

**International Lessons to Improve  
Mass Fatality Management  
During a Pandemic Influenza Event**

**A Study Conducted for the  
Assistant Secretary for Health Affairs,  
Office of International Affairs and Global Health Security**



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## **Abstract**

High mortality incidents are rare in the United States but they frequently occur overseas. However, the lessons from these incidents are rarely captured and applied to the domestic decision-making process. In order to review and analyze information from past international experiences in mass fatality management, key participants were interviewed from six case studies of catastrophic events from the last ten years (1998-2008). Mass fatality management strategies, successes and failures, and lessons regarding coordination and operational procedures were collected from these past international events. Current interagency emergency structures relating to mass fatality management were examined for five nations and for the United States on both a national and state level. Of the six national emergency response frameworks reviewed, the United Kingdom presented the most inclusive plans on mass fatality management. For the US state level, only 46% of US state pandemic influenza plans analyzed address mass fatality management. Considerations, derived from both past events and current mass fatality planning, are identified for US policy in the areas of preparedness, organization, communications, and operations. Internationally, a common international MFM framework would facilitate identification, disposition, and possible repatriation of remains and would be beneficial in cross border mass fatality events like pandemic influenza.



# Introduction

***The care with which our dead are treated is a mark of how civilized a society we are.***

– Charles Haddon-Cave

High mortality events have been rare in the United States but they frequently occur overseas. The lessons from these events are rarely captured and applied to the United States domestic decision-making process. The threat of a mass fatality event in the United States is a real one, with increased vulnerability to natural hazards, weapons of mass destruction (WMD), and widespread disease epidemics. The World Bank estimates that a worldwide H5N1 influenza pandemic would cause at least 71 million deaths (1). Based on projections modeled from prior pandemics by the US Department of Health and Human Services (HHS), an influenza pandemic could result in 200,000 to 2 million deaths in the United States depending on the pandemic's severity (2).

The term “Mass Fatalities” is typically defined as the number of fatalities that exceeds a local jurisdiction's capacity to cope due to infrastructure/support limitations. While even a small number of fatalities may overwhelm a city, this analysis focuses on mass fatalities resulting from catastrophic events; operationally defined as an event that results in more than 1,000 deaths at a local jurisdiction level within one week of the occurrence of an event. Mass fatality management (MFM) planning is critical to ensure an effective response to an influenza pandemic or other catastrophic event. Planning can also help mitigate the costs of household and community recovery, mental health rehabilitation, and loss of national income and productivity.

This report presents a background analysis of the MFM issue and lessons, provides a review of best practices, and offers recommendations for US and international emergency management policymakers and practitioners to consider. The goal of this analysis was to examine international mass fatality (MF) events and compare MF response and planning in other countries with that of the United States in order to extract international and domestic best management and planning practices and assess the implications for domestic mass fatality policies and preparedness measures.

## Methodology

This thematic analysis draws upon recent global experiences in MFM and MF preparedness. The purpose of this analysis is to extract actionable lessons from MFM experience and efforts to help prepare for future MF events. The analysis focuses on overall management and coordination of MFM as well as specific tactical level activities such as body recovery, victim identification, storage, disposition of remains, and family assistance. The analysis includes lessons related to human remains as a public health threat and also cultural requirements of MFM.

Specific objectives of this analysis are to:

- Extract field lessons learned from recent MF events to answer the following questions:
  - Were preparedness plans in place pre-event?
  - How was the MFM component managed?

- What were the key lessons learned regarding MFM preparedness and response at the strategic, operational and tactical levels?
- Compare and contrast MFM organization and preparedness among the United States and selected benchmark countries (those having strong disaster management systems):
  - How is MFM managed at the national, regional, state/provincial and local levels?
  - Which agency serves as lead agency?
  - Does MFM play a prominent role in the disaster management frameworks?
  - What MFM-related guidance and tools does the national government provide to regional/local governments to enhance local-level preparedness?
- Find MFM information in US state and territory pandemic influenza (PI) plans, using the Department of Homeland Security's (DHS) Lessons Learned Information Sharing System (LLIS), <http://www.LLIS.gov>, and US state websites.(3)
  - Does MFM play a prominent role in US state/territory pandemic influenza management frameworks?
  - How is MFM managed at the US state/territory level?
  - Which agency/position serves as lead agency?

