CONCEPTS

Emergency Response to Mass Casualty Incidents in Lebanon

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ABSTRACT

The emergency response to mass casualty incidents in Lebanon lacks uniformity. Three recent large-scale incidents have challenged the existing emergency response process and have raised the need to improve and develop incident management for better resilience in times of crisis. We describe some simple emergency management principles that are currently applied in the United States. These principles can be easily adopted by Lebanon and other developing countries to standardize and improve their emergency response systems using existing infrastructure.   (*Disaster Med Public Health Preparedness*. 2013;7:433-438)

Key Words: Lebanon, emergency response, mass casualty incidents, disaster, developing countries

Lebanon is a developing country in the Middle East on the eastern coast of the Mediterranean Sea. Manmade disasters predominate in this region, and armed conflicts, civil strife, complex human emergencies that result in high human costs (ie, large numbers of persons killed, injured, or displaced from their homes) and staggering economic costs are frequent. The local or national response to these types of events is usually supplemented with extensive involvement of international organizations such as the World Health Organization (WHO) and other United Nations (UN) agencies. During the 2006 conflict between Lebanon and Israel, a crisis that affected more than 1 million persons and resulted in large number of internally displaced people, WHO helped coordinate humanitarian aid and relief efforts.[1] Another internal armed conflict took place in 2007 at Nahr El Bared Palestinian refugee camp and resulted in approximately 446 casualties and thousands displaced. Again, involvement of international agencies such as the UN Relief and Works Agency (UNRWA) was extensive in providing relief efforts.[2]

The predominance of human conflict, for which emergency response is unpredictable and follows the multinational response model, has rendered Lebanon largely dependent on foreign assistance in responding to disasters and unprepared to respond to other types of incidents. Additional factors have contributed to this situation, including, but not limited to, the relative infrequency of other types of hazards and the absence of a national emergency preparedness plan or a framework for a multiorganizational response. Since 2007, three large and unusual events have resulted in multiple casualties and have tested the Lebanese emergency response, thereby exposing its vulnerability to such incidents.

This variation in hazard probability and in the vulnerability of a society to different types of incidents is not the exception but the rule. It is the basic premise of all-hazards emergency preparedness and the main incentive to standardize the emergency response to all incidents from the smallest event to the largest catastrophe by applying the same response model within a predefined framework. Most developed nations, including the United States, have implemented such frameworks. In 2004, The US Department of Homeland Security developed the National Response Plan. This plan was a revision of the Federal Response Plan of 1992 and was later followed by the 2008 National Response Framework, which currently serves as the guide on how the United States would conduct an all-hazards response.[3]

This report discusses the current emergency response to mass casualty incidents in Lebanon using 3 different events as examples. It also describes emergency management principles that Lebanon and other developing countries can apply from the US National Response Framework to improve their emergency response to mass casualty incidents.

EXISTING EMERGENCY RESPONSE IN LEBANON
First Example: A Sinking Ship

On December 17, 2009, a Panamanian-flagged cargo ship *Danny II* capsized about 11 nautical miles off the northern coast of Lebanon due to stormy weather. The ship was carrying 6 passengers and 77 crew members and was transporting livestock (10 224 sheep and 17 932 cattle).[4] This incident sparked a major rescue operation led by the Lebanese Army and Navy in collaboration with the maritime unit of the UN Interim Forces in Lebanon (UNIFIL).

A Cyprus-based British helicopter unit was also involved in this operation. At least 38 sailors were rescued; however, few bodies were recovered, and approximately 41 persons were presumed dead.

Survivors were transported from the port of Tripoli (largest city in northern Lebanon) to local hospitals by Lebanese Red Cross ambulances. The scope and nature of this incident, in spite of its relatively small size, required a complex response that exceeded the existing capabilities of the Lebanese authorities. This incident prompted the immediate up-scaling of the response to a multinational level, with the involvement of UNIFIL ships (Italian frigate, a German mine hunter, and a German supply ship) and a British helicopter.

