. Tracking children is also difficult as there are no automatic or rapid means to do so.

### **3.1.2: Policy and Planning**

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**Pediatrics should be an important consideration in emergency planning and preparation because it can directly affect response.** Responders will have an increased operational tempo because temporal factors/timelines are compressed for pediatrics mostly because of physiology issues. Depending on the age, children can negatively react to cold more quickly, making it important for the decontamination process to be rapid. They can dehydrate more quickly, they may breathe in or absorb more contaminants and their systems can be adversely affected by toxins and agents at a much greater rate than adult victims. These are all factors

making it crucial that they receive care at a faster rate. Adding in children with special needs can complicate the situation even further. Children usually do not carry identification and very young children may not be able to identify themselves or their ailments and symptoms--vital communications issues that responders ordinarily rely on with adults. This slows down an already compressed timeline.

Response is also complicated by the parent-child dyad. In effect, there are two patients. Responders not only have to deal with the issues at hand concerning the child, but also with the parent's anxiety and reluctance to separate from a child. The same is true for the child's relationship with the parent. This situation could easily impact response efforts in a biological attack for example, where parents do not want to be separated from their children who may be contaminated. Finally, Responder mental health can take its toll during major incidents and disasters if there is poor stress management. This situation becomes even more critical when dealing with child casualties and can result in injuries, ineffectiveness and inefficiency in the short-term, and depression and substance abuse in the long-term.

**Planners cannot use “adult X1/2” as a planning assumption, especially for equipment and pharmaceuticals.** Children are not little adults who can be treated with reduced measures. Age-, weight-, height- and development-appropriate equipment and supplies must be made available to the response community rather than relying on tweaking of adult counterparts. Responders and caregivers need to build up their competencies in pediatric care in terms of training, awareness and equipment in order to most effectively respond to a large-scale event involving children. The approach to children is simply not the same as adults with some alternation and the institutional knowledge and culture must be changed to reflect this. **Most importantly, there should be a requirement for a pediatric annex for all emergency response plans.**<sup>2</sup>

**The system cannot bear new unfunded or understaffed mandates.** With limited resources, it would be difficult to effectively accomplish better pediatric emergency preparedness and response without the appropriate financial and personnel support. Responders have to balance their current requirements for day-to-day activities with any additional responsibilities. The educational system, for example, always seems to have budget and funding issues; to add to that would probably overburden an already burdened system. Pediatric emergency preparedness and response is also more personnel intensive in some capability areas requiring a funding stream for additional personnel resources.

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<sup>2</sup> Columbia University, Mailman School of Public Health is currently developing a Model Pediatric Component for State Disaster Plans.

**To ensure funding is available for pediatric specific initiatives, and so that they are not overshadowed in general emergency response and Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) funding, one possible solution is to have specific Congressional earmarks or federal agency funding designated for pediatric emergency preparation and response.** This can be accomplished through Congress making direct appropriations, or agencies such as the Department of Homeland Security (DHS) and its constituent agencies and departments (ODP, FEMA, S&T Directorate, etc.), the Department of Health and Human Services (DHHS) and its constituent agencies and departments (CDC, FDA, etc.), and other agencies such as the Department of Education and the Department of Justice increasing their pediatric specific initiatives and setting aside funding specifically for pediatrics in grants to jurisdictions.

**There is a need to look at the impact of, and responses to, natural disasters both domestic and overseas on children as they present concrete, real-world examples of how to respond to a mass casualty incident, what contingencies need to be planned for, and what capabilities would be overwhelmed.** While natural disasters are not terrorist incidents, nor are capabilities to respond to them outside the US necessarily the same as in the US, large-scale incidents may have a significant impact on children. In Hurricane Katrina, there were issues with the displacement of children from adults, as well as the psychological issues of losing their homes and being forced to move to unknown environments. However, as bad as Hurricane Katrina and its aftermath were, it paled in comparison to the disasters in Asia. In the Asian tsunami and the Pakistan earthquake, many families were wiped out leaving a number of orphans stripped of all that was familiar and comfortable in their lives. Trying to identify, protect, re-unify and settle these children has been a daunting task. In Pakistan for example, not only were many children orphaned or separated from their parents, but many were also disastrously injured, and 8000 public and private schools were damaged or destroyed—all adding to the calamity. UNICEF estimates that almost 20,000 children will have physical ailments due to injuries and amputations suffered during the earthquake.<sup>3</sup> The question is how would the United States plan to deal with such a catastrophe on this scale? What are our capabilities? The local and federal response to Hurricane Katrina was harshly criticized, making many question how the US would deal with an larger disaster. Yet, Hurricane Katrina served as a wake-up call to many and examining preparation for and responses to natural disasters, rather than just relying on projecting scenarios, is a useful planning tool.

**Schools are improving their ability to integrate into response plans, although other child congregate centers have not. Schools must integrate more fully into the community response infrastructure and the community response infrastructure in turn needs to**

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<sup>3</sup> “Quake Claimed 17,000 children”, BBC News Online, October 31, 2005

**include or further include schools and other child congregation centers in their planning.**

A number of school systems have increased and improved their pre-planning activities with the development and augmentation of school safety, security and emergency management plans. It is important that these plans go beyond traditional public safety and also institute measures to regularly drill plans beyond just the traditional such as fire, and weather related drills and integrate into wider community preparedness and response plans. Some jurisdictions have also started audits of their school security needs. It is very important that measures for compliance are also considered or it is unlikely that these plans will be fully mature in the event of an emergency. Private schools must also be brought into any state or local response process. Other congregate care facilities such as day care, after school programs, summer camps, etc. must also be brought into the planning structure for emergency response as well.

**Many schools do not have a mandate to do public health monitoring and many do not even have a school nurse or a focal point of contact.** In a recent survey, many school nurses acknowledged that they had little familiarity with or confidence in how to respond to a large-scale disaster and especially bioterrorism. Many stated that there was a need for training in this area. Beyond a lack of familiarity however, is the issue of integration of schools into the public health arena. Most emergency response and safety plans where collaboration exists are with police and fire agencies; public health agencies are often left out. Because most children spend much of their time in schools, and schools and other child congregate care facilities can act as an incubator for illnesses, they would be an important data point for syndromic surveillance. While data from schools is usually not year-round, and basic and common childhood ailments can make for a lot of background noise, schools still can provide a useful early warning system. It would also be useful for school nurses to be able to discern differing or dissenting patterns of illness.

### **3.1.3: Training and Awareness**

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**Pediatric preparedness and response has not been tested as an express element of large-scale national exercises and tabletops (such as TOPOFF). As such, the pediatric issue needs to be incorporated into these exercises so that policymakers, planners and operators alike are familiar with the unique problems they will encounter in dealing with a catastrophe that includes many child victims, parents, and the media.** While there may be some individual and small-scale exercises and scenarios conducted in local jurisdictions, they tend to be ad-hoc, punctuated and not accorded the same stature of the larger exercises. Large-scale exercises and tabletops for emergency preparation and response to terrorist incidents have often left out the pediatric element. There may also be crossover from school safety drills



and planning. Awareness for this issue has certainly increased after school shooting incidents, most notable of which was the Columbine rampage, as well as concerns over gang violence in schools.

At the tactical level, both in large-scale exercises and regular drills, it is imperative that responders gain the technical skill set in training by specifically practicing with pediatric techniques and equipment. Although it is difficult to keep current on training which does not have as much real world application, it should be pointed out that CBRNE training is not for regular occurrences either, but rather contingencies. But there still is a need to practice for it, and similar reasoning should be applied to a special needs population such as pediatrics. This sort of training should occur at all levels, schools should regularly exercise their emergency plans for example.

**Special training to manage children is needed at all levels of community.** At the root of these issues is having well trained people. The list of who would be involved in preparedness and response goes well beyond what we consider traditional responders when children are involved. These include caregivers, school officials, transportation providers, family practitioners etc. No one expects these people to have the detailed training of emergency responders and medical professional. However, it would be appropriate for them to have training along the lines of first aid, emergency drills (i.e., fire, etc), and child safety, as well as have more incorporation of training that helps personnel recognize warning signs, determine to whom to report them, and what to do in an emergency. This type of training can be incorporated into other types of public safety training rather than creating an entire new curriculum and can be part of continuing education programs to maintain skill sets.

**More pediatric specialists, pediatric specialized teams, and pediatric specialized CBRNE training would also be imperative to building up capability.** A longer-term issue is the encouragement of medical personnel to pursue more pediatric specializations. This is a systemic education issue that needs to be resolved. A problem that can perhaps be addressed in a shorter timeframe is the encouragement of a pediatric element or rotation to medical personnel's regular training so there is at least some familiarity with the unique issues of pediatrics. In addition, it is important that CBRNE training programs be developed that have a pediatric component instead of training just for adult scenarios.

**More specialized DMAT pediatric, detachable sub-groups and/or fully functional Pediatric DMATs, Pediatric DMORTS, and Pediatric Mental Health DMATs would augment specialized response capabilities.** In the emergency response community we also have rapid response specialized teams that are activated to respond to specific and major incidents.



These include Disaster Medical Assistance Teams (DMATs), which can also include Disaster Mortuary Operational Response Teams (DMORTs), which are part of the National Disaster Medical System (NDMS). Currently, there are teams that fall under the DMAT for various specializations; including pediatric teams which usually encompass a mix of physicians and nurses, EMTs, and other healthcare professionals who have specific training and skills in the care of pediatric patients.<sup>4</sup> The point is that there are too few of these specialized teams with strong capabilities. It would be helpful at a basic level if the DMAT had more trained personnel with pediatric experience. Having more specialized DMAT pediatric specialized sub-groups would also be a means to increase capability especially if they had the capability to insert into other DMAT teams who have deployed. A more far-reaching goal would be the creation of an entire Pediatric DMAT that encompassed its own logistical capability. Whether or not it is a full Pediatric DMAT or a Pediatric DMAT sub-group in place, it may be helpful to have them stationed at least regionally if it is not possible to augment capability in all areas. A similar expansion of specialization could also be created with the formation of Pediatric DMORT teams, and Pediatric Mental Health DMAT Team to augment capability.

**There is a definitive need to look at best practices and lessons learned (both domestically and internationally) in order to adapt best practices on a wider basis, plan for contingencies, and to fulfill current gaps where applicable. Capability that exists for pediatric emergency response practices has never been examined in a cohesive and comprehensive manner.** There are some interesting initiatives, programs, and solutions taking place around the country although capability in this area is immature and inconsistent nationally. However, it would be very helpful to have an accurate picture of what exists, so as not to have to reinvent the wheel. This would also include any practices that could be transferable or adapted from the military to the civilian world. There may also be valuable knowledge to be gained by looking at how other countries have responded to incidents of terrorism involving children or dealing with a heightened threat of terrorism against their children. The school siege in Beslan, Russia, general lessons gleaned from how Israel deals with terrorism on a daily basis, as well as children who are caught up in indiscriminate suicide attacks in Iraq all can offer insights on how to deal

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<sup>4</sup> However, the majority of these teams fall under the DMAT category of Type II in capability. Type I DMAT teams can deploy within 24 hours with all equipment and staff, and function for 72 hours in an austere location without re-supply. A Type-II DMAT can also deploy within 24 hours with staff, but basically takes over from the team in place using the supplies and equipment in the existing facility. However, Type-II pediatric teams do not normally deploy as a fully functioning team, but usually co-deploy or augment another team. Currently, there are two fully formed DMAT teams for pediatrics in the country based in Boston and Atlanta. The Boston Pediatric DMAT is a sub-group or specialty of the wider MA-1 DMAT team. It is usually called up as part of the MA-1 DMAT which is a Level I team. Although this DMAT team has a high level of capability, the pediatric team does not normally deploy separately, because it relies on the logistics, and communications infrastructure of the larger team. However, it can be detached and placed in the service of another DMAT team that is already established with infrastructure as supplementary asset.

with the threat of terrorism. However, a caveat should be noted that useful applications and lessons from foreign shores need to be put into context. The United States, for example, is not in a constant state of security like Israel; therefore, commonplace practices over there are not necessarily applicable here.

### 3.1.4: Legal Issues

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**Pediatric victims of terrorism may be medically uninsurable into adulthood even though they will require a lifetime of care. Provisions should be made for these children to be provided health insurance and coverage.** Many injuries sustained from a terrorist attack may be chronic and affect them well past childhood. While these children may be able to have productive lives as an adult, the onus of not being able to gain health insurance because of their medical conditions is an untenable position. This is an extremely long-term and negative impact on child victims of terrorism and something that should be addressed by legislators. This issue has not gained a great deal of attention because most incidents involving severely injured children have occurred overseas or, as in the largest terrorist incident in the US, the September 11<sup>th</sup> attacks, children did not sustain severe physical injuries. However, in the bombing of Alfred Murrah Federal Building in Oklahoma City in 1995, a daycare center in the building was also destroyed causing pediatric casualties. A small number of children from that terrorist attack survived but sustained long-term injuries. It is children like these who should not be forgotten, and should have their life-long medical needs taken care of.

**Public health planners cannot assume that adult model laws will work for pediatrics especially in the realm of bioterrorism and, as a result, pediatric specific model laws may need to be implemented.** For example, in a quarantine situation it may not be possible to rely on adult assumptions. The need for parents to be with their children and potential dangers associated with that make it important that the pediatric angle be considered in developing courses of action and clear laws that complement these courses of action. Responders lack sufficient or sufficiently clarified legal authorities to deal with certain pediatric situations such as quarantine, early warning/epidemiological surveillance and even pharmaceuticals. Responders may not be fully aware of what their legal options are in terms of treatments, courses of action and, collecting, releasing, and accessing private medical information. Furthermore, even when authorities do exist, they may not be clear or widely known.

## Section 4: Capability Areas-Findings and Insights

This section examines the key sets of capabilities critical to performing or supporting Emergency Preparedness and Response (EP&R) functions for pediatrics. This section defines and describes minimum essential capabilities required to respond to pediatric victims of catastrophic terrorism, describes current capabilities or gaps, and, in certain cases, provides recommendations for improvement where applicable.

**Capability Areas** are the general categories of capabilities used to perform functions, tasks, and missions. Six main capability areas were examined as part of the project methodology. These areas are: *Equipment and Resource Management, Legal/Authorities, Training, Techniques and Procedures, Pharmaceuticals, Surge Capacity, and Data Collection and Information Management.*

### 4.1.1: Equipment and Resource Management

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**Definition:** *The availability of equipment, supplies, and manpower that may be pediatric-specific or transferable, knowing where they are located, their status/readiness, and how to apply or contact them.*

Equipment and resource management capability is available but may not be pediatric specific enough or available in large enough quantities to fully support pediatric emergency preparedness. This capability is considered adequate for decontamination needs, partly because the prevailing policies are to use the same tools from the adult world. However, there are areas where pediatric specific equipment would help. Scrub brushes and other equipment that are adult sized may not always be applicable when transferred to children. For example, most children would not be able to fit into the adult sized decontamination clothing, such as the adult sized Tyvex protective clothing, and masks may not fit securely to prevent inhalation while undergoing decontamination. Most training equipment usually focuses on adult-oriented equipment, for example, most mannequins for training are usually adult-sized. The availability of facilities may also be an issue when dealing with isolating children. There are probably not enough pediatric rooms available during an emergency (or in general) that have negative airflow capabilities. This also ties into the ability to surge this resource in the event a large number of children are required to be placed in isolated rooms.

There are problems across the board with pediatric equipment and resources, especially in hospitals and other care facilities. Pediatric resources are less common in hospitals, and, if

the hospital does not regularly deal with pediatrics, less equipment and other resources would be available. Hospitals that perform high volume surgical procedures as part of their business lines usually focus on adult care; it simply is not as profitable to invest in the less frequent pediatric version. Even when equipment is there, resources in terms of dollars and people may be problematic. This capability is also affected by geography. Outside major metropolitan areas, there is a lack of resources and lack of infrastructure to fully support the needs of pediatric emergency care. Even within major metropolitan and urban areas, capability can vary by institution. There are significant differences in resource availability between medical centers, hospitals with Pediatric Intensive Care Units (PICUs), hospitals without PICUs, and acute care centers. A PICU can be a real divider of capability. Yet, there can be significant issues in capability even with facilities that have PICUs if they, for example, do not have burn units.

Age, height, weight and development-appropriate equipment should be made more available for both hospital and EMS use. A sample of basic equipment and other resources that a hospital might need with a large influx of pediatric patients include: I.V. pumps, I.V. needles, Broselow tapes, crash carts, respirators, EKGs, surgical instruments, heart monitors, pain management regimes, appropriate sized tubing for tracheas, beds for parents to stay, pediatricians and specialists, mental health counselors, trained staff overall, child life specialists, and entertainment equipment.

The availability of, or rather the lack of, skilled personnel is another major gap in terms of human resources. There are very few pediatric infectious disease specialists and pediatric intensive medicine specialists available in general and especially as a surge resource. Moreover, there tends to be less medical practitioners choosing to become pediatricians, let alone choosing specializations within pediatrics. There are also not enough emergency doctors with pediatric training. Personnel resources, of course, go beyond just pediatricians; this also applies to nurses, nurses' aides, physician assistants, psychologists, counselors and social workers. In order to improve personnel resources in this field, more training and specialization in the pediatrics field needs to take place (Please see Training, Techniques, and Procedures for more information). Bringing doctors in from other areas is a possible solution to make up for the manpower shortfall, but there may be issues with transfers of credentialing.

There are also commensurate issues that can impact resources. With a lack of pediatric facilities, or pediatric specialties, it is likely that children would have to be transported between facilities, making transportation issues an additional resource constraint. In terms of supply chains, and because pediatric resources tend to be less common, throughput and re-supply become more difficult. It may be harder to locate and access new resources in a timely manner.

More pediatric patients may also arrive at hospitals and other care facilities via private means (i.e. not according to plan), which could easily tax Emergency Department staff and resources. In addition, EMS providers may not always have knowledge of locations and capabilities of pediatric centers and specialists, leading to delays in accessing resources that are needed.

#### **4.1.2: Legal/Authorities**

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**Definition:** *The legal and policy instruments and concurrent responsibilities that allow or enable responders to perform their mission with respect to pediatric victims or populations.*

Legal authorities have been examined for quarantine, but there are probably still issues that need to be re-examined when it comes to pediatrics and issues that have not been tested enough--not so much in terms of what the authorities are, but whether they are practically enforceable. Generally, quarantine laws provide a clear legal framework for restricting the activities of persons who have been exposed to a disease or who are in an emergency situation. Despite this clarity, the laws are not complete. The laws are consistently framed for adults and do not account for the unique vulnerabilities of children during times of crisis. Instead, there is an underlying assumption that the authority as written will simply translate to a pediatric focused emergency.

In the event of a pediatric-focused emergency, it is unlikely that quarantine laws will be practically enforceable because they do not explicitly contemplate the special needs children bring to emergent situations. For example, while schools are authorized to quarantine students in an emergency and keep parents out, studies analyzing children's reactions to emergencies shows that children cope better with a parent close by. Additionally, given the high emotional responses these incidents generate, parents are not likely to heed quarantine restrictions and instead may force their way into schools trying to get to their children, thus hindering or complicating the emergency workers' efforts to respond.