The analysis employed multiple research methods, which included document review, analysis of secondary data, and 29 structured interviews. First, the Center for Research on the Epidemiology of Disasters (CRED) disaster database was used to identify MF events that occurred during the past 10 years (1998-2008). An inquiry of case studies from a selected sample of these MF events was conducted to identify recent MFM practices. Selected events included the floods in Venezuela in 1999, the World Trade Center (WTC) attack in 2001, the Indian Ocean tsunami in 2004, the Pakistan earthquake in 2005, Hurricane Katrina in 2005, and the earthquake in China in 2008. These cases were selected to provide broad coverage of differing types of MF events in a variety of geographic areas.

Next, case study analysis of policies and preparedness efforts domestically and among selected peer countries was conducted. Peer countries were selected based upon reputational assessment of readiness or geographical proximity to the United States. Countries selected included Australia, Canada, Israel, Mexico, and the United Kingdom. An Internet search was done to review information and national response plans regarding MFM procedures.

To further review interagency emergency structures within the United States, US state/territory pandemic influenza plans available on LLIS or state/territory websites were reviewed for MFM content. This analysis was used to compare the status of MFM and pandemic influenza planning across the 59 US states, territories and possessions.

## **Analysis**

### **Review of Mass Fatality Events**

Table 1 illustrates the magnitude of catastrophic mass fatalities globally, documenting hundreds of thousands of lives lost over the past 10 years from natural disasters. During the five-year period from 2004 to 2008, over half a million deaths occurred from MF events. The large number of deaths in 2004 and 2008 were due to the Indian Ocean Tsunami in 2004 and the

cyclone in Myanmar and earthquake in China in 2008. During this 10-year period, only one mass fatality event resulting from a natural disaster was recorded from the United States.

**Table 1: 25 Largest Mass Fatality Events Resulting From Natural Disasters, 1998-2008**

Date	Event	Location	Estimated deaths
2008	Earthquake	China	87,476
2008	Storm	Myanmar	133,655
2007	Storm	Bangladesh	4,234
2006	Earthquake	Indonesia	5,778
2005	Earthquake	Pakistan	73,338
2005	Storm	United States	1,833
2004	Earthquake (Tsunami)	Indonesia, Thailand, India, Sri Lanka	225,841
2004	Storm	Haiti	2,754
2004	Flood	Haiti	2,665
2003	Earthquake	Iran	26,769
2003	Extreme heat	Europe	72,225
2003	Earthquake	Algeria	2,266
2002	Epidemic	Afghanistan	2,500
2001	Earthquake	India	20,005
1999	Flood	Venezuela	30,000
1999	Storm	India	9,843
1999	Earthquake	Taiwan	2,264
1999	Earthquake	Turkey	17,127
1998	Storm	Central America	18,345
1998	Earthquake (Tsunami)	Papua New Guinea	2,182
1998	Flood	China	3,656
1998	Storm	India	2,871
1998	Earthquake	Afghanistan	4,700
1998	Extreme heat	India	2,541
1998	Earthquake	Afghanistan	2,323

**Note:** The 25 largest catastrophic natural disaster mass fatality events of the past ten years in terms of lives lost are listed above. Data only include rapid onset events resulting from natural disasters.

**Source:** EM-DAT: The OFDA/CRED International Disaster Database <http://www.em-dat.net>, Universite Catholique de Louvain, Brussels, Belgium (4).

### Major Events Selected for Key Informant Interviews and Literature Review

Six MF events were selected for examination. Table 2 illustrates the variability of these events, fatality levels and MFM lead and coordinating agencies. Deaths ranged from under 2,000 in the case of Hurricane Katrina to more than 200,000 in the case of the Asian Tsunami of 2004. The types of events include two earthquakes, the Asian Tsunami, a hurricane, a major flood, and a terrorist attack.