Second Example: An Airline Crash

On January 25, 2010, Ethiopian airlines flight 409, a Boeing 737-800 plane carrying 90 passengers and crew, crashed into the Mediterranean Sea shortly after takeoff from Beirut Rafic Hariri International Airport.[5] The Lebanese Army and Air Force helicopters and naval vessels led the initial search and rescue response. UNIFIL ships provided immediate assistance during the initial stages. The US Navy, the French Navy, and the British Royal Air Force participated in later stages of the rescue operation at the request of the Lebanese government. All 90 people on board were presumed dead. The Lebanese Red Cross Emergency Medical Services (EMS) handled the fatality management process. The recovered bodies were sent to a local university hospital (Rafik Hariri University Hospital) for identification. Frequent statements and media reports quoting different official governmental sources created confusion regarding the cause of the crash, the circumstances surrounding the accident, and the status of the search and rescue operations.

The scale of the response immediately reached a multinational level within a few hours after the accident. Within 1 month of the accident, all 90 bodies were recovered and identified. The flight data recorder was also located and recovered by Lebanese Army divers. International experts from the US National Transportation Safety Board and Boeing Company assisted the Lebanese Civil Aviation Authority with the investigation. The final report cited pilot error as the cause of the crash.[5]

Third Example: A Structural Collapse

On January 16, 2012, an old 5-story residential building housing approximately 50 tenants collapsed on a Sunday evening in the Lebanese capital of Beirut. Neighboring civilian residents carried out the initial search and rescue response. Soon after, rescue workers from the Lebanese Civil Defense, a firefighting-based government agency that is in charge of urban search and rescue operations, arrived on the scene. Emergency responders from several other agencies including the Lebanese Red Cross, the Lebanese Army, and the Lebanese security forces were searching the scene for survivors. The lack of appropriate equipment was immediately evident, as bulldozers and cranes were used to search the rubble.[6] Twelve survivors were transported to local hospitals by the Lebanese Red Cross EMS. The search and rescue operations ended after 2 days, with a death toll of 27 people. Media critics predominantly targeted for blame the absence of official inspection and nonenforcement of necessary safety standards for residential buildings.[7]

A summary analysis of the response to the 3 different incidents reveals the following key points. First, the absence of a standardized response framework to mass casualty incidents leads to a disorganized response; no clear agency is in charge, and coordination among agencies and resources is lacking. Because several agencies share the responsibility of providing assistance during mass casualty incidents, this practice creates confusion about who is actually in charge of organizing the response and coordinating relief efforts at both local and national levels. Beyond the traditional Lebanese government structure, the existing response organization (Figure) does not clearly delineate the horizontal and vertical integration of the different governmental agencies and nongovernmental (NGO) organizations during an actual response. Second, the Lebanese army plays an important role in responding to all mass casualty incidents. Its military command structure compensates for the absence of a response framework and a lead agency for emergency management. Third, excessive reliance on international agencies to join the response as early as possible gives the impression that local resources are quickly overwhelmed after large-scale incidents. The capabilities of local agencies to manage incidents at a local or national level are not clear. Beyond small incidents, the emergency response scales up quickly to a multinational level, with international agencies playing a major and active role in responding to mass casualty incidents in Lebanon.

These findings are not specific to Lebanon but can occur in other developing countries where the military might take control of the disaster operations and mutual aid is invoked early. This process is in contrast to that of developed countries, where the military traditionally assumes a minor role in managing disasters with a preserved civil control over disaster operations.[8] The transition from 1 type of response model to another can be costly, difficult, and not necessary, especially in the absence of clear evidence regarding the advantages of any model over another. Lebanon and other developing countries, however, can adopt simple emergency management principles that can help improve all phases of the disaster cycle.

RESPONSE FRAMEWORK

The first step is for stakeholders to define and adopt a framework of response. The purpose of this framework is to provide a uniform structure for any emergency response. This structure entails (1) identifying key agencies that usually respond to mass casualty incidents and (2) identifying agencies' roles, capabilities, and responsibilities.