Conversely, there are significant dangers in involving parents and allowing contact during instances of quarantine. A powerful example of this danger is a recently documented case involving the Avian flu. An 11-year-old girl contracted the flu from chickens in the household. Her mother, who lived in a different city, insisted on visiting her daughter in the hospital, despite the risks. Unfortunately, both mother and daughter died from the flu. This story illustrates that a parent will face the risk of death in order to be with her child. Even though there are competing ideologies concerning the role parents should play in quarantine-based emergency situations, it is necessary to take these issues into account. The laws should clearly speak to these issues, and situational exercises should reflect the complexities of enforcement.

There are potential policy changes to cure the problems of enforceability. In order to be fully prepared, first responders should be trained and educated concerning children's unique needs and vulnerabilities. Model pediatric quarantine laws should be drafted and states should be encouraged to adopt these models as they best fit the particular state. Family resource centers should be created to inform families in the case of an emergency and to respond to pediatric specific inquiries.

Consent issues for supervision, treatment, and custody of children *in loco parentis* during an emergency or due to the effects of an emergency situation can sometimes suffer from a lack of clarity or understanding by responders. Although the law is fairly clear, there can be gray areas. Under United States common law, parental consent is generally required for the medical treatment of minor children.<sup>5</sup> Yet, there are exceptions that allow minors to be treated without parental consent. For example, some states recognize an emancipated minor as legally able to consent at the age of 14 or 15 if the teen is pregnant, married, living independently or in the armed forces. Most of the other exceptions fall under "emergency situations".<sup>6</sup>

The Federal Emergency Medical Treatment and Active Labor Act, permits a minor to be examined, treated, stabilized and transferred for emergency care without consent from a parent.<sup>7</sup> Many state and local laws also allow for provisions of emergency care to minors without parental consent in emergency situations. The trigger for whether consent is required is the onset of the actual emergency event. During the emergency, consent can be waived in the name of public health, however, when the emergency is over and the child is in long-term care, consent is more likely to be required from the parent or guardian before additional treatment is provided.

The federal and legal authorities are clear on consent issues. Schools, under normal circumstances, are *in loco parentis* and have responsibilities toward children, which include dispensing medication and having access to medical records. The presumption is that this duty carries over into emergency situations and may even be enhanced by the urgency of the circumstances.<sup>8</sup> There are two types of emergencies that might be considered particularly relevant to our issue: emergencies where children are quarantined or isolated, and emergencies where children are transported to medical care facilities. There may be a tension between how the child can be treated in each situation; yet, the public health exception still overrides parental consent. The law is unclear on where to draw the line between long-term care decisions (more likely when the child has been transported and parental consent is necessary) and isolation decisions (more likely not to need parental consent).

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<sup>5</sup> See <http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b111/3/703>

<sup>6</sup> Id.

<sup>7</sup> Id.

<sup>8</sup> Schools and Terrorism: A Supplement to the National Advisory Committee on Children and Terrorism. (2003)



In an emergency situation, the public health concern will trump individual rights and may render a parent's refusal of consent for a minor's care moot. This will become particularly relevant under circumstances where children must be treated quickly. For example, in March, 1995, the Japanese subway system was attacked with the nerve gas Sarin. Many children were hurt in this attack. While the law does not specifically speak to this issue, one can infer from the general language granting power to override parental consent in emergency situations, that first responders would *per se* have the ability to treat children in an effort to alleviate the public health crisis.

During decontamination, it can be inferred that children will not have a choice whether or not their parent or caretaker is there. The Public Health officials, school officials and others in control of the situation will likely have the authority to determine if the parent is allowed near the child or if the child can request their parent's presence. Additionally, there are probably not liability issues in an emergency when treatment requires a quick response. However, in more long-term care, where the parent is available to consent and a decision does not have to be made immediately, responders will be liable to parents and guardians.

The law however, remains slightly less clear concerning other areas of congregate childcare. Nevertheless, when children are at camp or in other settings, parents often have to sign forms giving their consent in the case of a medical emergency.

Although the law is mostly clear in this area, first responders, school personnel, parents and others need training on the law and their authority to act in emergency situations. With the proper training, this issue can be resolved and responders will be better equipped to confront pediatric emergency situations.

In an emergency situation, it may be difficult to identify children and their vital information because they usually do not carry identification as a standard. The legal standards to require mandatory identification such as ID bracelets would be complicated by privacy and security concerns. Currently, children under 16 usually do not carry the most common forms of identification, such as a driver's license, and even fewer would carry, or even necessarily possess, a passport. While conscious older children may be able to offer their names and vital information, very young children may not have that ability, and it would be difficult to gain this information in a timely manner if a child was unconscious or incapacitated. Efforts to mandate standardized identification for children have focused on medical alerts, such as for diabetes. Identification methods include bracelets, necklaces, dog tags and a shoelace charm. All of these identifications are voluntary and parents may choose whether or not to have their child wear the medical alert. Some of these identifications also have a number to call, where medical information for the wearer is stored.<sup>9</sup>

<sup>9</sup> See [http:// www.medicalert.org](http://www.medicalert.org)

If standardized identifications for children were required, doctors and other responders could easily identify children and their medical issues.<sup>10</sup> However, safety issues arise because of the increased availability of the information about the child wearing the tag to the general public. Child advocates are concerned that adults interested in doing harm to children (particularly child sex offenders) will be able to ascertain the child's name, address and potentially other information that make it easier to abduct or do harm to them. It is, therefore, important to carefully consider what type of information an organization put on an identity bracelet.

It may be possible to have standardized identifications, however, it seems that the identifications would have to be a voluntary choice by caretakers. While criminals, those accused of crimes, and some under house arrest may be required to wear bracelets, it is unlikely that mandatory identification for children would pass a constitutionality test<sup>11</sup>, and may receive significant public resistance.

There is also some confusion and misunderstanding in the response community over patient health information privacy concerns manifested in the meaning and application of the Health Insurance Portability and Accountability Act (HIPAA). HIPAA was established to improve the efficiency and effectiveness of the health care system. The Privacy Rule<sup>12</sup>, incorporated in 2001, covers all health care providers, regardless of size, who transmit health information electronically. However, once a provider falls under HIPAA, the Privacy Rule then applies to any form<sup>13</sup> of health information that either identifies or could reasonably be used to identify a patient and specific information about them such as the patient's name, address, or specific condition. The information that the Privacy Rule protects is called "individually identifiable health information". Essentially, the Privacy Rule is meant to prevent healthcare providers from disclosing identifiable health information to anyone who does not need it without the patient's informed consent.

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<sup>10</sup> See Medical IDs Save Lives says ER doc; identification, emergency room Executive Health's Good Health Report, (1998) (Dr. Charlotte Yeh would like to see every American with a chronic condition wear a medical identification bracelet because it tells emergency workers your vital medical facts and helps avoid delays and complications)

<sup>11</sup> But see *Ballenger v. State*, 210 Ga.App 627 (1993) (ruling that court can require man to wear DUI bracelet while he was on probation).

<sup>12</sup> The Privacy Rule requires healthcare providers to:

- Provide information to patients about their privacy rights and how their information can be used.
- Adopt clear privacy procedures for the practice, hospital, or plan.
- Train employees so that they understand the privacy procedures.
- Designate an individual to be responsible for seeing that the privacy procedures are adopted and followed.
- Secure patient records containing individually identifiable health information so that they are not readily available to those who do not need them.

<sup>13</sup> Once a healthcare provider is covered by HIPAA, the Privacy Rule applies whether they are transmitting specific information orally, in writing, by fax, telephone, or any other way. This means that if a hospital or doctor's office sends a patient's information via email even once or twice, they must then follow the Privacy Rule at any time they are discussing or transferring patient files or information, even if it is not electronically.



The criteria for a healthcare provider to be covered by the Privacy Rule are linked to the transmission of information electronically. Therefore, it is important to note that many healthcare providers who regularly deal with children, such as primary or secondary school infirmaries or daycare nurses, may not fall under the Rule at all. On the other hand, large institutions such as community colleges<sup>14</sup>, vocational, or charter schools catering to a small number of minors each year, would be covered if their student health service records are maintained and transmitted electronically.

It is important to note that the Federal Privacy Rule functions as a “floor” standard for privacy protections within all states. A state law whose health information privacy standard is stricter than the HIPAA Privacy Rule (i.e. parental consent or notification requirements for certain treatments for unemancipated minors) will still apply to all covered entities in that state. However, any state whose health information privacy standard is looser than the HIPAA standard or whose regulations are directly contrary to HIPAA is overridden by the federal standard.

There are some circumstances where identifiable health information is releasable without the individual’s authorization. The exception most relevant to the issues associated with pediatric emergency preparedness and response is the public interest/ public health exception.<sup>15</sup> This exception allows healthcare providers to disclose normally-confidential information to public health officials and agents (responders) working to end the emergency without taking the time to acquire the patient’s or their guardian’s authorization.

Therefore, a covered entity may, consistent with applicable law and ethical standards, use or disclose a minor’s protected health information if the covered entity believes in good faith<sup>16</sup> that the disclosure is necessary to prevent or reduce a serious, imminent threat to the health or safety of the individual or the public, and that the person to whom the information is being disclosed is reasonably able to prevent or reduce the threat.

While most major healthcare providers engage in some amount of HIPAA training for their staff, few, if any, focus on specific provisions regarding the transmission of information during

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<sup>14</sup> For example, higher education institutions with “dual enrollment” or “pre-college” programs which admit minors, or specialized arts or vocational programs.

<sup>15</sup> The most relevant exceptions are:

- 1) to the individual,
- 2) for “treatment, payment, and health care operations”
- 3) for “public interest and benefit activities”
- 4) as a “limited data set for purposes of research, public health, or health care operations.”

<sup>16</sup> 45 C.F.R. § 164.510(b)(3): A covered entity may use professional judgment of the patient’s best interests to use or disclose protected information when emergency circumstances make it impracticable to seek express authorization for use/disclosure or to give the patient the opportunity to object to the use/disclosure.

a bioterror or other emergency involving children. Because the law itself is so complicated and highly nuanced based on individual state law, it is not widely understood across disciplines and jurisdictions. Therefore, it is vital that training and exercises are developed to help providers and responders more clearly understand how the law impacts their ability to meet the unique needs of children during an emergency. Focused trainings will alleviate concerns about liability for turning over pediatric patient information to health officials or agents who need it in order to end an emergency, and will result in more effective responses by the specialized interdisciplinary teams needed to treat children.

Finally, the law on compensation for families and health insurance victims is lacking. Federal compensation for victims and families currently makes a distinction between international and domestic terrorism. Pediatric survivors of catastrophic terrorism are often uninsurable as they grow and enter adulthood. There should be some kind of legal mitigation or special health care coverage for this relatively small population, and compensation that equally addresses all victims of terrorism.

#### **4.1.3: Training, Techniques, and Procedures (TTP)**

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**Definition:** *The development, standardization, and application of the knowledge, skills, and abilities for pediatric emergency preparedness and response.*

Perhaps the area most underrepresented in pediatric-specific capability is training, techniques and procedures. It is also one of the widest areas ranging from medical training for public health professionals to awareness training for educators. Capability in this area does not have many defined or well-known pediatric components. The current state of capability can be considered a mixture of being present to a limited extent and not being present at all. The problem is that while resources can be tweaked for pediatric usage, the knowledge of and training on how to do so, or how to deal with pediatric victims in emergency planning and preparation is not always up to par with that of the adult world. Part of the problem is that until very recently, the pediatric element was not considered a major part of emergency preparedness and planning and that has trickled down into the training arena. For most of the traditional emergency responders there is only a certain amount of training that can be accomplished with limited funding and everyday job requirements. Even with the current security pre-occupation with terrorism, and especially CBRNE terrorism, responders still have to adopt an all-hazards approach to training in most cases.

Paradoxically, there is also limited experience in handling child crises because of their infrequency. More people need to be trained on what is unique, but the devotion of resources

to infrequent contingencies must compete with real-world threats and problems. Responders also tend to need to be frequently re-trained on skills that are not commonplace, because if they do not use these skills on a regular basis they tend to deteriorate in capability. Moreover, when children are involved, the term “responder” gains a wider connotation to include many different disciplines that come into contact with children. This can range from traditional medical personnel to educators; further complicating the training picture. Another issue is that the adult-child ratio is skewed when it comes to pediatric victims. Because children need more care, more people are involved in the response and hence more people need some sort of training.

At the start of the training continuum, awareness is a key facet of preventing and pre-empting a potential terrorist act. Training for awareness is very difficult because of a lack of funding, a lack of staff, and high turnover rates. While some schools do have safety and emergency plans, for the most part, most of the personnel who work with children on a regular basis (ranging from teachers to bus drivers) do not regularly receive training to recognize suspicious activities and know where to report them. Another issue is trying to incorporate this type of training into already packed agendas. Child surveying agencies and other organizations that deal with children have limited resources to train and implement pediatric emergency preparedness and goals. Yet, education and training enabling the people entrusted to take care of our children to recognize a threat or suspicious activity is our first line of defense.

Another area of training that is lacking is in the communications field. The way information is extracted from children and conveyed to children, their parents/caregivers, and the media must be done in a delicate manner in order to prevent misunderstandings, miscommunications, or extenuating psychological trauma. Schools also need training on how to interact with the media. Behavior and communication techniques on how to deal with children can contain later psychological trauma. Many would argue that in a rapidly evolving emergency situation, responders simply may not have time for this carefully measured response, but some training on how to do it when the opportunity arises is crucial. There are some existing programs/models on how to communicate with families, but often once these models and programs are developed there is a lack of funding to implement them.

Training is also needed on the best ways to identify children and how to communicate that information. In a crisis, there may be very young children, children separated from parents, and unconscious children unable to directly identify themselves, and more time is required by whoever is taking charge of them to elicit this information. When an actual name is not forthcoming, responders need to know how to accurately describe children so that anxious parents can locate them.

On a more somber note, more training and development of protocols is needed for personnel involved with pediatric mortuary affairs. Child victims require increased sensitivity when dealing with loved ones, and parents must have some sense of closure. There is also a need for training on how to communicate information to families on procedures for pediatric mortuary. At the same time, those personnel working with children, especially in disaster and death situations, must limit their hours as a matter of procedure, or it is simply too traumatizing.

Because the situation with children can be more chaotic, especially when the parent is not present, the response community should receive some sort of training or, at least, orientation to understand liability issues. There is some confusion on the legalities of what a responder can and cannot do with children if there is no parent present. Another issue is if children need some sort of training along the same lines of fire, hurricane and other disaster drills. This, of course, may depend on the age group of the child, and must strike a balance between not scaring or overburdening children and yet still provide some simple and reassuring training which could protect them later.

For the most part, there is a lack of trained personnel across the country when it comes to pediatric emergency response. Some of this has to do with the lack of pediatric disciplines chosen, and a lack of specialized or supplemental training. One area where training is lacking is in pediatric specific CBRNE training. For the most part, while there are a number of CBRNE training programs out there that responders utilize, these tend to be geared towards the adult population. While some of this training can be applied to the pediatric population as well, there is a definite need for a unique Pediatric CBRNE training. For example, there are very few specialized TTPs for pediatric decontamination; children are usually treated like adults despite some physiological difference. Different dilutions and dosages may be required for pediatric decontamination materials and it is important that the knowledge is there to accomplish that. Even simple training tools such as mannequins that are used for practice tend to be adult sized. There are also many unknowns in TTP for quarantine, as there is little training on the pediatric element.

While realizing that non-specialized medical personnel can still treat and perform medical procedures on children, the fact remains that pediatric training and specialization in the medical field is weaker than for the adult population. There are simply not enough Emergency Department doctors with pediatric training, and the same is true for nurses, nurse practitioners and physicians' assistants. This is both a human resources issue and a training issue (Please see Equipment and Resource Management for more information). Traditionally, there has not been as much demand for pediatric specializations and it has been viewed as a low-volume but high risk area. As a consequence, there is limited familiarity with pediatrics. More medical

personnel need to be encouraged to pursue a pediatric specialty or at least have some pediatric component included in their regular training. All Emergency Department staff should have some sort of pediatric specific training and expertise. Upkeep of this skill set is also important. For example, nurses who do a pediatric rotation will often rotate back to adult rotations once their rotation is over, losing some of the specialized experience they have gained. Refresher courses or rotations should be included in regular training cycles. Cross-licensure for pediatric specialists may also be a useful tool to encourage the specialized training.

The need for training is also impacted by decreased timelines for EMS response with children and unfamiliarity with the problem, which can lead to pressures on judgment and decision-making. EMS responders need to build competencies in pediatric care. Some sort of pediatric specific training would be useful in these circumstances whether simply knowing where specialized facilities are or the best way to triage. Currently, while there are no pediatric specific TTPs for EMS, and it is not a sub-unit of broader training, there are pediatric specialized courses that EMS providers can be certified in, such as Pediatric Advanced Life Support (PALS) or pediatric Basic Trauma Life Support (BTLS). Whether or not these courses are required for all EMS staff depends on the jurisdiction, but they are something that helps to build up competencies in pediatric care for EMS crews. There are also other programs such as the JUMPSTART Triage Program and Advanced Pediatric Life Support (APLS). Some states, Massachusetts for example, have specific WMD protocols that include specific dosage and treatment protocols for a wide range of WMD interventions. While some of these procedures have been thought out, it is also important that responders are familiarized with them, and tested on them on a regular basis. If protocols remain as a piece of unused and unfamiliar literature, then their utility diminishes. But they form the foundation on which training can be supported.

#### **4.1.4: Pharmaceuticals (Trials, Dosages, etc.)**

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**Definition:** *The knowledge and availability of pediatric medicines, prophylaxis, drug trials, and dosages or alternative treatment protocols.*

In the event of a public health disaster, whether natural or manmade, local authorities will need to develop a rational plan for treating pediatric patients. Pharmaceuticals will play a significant role in the success of any treatment protocol and deserve specific planning and preparation. Key to understanding the issue is the fact that there are various differences in the physiology of the pediatric patient that must be considered when developing plans to use pharmaceuticals to treat or provide prophylactic protection in the event of a disaster. In addition to the differences in patient height and weight that can affect the required dosages of pharmaceuticals, there are

differences in the absorption rates, metabolism, and elimination of chemicals that can make pediatric pharmacology differ from adult pharmacology. There may also be differences in the preferred routes of drug administration in children when compared to adults.

One of the most important differences between adults and children is the actual quantity of the drug that each group needs to achieve the desired physiologic effect. There already exist initial efforts to make the calculation of these different doses clearer for emergency responders. There have been a variety of efforts to simplify and accelerate the calculation of doses for the pediatric patient in the event of an acute emergency. For example, Drs. James Broselow and Bob Luten have developed a tape with guidelines for pharmaceutical use in pediatric patients that is color-coded and based on the weight of the patient--making quick decisions about dosing easier. Although most of the information displayed on the Broselow-Luten chart is clear and easily understood, specific training should be given to health care professionals so that they can adroitly use this tool. This system has recently been updated to include biological agents.