**Table 2: Major Events Examined For This Analysis**

Event	Date	Location	Estimated fatalities	Who handled MFM	Interviews Conducted	Documents Reviewed
Earthquake	05/12/08	China (Wenchuan)	87,476	National Disaster Reduction Center of China (MCA)(5)	1	9
Earthquake	10/08/05	Pakistan (Bagh, Muzzafarabad ...)	73,338	The Pakistan Army(6)	1	19
Storm (Katrina)*	8/29/05 - 9/19/05	United States (Mobile, Bayou ...)	1,833	State Medical Examiner, US Federal Emergency Management Agency (FEMA), Disaster Mortuary Operations Response Teams (DMORT) (7)	15	4
Tsunami	12/26/04	Indian Ocean region: • Indonesia (Acheh Province, Sumatra)	over 200,000 • 165,708	• Military + other organizations (variable within country)(8)	3	21
		• Thailand (Krabi, Phang Nga, Phuket)	• 8,345	• Department of Interior		
		• Sri Lanka	• 35,399	• Community groups largely		
Terrorist attack	9/11/2001	United States (New York)	2,749	NYC Office of Chief Medical Examiner (OCME), NYC Police Department (NYPD), NYC Fire Department (FDNY), US Federal Bureau of Investigations (FBI)(9)(10)	8	17
Flood	12/15/99 -12/20/99	Venezuela (Federal district Caracas ...)	30,000	Venezuelan Civil Defense, Venezuelan Red Cross(11, 12)	1	13

**Note:** The major events, dates, location, estimated deaths and agencies or organizations in charge of MFM are listed above. All numbers from OFDA/CRED database(2). The number of documents and interviews consulted in this analysis is shown.

\*While Hurricane Katrina affected a large area of the Gulf Coast, the majority of the mortality occurred in Louisiana and particularly in the Greater New Orleans area. For this reason, the case analysis focuses on New Orleans.

All of the events examined, regardless of country of origin or size of event, reveal failures and successes in the management and care of disaster victims. Interviews and documents related to the aforementioned case studies identified several lessons to be considered for MFM preparedness and response planning. The successes and failures in MFM from these specific events are reflected in Table 3, while overarching “lessons learned” that can be applied by MFM community are summarized in Table 4.

**Table 3: Successes and Failures Noted In Case Studies**

<b>Event</b>	<b>Greatest Successes</b>	<b>Greatest Failures</b>
<b>China Earthquake May 2008</b>	<ul style="list-style-type: none"> <li>• Rapid mobilization of 50,000 troops to serve as disaster response workers</li> <li>• Photographs and DNA sampling done prior to mass grave disposition(13)</li> </ul>	<ul style="list-style-type: none"> <li>• Misinformation regarding corpse and infectious disease risk resulted in discord between China authorities and World Health Organization (WHO)(14)</li> <li>• Overtaxed disaster response workers(15)</li> </ul>
<b>Pakistan Earthquake Oct 2005</b>	<ul style="list-style-type: none"> <li>• Communities in rural areas mobilized to recover and bury dead quickly</li> <li>• Community effort to bury dead according to Moslem cultural requirements</li> <li>• Trust built between Pakistani military and non-governmental organizations (NGOs)</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of planning</li> <li>• Transportation difficulties to rural areas resulted in slow response time and supply delivery issues</li> <li>• Lack of material resources for religious burial practices</li> </ul>
<b>Hurricane Katrina Aug 2005</b>	<ul style="list-style-type: none"> <li>• Victim identification largely accomplished with only 10% of bodies unreturned because of family refusal</li> <li>• Adaptability of state and Federal partners</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of pre-planning and Memorandums of Understanding (MOUs) resulted in slow body recovery, victim identification, and disposition</li> <li>• External contractor used in MFM operations lacked training and was unfamiliar with region</li> <li>• State relied heavily on DMORT for fingerprinting and identification (ID) work</li> <li>• Parishes were not working in tandem with the state</li> <li>• Poor communication between local/state and Federal agencies</li> <li>• Lack of standardized information sharing database for victim identification</li> <li>• Approval of FEMA expenditures for mortuary-related expenses tedious</li> <li>• High cost: roughly \$69,800/fatality</li> </ul>
<b>Indian Ocean Tsunami Dec 2004</b>	<ul style="list-style-type: none"> <li>• In Indonesia, specially-selected battalion was pre-trained and pre-identified to respond to mass fatality events</li> <li>• In Sri Lanka, fatality management personnel took pictures of the deceased before decomposition began, which greatly increased identification</li> </ul>	<ul style="list-style-type: none"> <li>• For international organizations and most governments, lack of planning at all levels for an event of this scale</li> <li>• No clear designation of the responsible agency (international or national)</li> <li>• Lack of public information regarding where the public could go to identify the dead or claim remains</li> <li>• No single numbering and labeling system and method to consolidate information</li> <li>• No standard protocol of body examination resulting in redundant body examinations</li> </ul>
<b>WTC Sept 2001</b>	<ul style="list-style-type: none"> <li>• Integration of anthropologists in the response effort</li> <li>• Development of the Unified Victim Assistance System</li> <li>• Advancement in identification techniques</li> <li>• Experience gained in: <ul style="list-style-type: none"> <li>- recovering contaminated human remains</li> <li>- family assistance practices</li> <li>- urban area recovery</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• OCME was not considered a primary responding city agency</li> <li>• No system previously existed to assist NYPD identify missing persons</li> <li>• Lack of security presence and process at the morgue</li> <li>• Inadequate psychological support</li> <li>• 24/7 response culture led to employee fatigue and employer detachment</li> </ul>
<b>Venezuela Floods Dec 1999</b>	<ul style="list-style-type: none"> <li>• Community, faith-based and regional donations in response</li> <li>• Hazards risk assessment and disaster plans have subsequently developed</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of planning at all levels</li> <li>• No lead agency</li> <li>• Poor communications lead to Venezuelan government, NGOs, and other emergency responders working independently</li> </ul>