FIGURE

Current Organization of Emergency and Disaster Response in Lebanon.

* International Federation of Red Cross and Red Crescent Societies
# Lebanese Red Cross
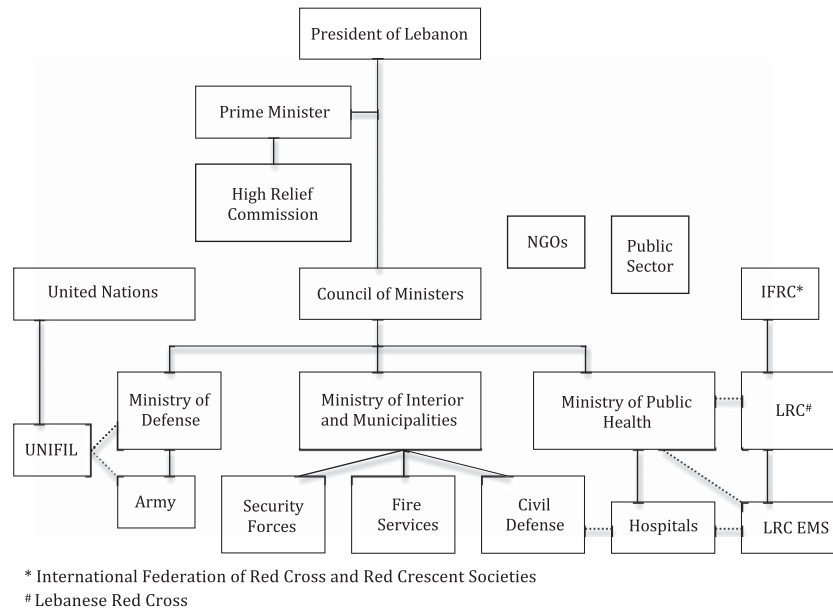
Abbreviations: EMS, Emergency Medical Services; IFRC, International Federation of Red Cross and Red Crescent Societies; LRC, Lebanese Red Cross; NGOs, nongovernmental organizations; UNIFIL, United Nations Interim Forces in Lebanon.

Several agencies are involved in an emergency response in Lebanon. These include the Lebanese Civil Defense, the Lebanese Red Cross, and the Lebanese military, in addition to other national and international NGOs. The civil agencies' roles are not clearly defined during a mass casualty incident, and their capabilities are not fully assessed in terms of readiness and the ability to respond to different types of hazards. The Lebanese military with all its branches usually supplements the civil response with regard to supplying training, equipment, and resources when responding to different incidents such as forest fire suppression, maritime accidents, and structural collapse. Another entity that is often mentioned in mass casualty incidents in Lebanon is the High Relief Commission, which was formed according to a ministerial decision (No. 93/30) issued on August 2, 1993. The role of this commission, however, has been limited to the recovery phase of a disaster by providing relief aid and monetary compensations to people affected in large-scale incidents including wars.[9]

The Lebanese government must therefore conduct an assessment of these existing agencies and their capabilities to identify gaps in the response framework and plan on mutual aid collaboration to cover these deficits. This assessment would also help local agencies set up plans of action to upgrade their capabilities, clarify their role and responsibilities, and ultimately improve the current emergency response.

RESPONSE MODEL

The development of a response model identifying the response organization should follow the adoption of a framework. This model describes the interaction of the different elements within the framework during response to a mass casualty incident.

The United States employs the National Incident Management System (NIMS) as a template for the management of incidents of all sizes. The core principles of NIMS are flexibility and standardization.[10] Flexibility means that NIMS can be applied to incidents of different types and sizes. Standardization involves the use of common terminology and of standardized organizational structures and processes to streamline the coordination among different agencies from different sectors during the management of an incident.

These core principles of flexibility and standardization apply to all components of NIMS including preparedness, resource management, communications and information management, and incident command management. The use of an incident command system (ICS) in NIMS is an example of how clear role definition and common terminology can help improve coordination between different sectors (law enforcement and safety) and standardize the response organization regardless of the size, complexity, or type of incident. Within the ICS organization, a single entity (incident commander or unified command) is designated with overall incident management responsibility.