The Food and Drug Administration (FDA) has also begun to recognize the importance of dealing with the pediatric patient in the event of a WMD event in the United States. Although many pharmaceuticals used to counteract the threats of chemical, biologic and radiation attacks are not explicitly labeled for use in this population, the FDA has still decided to publish guidelines for administration of some of these agents in children. Presumably, this is because the potential benefits of using these agents in disaster situations outweighs the risks of taking no action, even though safety testing of these agents in children may be limited or incomplete. An example of these guidelines are the explicit online instructions on dividing adult preparations and creating drug mixtures that may be more acceptable to the pediatric patient. These instructions are published by the Center for Drug Evaluation and Research (CDER) on their web site.<sup>17</sup>

There are a variety of factors, ranging from public policies to economics that interact in a complex way that affects the pharmaceutical resources of any given geographic region. As state disaster planning is driven by state law and implemented at the local level, the degree of pediatric preparedness can exhibit some measure of regional variability. As some states and municipalities are more aggressive about these issues than others, the amounts of certain drugs and the dosages readily stocked and available for first responders may vary from one geographic area to the next. In planning for disasters, one would hope, and perhaps assume, that the linkage of hospital systems by telecommunications and emergency medical services would facilitate the “flow” of depleted resources from overstocked areas to those that have been depleted, thus minimizing the effects of these inter-city and inter-state variations in capabilities. In reality, however, this is a relatively untested hypothesis in disaster situations,

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<sup>17</sup> See <http://www.fda.gov/cder/drugprepare/>



and, without some established chain of command to direct the flow of resources, it would be a mistake to assume that the decentralized network of health care institutions and providers could efficiently and effectively adapt to a rapidly unfolding health crisis.

Another factor that may influence pediatric specific pharmaceutical availability is the overall makeup of the health care infrastructure in any particular region. Whether or not a hospital carries certain drugs is not simply a result of its designation as either a specialized “children’s hospital,” or a more traditional “full-scale hospital.” The decision by a hospital to stock a particular drug is often the result of combined input and discussion between pharmacists, physicians, hospital economic officers, and others charged with the operation of the hospital. From a large-scale perspective, it seems likely that pediatric specific hospitals are more likely to carry a wider range of pediatric specific drugs and formulations than their adult counterparts, but even that may not always be a correct assumption. More abstract economic forces such as inter-hospital competition, bulk purchasing power, supply, and demand can often influence the capabilities of any given hospital in ways that are difficult to predict in the long term. In some cities where children’s hospitals may not exist, it is possible that the adult hospital may or may not carry certain pediatric drug formulations. Depending on how large a city’s pediatric hospital is, it is also possible that a larger regular hospital may have greater pharmaceutical stocks. Thus, pharmaceutical availability at the hospital level can often exhibit a measure of variability that can affect supply.

The Strategic National Stockpile is the United States’ collection of drugs that can be mobilized in the event of a major public health emergency. Assessing the surge capacity and the specific content of the Stockpile can be difficult, however, given its classified nature. Pharmaceuticals that will be administered to populations affected by a chemical, biologic or radiological event are available in some quantities in the pharmacies of most cities. However, because such large amounts of these substances would be required in this type of public health crisis, the federal government has developed the ability to pre-position and rapidly move them to any location of need within 12 hours. This stock and capability, named the “Strategic National Stockpile (SNS)”, is managed by the Center for Disease Control (CDC), who is in turn responsible for selecting and managing the quantity and preservation of all materials and medications that are in the stockpile. The exact contents of SNS materials, the drugs themselves, and the dosages they stock have never been publicly discussed—the location of the SNS depots themselves is classified information. Although the stock is thought to include pediatric materials, its classified nature makes it difficult to analyze whether or not stocks are adequate or appropriate.

When a chemical, biological, or radiological event occurs, the Office of the Governor of the state in question contacts the CDC to request assistance from the SNS. The SNS is then

activated in two steps. The first is the mobilization of a “12 hour push package” which is named for its ability to be shipped to any location in the US within 12 hours. The exact contents of a push package are classified, but are thought to include: “antibiotics, chemical antidotes, antitoxins, life-support medications, IV administration, airway maintenance supplies, and medical/surgical items.” Within 24-36 hours of the initial event/attack, part two of the SNS response would be activated. This is the mobilization of Vendor Managed Inventory (VMI), which actually represents 97% of the SNS inventory. These materials would be tailored to the presumed causative agent itself and would be a much more focused response. These materials are maintained under vendor storage for a fee paid by the federal government, and would be shipped via commercial shipping means. Likely materials include more specific antibiotics, first aid materials, etc. Following these deployments would come other assistance in the form of health advisors, buying power, technological support, etc. The SNS is designed to assist only after local supplies have been depleted and is *not* a first line response tool to be used in “any” event—it is specifically for use only after local supplies have been depleted.

Successful drug development and their safe use in the population is a difficult task that makes the development of pediatric specific drugs a complicated issue. The complexity of the drug development process is key to understanding the difficulties with producing drugs specifically indicated for pediatric usage. Regarding FDA and drug indications, any time a drug is developed “from scratch” it goes through a vetting process with the CDER—a branch of FDA. The vetting process is classically a three phase process where either a commercial company, physician, or individual files an Investigational New Drug (IND) application regarding the use of a new chemical or material for a *specific* use (this is the “indication” for which it is approved). These phase trials can typically last anywhere from 1 year (very short) to 10 years (more likely). When a drug is finally “approved,” it is approved for an explicit indication and only for specific age groups based on testing done during the three phase trials. FDA indications are those uses that have been thoroughly tested and listed on the package inserts.

The net effect of these trials and their associated costs means that it can be difficult to attain an approved “indication” for populations where the drug may be used less often. Because children are often not thought of as the prime targets for a drug in development, expanding the indication to all age groups often comes at considerable cost, time, and effort. One long run effect is that many drugs are never tested, and therefore never indicated, for use in children. Unfortunately, only a small portion of the medications that have been approved by the FDA have been as thoroughly studied in children as their adult counterparts have been. According to the FDA’s own publications, only 20-40% of the medications that are currently being administered to pediatric patients have met the same level of clinical study in pediatric patients as they have for adults.



There are efforts to improve these shortcomings, however. CDER does have an emergency use IND process in which experimental drugs can be approved for use without a full three phase trial sequence. These are usually used in the cases of refractory cancers/diseases that have not been cured with already approved drugs and are often “last hope” types of situations. It is unclear whether this sort of application could be used in the emergency situation of a biological attack to approve something for an “off label” indication. The term “off label use” typically means the use of a drug for a disease or indication for which it has not been explicitly approved.

An important point to be made, however, is that the use of drugs “off label” is a legal right that physicians are able to exercise on a daily basis. However, they are only allowed to exercise this right in the interest of the “practice of medicine.” These decisions are made by physicians and pharmacists educated in the physiologic mechanisms of drug activity and are based on assumptions of how a drug may act on a disease with a similar pathophysiologic basis to the one for which it is intended. Although many medications are already used in the pediatric age group “off label,” it is possible that such off label use would become more common in a disaster situation.

Whether or not drugs in the SNS could be used in an “off label” manner for children is difficult to answer without knowing the contents of the SNS itself. One possibility that should be considered, however, is whether explicit indications would be closely adhered to in the chaos of a disaster situation where time may be of more concern than the uncertainties of off label use. If it seems that the damage caused by taking no action and adhering to indication guidelines is outweighed by the possible benefits of using the drug “off label”, it is possible that first responders and health care providers may use the drug at their own discretion.

Congress has also passed two laws specific to pediatric medications. The first is the 2002 “Best Pharmaceuticals for Children Act” (BCPA) which is designed to improve the safe use of pharmaceuticals originally tested in adults, and possibly already on the market, in pediatric populations. This law provides processes and economic incentives for studies of both “on-patent” and “off-patent” drugs in children that may not have originally been undertaken. Second, and as a complement to this law, the Pediatric Research Equity Act (PREA) “Pediatric Rule” requires pharmaceutical companies to study biologics in the pediatric population. It also creates a Pediatric Advisory Committee that will help the FDA manage the process.

More recently (2004), Project Bio-Shield includes incentives to pharmaceutical companies for the creation of vaccines and antidotes for chemical, biological or radiological weapons. Included in this program is the development of a pediatric specific potassium iodide pill. While these acts encourage the study, development, and responsible use of drugs that benefit

the pediatric population, they are, in a way, focused on already existing drugs. There are few anti-CBRN drugs that are approved specifically for pediatric use, and more incentives should be offered for the research, development and manufacture of these agents.

Although CBRN disaster planning is still in the early stages for children, there are already some efforts being taken to develop explicit treatment protocols for the pediatric population. One antidote that can be used for nerve or organophosphate agents are Mark-I kits, which are recommended when IV meds are not available or appropriate. The kits are two-part antidote injectors comprised of a separate, pre-measured atropine “Atropen,” and a pralidoxime chloride “2-PAM” autoinjector. Together, they provide predictable drug dosages and are quite easy to use, thus making them effective for operators of varying skill levels. The drug dosage given can be adjusted simply by changing the number of pens injected, which be adjusted based on a given child’s weight. One problem with these kits, however, is that testing in children under three years of age is incomplete, and it is largely unknown what, if any, side effects would present in this age population with Mark-I use. In an emergency situation, however, it is possible that the use of Mark-I kits may be the only option.

The FDA recently approved a pediatric specific “AtroPen,” however, it is not yet approved for children less than three years old and only contains atropine, not pralidoxime. Agencies stocking the AtroPen are instructed to keep pralidoxime in separate but available vials for administration. A third option, employed by some jurisdictions, is the separate stockpiling of atropine and 2-PAM vials and syringes for individualized dose formulations. Clearly, a drawback to this strategy is the time involved in calculating doses and drawing up these two drugs individually, as opposed to simply using a Mark-I autoinjector for which the dose is based only on the number of injectors the responder administers.

Regarding other chemical agents, cyanide antidote kits are also available, but may not stockpiled in sufficient quantity for a large-scale event. While there exist pediatric protocols for the use of this antidote in children, the antidote also carries the side effect of methemoglobinemia<sup>18</sup>, which can occur in both adults and children. Owing to the unique physiologies of children, however, it is possible that the safety margin for the use of this drug in children may be considerably narrower than it is in adults.

In a radiological event, if potassium iodide, or “KI” is indicated, currently stockpiled tablets are 130 mg dosages. The pediatric dose is 65 mg but is not readily available. There is a liquid

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<sup>18</sup> Methemoglobinemia is defined as a “condition in which the iron in the hemoglobin molecule is defective, making it unable to carry oxygen effectively to the tissue” according to Medline Plus, U.S. Library of Medicine and the National Institutes of Health at <http://www.nlm.nih.gov/medlineplus/ency/article/000562.htm#Definition>

form of KI available, but may be difficult to administer in a mass casualty setting. Under Project Bio-Shield, a pediatric specific KI pill is scheduled for development.

In terms of a biologic event, suitable antibiotics will depend on the agent, and what is suitable for children or adults can also change with the threat. Currently, ciprofloxacin and doxycycline are commonly stockpiled antibiotics for adults and children, respectively. Despite ciprofloxacin's effectiveness against certain pathogens, however, it has a poor side effect profile in children, particularly its detrimental effects on bone development. A liquid doxycycline preparation can instead be used for children, but it may be difficult to dispense in a mass casualty setting.

Ideally, the availability of pre-packed drugs separated by a child's weight would be convenient in a disaster situation. However, such a scenario would be particularly expensive and would likely be impossible in practice.

It is unknown what liability issues may be applicable should pediatric dosages of pharmaceuticals not be available in sufficient quantities. A priority of health care organizations in bioterrorism preparedness is the coordination of pharmaceutical stockpiles between hospitals and other local healthcare providers, specifically, those supplies that are on-hand in regional, state-wide, and federal stockpiles.<sup>19</sup> Liability issues regarding pediatric dosages of pharmaceuticals will likely stem from one or two key factors:

- 1) The amount of an entity's<sup>20</sup> pharmaceutical supply on-hand, and/or
- 2) The correct dosage for pediatric patients

In 2003 the National Center for Disaster Preparedness held a National Consensus Conference on Pediatric Preparedness for Disasters and Terrorism and made key recommendations regarding pharmaceutical stockpiles, the national stockpile<sup>21</sup> and addressing the needs of children. The American Hospital Association, which made similar recommendations<sup>22</sup> for the timeframe that hospitals should stock on-hand supplies, assumed that external sources of drugs including the national stockpile would become available to supplement hospital supplies no later than 24 to 48 hours after a mass-casualty event was reported. However, it should be noted that this expected time may be increased to anywhere from three to five days in light of the difficulties faced by hospitals in the aftermath of Hurricane Katrina and other disasters in the latter half of

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<sup>19</sup> Including the Strategic National Stockpile (SNS), aka the Strategic Pharmaceutical Stockpile (SPS), established by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002.

<sup>20</sup> Be it a local hospital or care provider, a regional pharmaceutical supplier, or a major warehouse containing portions of the national stockpile.

<sup>21</sup> Which will be maintained and managed by the Secretary of Health and Human Services

<sup>22</sup> American Hospital Association, "Hospital Resources for Disaster Readiness," [http://www.hospitalconnect.com/aha/key\\_issues/disaster\\_readiness/readiness/ReadyAssessmentB1101.html](http://www.hospitalconnect.com/aha/key_issues/disaster_readiness/readiness/ReadyAssessmentB1101.html)

2005.<sup>23</sup> Based upon the reaction to both the local and federal response to Hurricane Katrina, the focus of potential liability may shift to state and federal preparedness organizations and agencies if there is the fear that supplemental stockpiles of pharmaceuticals for pediatric and other special needs patients will not be available or accessible to local authorities within critical timeframes.

Additionally, courts have found that hospitals have a duty to supply “the required equipment and instrumentalities for the care of their patients.”<sup>24</sup> However, it is important to note that a hospital will generally not be found negligent unless a court determines that they had deviated from a particular standard and duty of care by failing to supply a certain equipment or drug.<sup>25</sup>

Regarding liabilities for drugs that may in fact injure (for example, a bird flu or anthrax vaccine) legislation is being considered that would require individuals having to prove willful misconduct by the drug manufacturers, and awards would be limited to specific amounts. The HHS Secretary would have to make that misconduct declaration. The idea behind adding liability protections is to ensure that it is economical to manufacturers to produce anti-virals and vaccines without having to consider potentially huge liability costs. However, the proposed legislation is only discussing liability protection for serious situations, over a set period of time, for a set purpose.<sup>26</sup> In other words, no one wants to give drug manufacturers carte blanche to produce bad drugs without some form of liability. The reason this is important to pediatrics is that many drugs are not specifically tested for children and it is possible that drugs may affect them differently. Questions have been raised about linkages between the recent deaths of 12 Japanese children and Tamiflu, but the FDA at this time does not believe that it is necessary to update labeling to report this as a possible side effect and cannot say definitely that there is a causal relationship between the drug and the deaths. However, in the future it is possible that more questions like this will be raised.

Finally, the following additional interventions might mitigate liability of responders, healthcare providers, and preparedness organizations:

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<sup>23</sup> September 22, 2005 Testimony by physicians working in New Orleans-area hospitals during Hurricane Katrina reported that communications breakdowns during and after the storm resulted in food and medical supplies running low for days after the storm until word could be sent out via a television station that help was needed. See <http://www.aha.org/aha/advocacygrassroots/advocacy/testimony/content/HurricaneKatrina092205.pdf>

<sup>24</sup> *Cobb v. Dallas Forth Worth Medical Center—Grand Prairie*, 48 S.W.3d 820, 825 (Tex. App. 2001).

<sup>25</sup> *Id.* See also *Clary v. Hospital Authority of City of Marietta*, 126 S.E.2d 470 (Ga. App. 1962) (Hospital was not found liable for using an adult size bronchoscope on an infant when no emergency or special urgency required use of such an instrument and choice of using it was not exclusively that of physician or surgeon.)

<sup>26</sup> Congressional Daily, Wednesday, November 16, 2005

- Developing and adopting a set of new, formal recommendations specific to supplies of pediatric pharmaceuticals by recognized governing entities such as HHS, DHS, etc and industry standard-setting organizations.
- Drafting new laws or amending existing laws to include specific requirements for healthcare providers and preparedness organizations to address the needs of children.
- Developing education and advocacy campaigns to encourage the healthcare industry to produce and stockpile pharmaceuticals in forms and dosages for pediatric patients.

#### **4.1.5: Surge Capacity**

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**Definition:** *The ability and resources to expand functional areas of emergency preparedness and response for pediatrics necessary to meet temporary, extraordinary demands during a crisis.*

Surge capacity in general for pediatrics is difficult as already strained resources or those with an already low baseline capability become taxed quickly. In the case of such health arenas as privately run hospitals, it may simply be too difficult to expand services as they are not structured in a manner allowing for surge due to cost effectiveness. On the other hand, there are contingencies to make up for shortfalls such as external and outside resources that can be brought to bear in a crisis situation. The situation becomes much more complex for pediatric emergency preparedness and response, namely because of lack of knowledge, resources, and specialized training in the pediatric field. When the baseline is lower than the adult standards, surge capacity becomes all the more of an uphill battle.

Since most pediatric elements have either been excluded from or subsumed in disaster planning, there will be problems with surge across the board for most functional areas. This capability will not be improved without a lot of work or funding. The pediatric element acts as a force multiplier in terms of the ability to surge. In any large-scale incident, more personnel will be needed regardless of the victim set. During a crisis that involves a large number of children, especially young children, that ratio becomes even more stretched. In contrast to adults, children will need a lot of people to take care of them, further stretching personnel resources. In terms of triage in a large-scale incident, it is likely that a large number of pediatric victims will send triage to surge almost immediately.

Personnel and training issues also impact surge capability. Psychological issues can affect staff and their ability to perform in a variety of ways. On one hand, staff may be reluctant to report for duty or extra duty if they believe that their own family has not been first taken care of. If

they fail to report for duty, surge capability can seriously be impacted. At the other end of the spectrum are those staff who may overwork themselves. Any disaster or large-scale incident in which numerous people are wounded and killed can be emotionally taxing, but adding in children to that mix makes it become even more emotional. Overtired and traumatized workers who have reached this state will not have the ability to surge. Yet, the irony is the taxing work schedule that surge demands in a crisis may be inherently self-defeating.

Surge capability is most directly affected by personnel issues. The lack of medical personnel with pediatric specialties or training would be a major issue when a large-scale incident takes place involving pediatric victims. To a certain extent, it is possible to bring in pediatric expertise from surrounding medical care facilities and other jurisdictions, as is the case with other surge requirements. However, valuable time can be lost in doing so, especially in areas outside major metropolitan regions. What is different from the adult world, however, is that there are less pediatric medical specialists to tap into even if they are pulled from external sources. Specialization within the pediatric field also limits the amount of personnel available for surge. For example, there are very few pediatric infectious disease specialists. More personnel will also be required for quarantine of children than adults, further taxing the personnel resources for surge. Quarantine requires a large span of control generally, and, in the case of children, more people will be required to help take care of them.