**Table 4: Lessons Identified From Case Studies**

<b>MFM Task</b>	<b>Lessons Identified</b>
<b>Coordination and Management</b>	<ul style="list-style-type: none"> <li>• Comprehensive MFM plans are needed at the national level for strategic guidance and should fit with multinational organizations standards (WHO, INTERPOL, ICRC)</li> <li>• Improve MFM capability among international organizations</li> <li>• Identify international authority in MFM Designate lead agency in national and state/local plans</li> <li>• Regional management networks can serve as interface between national and state emergency management levels</li> <li>• Include MFM in state emergency preparedness drills and exercises</li> <li>• Develop better communication between international organizations and national governments</li> <li>• Dispel false beliefs about the infectious disease risks posed by corpses and disposition methods</li> <li>• Establish transition period when operations shift from response stage to recovery stage</li> <li>• Mortuary tasks should be designated to an agency that is not also responsible for the care of the living.</li> <li>• Move MFM from United States Emergency Support Function (ESF) #8: Public Health and Medical Services</li> </ul>
<b>Recovery of Remains</b>	<ul style="list-style-type: none"> <li>• Community preparedness and response is critical for prompt MFM operations</li> <li>• Create MOUs regarding how to obtain necessary mortuary resources</li> <li>• Communicate MFM plan to public post-disaster so initial community search and rescue (S&amp;R) can follow set protocol and do not overwhelm hospitals or morgues</li> <li>• Formal S&amp;R operations should use established MFM plans</li> <li>• Establish transition plan when S&amp;R turns into body recovery, especially if different agencies and/or personnel are used</li> <li>• Implement body recovery expediently to reduce psychological repercussions</li> <li>• Use trained recovery professionals in recovery when possible</li> <li>• Incorporate anthropologist into MFM recovery team</li> </ul>
<b>Victim Identification</b>	<ul style="list-style-type: none"> <li>• Use simple “low tech” means (photographs, dental, and fingerprints)</li> <li>• Need for uniform identification procedures, forms and databases</li> <li>• Take and catalogue photographs of remains in all mass fatality events</li> <li>• Supplement simple methods with DNA analysis if resources and comparative data are available</li> <li>• Collect DNA samples for later identification, especially when using mass graves</li> </ul>
<b>Storage of Remains</b>	<ul style="list-style-type: none"> <li>• Optimize use of local available assets (e.g. hospitals, universities, funeral homes, athletic facilities)</li> <li>• Refrigerated containers provide the best storage</li> <li>• Temporary burial in trench graves can be used if refrigeration is not available</li> <li>• If trench graves are used, bodies must be buried side by side and in well marked graves</li> </ul>
<b>Disposition of Remains</b>	<ul style="list-style-type: none"> <li>• Preparedness supplies for MFM events should include items needed to perform culturally and religiously competent cremations/burials</li> <li>• Mass graves may be necessary following large disasters</li> <li>• Because of public health repercussions, bodies should not be hastily buried in most natural incidents</li> </ul>
<b>Family Assistance/ Counseling Needs</b>	<ul style="list-style-type: none"> <li>• Create Family Assistance Centers (FAC) without delay</li> <li>• Provide crisis counseling outreach and programming for bereaved survivors</li> <li>• Create and offer special outreach, education, and coping strategies for child survivors</li> <li>• Use professionals with training in family survivor counseling when possible (e.g. funeral directors, clergy, social workers)</li> <li>• Provide MFM personnel with coping education/counseling and have frequent schedule respites</li> <li>• Use the internationally recognized method for responding to families “Critical Incident Stress Management and Debriefing”</li> </ul>