Additional command staff including a public information officer, a safety officer, and a liaison officer are designated with clear roles and responsibilities to assist the incident commander. The rest of the general staff are assigned as section chiefs with functional roles consisting of operations, planning, logistics, and finance and administration. Each section is divided into units with predefined roles; the resource unit within the planning section is, for example, in charge of monitoring the status of the resources committed to the incident and evaluating the need for additional resources. Depending on the size and complexity of the incident, additional branches and divisions may be established within each section.

This ICS structure represents a common organizational structure or collaborative platform that can be used by 1 or multiple agencies for incident management. By adopting a similar response template or structure, developing countries such as Lebanon can enhance their emergency response and incident management structures.

In addition to the general emergency response principles of flexibility and standardization, several specific principles should guide the emergency response for better organization, coordination, and control. These principles are engaged partnerships, unified command, and clear communication and public information.

Engaged Partnerships
The first principle is engaged partnership, whereby different stakeholders develop shared response goals and align their capabilities for better coordination in time of crisis. This principle first requires an assessment of the capabilities and roles of existing agencies. Next, mechanisms are defined to describe clearly the channels and procedures to request mutual aid and assistance and to coordinate additional resources in time of crisis.

This principle is currently adopted in part in large-scale incident management in Lebanon. The UNIFIL forces and Lebanese Armed Forces conduct regular disaster preparedness exercises involving most agencies that usually participate in an emergency response.[11] The proper channels through which mutual aid is requested and the procedures to follow in requesting and coordinating external assistance are still not clear. Adopting a standardized response plan could provide the framework for this process.

Unified Command
The second principle is unity of effort through unified command. The involvement of multiple agencies in emergency response requires a high level of coordination and collaboration for the response to be effective. Unified command ensures that all involved agencies from different sectors work together under clearly defined strategies, with clear flow of information to mount an effective response. Unified command also establishes more efficient and appropriate resource management, clear

communication through a single chain of command and across different disciplines, while maintaining the independence of the different agencies involved in the response.

Another advantage of unified command is that it makes the response more flexible and scalable to the needs of incidents with changing size and complexity. The use of unified command would be even more important in incident management in Lebanon because of the involvement of the Lebanese Army and of international NGOs with their own military structures (UNIFIL) in responding to different types of incidents.

Clear Communication and Public Information
A third principle is clear communication. Clear internal communication and information management within the response network through the chain of command and among different agencies is essential for an effective response. Communication and interoperability were identified among the most challenging aspects of disaster management during Hurricane Katrina and the 9/11 terrorist attacks.[12,13] Standardizing the response model, using unified command and common terminology, in addition to assigning clear roles and responsibilities and establishing a joint information center with all agencies represented would help streamline the management of internal information.[14]

Keeping the public and media organizations informed is another important aspect of communication management in a mass casualty incident. The authorities involved in incident management must balance the pressure of providing quick information and frequent updates with the importance of accuracy and reliability in communicating information. Timely, accurate, and clear communication of information to the public regarding the response status is a requirement of an effective response. The information must be gathered from predesignated sources that are part of the incident management structure, usually the command staff. Its accuracy must be verified through preestablished protocols. The information to be disseminated must be coordinated by obtaining approval from those with authority and by establishing key, consistent messages that relay the information in a clear manner. Finally, the dissemination of information should be followed with media monitoring to prevent inaccurate reporting.[10] Not adhering to these steps in communicating information to the public may lead to confusion, media speculations, and increased blaming and public criticism of authorities involved in incident management.

PROPOSED RESPONSE MATRIX
All of the principles discussed require regulatory and legal steps or "national legal preparedness."[15] Laws governing all aspects of incident and disaster management including response activities must be enacted. This process can be complex and evolving. In the United States, the Robert T.

Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act) of 1988 forms the legal framework for disaster management.[16] This act is an amendment to the Disaster Relief Act of 1974 and is the governing legislation of the Federal Emergency Management Agency (FEMA), which is the primary agency in charge of disaster response in the United States.[16] The Stafford Act was later amended by the Homeland Security Act of 2002, consolidating the activities of several executive agencies including FEMA under the Department of Homeland Security (DHS).[17] DHS later became the cabinet agency in charge of improving response to natural and manmade disasters.[18]

Other countries have similar legislations such as the United Kingdom Civil Contingencies Act of 2004, which is the legal framework for civil protection in the United Kingdom.[19] International guidelines are also available to help countries create a legal framework, not only for national response to disasters but also for international assistance when a multi-national level response is needed.[20] A recent project funded by the UN Development Programme (UNDP), aiming at disaster risk reduction in Lebanon, paved the way for a new bill that was submitted to the Lebanese Parliament in 2012.[21] If approved, this law would establish a Disaster Management Authority and would be a landmark step toward the development of a legal framework for disaster management in Lebanon.

This Disaster Management Authority would be linked directly to the prime minister and would consist of a supreme council chaired by the prime minister and comprising ministers of national defense, interior and municipalities, public health, social affairs, public works, transport, environment, energy, water, communications, economy and trade, media, agriculture, and finance. Its executive branch would consist of representatives from different agencies, government branches, and NGOs that are stakeholders in disaster management. Although its exact organizational chart is not yet clear, this Disaster Management Authority will serve as a crucial link among all stakeholders, centralize the command structure, and clarify horizontal and vertical chains of command in disaster response. These elements, however, are only some of the elements of an effective response. In a conference convened by the New York Academy of Medicine and the Royal Society of Medicine in June 2007, where the US and UK response experiences were reviewed, additional key elements were identified. These elements included "careful advance planning, clear delineation of spheres of responsibility and response roles, integrated hospital and ambulance services and provision for adequate communication with the public".[22]

An important element to be considered in the new response framework is the role of the Lebanese Army. As described in the 3 incidents, the army plays a major role in responding to mass casualty incidents. Clear guidelines regarding its involvement should be well delineated in the new model if a civil agency is to be in charge of disaster management. An alternative option would be to preserve the traditional model of emergency response and let the army assume control of the response activities with support from existing civil agencies. This latter model was also considered applicable in extraordinary circumstances in the United States, in spite of its developed response model, to solve the problem of federal passivity that was identified in the response to Hurricane Katrina.[23] Regardless of the response model that the Lebanese government decides to implement, planning for a high level of coordination between the military and civil agencies is needed to mount an effective response.

Finally, the availability of international agencies (eg, UNIFIL) to respond early and support the national response is an asset that Lebanon enjoys. Organizing and coordinating this type of international assistance can be complex and requires mutual aid agreements that build on local capacity and a governing national legal framework. This assistance should complement the local response and not undermine it. Command and control of the response operations in addition to monitoring the efforts provided by foreign actors should remain the primary responsibility of local authorities.

Any discussion about disaster response improvement would be incomplete without emphasizing the need to address all 4 phases of the disaster cycle: planning, response, recovery, and mitigation. This proposed national framework would be used throughout all phases. Improved planning through standardized education and training, more focused mitigation efforts, enhanced resilience, and faster recovery are some of the expected outcomes of the implementation of this framework. More specifically, in the response to the 3 different incidents described, this framework would enhance coordination and cooperation among all stakeholders through unified command, identification of a lead agency in charge of incident management, and clear delineation of roles and responsibilities of responding agencies. It would also standardize internal and external communication and help define mechanisms to coordinate support and resources deployment from national agencies and international NGOs.

CONCLUSIONS

A basic premise for an effective response is the adoption of a response framework and a response model that clearly delineate roles and responsibilities and that dictates the integration of different stakeholders into a single response system. Once a clear framework is adopted, agencies involved in incident management and authorities in Lebanon and other similar developing countries can easily adopt and apply NIMS emergency management principles described in this report. Preparedness through advanced planning, standardized education, and training of everyone involved in disaster management remains instrumental to ensure a successful implementation of this process.

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