It would also be difficult to surge in the mental health arena. Some of these issues are institutional and others are personnel related. There is already a treatment shortage for pediatric mental health, only about 20% of children gain access to the mental health care they need<sup>27</sup>, and there is a shortage of child psychologists. Therefore, it is difficult to surge from a lower baseline. At other times, it is difficult to maintain surge for long-term care. Sometimes, the manifestations of an incident take some time to show themselves requiring longer mental health counseling. While there may be initial grants and follow-up programs focusing on mental health needs, these are sometimes not sustainable and cut off prematurely.

Both hospitals and emergency departments within them may have some issues with ramping up pediatric surge capability. Emergency Departments will also reach surge capacity at a quicker rate mainly because of the compressed timelines needed for treatment of children and because of lesser resources that will be used up faster. There may also be secondary or cascading surge issues that will tax Emergency Departments because of parents, family, etc who will be attendant with any child casualties. Surge capability can also be uneven with hospitals. In a mass casualty situation, the capability to surge may depend on community size—if the community

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<sup>27</sup>As reported in, United States Department of Health and Human Services (2000). Report of the Surgeon General's Conference on Children's Mental Health: A National Action Agenda. Washington, D.C.



and its facilities are small, it will be more difficult to achieve a successful surge capability. If the facility in question does not regularly deal with pediatrics, at least on a sustained basis, it may not have the correct and sustainable amount of equipment, facilities and pharmaceuticals to deal with an influx of pediatric victims, making surge difficult. It would also be very difficult and impractical to store infrequently used equipment in anything but limited capacity. For example, if there is a need for larger scale isolation capacity, surge may be difficult to achieve because of a lack of pediatric rooms in general and especially those with negative airflow. It is likely that hospitals unable to meet surge demands will have to divert patients.

The ability to surge in a mass casualty incident involving many deceased victims is problematic for both adult and children. Many hospitals do not have adequate storage for bodies, and there may be issues in the transportation of the deceased. And only so many autopsies can be conducted at a time due to personnel and facilities issues. However, while it is possible to improvise in a mass casualty incident with adults (i.e. storing bodies in refrigerated meat trucks until space is available) this type of improvisation probably would not be acceptable for children. This is not a technical or a resource issue for surge, but rather a sensitivity challenge. While all life in a disaster or incident is considered precious, and a large loss of life is emotionally wrangling, in the case of children, it becomes even more of an emotional issue. For example, in the school hostage siege in Beslan, Russia, there were a large amount of child fatalities, which overwhelmed the system. Many parents were left distraught and confused trying to find their children's bodies. The ability to surge for mass casualties involving children is complex, heart-wrenching and problematic, and is a reality we hope not to face, but for which we should be prepared.

#### **4.1.6: Data Collection and Information Management**

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**Definition:** *The capability to collect, process, store, and disseminate data for pediatric preparedness and response, to include victim identification and population monitoring.*

As a crosscutting capability, needs arise in data collection and information management in functions that rely on information collection, processing, and sharing for their effectiveness. These issues arise in some form across every functional area examined in this project, with the sole exception of Decontamination. For Decontamination, data collection and information management is important. However, responders currently maintain a sufficient capability in data collection and information management to meet the needs of decontamination. This is not the case in any other functional area.

Data collection and information management is critical to decision-making. Thus, functional areas that support decision-making—early-warning, incident and crisis management, triage, public affairs—will especially rely on this capability. For example, there will be significant challenges in identifying the presence of child care facilities in a targeted building before units arrive, identifying and tracking individual children who cannot communicate basic data such as name or family locations, and determining point of entry plans and victim tracking during and after triage and emergency medicine. Data collection and information management are key to solving these problems and supporting decision-making. One of the most important contributions this capability can make to decision-making is real-time data acquisition and sharing.

Real-time data is critical to meeting the needs of many functional areas described in this report. For example, early warning and epidemiological surveillance would benefit from real-time data on absenteeism to public health authorities, and even law enforcement, when epidemiological protocols or unusual biological incidents warrant it. This envisions a much more robust system, standards, and practices for collecting data, processing it into actionable information and analysis, and disseminating it to the appropriate decision-makers for action. Such *complete* systems do not sufficiently exist to meet the goals of early warning. To the extent data algorithms currently exist, they have not been tailored to the pediatric population, which require different baselines for “normal” illness, anomalies, etc.

Data collection and information management can also support establishment of knowledge bases useful to store and provide knowledge on the unique needs, solutions, and best practices for responding to pediatric victims of catastrophes. For example, creation of a knowledge base and “virtual reach-back” of health care providers competent in pediatric issues, organized by skill set as well as regional availability, would provide immediate and organized access to specialized knowledge in time of crisis. Such a capability would meaningfully contribute to each functional area described in this report.



## Section 5: Functional Areas

This section examines the key functions that support emergency preparedness and response relevant to the pediatric population. This section defines and describes each functional area, its unique requirements and challenges, the state of current capabilities in support of these functions, goals for improvement, gaps and gapfillers, and differences in functional capability based on operational or geographic environment.

**Functional Areas** are the general areas describing functions, tasks, and missions. Fifteen functional areas were considered as part of pediatric emergency preparedness and response. They include the following:

1. Emergency Medicine
2. Emergency Medical Services/Triage
3. Awareness: Prevention and Pre-emption
4. Crisis Management
5. Incident Management
6. Early Warning: Epi-Surveillance
7. Isolation
8. Quarantine
9. Post-Emergency and Acute Hospital Medicine/Health Care
10. Public Affairs
11. Mental Health Care (Urgent)
12. Mental Health Care (Long-Term)
13. Mortuary Affairs for Children in Mass Casualties
14. Decontamination
15. Mass Prophylaxis of Children

### 5.1.1: Emergency Medicine

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**Definition:** *The ability to provide optimum rapid treatment, resources and facilities to a large influx of pediatric victims who have injuries and/or illnesses brought on by some form of contamination or intentionally introduced pathogen.*

#### Unique Requirements and Challenges

**Pediatric injury/illness is low-volume/high-risk, which has implications for emergency medicine preparedness (treatment, training, equipment, etc.).** Emergency Department

(ED) personnel will have limited familiarity with pediatric victims, which has implications for treatment decisions, etc. All ED staff need some form of pediatric training and expertise. Equipment issues may be different depending on the daily practice of the ED—if the typical practice does not include pediatrics, then there will be fewer resources available such as specialized monitors and ventilators.

**Surge capacity will be invoked and reached more quickly in this environment because of unfamiliarity and unique needs of pediatric patients.** Compressed timelines needed for treatment of children will also add to the pressure. Pediatric resources are generally less common than standard resources, making surge capacity, throughput, and re-supply harder to achieve. There may also be secondary surges for Emergency Departments, because of parents/family and the media all congregating there.

**Private transport to hospitals might be more common with pediatrics and this will result in victims delivered to hospitals not according to plan or to informed decisions.** It is possible that these unknowns will also tax the ED staff and resources.

**Injured children are a greater potential threat to the workload of EDs, because treatment decisions may not meet the perceived needs of family members and, as a result, there would have to be more psycho-social support for family members.**

**Hospitals diversion is hard to plan around, especially with the addition of the pediatrics issue.** It is possible that, for pediatrics, there will not be enough diversion and with a chemical or biological incident they will divert too much.

**Children generally need more care in an emergency setting and certain procedures such as X-rays, CT scans, and possibly MRIs are more of a challenge to frightened, excitable children.**

### Current Capabilities

Resource coordination and communications systems exist, but in very limited numbers. Hospital communications systems are not exercised often, particularly between hospitals, but the situation is better between hospitals and EMS.

Hospitals have surge capacity plans, but many of these include difficult decisions that will be exacerbated by the pediatrics issue.

Pediatric victims will bring heightened medical staff cooperation and phone consultation.

Many hospitals do not have a pharmacist available after hours, and some Emergency Departments do not have the medicines or dosages needed for pediatrics.

### Goals

- ED staff should undergo more training and exercises with pediatrics and familiarity with resources.
- Better real-time communications and data/information management and sharing among EDs and with EMS, with respect to pediatric situations, cases (in EDs and en route), resources, needs, etc. should be implemented.
- Hospitals that provide a significant amount of pediatric care can function as educators and consultants—for training and crisis—for hospitals that do not.
- Standardized methodology should be established for accurately assessing an ED's capability/capacity.
- Establish the ability to set up secondary triage for victims who are potentially contagious or contaminated, and treat them so they can be moved into the ED or elsewhere—there needs to be a plan in place to do this before it starts.

### Gaps/Gapfillers

Not all Emergency Departments have the equipment and resources to deal with pediatrics, but this varies by location, size and resource and personnel issues. With urban hospitals, capability increases significantly.

The gaps in capability are primarily in TTP, surge capacity, and data collection and information management (between hospitals). Equipment issues depend on the daily practice of the Emergency Department.

The goal of secondary triage adds an entirely different dimension to the capability areas needed for emergency medicine. This has similar implications as EMS/Triage, except there are fewer resource and personnel issues.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

Hospitals are more likely to divert for a chemical or biological weapons attack than with a conventional explosion unless they do not have the capacity to treat large numbers of victims.

When a potential threat is added to caretakers' or responders' families, hospitals are more likely to divert, and responders may be less likely to show up for work.

### **5.1.2: Emergency Medical Services/Triage**

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**Definition:** *The ability of EMS providers to sort and direct treatment (to include transportation to the appropriate facility) of child victims of a mass casualty incident according to severity of injuries and resources available.*

#### *Unique Requirements and Challenges*

**The Emergency Medical Technician (EMT) will need to know the location and capability of pediatric centers/specialists/etc.** This knowledge needs to be added to the appropriate repertoire of facilities for treatment either by predetermination or immediate reachback to a knowledge base. This is important to formulate point of entry plans for transporting pediatric victims. Early notification to hospitals is a higher priority for pediatric response—hospitals need more time to marshal resources and staff.

**EMS and triage is an inexact science already, and the pediatric issue only complicates this capability.** Adding pediatric victims to the mix will put pressure on the an already pressured judgment and decision process by such issues such as hysteria, emotion (emotional responses can affect judgment and treatment decisions), compressed timelines and unfamiliarity with pediatric trauma and injury, etc. This makes resource allocation and transportation decisions more critical. EMTs will be less familiar with pediatric physiology, trauma/injury, etc because large numbers of pediatric victims are not a regular or familiar occurrence for their patient runs. This may lead to over-triage.

**A pediatric victim population will bring triage straight to surge capacity.** Because of unfamiliarity, emotional and compressed timeline issues, over-triage of pediatric patients will surge a situation faster than with an adult population.

Delayed EMS triage because of crisis management protocols (e.g., a suicide bomber or a secondary device) will conflict with compressed timelines and urgent triage needs for children.

**There are many equipment/treatment issues to take into account for pediatric needs when starting treatment at the scene.** Physiological and medical/pharmaceutical dosage differences drive these issues and will be different.

**For chemical and radiological operational environment areas, absorption and toxicity levels will differ and require different treatment/triage options.**

**Sometimes arriving units will be unaware that a pediatric congregation/caregiver facility is part of the incident.**

**Identification and tracking of victims/patients is difficult because some children will not be able to identify themselves.**

### *Current Capabilities*

Some adult EMS/triage capabilities can be applied to pediatric EMS/triage. For example, the Broselow Tape was originally designed for adults and has since been adapted for children's dosages and equipment.

There are a variety of programs and protocols that have been developed which are pediatric specific but may not be applicable to all the situations that their adult specific counterparts cover. Additionally, they may not be adopted on a wide-spread basis and training may not be mandatory for these programs in all jurisdictions.

The JumpSTART triage system for pediatrics is a parallel system to the START (Simple Triage and Rapid Treatment) triage tool but focuses instead on the unique physiologies of small children and offers objective decision thresholds and protocols for triage.

There are the Pediatric Advanced Life Support (PALS) courses that EMTs and paramedics can train on, although they are not requirements in all jurisdictions. PALS focuses on infants and children and trains responders in detecting those at risk for cardio-pulmonary arrest, prevention, and resuscitation and stabilizing those in respiratory failure and cardio-pulmonary arrest. Advanced Pediatric Life Support (APLS) Courses are also available but are not generally geared towards the EMT technician or paramedic. There are also pediatric versions of Basic Trauma Life Support (BTLS) courses.

Shriner Care and similar pediatric care providers and volunteer organizations can be drawn upon to assist in transportation and location of resources.

The local Metropolitan Medical Response System (MMRS) does real-time monitoring of resources for pediatric EMS/triage.

Poison control centers support EMS/triage for chemical and radiological agents.

### Goals

- EMTs should have instant reach-back to pediatric specialists. This should be virtual reach-back, not on-scene.
- Require training and regular exercises for pediatric EMS/triage, to reduce over-triage and increase familiarity with pediatric issues (treatment, dosages, etc.). A new course / curriculum needs to be developed, standardized, and implemented by a national organization.
- Improve data research to increase empirical evidence to develop and support a standardized pediatric EMS triage system.
- EMS triage units should have a “minimum capability” of equipment and medicine to manage a situation until a cache arrives.
- Develop EMS/Triage staging Tactics, Techniques and Procedures to account for crisis management protocols.
- Establish a mobile pediatric EMS equipment/pharmaceutical cache deployable for emergency response when a mass pediatric call comes in (depends on planning and IM knowing location of schools, day care, etc.—see “Incident Management”).
- EMTs need real-time resource monitoring, special knowledge and point of entry plans for transporting pediatric victims to specific locations with specific capabilities.
- Pre-hospital personnel should have clinical rotations in the pediatric population on a regular basis.
- Develop the equivalent of a national poison control hotline for specific pediatric treatment for chemical and biological agents, etc.

### Gaps/Gapfillers

Tactics, techniques and procedures for EMS/Triage specific to pediatrics is poor. However, what does exist could be built upon as a foundation, but would need to be integrated and updated.

FDA has not approved PAM-II for children under 4 years of age.

It is not difficult to conceive of a mass casualty incident scenario that will overtax surge capacity and will affect the interface between Emergency Departments and EMS.

Most data information management failures usually happen at tracking and identifying location of victim. There are also issues in knowing whether pediatrics caregiver/congregation facilities

are present at scene. The real-time monitoring of resources will affect point-of-entry decisions and transportation.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

Biological agents may produce more of a system triage situation over a longer, multi-day period with multiple entry sites throughout community.

Chemical and radiological pediatric victims will have different treatment needs because of different absorption (including respiratory) and toxicity rates due to body mass, body surface area, respiratory rates, physiology, and vulnerabilities to trauma and pressure, etc.

Smaller communities are more likely to lack pediatric-specific capabilities, and rural areas will require longer transportation times, conflicting with the compressed timelines and vulnerability for pediatrics

Children will be more susceptible to temperature extremes in weather affecting how long they can stay in outside in triage areas.

### **5.1.3: Awareness: Prevention and Pre-emption**

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**Definition:** *The ability of individuals in or around an environment where children may be present to recognize signs of imminent threats or of variant or suspicious activities and to share that information with the appropriate authorities; to have knowledge of the correct course of action to take to ensure the safety of children or safely reduce or eliminate the threat.*

#### *Unique Requirements and Challenges*

**Awareness does not only concern schools but other child congregate care settings such as the YMCA, daycare, church groups, camps, clubs or other large groups of children in congregate settings.**

**Many child congregate facilities are under-funded and understaffed with high turnover rates, making it difficult to institute the proper training for awareness.** High turnover of staff means training must be held multiple times.

**Child congregate settings are usually not hardened and access control is usually weak.** Despite improvements in school security due, for example, to gangs, violence, school shootings and predators, not all schools have the same level of security or awareness, and other child congregate care facilities have even less. Access control issues may also be weak due to budgetary concerns.

**Since these facilities are not normally focused on these types of security threats, it would be difficult to mandate any new requirements without funding.** It is likely that not all awareness measures will require expensive new investments. For example, one measure is a fairly simple and routine procedure such as access control for child congregate settings requiring the showing ID if signing in or visiting a facility. However, other areas such as hardening facilities, surveillance technologies, additional security guards, and providing awareness training will take time and resources to implement. It is also likely that very small facilities may not be able to do this.

*Current Capabilities:*

While there are certain aspects of awareness in place, they are not consistent on a national level and therefore the capability is poor.

Certain pilot programs are underway. For example, the “Model School Program” at the Beatrice Gilmore School, which is funded through federal homeland security money in partnership with the West Patterson School District, the New Jersey Institute of Technology and the Passaic County’s Prosecutors Office. This program is testing new technologies in order to develop a model for school protection. This includes smart cameras to detect anomalies in usual hallway traffic for unusual or suspicious activity, smart ID cards for school staff, and biometrics to identify school visitors.

The Freehold Borough School District in New Jersey now has iris scan technology installed in three elementary schools as part of the Teacher-Parent Authorization Security System (T-PASS) funded through a school safety grant from the National Institute of Justice.

School security has improved in certain areas to combat drugs, school violence and gangs, but improvements tend to be made on an ad-hoc basis depending on the problems and issues the particular school system is facing. The exception are new initiatives such as New Jersey’s School Security Initiative Program (See the Crisis Management Functional Area for more detail) which has audited schools for the express purpose of identifying changes that need to be made to improve school security.



Fear of child predators and abductions has also increased awareness for child safety in terms of looking more closely for out of place individuals or variant or suspicious behavior.

### Goals

- Enhance and standardize school security procedures and policies.
- Legislation needs to be enacted that makes training response consistent locally and, eventually, nationally.
- Schools should have the legal ability to share information with each other as well as up the chain of emergency response command, to include focal/local intelligence centers, such as a Terrorism Early Warning Group.
- Help schools and other entities reach compliance goal once legislation is enacted. (Helpful Enforcement)
- Provide education and training to personnel who work with children to enable them to recognize a threat, suspicious activity, any activity which may pose a threat or any other variant activities.
- Provide integrated training in which schools, law enforcement, medical, etc. have the opportunity to train together in order to encourage familiarity.
- Develop clear guidance on chain of command for reporting information about variant/suspicious activities and emergencies to the appropriate personnel to include an information call tree.
- Develop the ability to identify or track lost or stolen equipment such as buses, uniforms, keys, etc, that allow easy access to children and their facilities.
- Develop mutual aid agreements between schools.
- Share information on how soft targets can protect themselves.
- Leverage existing E-Team Incident Management software to link up schools, hospitals, and counties.
- Tailor crisis drills for different age groups.
- Define roles that individual staff need to play.
- Nurses need to be placed in the system for data collection.
- Invest in more physical security measures that are currently available such as CCTV, physical barriers, and security personnel in order to harden facilities.

### Gaps/Gapfillers

Money, training and cross-communication are the biggest gaps in this area.

Emergency response legislation where it exists is not always followed consistently, resulting in a lack of compliance.

Standardization and compliance are huge legal issues.

Improve awareness of other child congregate centers such as YMCA, daycare, clubs, and camps.

Children in psychiatric institutions or other residential settings also need to be protected.