## Review of Benchmark Countries

On a national, regional, and local level, the structure of emergency management and preparedness agencies and department is important to the effectiveness of all disaster response activities. Public documents on emergency management and pandemic flu from the United States, United Kingdom, Israel, Australia, Canada, and Mexico were found using an Internet search to identify national agencies responsible for MFM response activities. (Table 5)

**Table 5: MFM Organization Among Six Selected Countries**

Country	Agency responsible for management of response to catastrophic event	Agency specifically identified to lead MFM	Supporting agencies for MFM tasks	Publicly accessible, nationally published plans detailing MFM strategies/operations
<b>Australia</b>	<b>National:</b> Emergency Management Australia (EMA) (17)	<b>Regional/Local:</b> police/local coroner(16)	EMA, Australian Defence Force (ADF), Australian Federal Police (APF) Department of Health and Ageing, Australian Council of State Emergency Services (ACSES), Australian Search and Rescue(17)	<ul style="list-style-type: none"> <li>• <i>Emergency Manual Series, Manual 13: Health Aspects of Chemical, Biological, and Radiological Hazards, Chapter 10 "Forensic Issues"</i> (16)</li> </ul>
<b>Canada</b>	<b>National:</b> Public Safety Canada(18)	None identified	Public Health Agency Canada (PHAC)(18), Health Canada (HC) (20), Funeral Services Association of Canada (FSAC)(21)	<ul style="list-style-type: none"> <li>• <i>Annex 1 Canadian Pandemic Influenza Plan for the Health Sector</i> (21)</li> </ul>
<b>Israel</b>	<b>National:</b> Israel Defense Forces (IDF), Homefront Command (HFC) (22)	<b>National:</b> Israel Police (IP), IDF (23), National Forensic Medical Institute (NFMI) (24)	Ministry of Health(25), Magen David Adom (MDA) ambulance service(26)	None found on national Internet websites
<b>Mexico</b>	<b>National:</b> General Coordination for Civil Protection (GCCP) (18), Ministry of Health (MoH): National Committee for Health Security (NCHS)(27)	None identified	None identified	None found on national Internet websites
<b>United Kingdom (UK)</b>	<b>National:</b> Home Office (28)	<b>National:</b> Home Office (28)  <b>Regional/Local:</b> Her Majesty's Coroners(28)	Regional Resilience Teams (28), Department of Health (DH)(29), UK Fire(28), National Health Service (NHS)(29)	<ul style="list-style-type: none"> <li>• <i>Guidance on Dealing with Fatalities in Emergencies (Home Office)</i> (28)</li> <li>• <i>Planning for a Possible Influenza Pandemic: A Framework for Managers Preparing to Manage Deaths</i> (29)</li> </ul>

