

from respiratory (26%) and gastrointestinal infections (28%), whereas the adults had a significant number of musculoskeletal complaints (21%), non-specific diagnoses (19%), and chronic medical conditions (11%). Only (6%) of the conditions required surgical interventions. A significant number of complaints were related to post traumatic stress disorder (10%).

**Conclusions:** Mobile clinics were useful for treating patients who did not have access to medical care. The post disaster epidemics that were expected were not experienced. Given the patient load, it was useful to have a pediatrician, primary healthcare physician, and emergency physician to cope with the cyclone-related medical conditions.

**Keywords:** Cyclone Nargis; disaster; mobile teams; Myanmar  
*Prehosp Disast Med* 2009;24(2):s150-s151

### (C35) Pediatric Morbidity from Cyclone Nargis *Arif Tyebally*

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**Introduction:** Cyclone Nargis struck on 02 May 2008, and was the worst disaster due to natural hazards in the recorded history of Myanmar. More than two million people were affected by the cyclone, which left 146,000 people dead. Children made up a significant proportion of those affected by the cyclone, and formed a significant patient load during Team Singapore's medical relief mission. The pediatric morbidity was studied in order to help plan for future disaster relief missions.

**Methods:** Demographic and medical data from the medical records of the 4,489 patients seen by team doctors was collected and analyzed.

**Results:** A total of 1,402 pediatric patients  $\leq 16$  years of age were seen during nine days from team visits to a hospital, eight camps/villages, and an orphanage. They formed  $>30\%$  of the total clinical workload. Most of them suffered from respiratory (36%) and gastrointestinal infections (29%). Injuries and wounds made up 12% of the attendances, and 2.8% of the children presented with psychological manifestations/post-traumatic stress disorder.

**Conclusions:** Children are more susceptible to infection, vulnerable to the effects of vomiting and diarrhea, and often form a large population of victims during a disaster. Their psychological needs must be addressed. The needs of children are unique and medical aid should be rendered by pediatric specialists trained to render medical assistance to children during extreme situations. The special requirements of children must be considered during the planning of any disaster relief mission.

**Keywords:** children; Cyclone Nargis; mobile medical teams; Myanmar; pediatrics  
*Prehosp Disast Med* 2009;24(2):s151

### Oral Presentations—Terrorist Attacks in High-Density Areas

#### New Concepts in Terrorism and Non-Conventional Global Threats: Framework for Health Response and Preparedness

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After the 11 September 2001 attacks, it became clear that all nations are vulnerable to a mass-casualty incident (MCI) caused by the use of non-conventional weapons. Repeated terrorist attacks in different areas and the global threat of a possible non-conventional chemical, biological, radiological, nuclear, or explosive attack (CBRNE) now are considered to be a worldwide problem. The size of the attack, setting, sophisticated level of planning and organization, and the methods employed were unprecedented.

Public institutions such as government facilities, hospitals, universities, schools, and public gathering places may be targeted by terrorists using weapons of mass destruction (WMDs). Governmental and public institutions must be prepared to prevent or respond to such attacks.

The healthcare system is called upon to react to terrorism incidents. Appropriate alternative actions for the response to these threats require planning with consideration of the level of risk and the local reality.

The development of models, an analysis of new forms of terrorism, and possible non-conventional attacks, with the examination of alternative actions according to types of risks, and the selection of the most appropriate settings for preparedness and response are underlined and suggested. The study and application of laws and regulation based on population protection and with the respect of civil liberties will be explored.

Planning, teaching and drills, risk assessment and risk communication, and inter- and multi-level cooperation at national and international levels are emphasized.

**Keywords:** chemical, biological, radiological, nuclear, and explosive; human rights; non-conventional attack; preparedness; response; terrorism; weapons of mass destruction

*Prehosp Disast Med* 2009;24(2):s151

#### Willingness of US Emergency Medical Technicians to Respond to Terrorist Incidents

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**Introduction:** There is a difference between prehospital providers' ability and willingness to respond to terrorist, public health emergencies, and disaster incidents.

**Methods:** A nationally representative sample of the 203,465 basic and paramedic emergency medical service providers in the United States was surveyed to assess their ability and willingness to respond to terrorist incidents.