The high turnover of staff at these facilities means training needs to be held multiple times which can keep setting back progress on awareness capability.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

Geography does reflect significant differences in awareness capability, which is based primarily on location and experiences. While most schools strive to have some awareness to protect their children, it is likely that their level of awareness is based on available funds and perceived threat. However, for school districts that have had issues such as violence and gangs, it is more likely that they have taken precautions related to awareness, and correspondingly have a better baseline to build on.

#### **5.1.4: Crisis Management**

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**Definition:** *The ability to ensure children's and their caregivers' health and safety by anticipating, preventing, and/or reducing or resolving imminent or present threats until the crisis is managed, mitigated, or eliminated.*

#### *Unique Requirements and Challenges*

**Due to their infrequency, there is limited experience in handling children's crises, which has lead to underlying assumptions that may no longer be valid.** Up this time, the mechanisms for crisis management have usually assumed that the parent is with the child. Crisis management contingencies can no longer afford to make that assumption as the parent may not be there to assist with the child or to give permission for care and treatment. Legal issues then arise concerning who is authorized to execute permission of care if parent is not available.

**Adult protocols for a CBRNE attacks do not necessarily apply to children in a crisis situation, which can impact the management of a crisis.** Should a school be cordoned off, or children put into decontamination, it is likely that responders would have to deal with significant pressures from parents and would have to account for this in the management of a crisis. It would become especially difficult if it were necessary to separate parents from their children in a quarantine situation.

**Many child-surveying agencies have limited resources to train and implement pediatric emergency preparedness plans and goals.** They are also usually not well integrated into regular emergency and crisis management systems.

**Most state response plans do not currently have a pediatric specific annex.** Most planning for crises on the macro level subsumes the pediatric population under the general crisis response.

**Communications becomes crucial when parents are separated from or otherwise not with their children.** Information to parents becomes a priority especially conveying what is happening, where the child is, or has been sent.

**It is also important that children who do not normally carry identification be immediately identified so that both responders and parents know where they are.**

**Whole families may be affected by an incident and end up at different hospitals, further adding to confusion in a crisis situation.**

**Personnel needed to assist in a pediatric crisis will be greater in numbers.** Children, especially very young children, cannot take care of themselves and will require adult supervision throughout a crisis. More people will be required to manage children than adults during a crisis.

### *Current Capabilities*

Traditional response training, operating plans and protocols for adults exist in this area as an overarching and generalized capability. In terms of medical capabilities, there is implied consent, which allows for the immediate treatment of life threatening conditions. Emergency information forms can also be used for special health care needs. In certain jurisdictions such as Los Angeles, Dallas, New Jersey, and Tulsa, systems are in place to filter patients to other hospitals to prevent maxing out surge capacity. There are also communications plans in place in some hospitals.

Emergency operating plans are in place in most schools. Plans may be in existence nationwide but are not always enforced and may vary as to how comprehensive they are. Various jurisdictions are also working on improving their capabilities in this area, and the following examples illustrate a selection of what is occurring in some jurisdictions. Boston is currently in the process of updating their emergency operations plans. School safety planning has been researched and risk analysis performed to identify probable types of emergencies, while still taking a multi-hazard approach.<sup>28</sup> In New Jersey, the Governor launched the School Security Initiative Program in 2005. It started with a review of emergency plans at every school and the development of a checklist of security measures every school should implement.<sup>29</sup> In California, state law mandates that all public schools establish a multi-disaster preparedness plan, establish a broader school safety plan and integrate SEMS, the Standardized Emergency Management System, as part of their preparedness plan.<sup>30</sup>

The U.S. Secret Service completed the Safe School Initiative, a study looking at school shootings and other violence, in conjunction with U.S. Department of Education. Both organizations have used the findings in this study to modify their threat assessment approach for use in schools.

While currently there is no plan which has an annex specifically addressing children, a Model Pediatric Component for State Disaster Plans is being developed by the Columbia University Mailman School of Public Health National Center for Disaster Preparedness.<sup>31</sup> According to a briefing, a coalition of experts is to build a consensus on the appropriate methodology development of a model assessment method inclusive of the specific needs of children. The information from the assessment models is to be used to develop a Model Pediatric Component (MPC) in State

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<sup>28</sup> In Boston, school safety contingency plans are submitted each year and then consolidated with Fire Safety Plans. Scenarios included hostage crisis, adverse weather, trespassing, terrorism, etc. These situations and scenarios are divided by tiers, depending on seriousness of threat level and accorded crisis response guidelines.

<sup>29</sup> The checklist contains 56 review items on protocols, training, communications, policies and procedures, best practices and crisis and emergency planning. This checklist was then used to audit all schools in order to identify changes that need to be made to improve security. Details from the audits will be used to create a database on the statewide capability of school security measures. A school security summit was also convened to bring together the best ideas on school security. At the summit, then Acting Governor Richard Codey also announced the future creation of a continuing education course on school security and emergency management for teachers and administrators. Currently, no courses like this are offered, but teachers have cited the need. Also, while this is not school specific, the state has also requested that the DHS provide “Soft Target Vulnerability Assessment Training” in the state and a few classes have taken place.

<sup>30</sup> SEMS is a management model used to centralize, organize and coordinate school’s response to emergency crisis. Currently, most schools are not yet in full compliance but are working towards those goals. Compliance is also tied to the use of SEMS for reimbursement of emergency response-related personnel costs after an emergency is declared by the State.

<sup>31</sup> See David Markenson, M.D., Powerpoint Briefing, “Model Pediatric Component for State Disaster Plans and Additional Resources”, the Program for Pediatric Preparedness, National Center for Disaster Preparedness, Columbia University Mailman School of Public Health, (2005), [www.cademedial.com/archives/mchb/emsc2005/ppt/4d.pps](http://www.cademedial.com/archives/mchb/emsc2005/ppt/4d.pps)

disaster planning. The Model Pediatric Component structure is based on the Federal Response Plan (FRP), Emergency Support Functions (ESFs), as well as existing and new annexes.

A new system for child identification and tracking was introduced at Camp Gruber, OK, which was an evacuation point for Hurricane Katrina in its aftermath. The Oklahoma health authorities developed Operation Child-ID. Operation Child-ID is a rapid systematic protocol for identifying and protecting displaced children. It is possible that this system can have applications as a template and resource on a wider basis, and the CDC has released an Official Health Advisory about this protocol.

### Goals

- Have protocols and plans in place to deal *specifically* with the following for child congregate facilities or major incidents involving children: disabling terrorists and threat devices, hostage rescue, evacuation, lock-downs, quarantine enforcement, and perimeter security.
- Need to include crisis counselors specifically trained and certified in pediatrics in crisis management.
- Bridge the gap between child and parent/guardian by communicating to parents what is going on and by being able to locate their children.
- Have a system in place to rapidly identify and protect children (ID bracelets is one option), including those with special medical needs.
- The community needs to be educated to understand that liabilities change in an emergency crisis.
- In a crisis, pre-prepared and pre-packaged pediatric dosages of drugs for children separated by weight would be beneficial.

### Gaps/Gapfillers

Communication systems would overload any one hospital in a major incident, adding pediatrics to the mix could be an additional burden.

It is very difficult to dissolve solutions for children if the responder is in full protective gear.

While pharmaceutical stockpiles may have a number of pediatric specific drugs, the problem may be in quantities, for example during a large-scale natural incident [Hurricane Charlie] there were not enough kits available to treat children with asthma. Other problems may lie in the fact that not all jurisdictions have the correct dosages.

Some of the legal frameworks exist, but there may be gaps between federal and state laws. It is also difficult to find clear guidance for separating children for containment, removing a child to another city for treatment, evacuation or dealing with displaced and orphaned children.

There is a need to bridge the gaps between child and parent/guardian during a crisis. A child being separated from a parent or a parent refusing to separate from the child can have repercussions for crisis management and should be thought through in planning.

Skills need to be built and maintained for pediatric crisis management and continuum of care needs to be met.

Credentialing in a crisis, especially for pediatric specific needs, may complicate crisis response.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

There may be geographic differences in crisis management capability when considering children. Some jurisdictions seem to be thinking more about these issues than others.

### **5.1.5: Incident Management**

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**Definition:** *The ability to effectively direct the execution of plans, marshalling of resources, and performance of tasks and missions to respond to and resolve emergency situations. Incident management includes, but is not limited to, direction of pre-planning, operations, assessment, communications, deployment of assets, logistics, finance and administration, intelligence, mitigation, recovery, and after-action reporting of an incident, to include transition of these duties from the principal point of responsibility at the caregiver location to the arriving incident commander.*

#### *Unique Requirements and Challenges*

**Crisis communication is more difficult when large numbers of children are involved.** Children who cannot speak for themselves or comprehend the situation, surrogate supervision issues when the parent is not present, and the high emotional impact and hysteria that may emanate from both sides of the parent-child dyad all serve to complicate this issue. Trust relationships tend to be strongest with the teacher or caregiver who spends the most time with

the child. However, if that individual is not well-trained, healthy, or level-headed, it will be all the more difficult to direct and communicate with children and manage them through specific processes.

**Small children in general require extra care, and especially those with special needs.** The size of children and a lack of awareness make them harder to locate and manage. Children may be difficult to see when responders are trying to move them, either because they are hidden or are low to the ground, and those children that are actually ambulatory may be too scared or too immature to understand the needs and direction of a responder. Special needs children present additional problems in communication and direction as they require even more care.

**Emergency responder incident commanders needs to be aware of all the different issues raised in pediatric response, across the board. Pre-planning will have to account for all these issues.** This will have implications for resources, staging areas equipment, pharmaceuticals, etc., that the incident manager will need to account for, to include distractions and emotional aspects of managing an incident. Both subject-matter expertise and knowledge base requirements will be different for managing an incident for pediatric victims. Another major difference is that the timelines for management and reaction, resource response, etc. are far more acute for pediatric patients than in the adult world and must be factored into the management of an incident.

**Parents and neighborhood citizens will more likely self-refer in a pediatric event, and will need to be kept (or managed) out of the perimeter.** This will produce additional burdens and distractions for the Incident Manager to account for in planning and execution of his mission. Accountability issues will also factor into planning such as matching up children with parents. While it is likely that this will be delegated, planning for this still needs to take place.

**Relaying timely information to and establishing a communication system with parents is also part of the incident management structure; the challenge is finding the best method to do so.**

### Current Capabilities

Schools are becoming more involved with pre-planning, but it is not complete or is in the nascent stage. Their plans are often not widely shared or disseminated within the emergency response community or across disciplines.

Many schools do have school safety officers. These can serve as POCs to work with public safety officials and to develop plans. There are many cases where school systems send safety



officers to train and communicate with public safety officials. However, many schools do not have this program, and there may be differences in how private schools step up to this task.

Most other child congregate and caregiver locations as well as personnel are wholly unfamiliar with incident management. The extent of their plans and training is limited to fire drills and weather drills; anything beyond is an unfunded mandate.

Incident command is trained on staging areas and there is a set process for reuniting parents and children, but this is an uneven capability across the US. Sometimes reunions clog up the scene, and the process is not managed efficiently.

The media, schools, and the informal parent network are the most effective means for Incident Commanders to communicate with parents and the community. Tools similar to the Amber Alert system would have some utility in this context. The timely dissemination of information is vital—otherwise parents may end up going down to a scene and potentially adding chaos and confusion to an already difficult situation.

Leveraging existing networks such as the National Association of Children’s Hospitals and Related Institutions (NACHRI) may be crucial. For example, an organized effort to evacuate/fly children out of the children’s hospitals in New Orleans was very effective, and Incident Management in this case seemed to work better for the pediatric population than for adults.

### Goals

- It is important to institute some form of cross-training so that other teachers, staff, caregivers, etc., can take over responsibilities for communicating with and directing children.
- Incident Management capability should have the resources for the reach-back of pediatric sub-specialists and Subject Matter Experts.
- The Incident Commander (IC) needs a critical incident stress team as a tool in the Incident Management toolbox. The tool is needed not only for the IC, but also as a resource that he or she can direct and deploy to help manage the incident.
- Incident Management should facilitate rapid parent-child reunion.
- Each child congregate or caregiver location/facility should have a “critical partner” incident management plan and team that manages the incident until the arriving Incident Commander can take over.
- Incident Commanders should be trained in all of the unique needs of pediatric response, especially knowledge of caregiver/congregation locations and populations upon dispatch (in pre-incident plans drawing on a knowledge base), how to manage from



start to finish a scene in which children are involved, and how to make the response mechanism sensitive to the needs of the parents.

- Public safety agencies should engage schools and other caregiver locations in pre-planning and exercises.
- Community disaster preparedness/management should be in the school curriculum for students and staff.
- The priority of providing timely information and communication systems with parents, as part of the Incident Management structure, to both give and receive critical information to/from parents (e.g., location of child, emergency contact info, etc.) should be raised.

### Gaps/Gapfillers

The majority of gaps in incident management capability aimed at the pediatric population are in the capability area of Training, Techniques and Procedures. The pediatric element in this field is in a nascent phase, and while it is now being considered, it has a long way to go before it can be fully integrated into the regular functions of incident management.

Pre-planning does not usually account for all the unique challenges of pediatrics. The unique aspects of pediatrics need to be incorporated into pre-plans.

Communication with and accountability of pediatric patients is lacking. Mobilizing social workers can close some of the gaps in accountability and communication with pediatric patients.

Incident Command can be a very weak capability in general in a large scale incident. Hurricane Katrina was a very poor showing of this capability. Communications capability has also been demonstrably weak. Improving communications capability would help Incident Command.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

The panic factor and emotional aspects associated with specific agents can further complicate the management of an incident.

### 5.1.6: Early Warning: Epi-Surveillance

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**Definition:** *The ability to provide timely detection, identification, and assessment of exposure (actual and potential) to and diagnosis of both acute and syndromic disease in the pediatric population from data sources such as schools, day-care centers, family and pediatric practitioner offices, pharmacies, as well as hospitals, in time to mitigate the spread of disease and respond in pre-crisis phases.*

#### Unique Requirements and Challenges

**Schools are unique and often primary sources of indicators of naturally occurring disease, although for intentional bioterrorism events they may not be as unique.** Even at baseline, children are often sick and can spread illness from person to person more rapidly than adults can simply because schools bring large collections of people into close contact. That close contact often facilitates pathogen propagation. Part of the challenge of pediatric surveillance in general is that children tend to be more susceptible to disease due to a lack of prior exposure and suffer from childhood illnesses that do not affect adults. As a result, epi-surveillance that is based on detecting increases in disease incidence will need to account for these variations between adult and child populations. If these variations between adult and children are properly accounted for, then any increases in disease incidence may be a good indicator that something is amiss. Yet, epidemiological information from schools (unless a school has been deliberately targeted) probably would not be any more unique as a source indicator for an intentional biological attack. However, should a particular biological agent affect children sooner, then it is likely that wherever children are congregated could serve as an earlier warning mechanism.

**Communications and indicators are more complex depending on the child's age and are often reliant on third parties for information when dealing with very young children. There may not be a direct line of information from the patient.** While very young children may lack the vocabulary to articulate their symptoms and illness, slightly older children can at least communicate they are sick, and children at the middle school level and above may be able to describe symptoms fairly well. The communications and indicator issue, therefore, has implications for how many trained health care professionals may be needed to monitor schools and other child congregate facilities; the implication being that the numbers needed would vary depending on the different levels of schooling. A greater amount of input from parents who are able to monitor their children more closely as well as pediatric medical practitioners and care-givers would also be needed.

**Many schools do not have the mandate, the resources or the willingness to monitor public health issues.** There are differences in availability of funding for school health around the

country, which can translate into a lack of availability of school nurses and other officials who can actually monitor children's health. Currently, there are many schools that no longer have a school nurse. This underscores the difficulty of not having a logical point of contact to deal with when trying to elicit information from schools. Public schools may not want to participate in such a system for a variety of reasons which may relate to resources, funding and staffing issues, and an overburdening of current mandates. They may also not want the responsibility as their primary purpose is education. However, it may be easier to mandate such a system with public schools. Some private schools, on the other hand, may have more resources available making it easier to participate in such a system, but others may be resource-constrained as to where they spend their money. In any case, neither public nor private schools are pushing to step up to establish and participate in public health monitoring.

### *Current Capabilities*

Currently, very little ongoing surveillance is taking place in schools, and this is especially true for other child congregate care settings. However, absenteeism rates are captured in syndromic surveillance in major areas. Data from Emergency Departments and pharmacies, for example, does not necessarily tell you what is wrong, but highlights anomalies when more children than usual are out of school—a measurable indicator that something is out of the ordinary. This system would not have the data available to provide a clinical diagnosis, and at this point the indicator results would require follow-up investigation, sample collection, physician referrals, discharge diagnosis, etc., to determine causality.

Epi-Surveillance for pediatrics would not, by itself, be that difficult to institute, as the pediatric element would just be another data set. There are currently systems in place that can be used to separate data with pediatric outcomes such as age for example.

Specific jurisdictions may have their own syndromic surveillance programs in place, especially in major metropolitan areas monitoring a range of data sets from Emergency Departments, pharmacies, 911 calls, absenteeism, etc. It is estimated that about 100 health departments nationwide have varying degrees of sophistication to conduct syndromic surveillance.<sup>32</sup> More specifically, there are also a number of programs, tools, initiatives and systems that have been developed or are in the process of being developed by the CDC, universities and other entities. A selection of these systems and tools is as follows. The list is not meant to be exhaustive, but illustrative of the types of programs that have been developed or are being developed.

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<sup>32</sup> Smith, Stephen, "City and Hospitals to Watch for Early Signs of Bioterrorism", Boston Globe, May 27, 2004. See [http://www.boston.com/news/nation/articles/2004/05/27/city\\_and\\_hospitals\\_to\\_watch\\_for\\_early\\_signs\\_of\\_bioterrorism/](http://www.boston.com/news/nation/articles/2004/05/27/city_and_hospitals_to_watch_for_early_signs_of_bioterrorism/)

### **CDC<sup>33</sup>**

- The Early Aberration Reporting System (EARS)
- The Enhanced Surveillance Project
- The National Electronic Disease Surveillance System (NEDSS)
- The Public Health Information Network (PHIN)/Early Event Detection (EED)
- The BioSense Initiative

### **DOD**

- The Electronic Surveillance System for Early Notification of Community Based Epidemics (ESSENCE)<sup>34</sup>

### **Collaborative/University**

- The National Bioterrorism Syndromic Surveillance Demonstration Program.<sup>35</sup>
- The University of Pittsburgh and Carnegie Mellon University's Realtime Outbreak and Disease Surveillance Laboratory (RODS).<sup>36</sup>

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<sup>33</sup> The Early Aberration Reporting System (EARS) was developed initially for large-scale events, but is now used by various jurisdictions' public health authorities looking at syndromic data from Emergency Departments, 911 calls, pharmacies, etc. See <http://www.bt.cdc.gov/surveillance/ears/>. For special events, the CDC has worked with state and local health departments to enhance real-time syndromic surveillance through the Enhanced Surveillance Project (ESP) monitoring hospital emergency department visits. See <http://www.bt.cdc.gov/episurv/esp.asp>. The National Electronic Disease Surveillance System (NEDSS) seeks to improve data and information management standards for integrated and inter-operable surveillance systems at all levels of government. See <http://www.cdc.gov/nedss/>. NEDSS is also a component of the Public Health Information Network (PHIN), see <http://www.cdc.gov/phिन/overview.html>, a CDC vision to develop a national framework for interoperable public health information systems. More specifically, the Early Event Detection (EED), [http://www.cdc.gov/phिन/preparedness/eed\\_overview.html](http://www.cdc.gov/phिन/preparedness/eed_overview.html) component of PHIN Preparedness uses case and suspect case data and statistical surveillance of health care data to pinpoint the earliest signs of a public health emergency. The CDC BioIntelligence Center uses the BioSense surveillance application, see <http://www.cdc.gov/mmwr/preview/mmwrhtml/su5401a21.htm> to monitor national syndromic data to identify and decipher data anomalies. It has an Internet based interface and is meant to be a "multi-jurisdictional data-sharing surveillance application" that is national in scope.