Country	Agency responsible for management of response to catastrophic event	Agency specifically identified to lead MFM	Supporting agencies for MFM tasks	Publicly accessible, nationally published plans detailing MFM strategies/operations
<b>United States (US)</b>	<b>National:</b> Department of Homeland Security (DHS)	<b>National:</b> Department of Health and Human Services (HHS)(30)	Department of Homeland Security (DHS), Department of Defense (DoD), Department of Justice (DoJ), Environmental Protection Agency (EPA) (30, 31)	<ul style="list-style-type: none"> <li>• <i>Target Capabilities List, Respond Mission: Fatality Management (32)</i></li> </ul>

**Note:** Information was gathered using publicly available resources including state published and independent websites, state plans and emergency documents, journals, and news publications.

While many of the selected national governments have produced and publicly published MFM plans and policies, the content of these plans varies widely and often lacks adequate MFM considerations. Of the six international national emergency response information gathered, the United Kingdom presented the most inclusive plans on mass fatality management (Table 6). The UK's MFM plans are thoroughly developed and standardized, providing management responsibilities at each level of government as well as recommendations regarding operational and logistical planning, equipment needs, and procedures (28). The UK prioritizes the MFM issue and has recognized fatality management as one of seven key response areas in emergency management for several years. The United States is the only country in which a national health department was identified as the lead national agency for MFM.

**Table 6: National MFM Documents and Content Readily Accessible on the Internet**

MFM Planning Criteria	Australia	Canada	Israel*	Mexico	UK	US
Emergency management/response plan available to public	✓	✓		✓	✓	✓
Explicitly states national agency tasked for MFM operations in national emergency management plan					✓	✓
National health agency lead in MFM operations						✓
MF response detailed in separate plan/annex	✓	✓			✓	✓
Stresses regional/local response for MFM activities	✓	✓			✓	
National government appoints regional/local lead for MFM operations	✓				✓	
National government provides regional/local actors tools for MFM planning					✓	✓

**Note:** Information was gathered using publicly available from state published websites and documents.

\* Israel has set protocol for incident management, victim recovery and identification procedures, and medical triage/hospital coordination. Although incident management procedures exist, no publicly accessible plans were found using Internet searches.

### **MFM planning in the United States at the State and Local Level**

For US state governments, pandemic influenza preparedness/response plans have served as adjunct planning tools for mass fatalities. To compare US Federal MFM strategies with state plans, the LLIS database and state websites were queried to find pandemic influenza (PI) plans

from any of the 59 US state and territorial governments (Table 7). Of the 52 PI plans found, 67% were posted on LLIS. Only 46% of state PI plans address MFM. The MFM lead agency was identified in 42% of the PI plans. Of these plans, 55% identified ESF #8 or a state health agency as the MFM lead.

**Table 7: State and US Territory Pandemic Influenza Plan and Mass Fatality Management Content**

Mass Fatality Management Content in United States State Pandemic Influenza Plans								
	Mass Fatality Management Incorporated in Pandemic Influenza (PI) Plans N = 52 PI plans					Mass Fatality Management Lead Agency/Position N = 22 plans indicating lead agency		
	PI Plan	PI Plan on LLIS site	MFM in PI Plan	Projected PI Deaths Specified	Indicates MFM Lead Agency/Position	ESF #8/State Health Agency Lead	Medical Examiner/Coroner (ME/C) Lead	Other Lead
<b>State/Territory</b> N = 59	88% (52/59)	67% (35/52)	46% (24/52)	69% (36/52)	42% (22/52)	55% (12/22)	18% (4/22)	27% (6/22)

**Note:** MFM content was evaluated from 52 available US state and territory PI plans. Lead agency/position was determined only from those plans who identified a lead (N= 22). ESF #8/Health Agency Lead includes all plans that put MFM in the ESF #8 category or stated that the state's department of health or public health served as lead agency on MFM affairs.