**Results:** Emergency medical technicians were appreciably (10–20%) less willing than able to respond to such potential terrorist-related incidents as smallpox outbreaks, chemical attacks, or radioactive dirty bombs ( $p < 0.0001$ ). Emergency

medical technicians who received terrorism-related continuing medical education within the previous two years were nearly twice as likely (OR = 1.9, 95% CI 1.8, 2.0) to be willing to respond to a potential terrorist incident as those who indicated that they had not received such training.

**Conclusions:** Timely and appropriate training, attention to interpersonal concerns, and instilling a sense of duty may increase first medical provider response rates.

**Keywords:** emergency medical services; emergency medical technicians; response; terrorist incidents; willingness

*Prehosp Disast Med* 2009;24(2):s151–s152

### Paramedics and Terrorism Response: Lessons Learned from 9/11 and the London Bombings

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**Introduction:** Terrorist attacks are exceptional events that place paramedics in high-risk situations. When terrorist events occur, paramedics play an integral role in the response to, and management of, these events. Given that responding to terrorist events places paramedics at a high risk for a variety of health problems and injuries, it is imperative to adequately prepare for such events through the use of appropriate teaching and educational programs. These programs should be based on the direct experiences of paramedics responding to previous terrorist events.

**Methods:** This research utilized a series of focus groups in New York and London to investigate how paramedics experienced working during 11 September 2001 and the London bombings. Specifically, this research focused on what concerned paramedics about responding to terrorist events, whether they would be willing to respond again, and what can be learned from these experiences in regard to disaster response training and education.

**Results:** Paramedics reported a number of primary risks that concerned them during their responses to 9/11 and the London bombings. These included injury, death, potential contamination, and exposure to unknown hazards and agents. Personal protective equipment (PPE), communication networks, and reliability of information all were areas of concern that must be addressed by disaster planners. Paramedics reported that the most negative aspect of responding to these terrorist events was the inability to communicate with loved ones and the lack of timely and accurate information regarding updates on the situation. Personal protective equipment was not always available, and at times the wearing the PPE interfered with providing optimal patient care.

**Conclusions:** Key lessons can be taken away from paramedics experiences during 9/11 and the London bombings. These include the need for dedicated communication channels, accurate and timely information, suitable training and education (including an emphasis on infectious

agents), and the provision of suitable PPE conducive to optimal working conditions.

**Keywords:** 11 September 2001; London bombings; paramedic; psychosocial; terrorism

*Prehosp Disast Med* 2009;24(2):s152

### Civil-Military Partnership in Disaster Drills: A Necessity in Developing Countries Affected by Terrorist Activity

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**Introduction:** Sri Lanka has experienced a 24-year civil war with monthly terrorist incidents. Disaster drills, as a method of reinforcing collaboration and improved communication, can enhance military and civil response coordination and ultimately benefit the community and the injured victim.

**Methods:** Two large-scale disaster drills occurred in Sri Lanka in 2008 with participation of military disaster response teams, civil hospitals, international non-governmental organizations (INGOs), the World Health Organization, American universities and hospitals, the local governments, Ministry of Health, non-governmental organizations, the Red Cross, and others. Training occurred in incident command, communication, clinical response, crowd control, evaluation, and the planning process. Civil and private pre-hospital care responders worked closely with the military during the drill. More than 400 participants gave active feedback and an educational video of the recorded drills was distributed for future training exercises.

**Results:** Military and civil responders identified challenges and strengths and discussed improvements for future operations. In the days following the drill, participants responded to actual mass casualty incidents with improved skills, coordination and communication. Subsequent drills and task-force meetings were conducted. The INGOs supported follow-up activities and provided training materials. International partnerships were forged with military, civilian representatives, and disaster medicine specialists. Military and civil response teams had never performed a drill together before and felt it was invaluable for their coordination.

**Conclusions:** The promotion of drills involving military, civil society, and communities should be encouraged to improve response, especially in countries with ongoing civil conflict and high terrorist activity. Drills can help military and civil partners reach a broader understanding of the others' role and methodology of response, which may improve the outcome and timeliness of a disaster response.

**Keywords:** civil-military collaboration; disaster; developing countries; drill; preparedness; terrorism

*Prehosp Disast Med* 2009;24(2):s152