<sup>34</sup> The Department of Defense Global Emerging Infections System developed ESSENCE as a prototype system to detect outbreaks of disease at military treatment facilities (MTFs). The system examines syndromes data recorded at the time of patient visits. ESSENCE II is being developed in cooperation with civilian partners using analysis of both military and civilian outpatient visits, over-the-counter pharmacy sales, school absenteeism, and animal health data to further sensitize the system. See <http://www.geis.fhp.osd.mil/GEIS/SurveillanceActivities/ESSENCE/ESSENCE.asp> for further information.

<sup>35</sup> It is designed to detect localized outbreaks of illness using data from health plans and practice groups. While the program was CDC funded, it is a collaboration of multiple health plans and state health organizations coordinated by Harvard Medical School and Harvard Pilgrim Health Care. See <http://www.cdc.gov/mmwr/preview/mmwrhtml/su5301a10.htm> for more information.

<sup>36</sup> RODS was designed to work on methods for real-time detection and assessment of disease outbreaks and now hosts four major projects to work with health departments in the development of surveillance systems. See <http://rods.health.pitt.edu/> for more information.

- Monmouth University's Center for Rapid Response Database Systems.<sup>37</sup>

### Local

- NJ LINCS<sup>38</sup>
- Delaware Electronic Reporting Surveillance System (DERSS)<sup>39</sup>

Data and information management capability was considered sometimes marginal by workshop participants for epi-surveillance and early warning. However, with advances in information technologies, and the proliferation of health care data, and data sources, this capability has continued to improve. Certainly collecting and sorting the data is not a technological challenge. More data is also needed in electronic formats that can be shared with more analysts. A robust, real-time system with standards and practices for collecting data, the ability to process it for actionable intelligence and analysis, and the ability to disseminate the information to appropriate decision-makers would be the ideal. The more problematic technical issues are the sheer number of different systems out there which may not be interoperable and the development of viable data algorithms.

Data algorithms do exist to do *some* epi-surveillance, but they are not tailored to the pediatric group. More broadly speaking, while there are algorithms that can deal with these issues, they are just becoming capable of handling this data. Algorithms must be validated for accuracy and precision. Captured data must be evaluated to determine if the method used actually captured the required data, how accurate it is versus what it missed, and how consistent the method was at capturing the data. The system can then be adjusted to yield the best data set possible. The creation of an algorithm and testing is not the difficult or time-consuming part, it is trying to standardize the algorithms which can be difficult as each data set can vary.

Some participants in the workshop believed that it will take about ten years before really useful epidemiological information can be extracted, although the systems continues to improve. However, a caveat is in order with this assertion. The CDC may take a longer time because they wish to be thorough and utilize standardized methods where everyone uses the same

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<sup>37</sup> Through Department of Defense funding, Monmouth University is planning to develop a rapid response computer system to alert authorities to the first signs of a bioterror attack or major disease outbreak by linking databases at hospitals, schools, nursing homes, pharmacies and veterinary practices. It is hoped that such a system will be able to focus on a level of granularity that could for example, tell the user why children are staying home from school, a useful tool for looking at the pediatric population. See [http://www.monmouth.edu/athletics/news/news\\_story.asp?iNewsID=2509&strBack=%2Fathletics%2Fnews%2Fnews\\_archive.asp](http://www.monmouth.edu/athletics/news/news_story.asp?iNewsID=2509&strBack=%2Fathletics%2Fnews%2Fnews_archive.asp) for more information.

<sup>38</sup> NJLINCS is a communications system that connects the state health department with local public health departments and health organizations.

<sup>39</sup> DERSS links the Division of Public Health with Delaware's eight hospitals and two of the diagnostic labs.

algorithms. On the other hand, local health departments and academic institutions may be more willing to try non-traditional surveillance methods with the latest technological resources at their disposal.

### Goals

- All schools systems should have the ability to submit real-time data on absenteeism, and student health to relevant public health or other authorities responsible for Epi-Surveillance/ Early Warning. However, unless a great incentive is offered to attendance workers, it is unlikely such a system would work. The solution would be the automation of such a system.
- This real-time system should be automated in terms of collection, processing, reporting and analyzing. Outputs should be managed and monitored by the appropriate public health authorities. A good system would need to include both data from parents reporting absentees as well as capturing data on students who are sick while at school.
- Buy-in is needed not only from schools, but also from pharmacies and pediatricians willing to participate in an automated, real-time reporting system.
- The system would also have to function during gap times, such as summer, and also find a way to incorporate other child congregate care information.
- There is a need to develop data algorithms for early warning-epi-surveillance tailored to the pediatric population and with some specialization for each school that would have a better understanding of local disease patterns. Collection of information is not useful without a method of analysis.
- As a complement to an automated system, certification programs and training should be instituted for staff and administration officials to participate in the system in order that they correctly handle and report information that comes into, and possibly out of, the process.
- One person should be designated as the point person for the public health system at each school. While having a nurse on staff may be the logical choice, as not all schools have one, it may not always be possible. Therefore, another individual would have to take on this task.

### Gaps/Gapfillers

Barriers to instituting an early warning epidemiological surveillance system specifically designated for pediatrics include technological restraints, personnel, funding issues, and privacy concerns. In terms of privacy, there may be concern about and distrust of data going into public health system. Legal liabilities also potentially burden school participation in epi-surveillance activities due to privacy concerns about reporting sensitive personal and medical data on children.

There is also a gap with the public's acceptance of syndromic disease surveillance in general, let alone a system aimed at a special population. The technological wherewithal to produce such a system has its own inherent but not insurmountable difficulties. The automated equipment to build such a system is not currently in place.

City and County Health Departments are doing a good job at developing their own epi-surveillance systems.

Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?

This is primarily a biological agent issue although there may be some issues with chemical and radiological agents. Differences that exist are usually based on the size and resources of the region, in terms of personnel and funding, etc. Some communities may have more in place.

### **5.1.7: Isolation**

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**Definition:** *The ability to identify symptomatic children, separate them from the general population (to include other children and parents) and keep them secure in a controlled location, primarily a hospital, for a specific period of time.*

### Unique Requirements and Challenges

**Cascading issues develop when children are subjected to isolation measures.** Involving or dealing with the immediate family can complicate the situation, for example, Personal Protective Equipment (PPE) may be required for parents while in isolation.

**Capacity issues for children in isolation would also be prevalent.** It is likely that there would be a shortage of pediatric rooms in general and especially those with negative airflow.



Additional staff would be needed to take care of children and there may be a shortage of equipment if there is a surge of pediatric patients.

**Isolation is resource and time intensive, especially when dealing with equipment.** Masks must be worn; treatment on children will probably take more time and caution; decontaminating or disposing of equipment also takes up time and resources.

**Psychological elements will affect both caregivers and victims.** Separating children from their parents is traumatic on both sides. Also, the uncertainties of being kept in an isolation room and the unfamiliar and visceral images that such treatment evokes is sure to frighten children as well as adults whose children are involved. On the staff side (including janitorial, support staff, etc.), it may be difficult to get people to show up for work if they are scared for their own families. Or the opposite may occur and people may refuse to leave the hospital because of a mass influx of patients. This would be a significant problem for surge capacity of staff as they would be overtired and more prone to making mistakes.

### Current Capabilities

Organizations such as the American Burn Association maintain lists of resources (burn centers), and the staff has expertise in pediatrics.

While issues are present in area/state licensure, processes exist to waive licensure requirements in time of emergency.

HRSA guidelines require monitoring of current capacity, and also try to foster better surge capacity through ongoing investments.

Very few pediatric infectious disease specialists are available as a surge resource.

### Goals

- Pre-plans should examine the impact of isolation and quarantine on the overall pediatric care community, resources, etc.
- Increased and sustainable pediatric capacity for isolation should be developed with staffing to support surge requirements, and data/information management capability to identify what resources are available, and where (see pre-plans).
- Create knowledge base of health care providers that are competent for pediatric care in isolation situations, especially surge.



- There should be better provisions for cross-licensure of pediatrics specialization.

### Gaps/Gapfillers

The majority of gaps are in resources, in terms of facilities and expertise, as well as TTP and surge.

Isolation is in an inherently controlled environment, but generally requires more resources.

### Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?

Isolation is mainly focused on contagious biological agents, although there may be some relevance for radiological agents.

## **5.1.8: Quarantine**

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**Definition:** *The ability to identify exposed and potentially exposed children, separate them from the general population (to include other children and parents), and to keep them secure in a controlled location, on-site, at home or in a hospital, for a specific period of time, for observation of symptoms of a communicable disease.*

### Unique Requirements and Challenges

**There are two sets of people that are affected by quarantine when children are involved.** Both the child victim and their parents must be dealt with. Parents may also be proxies for observation and reporting, which may affect dependability or accuracy of reporting.

**Home quarantine will have different psychological effects than being isolated in a hospital.** On the positive side, children will feel more secure in familiar environments rather than in an austere, clinical environment. On the other hand, the sense of being restricted, and cut off from their outside life can also be as traumatic as in isolation. Also, the fact that their parents have to monitor and enforce the situation, rather than some external party, may also be traumatizing.

**In high profile incidents, a large amount of law enforcement will be needed to secure a school if children are being quarantined in place.** This has repercussions for logistical issues such as providing medication, food, and other special needs for children.

**It is currently unclear how the psychological and public safety risk/benefit analysis would be measured in order to allow parents into a quarantine situation.** While there may be legal and safety reasons to quarantine children in place away from parents, in practice, keeping parents away from their children may create a tense situation, and psychologically both parent and child may have less anxiety if kept together.

### Current Capabilities

See Current Capabilities for Isolation<sup>40</sup>

### Goals

- Pre-plans should examine the impact of isolation and quarantine on the overall pediatric care community, resources, etc.
- Policy resolution or guidelines on dealing with parents and the community in a crisis quarantine situation must be developed and completed.
- Provisions for cross-licensure of pediatrics specialization should be made.
- Technology and capabilities should be developed to allow parent/child/family communication across the zone/perimeter, especially in quarantine.
- Create knowledge base of health care providers that are competent for pediatric care in isolation situations, especially surge.

### Gaps/Gapfillers

Legal authorities have been reexamined, but there are probably issues that still need to be examined and which have not been sufficiently tested, not so much in terms of what the authorities are, but whether or not are they practically enforceable. The legal authorities are especially problematic for surge capacities.

For large points of population movement, serious personnel resources are required which will tax surge capacity. While quarantine surge does not need as much real estate and treatment/specialist capacity as isolation, the span of control requires more personnel to control the quarantine area, especially in crisis situations.

There are many unknowns in TTP and little training for the pediatrics issues of quarantine. Especially given how the adult/child ratio is skewed, there are far fewer people who can bear

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<sup>40</sup> Isolation and Quarantine were originally considered under one functional area, but workshop participants felt it was important to split them up as they had their own distinct attributes. However, in certain areas, many of the issues are similar.

responsibilities and carry out TTP. To date, we have never been in that type of situation and therefore do not fully know the issues.

Control issues are greater with quarantine than isolation—isolation is in an inherently controlled environment.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

This is mainly a contagious biological agent issue. Geographical issues do impact quarantine. Jurisdictional boundaries will complicate quarantine issues, and ports/airports/points of entry that have large population movements will also complicate quarantine.

### **5.1.9: Post-Emergency & Acute Hospital Medicine/Health Care**

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**Definition:** *The ability to provide treatment to pediatric mass casualty incident victims in the hospital.*

#### *Unique Requirements and Challenges*

**There are varied levels of personnel needed to manage these pediatric crises as well as different types of equipment and challenges to overcome.**

**Specialized equipment and resources are needed that are pediatric specialized.** These include: I.V. pumps, I.V. needles, Broselow tapes, crash carts, respirators, EKG, surgical instruments, heart monitors, tubing for tracheas, child life support, entertainment equipment, as well as pediatricians, pediatric specialists, mental health counselors, parents involved in care, and communication between doctors and parents.

**While facilities may have a pediatrics capability, generally speaking, in facilities without Pediatric Intensive Care Units (PICUs) there are problems with pediatric equipment and resources.** It should also be noted that even hospitals with PICUs may have some of these problems, but generally, a PICU is a real divider of capability. PICUs are also divided by levels of capability. Not all PICUs have Level I resources, but children can be stabilized and transferred from Level II PICUs. There is also debate on whether children have higher survival rates at pediatric trauma centers than regular adult ones. The bottom line is that more resources and equipment are generally available in pediatric emergency, trauma, and intensive care

facilities, but that these very specialized facilities are fewer in number. However, some adult trauma centers have additional pediatric specialties that also enhance capability in this field.

**Appropriately trained staff with pediatric rotations or specialties can be lacking.** There are generally fewer pediatricians, which can be problematic when there is a large influx of pediatric patients into a non-specialized care facility. The problem becomes more apparent when looking for pediatric sub-specialists such as pediatric intensivists or Emergency Department doctors with some pediatric training. Nurses and nurse practitioners also may not have the requisite training or certifications to deal with pediatrics. A telling question would be how many of the nursing staff at any given hospital is PALS certified. While some nurses may in fact do a pediatric rotation, they often rotate back to adult shifts, losing some of their skill sets.

**There is a lack of CBRNE training aimed at the special needs of the pediatric population.** Decontamination and dealing with the worried-well, for example, may have different implications for hospital staff when dealing with the pediatric population.

**Children may require more transportation options.** While some children may be brought in by both responders and parents, children may need to be transported to other hospitals or care centers that have more pediatric specialties. Many regions simply do not have the specialized facilities to treat pediatrics and must transport children to another location. Even in an area where there are some pediatric capabilities, it is likely that overburdening of capacity will require the transport of children to alternate locations.

**Different age groups, cultures, and languages of both children and parent/guardian, and possible documentation issues all can have an impact on children receiving the appropriate care.** In a terrorist incident or a major disaster, which will in itself create significant fear and confusion, practitioners in health care facilities need to have the training and understanding to deal with children and their parents/guardians from different backgrounds. In cases where there are illegal or undocumented children, information needs to be released to direct them where to go to seek treatment.

### Current Capabilities

In any given amount of time, there is less surge capacity for children as compared to adults. Generally, the capability in this area for mass casualties is minimal and dependent on community size.

There are parent-centered committees at hospitals and family centered care. Child victims bring additional people into health centers, such as parents and family, that must be handled.

Some hospitals have more choices concerning parental presence and reach out to child and family. Others do not have enough people trained to deal with families.

Certain states allow for emergency credentialing in a crisis. In these states, if there is a shortage of specialists, those from outside areas can come in to help without going through lengthy certifications and transfer of credentials, but this ability varies by location.

There are medical centers with PICUs and pediatric trauma centers which have the specialization and resources needed to deal with a large influx of pediatric patients. The problem is that there may not be enough of such facilities, as current availability tends to reflect the medical needs of the community at large.

While there are pediatric disaster preparedness courses in existence, or courses such as PALS (Pediatric Advanced Life Support), they may not be widely known nor widely required for certification. Most general courses tend to have very small components focusing on pediatrics. The educational material is mostly there, it is merely a matter of implementing and building upon it.

### Goals

- More comprehensive system for mobility of credentials so that pediatric specialists and medical personnel with pediatric training can be brought in to supplement existing staff.
- Capability in this area should be more evenly distributed rather than clumped together geographically.
- Increase pediatric training with nurse practitioners.
- Need to have more people available who are trained to deal with families.
- Need to increase the number of people trained on PALS, and need to have more instructors.

### Gaps/Gapfillers

There are currently not enough Emergency Department doctors trained in pediatrics, and specific pediatric CBRNE training for most healthcare and medical personnel is lacking.

The nursing gap can be improved by increasing the amount of specialized pediatric nurses with experience and training. This can also be applied to Physician Assistants and Nurse Practitioners.

DMAT teams with pediatric specialties can also come in to augment capability.

Transportation issues are a gap that could be overwhelming in a crisis.

Multi-disciplinary training in which everyone comes together and shares information might be another method to improve capability.

Case managers, clinical social workers, care coordinators, and appropriate intermediaries can provide a link between current situation and the parent/guardian/family.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

There are differences in capability across geographic regions as major metropolitan areas are more likely to have pediatric specialized facilities or a large number of hospitals or medical centers that are sizeable enough to have some sort of pediatric specialization. There may also be significant differences within a region between medical centers—hospitals with PICUs, hospitals without PICUs, and acute care centers—as well as within these areas—some may not have burn units, for example.

#### **5.1.10: Public Affairs**

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**Definition:** *The ability to have processes, procedures, and systems in place to communicate accurate and timely information and directives about an incident to parent/guardian, media, and the general population.*

#### *Unique Requirements and Challenges*

**There is a need for a tiered public affairs system that is responsive to the victims, the families of victims, the general public and the nation.** It is simply not efficient nor ethical to release news as a blanket statement without first informing the family of details about the status of their children. They do not need to hear information from the media, which may or may not be correct, without some sort of official update or corroboration. This can lead to confusion and additional emotional stress. On the other hand, public officials still need to respond to the media, silence will be met with speculation and interpretation of events, which may further worry families of victims.

**The media can be a positive public affairs tool and partner in several different ways.** There are ways to educate and control the media. It can be used to educate the public about health education as a proactive stance, to communicate what is going on as a situation is unfolding, and to provide information such as telephone numbers where people can get further information. This is where the media and the public affairs mechanism of the particular responder agency can work together. The media can also be responsive to educational campaigns. For example, the media had been a conduit to the suicide contagion. However, once the media was educated on how to effectively deal with this subject, the number of suicides decreased.

**It should always be remembered that the media is not there to convey a particular position and has its own motivations for reporting information.** It should not be assumed that the media necessarily cares about the situation. At the end of the day, they are a business concerned about ratings and their competition. The media can also distort the news.

**Conveying accurate and timely information can be more difficult with children because of victim identification.** This is a much broader and difficult area when it concerns children as they could be unconscious and responders still may not know who they are.

**Children must be reunited with parent/guardian as soon as possible and, in the interim, there is a need for someone to act *in loco parentis*.** Not knowing the status or location of their children will result in a glut of parents seeking information. Not being able to provide that information in a timely manner or having confusing or inaccurate information will only overburden the public information system.