## Conclusions

In the majority of recent international events, most countries did not have plans in place to handle a surge in fatalities, especially on a catastrophic scale. Planning and preparedness at the local, national and international levels is extremely important. While it is not practical to develop plans for every disaster, an all-hazards approach that includes mass fatality management should be implemented. Plans should include operational procedures regarding the recovery and management of disaster victims and the resources needed to accomplish this task, such as communication systems, personnel, command structure, and logistical support. It is also important that emergency planners better develop multi-agency and sector involvement in MFM planning and response, including participation from private, not-for-profit, civilian, and military sectors. All cases and events examined illustrated the criticality of strong local capacity and leadership in MFM.

This analysis identifies the need for a stronger and more comprehensive global management structure for MFM. Although a few agencies, mainly the International Criminal Police Organization (INTERPOL), WHO and International Committee for the Red Cross (ICRC), have demonstrated leadership in MFM among public sector and traditional international organization actors, a formal management framework currently does not exist. In a pandemic influenza event, a common international MFM framework would facilitate standardized practices of identification, disposition, and possible repatriation of remains.

Considerations for US preparedness at the national, state, and local level regarding MFM planning in the United States are summarized in Table 8. During a catastrophic mortality event, the unusually high levels of mortality, fear and possibly panic will be pervasive and difficult to manage. The ability of government leaders to exhibit forethought, compassion and skill in managing the treatment of the dead in a dignified and expeditious manner will undoubtedly aid the country in the grieving and recovery phase.

**Table 8: Mass Fatality Management Planning Considerations for US Government**

<b>Considerations for US Preparedness</b>	
<b>Preparedness</b>	<ul style="list-style-type: none"> <li>• Consider and plan for every MFM option, including temporary burial and communal graves.</li> <li>• Incorporate MFM in multiagency and all-hazards plans, not just health documents.</li> <li>• More agencies, the private sector, and religious groups should be included in MFM planning at all levels of government.</li> <li>• Hospitals and health providers should have the primary responsibility of caring for the living and injured. Hospitals should not be the lead for MFM planning and execution.</li> <li>• US Federal government should set benchmark requirements or funding standards to have state and local plans address neglected topics.</li> <li>• National governments, including the United States, should better communicate their role in MFM in isolated emergencies and catastrophic disasters.</li> <li>• If emphasis is on building state/local capacity for MFM management, national governments should present transparent MFM policies and tools to assist state/local governments in planning.</li> <li>• Every US state should have a comprehensive MFM plan that addresses the critical tasks for Fatality Management identified by FEMA as one of 37 target capabilities(32).</li> </ul>
<b>Organization</b>	<ul style="list-style-type: none"> <li>• Evaluate effectiveness of MFM activities residing in ESF #8 Public Health and Medical Services</li> <li>• Consider setting up regional MFM networks to serve as the interface between national and state governments in a large-scale emergency like pandemic influenza</li> </ul>
<b>Communications</b>	<ul style="list-style-type: none"> <li>• Examine communication issues, especially between agencies at different levels of government (ex. State health department and ME/C).</li> <li>• Consider providing more education to the public regarding MF events</li> <li>• Inform and educate the media on sensitive disaster topics like MFM to avoid misinformation and to promote the rights of the survivors to see their dead treated with dignity and respect</li> </ul>
<b>Information Sharing</b>	<ul style="list-style-type: none"> <li>• Create platform for information sharing for international emergency managers to arrive at consensus on difficult issues like MFM.</li> </ul>
<b>Operations</b>	<ul style="list-style-type: none"> <li>• Create and standardize MFM procedures, forms and databases and make available to state/local jurisdictions.</li> <li>• Include mental health support for responders and victims' family members.</li> <li>• Integrate new/existing victim information databases into international systems (INTERPOL).</li> <li>• Encourage simple, "low tech" means of victim identification</li> </ul>