**Terrorists also use the media to spread the terror. If messaging to the media is simple, clear and consistent, the media can be a conduit of communication instead of a tool of terror.**

**It is important that one entity be the “voice” of public affairs.** Although multiple agencies may be working together, the situation can be less confusing for public information flow if competing voices giving out information are eliminated. Parents and families need one solid, official source that they can rely on for information; otherwise, the situation will become too confusing.

**Pre-communication is almost as important as communication in a crisis.** It is important to let people know what they will hear, and why they may be hearing it, so that they will understand the message later.

### Current Capabilities

Many organizations currently have a Point of Contact to deal with the media.

The public media infrastructure itself can be used in public affairs.

Some entities such as larger school districts have communications departments built on existing strengths and relationships with the media.

There are organizations that routinely provide information in a national disaster as part of their mission, such as the Red Cross.

Preparing well-thought out statements on different scenarios ahead of time or having one unified face of leadership is a useful way to convey information. For example, after the attack on New York City on September 11<sup>th</sup>, Mayor Guiliani made reassuring statements to the public. In the DC sniper case, Chief Moose was the unifying face in the investigation.

There are programs/models out there that teach how to communicate with families. However, these models have been infrequently leveraged to train a cadre of people because of funding issues or, more specifically, a lack of funding. Funding has tended to go to other areas in emergency response rather than this type of training with children.

Schools and community entities already give out public affairs pre-information on such issues such as lock-downs, fires, carbon monoxide poisoning, and geographic weather information.

The Federal Government already has “FEMA for Kids”, and DHS is about to launch ”ReadyKids” to prepare children for both disasters and terrorist acts.

### Goals

- Schools should increase training on how to interact with the media.
- Informational centers need to be established near the site of an incident.
- One point agency needs to be the primary communicator. The different agencies cannot be giving out different information—that would only cause more harm.
- In order to work with the media in a crisis, a framework for the relationship must be built beforehand.
- Offering sound bites is useful to avoid having comments edited erroneously.
- The community should be educated on how to communicate to the media in a disaster.



- If possible, there should only be one conduit to the media and no one besides the spokesperson would be permitted to talk to the media. (It should be noted that this would not work for all sections of the community.)
- Establish two separate outlets for communications. One to the general media to convey to the public what happened and name hospitals if necessary, and another one to coordinate what hospitals victims are going to and provide that information specifically to parents.
- Establish a private media entity that deals with parents/guardians to get them information in a casualty situation. This does not currently exist. However, there are organizations that do this as a general response during national disaster situations, such as the Red Cross.
- Coordination must be at the ICS level so that information given out is accurate.
- Establish a community message board (possibly online) so families can find immediate information and answers to their questions.

### Gaps/Gapfillers

HIPAA is often poorly understood, which can cloud the release of information. Hospitals especially are still trying to figure out the intricacies of the act. This can make it difficult to share information, and during a disaster it is a bad time to be debating what information to release. (See Legal/Authorities Section for more information on HIPAA)

A media entity that deals specifically with parents/guardians to give them information in a casualty situation does not currently exist in this specific format (for terror attacks and for parents/guardians regarding their children.)

Build upon what the Red Cross already does. Add a pediatric affairs unit that deals with children during terrorist attacks. The Red Cross would actually come to the site and be the go to information center at the scene of the incident. Therefore, this would not be a new system, but a new entity within a system that already exists. This system would not give away any HIPAA sensitive material (medical information, etc) but just location information on where victims have been taken.

Public training can perhaps alleviate some of the pressures of a later public affairs campaign. For example, parents and families could receive information during wellness visits to the doctor's office, although some doctors may argue they have enough information to give out in a short timeframe.

Potential public-private partnerships with health care organizations could also be leveraged to share information and educate the public.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

Workshop participants did not specify any significant differences in capability regarding operational environments. Some participants felt that geography does play a role in capability as, for example, rural areas would have less capability since localized radio and television stations may not have the same capability as a big city station, and not everyone has access to cable. Others felt that it really did not matter, as the media really is a national entity and that issues can quickly become national or international in scope. On the other hand, different local entities may have varying capabilities to conduct public affairs or to deal with the media.

#### **5.1.11: Mental Health Care (Urgent)**

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**Definition:** *The ability to prevent, recognize, mitigate, and treat specific to their different age groups the immediate symptoms of psychological /emotional distress in children involved in a traumatic incident, as well as treat immediate symptoms in parents and responders dealing with child victims.*

##### *Unique Requirements and Challenges*

**There is enough difference between short-term and long-term mental health needs to necessitate each to be broken out separately; there are different systems in place to deal with each.**

**Children, parents/families, and responders may have different mental health needs.** What may be upsetting for a family member or parent is not necessarily upsetting for a child. Conversely, children may not have the mental wherewithal to process and deal with a traumatic event the way an adult may be able to and therefore may suffer more.

**The type of mental health intervention needed depends on time and length of exposure (direct or indirect), type of incident, and child's history.** It should be remembered that children do not always have to witness something directly to be traumatized; recurrent images on television, for example, can be upsetting.

**Children’s cognitive and developmental levels, age, cultural and religious background can all impact on their socio-emotional responses.**

**It is not always possible to honor parents’ wishes in a traumatic situation.** Sometimes parents do not want information passed on to very young children, but that can put teachers and other caregivers in a bind. There needs to be an understanding of the expectations of parents when something happens.

**Parents want to be with their children and this can impact mental health well-being.** During a major incident, while it may be unavoidable in some cases that children are separated from adults, especially if there is some sort of contamination, most children, especially younger children, feel more secure emotionally when their parents are with them. If they are not, then they may be more susceptible to mental health trauma.

**While first responders need to focus their training and real-life efforts on the task at hand, there needs to be some sort of balance between practicality and dealing with children and their emotions.** A first responder does not have time for psychology with children. However, they can be trained to provide information in a different way to a child that might be less alarming to their mental state. First responders have been asking for this type of training.

### Current Capabilities

There are simple procedures that can help relieve stress to the victims such as making phone calls to families—mental health professionals can help do this as well. Diagnostic checklists can also be used as an assessment tool, and items that give a connection to the child can also be used to soothe and comfort.

Employee assistance programs are starting to address issues in responder stress. Trauma debriefings for first responders are available, but not everyone wants to talk about their emotions right away. Also, there is a need for suitable people to conduct de-briefings.

The United States Department of Health and Human Services Substance Abuse and Mental Health Services Administration’s (DHHS/SAMHSA) has publications such as “A Guide to Managing Stress in Crisis Response Professions.”

There are currently not enough trained specialists such as child psychologists and counselors in this field.

### Goals

- The formation of a pediatric specific mental health DMAT or DMAT sub-group could be very useful in a crisis surge situation.
- Pediatric doctors and psychologists need to communicate directly with parents/guardians since they are the continuity of care.
- Parents/guardians and teachers need to set up a communication plan so everyone knows the protocol on communicating the incident.
- Need an understanding of the expectation of parents when an incident occurs.
- Institutions need to come up with various coping plans/advice for the parents on what to do when the child is out of the immediate crisis or has gone home (e.g., keeping routines.)
- Have all health care professionals and their families receive prophylaxis. It is important that healthcare workers that are also parents not have to choose between their families and work. Psychologically, they may perform better if they know that their children are safe. For example, in an Israeli hospital after a suspected chemical attack only 30-40% of the health care workers showed up.
- Have a rotation plan in place for workers as they will be needed over an extended period of time to provide care.
- Need to empower teachers with knowledge on how to deal with children in a crisis, as they may be the first responder in an event.
- Make information available that is both timely and accurate for parents. Misinformation can only add to mental trauma.
- Have a communications plan in place for the community so they know what services are available to them and therefore which can be utilized.

### Gaps/Gapfillers

More specialized training can be given to healthcare providers and those personnel who have regular interaction with children as a stop-gap measure to compensate for the shortfall in pediatric mental health and disaster specialists.

First responders need to learn how to provide information to children. That first encounter (psychological first aid triage) determines much for the child's well being. These are mostly simple behaviors and communication techniques.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

No significant differences exist.

### **5.1.12: Mental Health Care (Long-Term)**

**Definition:** The ability to prevent, recognize, mitigate, and treat specific to their different age groups the delayed symptoms of psychological/emotional distress in children involved in a traumatic incident.

#### *Unique Requirements and Challenges*

Language, culture, costs and availability can be barriers to effective long-term mental health needs of children and families in the community.

**Stigma about seeking mental health care can prevent the parent/guardian from allowing the child to get help.** Public education about the value of seeking psychiatric treatment needs to be improved.

**Under normal circumstances, there is already a treatment shortage, only 20 % of children gain access to the mental health care they need.** There is also a very severe shortage of child psychologists. Moreover, the costs of long-term care can also prohibit access.

**There is not enough understanding of how to handle mass mental health needs.** There is not enough coping skills curriculum, and it is an area in which the community needs to be involved.

**Parents, teachers and pediatricians need to be able to recognize the signs of what constitutes a delayed mental health reaction.**

#### *Current Capabilities*

Diagnostic testing can aid in the ability to recognize that children are having problems.

At the time of an incident, such as a school shooting or car accident, communities can rush in grief counselors, etc, but the situation becomes more complex, and the capability weaker, with larger incidents or on a sustained longer-term basis.

There are handbooks/guides dealing with post-traumatic events that can be used throughout different communities. For example, the Children’s National Medical Center’s “The Handbook of Frequently Asked Questions Following Traumatic Events: Violence Disasters, or Terrorism” lays out a wide variety of information to include: recognizing signs of stress in children, recognizing and coping stages of grief in children, ways children of different ages deal with stress, explaining how to identify children who need help and are at risk, and answering common questions both children and adults ask about terrorism and other acts of violence and disaster. The United States Department of Health and Human Services Substance Abuse and Mental Health Services Administration’s (DHHS/SAMHSA) National Mental Health Information Center and the American Red Cross have a variety of information sheets on Emergency Mental Health and Traumatic Stress with tips for talking about disasters for teachers, children and adolescents, adults, and families.<sup>41</sup> It is also likely that local health and social services departments may produce similar material.

### Goals

- Have referral sources after the initial shock has worn off (e.g., Pamphlets).
- In addition to therapy, offer skill building in children so they have ways to express themselves and function in daily life, enhancing their resiliency. There are non-traditional ways to build skills.
- Need to empower communities and families with the skills to sustain the more basic mental health needs of children over the long-term as there are simply not enough mental health providers in a mass casualty situation.
- Responders need to be taught how to deal with children to avoid later trauma.

### Gaps/Gapfillers

A major gap is access to mental health care and any requisite pharmaceuticals. Mental health care can be costly and insurance companies may only reimburse up to a certain amount.

While federal crisis counseling grants maybe available when there is a disaster, after a certain amount of time, either the programs are shut down or funding is curtailed. Unfortunately, these programs are not usually available for the long-term despite being still needed. Community and government need to provide these longer-term services as a continuity effort.

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<sup>41</sup> See <http://www.bt.cdc.gov/mentalhealth/> for a listing of publications.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

No significant differences exist.

### **5.1.13: Mortuary Affairs for Children in Mass Casualties**

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**Definition:** *The ability to collect, transport, decontaminate, and identify (to include forensic identification) pediatric fatalities in a large-scale incident.*

#### *Unique Requirements and Challenges*

**Mortuary issues in general are difficult to deal with and can be exacerbated by any perceived lack of sensibility or preparation.** Adding children to the mix only makes the sensitivity of the issue more acute.

**Most pressing challenge would be rapid identification of child, which can be difficult in a mass casualty situation as responders' priorities are to move quickly and save as many lives as possible.** Even in small-scale incidents, it may take some time to backtrack through records making identification problematic. In addition, the child may not be easily identifiable because of injuries, a lack of identification documents (which is common as children do not normally carry identification) or there is no one at the scene who can physically confirm identification. In an emergency situation with multiple victims, the focus would be on saving the living and identification would have to wait until later.

**Management of adults in a mortuary situation is clear, but methods and processes for a child are probably not as well known or would rely on adult protocols.** For example, pathology is very different for adults than for children and is not done on children on a regular basis. Timelines, roadmaps and procedures need to be very carefully explained to parents so they have some understanding of what is happening. Unclear, contradictory or no information at all will lead to even more emotional distress.

**Transportation and storage of mass casualties, especially when children are involved, can be even more traumatic if not handled with sensitivity.** Most hospitals only have a limited capacity to store bodies, which could quickly be surpassed in a crisis. For example, there were 168 victims in Oklahoma City Murrah Federal Building bombing, 19 of which were children. Many were stored in refrigerated trucks before the coroner could get to them.

In Hurricane Katrina, bodies were left on the street or never identified. This would be even more unacceptable if children were involved. Parents need to know where their children are located and be given the right information. Small courtesies such as placing a child in a blanket carried by an adult rather than a body bag or on an adult gurney could also help with dealing with the trauma and emotional crisis. Even something like developing a pediatric sized carrier to transport deceased children would be useful.

**There are cultural and religious issues as to how a child's body is handled that need to be known and followed.** It is important to communicate information that respects the dignity of that child to the family.

**Closure is also needed for the parent/guardian if at all possible, for example, being allowed to hold the child's body.** Fragments and bodies need to be identified so that everything in the casket belongs to the victim.

**It will always be a difficult choice as to who should be identified first in a mass casualty situation. Should it be adults or children?** It is less acceptable to extend timelines for identifying and then releasing a child's body than for an adult's. However, others who have lost a spouse or other adult loved one want that information and the body released just as much and so prioritization of either group may cause more emotional distress.

**When working with children, work hours must be regulated.** Working long hours in this context of badly injured or deceased children is just too traumatizing. For example, the psychological impact would be profound if responders had to make decisions quickly as to which children to triage as unsalvageable versus which children to treat. Responders can see a lot of injury and death in their work, but have often reported that dealing with children in this context is even harder. Add a mass casualty situation to the mix and it is likely their emotional distress would further increase.

**There is always political pressure to wrap up a crisis.** This trickles down to mortuary affairs, and it would be likely that there would be pressures to deal with pediatric victims in a timely and delicate manner, especially for areas like autopsies.

### Current Capabilities

DMORT teams exist, but pediatric DMORTs are not currently available.

Many pathologists do not have proper training or experience with children, and large-scale



events with children are sure to be taxing.

Basic technologies such as photos, DNA, fingerprints can be used to identify both children and adults.

Radio Frequency Identification (RFID) tags were injected into cadavers in the aftermath of Hurricane Katrina in Mississippi to help keep track of bodies and their distinguishing features for later identification and return. However, this system is sure to have controversy associated with it due to both religious and civil liberties/privacy concerns.<sup>42</sup>

Mass burials can be conducted to prevent disease, yet the US is very behind in this area. After the Tsunami in South East Asia, some guidelines were established by the government, but there is question as to whether the US can actually implement such a system. Workshop participants felt that if the idea of mass burial is communicated properly, then the US can handle it, but there needs to be properly established protocols in place. US law is also unclear as to whether you can bury children with radioactive emission fragments in their body if they were to cause a problem later. This is a very difficult area as the government has no experience on these types of issues on the mass casualty scale, and it is likely any approaches would be generalized and not differentiated between children and adults.

### Goals

- There needs to be an identification system and a bare minimum protocol and training to preserve evidence of identification at the scene of dead and injured children.
- Institute a procedure for people who are not forensically trained to preserve evidence that could possibly identify the child (e.g., Firefighters, other responders at the scene.)
- Institute Pediatric DMORT teams or detachable sub-groups.
- Include in preparation and training of responders the potential for exposure to mass pediatric victims.
- Provide debriefing after an incident for responders and providers who may be exposed to deceased children.
- Communicate information properly and respectfully to the families. A large amount of training is needed in this area.
- Increase training for pathologists to deal with children.
- Parents need a roadmap/pamphlet of what to expect from the beginning to the end. (This could include information such as phone numbers and timelines of what has

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<sup>42</sup> For more information on the system that was used in Harrison County, Mississippi, please see [http://news.com.com/RF-IDing+the+dead/2008-1006\\_3-6017623.html?tag=sas.email](http://news.com.com/RF-IDing+the+dead/2008-1006_3-6017623.html?tag=sas.email)

to occur after a child dies in a mass casualty disaster, explaining forensics, and what comes after the autopsy, etc.).

- In order to ensure proper counseling, the religious and the mortuary service communities need to be educated on mass burials and their relation to religious needs and beliefs.
- Need to establish communication protocols on a mass burial situation in the United States. Perhaps a separate children's mass burial apart from the adults might help assuage some of the angst associated with the mass burial.
- Representatives from various religious communities need to be active in the mass burial protocol.
- Invite a diverse group of people to create these mortuary disaster plans.
- There needs to be specific people trained and assigned to deal with parents and the media in the event of child fatalities. These include officials with protocols to release the news, and psychologists to counsel the family at the time the news is received.

### Gaps/Gapfillers

There is a need for more understanding and communications with different religious communities over mortuary and burial customs.

All mortuary affairs for a contaminated body in a nuclear or radiological incident need significant improvement for both adults and children. Legal issues are confusing in this area in regards to the ability and rights to bury a body.

It is likely that CBRN experts will not be on the scene for hours, therefore pathologists and other personnel must be trained to address these situations before experts arrive.

In a mass casualty event, it is possible that people will be moved to morgues and hospital facilities in meat trucks; this area needs critical reform especially when dealing with child victims.

While there are some protocols for mass burials of animals by the CDC, and the World Health Organization (WHO) has guidelines for mass burials, it is unknown if these would be sufficient for US needs.

The Aviation Disaster Family Assistance Act of 1996 has a process requiring the National Transportation Safety Board, air carriers, and the American Red Cross provide a family assistance center for families dealing/coping with a disaster to include the timely identification of victims and their belongings. Perhaps a similar template could be used in other disaster situations and tailored for children.

*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

There are significant differences across operational environments. There are minimal guidelines on CBRN for pathology. No one really knows what to do with the nuclear contamination of a body. There are minimum guidelines for mortuary affairs with biological contamination as well. Capacity also varies for mortuary affairs between large cities and rural areas.

#### **5.1.14: Decontamination**

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**Definition:** *The ability to identify, and remove or reduce to a safe level contaminants to which children are exposed or by which they are affected, allowing for safe transition from the hot- to the cold-zone.*

##### *Unique Requirements and Challenges*

**Children have physiological and psychological differences that should be considered in the decontamination process.** Because of their size, their ability to tolerate decontamination processes, ability to fit into decontamination clothing (mostly available is adult-size Tyvex), and tolerance for hypothermia may be different from that of adults. Some children may also be immobile and need to be carried through contaminated zones by protected personnel. Decontamination of children can also be traumatic because of anxiety, modesty and separation from parents.

**Timelines are usually compressed for pediatrics because of vulnerabilities based on toxic exposure rates, and susceptibility to agents.** For example, children can react more acutely to organo-phosphates, requiring faster decontamination timelines or prioritization in decontamination lines.

**Communication and direction is more difficult with younger or special-needs children.** There is a high granularity of differences from age group to age group—a large number of able adults are needed to herd younger children through a decontamination line.

**A contaminated child is more likely to be a multiplier of casualties than a contaminated adult.** They are harder to manage/herd and they tend to run off. Also, out of instinct to protect, people are more likely to treat them, pick them up, touch them, etc., while still contaminated.