## Appendix 1 - Acronyms

<b>Acronym</b>	<b>Meaning and Associated Country</b>
<b>ACSES</b>	Australian Council of State Emergency Services, Australia
<b>AFP</b>	Australian Federal Police, Australia
<b>ADF</b>	Australian Defense Force, Australia
<b>CREDE</b>	Centre for Research on the Epidemiology of Disease, Belgium
<b>DH</b>	Department of Health, United Kingdom
<b>DHS</b>	Department of Homeland Security, United States
<b>DMORT</b>	Disaster Mortuary Operational Response Team, United States
<b>DoD</b>	Department of Defense, United States
<b>DoJ</b>	Department of Justice, United States
<b>EMA</b>	Emergency Management Australia
<b>EMDAT</b>	Emergency Events Database
<b>EPA</b>	Environmental Protection Agency, United States
<b>ESF</b>	Emergency Support Function, United States
<b>FAC</b>	Family Assistance Centers, United States
<b>FBI</b>	Federal Bureau of Investigations, United States
<b>FDNY</b>	New York City Fire Department, United States
<b>FEMA</b>	Federal Emergency Management Agency, United States
<b>FSAC</b>	Funeral Services Association of Canada, Canada
<b>GCCP</b>	General Coordination for Civil Protection, Mexico
<b>HC</b>	Health Canada, Canada
<b>HFC</b>	Home Front Command, Israel
<b>HHS</b>	Department of Health and Human Services, United States
<b>ICRC</b>	International Committee of the Red Cross
<b>ID</b>	identification
<b>IDF</b>	Israel Defense Force, Israel
<b>INTERPOL</b>	International Criminal Police Organization
<b>IP</b>	Israel Police, Israel
<b>LLIS</b>	Lessons Learned Information Sharing, United States DHS
<b>MDA</b>	Magen David Adom, Israel
<b>ME</b>	medical examiner
<b>ME/C</b>	medical examiner/coroner
<b>MF</b>	mass fatality
<b>MFM</b>	mass fatality management
<b>MoH</b>	Ministry of Health, Mexico
<b>MOU</b>	Memorandum of Understanding
<b>NCHS</b>	National Committee for Health Security, Mexico
<b>NFMI</b>	National Forensic Medical Institute, Israel
<b>NGO</b>	non-governmental organizations
<b>NHS</b>	National Health Service, United Kingdom
<b>NRF</b>	National Response Framework, United States
<b>NYPD</b>	New York City Police Department, United States
<b>OCME</b>	Office of Chief Medical Examiner, New York City, United States
<b>PHAC</b>	Public Health Agency of Canada, Canada
<b>PI</b>	pandemic influenza
<b>S&amp;R</b>	Search and Rescue
<b>UK</b>	United Kingdom
<b>US</b>	United States
<b>WHO</b>	World Health Organization
<b>WMD</b>	weapons of mass destruction (chemical, biological, and nuclear weapons)
<b>WTC</b>	World Trade Center

## Appendix 2 - Questionnaire

The following questionnaire was used in the interviews:

1. Background information on respondent: title, number of years experience, catastrophic event experience (Katrina, Tsunami, New York, etc.) mass fatalities management responsibility and experience
2. How would you rate the effectiveness of mass fatalities management related to your catastrophic event experience overall?
  - a. What were the greatest successes?
  - b. What were the greatest failures?
  - c. What were the most important factors that affected success and failure?
  - d. In your opinion, what were the most important lessons learned for mass fatality management?
3. Based upon your experience, what changes should be made in policies and strategies in order to effectively handle mass fatalities?

	<b>Changes (General)</b>	<b>Types Of Resources</b>	<b>Amount Of Resources</b>	<b>Timeliness Of Resources</b>
<b>Local</b>				
<b>State</b>				
<b>National</b>				

4. (Asked only of selected personnel with direct operational/tactical responsibility). Based upon your experience, what improvements in policies or procedures could be made to the following aspects of mass fatality management:
  - a. Collection/recovery of remains?
  - b. Victim identification?
  - c. Preservation of remains?
  - d. Storage of remains?
  - e. Public health?
  - f. Notification of next-of-kin?
  - g. Processing death certificates?
  - h. Public affairs/information release?
  - i. Access to Federal resources?
  - j. Access to information (i.e. lessons learned) networks?
  - k. Religious and cultural information?
  - l. Temporary interment policies?
  - m. Other?
5. Given your concrete experience with mass fatality management, can you provide your assessment of how the current national framework is adequate or not in the event of a large CBRNE event that resulted in radioactive contamination and fatalities in the thousands?

## End Notes

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