**Parents will tend to be skeptical that an environment is sufficiently clean for their children.**

**Materials and measurements commonly used for adults may require some “tweaking” for children.** Water pressure on gross decontamination/deluge guns will be lighter for children. Special decontamination materials (e.g., dry decon, acid/base decon) may require different dilutions/dosages, or may require water instead.

**Most equipment is geared towards adult sizes and not children.** Most clothing is adult sized, scrub brushes and other equipment is not always applicable to small children; masks may not fit (to prevent inhalation while under decontamination), and training equipment (e.g., training dolls) are usually adult mannequins. Scanning for clean may be a challenge due to the configuration, size, etc., of the scanning equipment, instruments, etc., and the difficulty of making this work with smaller children. Specialized equipment (medical, mobility, etc.) for special-needs children will present unique decontamination challenges.

### Current Capabilities

Current planning procedures are simply to make contaminated victim as clean as possible as quickly as possible and to have monitoring equipment at the other end of the process to facilitate this.

Although many planning issues for decontamination equipment, resources and TTP, etc. are generally well thought out and established, the underlying assumptions are based on adults.

Currently, children are largely treated like adults in the decontamination process, with few specialized TTPs or equipment tailored to unique pediatrics challenges.

Firefighters may conduct familiarization efforts with schools (e.g., wear full SCBA/turnout gear in assemblies) to acclimate the school audience, but there is currently no version of this being done with decontamination personnel and equipment.

Decontamination units can also be set up for self-referring patients at hospitals as an option, and this capability would also be applicable for children brought in by parents.

Public health authorities are sufficient to enable responders to direct decontamination in the interest of public safety. However, in the case of juveniles (~12-15 yrs old) the authorities to force decontamination are not as clear, but it is likely the responder will choose to decontaminate in the interest of public safety and let the lawyers sort it out later.

Where it is relevant, data and information management is available, but in some cases it is not needed. All pediatric patients will be referred to a hospital, where they will be tracked.

### Goals

- TTP and guidelines for emergency responders should be developed to deal with the unique decontamination issues for pediatrics.
- Guidelines should also be developed on how to use caregivers/teachers/etc., in the decontamination process (e.g., if a teacher or parent is also contaminated, they take the child through).
- Training and exercises/drills with pediatric issues should be developed and conducted, using dolls or even real children (above 8 years of age). This would also help acclimate children to decontamination personnel and equipment.
- Equipment should be made available that is both size- and age-appropriate for children.

### Gaps and Gapfillers

The majority of gaps in this area are primarily in TTP, surge capacity, and, to some extent, equipment.

Gapfillers to improve this function would include training for emergency responders in unique decontamination issues, TTPs, etc. and plans that use pediatric victims as baseline assumptions.

There may be a lack of clarity on legal issues. As a result, there is a need for clear legal guidance on the liabilities of not decontaminating, the process for decontamination, and the authority to force resisting juveniles to undergo decontamination in the interest of public safety.

### Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?

Children can be affected more quickly and differently by CBRN agents than adults, making faster and thorough decontamination crucial. Climate can also be a factor when dealing with children. Cold weather decontamination and hypothermia are significant dangers with children.

### 5.1.15: Mass Prophylaxis of Children

**Definition:** *The ability during a threat, crisis or contingency to provide, on a large scale, asymptomatic patients (exposed and non-exposed)<sup>43</sup> with preventive or protective treatment (topical, oral, or vaccination) against biological agents, chemicals, or radiological sources that is commensurate with pediatric physiology. Other functional areas consider pharmaceutical treatment outside of prophylaxis.*

#### Unique Requirements and Challenges

**Pharmaceutical guidelines and stockpiles are not well established for pediatrics.** Children are not simply “adult x ½.” Indications, dosages, trials, and timelines (for treatment and medication) are unique to the physiologies and chemistries of children, and requirements can vary significantly across different ages, weights, height/length, etc. Thus, prophylaxis for children against dangerous pathogens or chemical agents requires precision with dosages and measurements. Current kits are designed for adults, and their equipment (e.g., needles) and doses (e.g., side effects) might injure small children. Furthermore, even when appropriate dosages are known, most stockpiles contain drugs in adult dosages. Even assuming responders have appropriate measuring equipment and knowledge of pediatric requirements, the physical creation of appropriate dose formulations for children (of specific age, weight, etc.) in the field takes precious time.

**Children often dislike or are unable to tolerate the act of physically swallowing a pill, it would be advantageous to have alternate formulations available.** Crushing pills and suspending them in solution is often a satisfactory alternative, but care must be taken to provide a solution that is palatable to children. As an example, juices are often used for this purpose, but care must be taken to insure that the juice, or any other solution, is able to remain on the shelf without becoming stale or contaminated by bacteria. Solutions to this problem may come in the form of temperature control or the use of other types of liquid that are palatable and have a longer shelf life.

**Parental consent will be required or assumed for some plans and capabilities.** Children lack legal capacity for consent and, as with most other medical processes, administering prophylaxis will require parental consent. Responders have plans in place to administer prophylaxis, but these plans assume that authorities have obtained parental consent for their children to receive treatment. In times of crisis, however, particularly at schools or similar facilities, parental consent may be difficult to obtain. When consent is uncertain or unavailable during operations, responders need a contingency plan, supported by clear legal authorities with respect to the

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<sup>43</sup> Note that this section focuses on asymptomatic patients. Treatment for symptomatic patients is discussed in other functional areas and their respective capability areas (especially Pharmaceuticals).

extent, and process, for prophylaxis on children without parental consent. Responders, in the interest of public safety, may assume parental consent, but actual consent may be legally ambiguous. Such a supposition has the potential to infringe on several individual rights, e.g., upon religious beliefs of the family.

**Timelines are compressed.** In the event of crisis, the time to act and respond to pediatric victims is often much shorter than with adult victims based on differences in physiology. Children are fragile and may succumb to physiological assaults more quickly than adults. Time to administer prophylaxis might be shorter, not only because of the sensitivity of child physiology and vulnerability to pathogens (and thus shorter amount of time a responder has to administer the prophylactic agent), but because of the dynamics of congregated children in crisis, parents who will seek to claim and evacuate their individual children, etc. This holds implications for strategy, planning, distribution, and stockpiling for mass prophylaxis.

### Goals

- Contingency plans are needed for when parental consent is unavailable or uncertain.
- More suspension doses, with increased shelf life are needed for the Strategic National Stockpile.
- Responders need Mark I kits, and other antidotes to organo-phosphate chemical hazards that are appropriate for children in terms of dosage, length and gauge of needles, proximity to child congregate centers, etc.

### Current Capabilities

Current capabilities for mass prophylaxis are marginal for all capability areas except legal authorities. Responders barely have any legal capability to conduct mass prophylaxis, due to the uncertainty of responders' authorities for prophylaxis without explicit parental consent.<sup>44</sup> Legal limitations are thus oriented around what can be done without consent or parental guidance, especially for administering medicine and handling contagious children. To the extent model codes exist, they do not address the specific and unique needs of pediatric response. Even where legal authorities exist, many responders are unaware of them, and most authorities have never been tested in court.

Currently, much of the stockpiled prophylaxis is for use against chemical threats. A recent development is the Strategic National Stockpile's atropines and potassium iodide suspension

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<sup>44</sup> Compounding this issue is the fact that many responders will act in the best interests of public safety and the victim, if legal authority is uncertain.



for pediatrics. Emergency medical providers regularly use intravenous therapy for children; this also can be used in a contaminated environment.

Limitations of pediatric equipment are usually oriented around quantity and shelf life. However, pediatrics capabilities are limited for several non-technological reasons. One is our perception of the threat, or lack thereof (i.e., terrorists who would target children). For example, Israel has more advanced capabilities because of the persistent and proximate threat, an ingrained culture of national defense that extends into the population, the size of the population, close geographic distances, and lighter regulatory regimes. Conversely, the US is a large country in terms of geography and population, has a different culture of homeland security and has complicated regulatory regimes. This would make it far more difficult to enhance capability than a smaller country where the threat is more prevalent.

Regulatory regimes slow development and deployment of pharmaceuticals. This has a correlative effect on development and deployment of capabilities for mass prophylaxis. Finally, responders *and* leaders (especially political leadership) simply have not trained or exercised enough to gain experience and understanding of the unique issues that arise in response to pediatric victims. Jurisdictions with experience or resources are better prepared.

The capabilities for pharmaceuticals and surge capacity are essentially the same for mass prophylaxis—this functional area assumes surge requirements at the outset. There is no surge capacity for suspension, but there is strong surge capacity for pills. Limitations on the data and information management capability for mass prophylaxis of children are not technical, but rather organizational and policy-based, and do not differ substantially from data and information management issues in responding to adult victims.

### Gaps/Gapfillers

Training is a high-payoff gapfiller for both legal issues and improving pharmaceutical administration for children. A critical gap could be filled relatively quickly simply by clarifying legal authorities that exist, identifying requirements for new or modified legal authorities, and training emergency responders on legal issues and authorities. Training on how to extend the utility and shelf life of stockpiles, compounding and mixing at sites, crushing pills for solution for easier administration, etc, might modestly improve capability in the near-term.



*Are there significant differences across operational environments (CBRNE) or geography (metropolitan versus rural, climate)?*

Chemical threats currently pose a greater challenge than biological threats. Because of the more immediate nature of chemical effects, the lesser likelihood of proximate prophylaxis, and the aforementioned shorter timelines for responding to pediatric victims, chemical threats pose a greater challenge than biological threats in planning stockpiles, and maintaining and administering prophylaxis against chemical attacks.<sup>45</sup>

### **5.1.16: Current Capability Assessment**

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After each functional area was explored, workshop participants were asked to give an assessment of each capability area for that function by a simple majority vote. As a visual tool at each intersection in the matrix shown on the next page (*Figure 2*), participants were asked, “does this capability exist today as defined by the goals?” The results of this assessment are expressed in the matrix by assigning a color: **green** if the functional capability generally exists today although there may be issues that need to be addressed, but none that prevent mission success; **yellow** if the capability exists to a limited extent, and there are a number of issues that need to be addressed to ensure mission success; and **red** if the capability virtually does not exist, and there are a number of issues that could prevent mission success. A **gray** color is used when the capability area is not applicable.

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<sup>45</sup> Note that radiological threats (e.g., “dirty bombs”) may be considered a combination of high-explosive and chemical threats, given the primary explosive for dissemination, and the effects of the radiological materials. Thus, response to radiological effects of dirty bombs would involve many of the same challenges as responding to chemical threats.

*Figure 2*

<b>CAPABILITY AREAS</b>						
<b>FUNCTIONAL AREAS</b>	Equipment/ Resource Management	Legal/Authorities	Training, Techniques and Procedures	Pharmaceuticals (Trials, Dosages etc.)	Surge Capacity	Data Collection and Information Management
Emergency Medicine	Yellow	Green	Yellow	Yellow	Red	Yellow
Emergency Medical Services/Triage	Yellow	Green	Red	Yellow	Yellow	Yellow
Awareness: Prevention and Pre-emption	Red	Red	Red	Grey	Red	Red
Crisis Management	Red	Red	Red	Yellow	Red	Red
Incident Management	Yellow	Green	Red	Grey	Yellow	Yellow
Early Warning: Epi-Surveillance	Yellow	Green	Red	Grey	Yellow	Yellow
Isolation	Yellow	Green	Yellow	Grey	Red	Yellow
Quarantine	Yellow	Yellow	Yellow	Grey	Red	Yellow
Post-Emergency and Acute Hospital Medicine/ Health Care	Yellow	Yellow	Yellow	Yellow	Red	Yellow
Public Affairs	Yellow	Yellow	Red	Grey	Red	Red
Mental Health Care (Urgent)	Yellow	Red	Red	Grey	Red	Red
Mental Health Care (Long-Term)	Yellow	Yellow	Red	Yellow	Red	Yellow
Mortuary Affairs for Children in Mass Casualties	Red	Yellow	Yellow	Grey	Red	Yellow
Decontamination	Green	Yellow	Yellow	Grey	Yellow	Green
Mass Prophylaxis of Children	Yellow	Red	Yellow	Yellow	Yellow	Yellow

## Section 6: Conclusion

Pediatric emergency preparedness and response has many different facets and many different stakeholders. Capabilities where they exist tend to be diffused around the nation, and/or not distilled from adult oriented capabilities. Under certain circumstances, this generalized approach may work, while in different circumstances, a one size fit all approach is simply not appropriate as pediatric issues are often *sui generis*. It is this unique element that differentiates how well prepared the United States is to respond to major terrorist incident or disaster involving children. Solutions to improve pediatric emergency preparation and response capability can build upon existing capabilities and also are balanced between materiel and non-materiel improvements. Most technological improvements can be made in pharmaceuticals and equipment, but improving pediatric response also depends on improved training, and planning and integrating the pediatric element into the way we view emergency response in general.

Experience is also often a driver of capability. To date, while September 11<sup>th</sup> was the impetus to improve our general emergency preparation and response for terrorism, no such similar and defining impetus has provoked the same level of urgency for the special needs population such as children. However, that attitude is now starting to change, and the terrorist attack on the school in Beslan, Russia has served as a visceral reminder that children are not immune from terrorist attacks, and that we must start thinking about them in emergency preparation and planning.

More emphasis and a specific focus on the pediatric element in emergency preparation and response is needed across all functional areas. Yet, there is often the argument that neither the Federal government or the local jurisdictions have the resources to do everything. Moreover, there is also tension between how to balance resources between what is perceived as low probability but high risk, and high probability but low risk. A special needs population such as pediatrics probably is in the first category. Improved capability for pediatric emergency preparation will take some time to build, but the problem, is what happens in the interim? In a major casualty incident, some sort of graded capability may be a possible stopgap measure. Staff working outside their area of expertise may be necessary in times of an emergency, but if the resources are not available for pediatric expertise in every circumstance, then having some protocols in place that allows them to follow a minimum set of procedures may be a useful.

This report highlights needs and gaps in capability and potential goals to improve capability. What is needed is some sort of assessment of capabilities and standards. Despite the fact that it is likely that equipment and resources will be probably be moved to the scene of a major incident involving a large number of pediatrics, and children may be moved out of the region,

any sort of capability/capacity assessment should be addressed at the local and state level. A “National Assessment of Capabilities” can become politicized very quickly. More importantly, the local and state communities know both their needs and capabilities to fulfill them better, and therefore are in a better position than anyone else to assess them. In terms of defining standards, a single focal point should be tasked to develop and define these standards. A number of organizations could be delegated to do this such as the InterAgency Board for Equipment Standardization and InterOperability (IAB), the Department of Homeland Security (DHS), or an entity that is already a pediatric stakeholder such as the American Academy of Pediatrics (AAP). This list is only suggestive, but it is crucial that one entity/organization take the mantle for standards. Because there is such a variation in capability depending on location, perhaps minimum essential standards would help to balance capability.

### **Recommendations for Future Study**

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One method to improve capability is to examine both best practices and lessons learned for pediatric emergency response and preparation. This may ultimately save time and resources by not having to reinvent the wheel. To date, this has not been examined in a cohesive or comprehensive manner. In addition, studies on how large-scale natural disasters impact children offer up real-world examples of mass casualty contingencies and would be useful for disaster planning scenarios that encompass both terrorist acts and naturally occurring incidents. Looking at naturally occurring infectious disease outbreaks and how they affect children physically would also have useful applications for the recognition and treatment of the disease in children, whether deliberately or accidentally introduced. Incentives for research, development and manufacture of drugs specifically for pediatric victims of CBRN type of agents should also be encouraged.

On the legal front, insurance coverage issues regarding child victims of terrorism must be addressed and legislation should be drawn up accordingly, in order that these children are covered into adulthood. In addition, it cannot be assumed that public health and emergency model laws and/or legal authorities for adults will necessarily work in large scale incidents involving children. More research needs to be conducted on the pediatric issues, and then implemented into legal authorities.

## About the Contributing Organizations

### **EMSA**

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EMSA, one of the nation's most respected pre-hospital emergency healthcare providers, was established in Tulsa, Oklahoma in 1978. Today, EMSA utilizes nearly 400 highly skilled emergency medical personnel and 62 advanced life support ambulances to provide service in 16 Oklahoma communities. EMSA is widely recognized as a leader in application of technology and clinical performance; after the bombing of the Murrah Federal Building and the devastating May 3, 1999 tornadoes, EMSA earned renown for its disaster response efforts. EMSA has been the driving force behind the development of metropolitan medical response systems in Oklahoma and is active in disaster planning and community readiness programs.

### **Terrorism Research Center, Inc. (TRC)**

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Founded in 1996, the Terrorism Research Center, Inc. (TRC) is an independent institute dedicated to the research of terrorism, information warfare and security, critical infrastructure protection and other issues of low-intensity political violence and gray-area phenomena. The TRC represents a new generation of terrorism and security analysis, combining expertise with technology to maximize the scope, depth and impact of our research for practical implementation.

The TRC provides core expertise in terrorism, counterterrorism, critical infrastructure protection, information warfare and security (including design review, technical assessments, policy development and review, and training), vulnerability and threat assessment (red teaming), systems engineering, encryption, intelligence analysis, and national security and defense policy.

The TRC maintains a network of terrorism and information warfare specialists drawn from industry, government, and academia in the United States, the United Kingdom, Sweden, Argentina, India, the Middle East, France, and Australia. By convening an international network of experts as required for customer projects, the TRC represents the next generation of collaborative research and analysis sharing. Similarly, the TRC is managed by a Board of Directors who represent the next generation of terrorism and information warfare experts. The TRC has produced a number of independent studies, including a comprehensive overview of US policy, strategy, programs, and budget to combat terrorism, produced for a US industry customer.

The TRC also maintains an advisory board comprised of leading experts who offer guidance and research recommendations to the Center. A limited number of interns also serve on the TRC staff, on a rotating basis.

As a public service, the TRC also operates a public web site that receives over 5,000,000 hits per month and is used by researchers worldwide. It is linked to by over 5000 sites on the Internet and has been cited as a source by CNN, the Washington Post, the New York Times, the Christian Science Monitor, Foreign Policy, Terrorism and Political Violence, Newsweek, NPR and numerous other popular news media, professional associations, and academic journals and books. Global media web sites such as CNN.com, as well as Official US Government web sites, regularly list the TRC as a sole private source for online information.

### **Biosecurity Institute at Georgetown University**

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The Institute will facilitate and assist in shaping the emerging biodefense industry and in educating future leaders in biodefense and biosecurity for the federal and local government and private industry.

A primary objective is to develop a coherent biodefense strategy by integrating clinical care, emergency preparedness, medical research, law, ethics, public policy and international relations.

The Institute brings together faculty with common interdisciplinary interest and professional skills in the area of biodefense and biosecurity, biosensor techniques and chemical antidotes, biochemical detection and therapeutic response, bioterrorism preparedness, decision making, protection of population and biosurveillance.

## Appendix 1: Project Pediatric Preparedness Workshop Participants

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## Appendix II: Senior Advisory Group Members

Convened April 27, 2005 and November 29, 2005

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