

SEEKING INFORMATION AFTER THE 2010 HAITI EARTHQUAKE: A CASE  
STUDY IN MASS-FATALITY MANAGEMENT

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The 2010 earthquake in Haiti, which killed an estimated 316,000 people, offered many lessons in mass-fatality management (MFM). The dissertation defined MFM in seeking information and in recovery, preservation, identification, and disposition of human remains. Specifically, it examined how mass fatalities were managed in Haiti, how affected individuals sought information about fatalities, and what needs motivated them. Data from 28 in-depth, partially structured interviews, conducted during two field visits ending 21 weeks after the earthquake, were included in a case study.

The data analysis revealed the MFM was severely inadequate. One interviewee, a senior UN official, stated, "There was no fatality management." The analysis also indicated a need to learn whereabouts of the deceased motivated individuals to visit spots the deceased were last seen at. It sought to illumine information-seeking practices, as discussed in the works of J. David Johnson and others, by developing a new model of information flow in MFM. In addition, it reaffirmed Donald Case and Thomas Wilson's theoretical proposition – that need guides any seeking of information – in the case of Haiti. Finally, it produced recommendations regarding future directions in MFM for emergency managers and information scientists, including possible use of unidentified body parts in organ transplants. Overall, the dissertation, which was supported by two grants of the National Science Foundation, attempted to add to relatively scanty literature in information seeking in MFM.

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## ACKNOWLEDGMENTS

I offer this dissertation in tribute to victims of the 2010 earthquake in Haiti, including survivors who suffered emotionally, physically, and financially. Many thousands of the survivors are still living in makeshift camps as of March 2013. I feel deeply obliged to my 28 interviewees in Haiti, including the five family members of deceased who shared heart-wrenching stories of survival. I acknowledge my former advisor, Arthur Oyola-Yemaiel of North Dakota State University, Fargo, for introducing me to mass-fatality management (MFM) and guiding my earlier field research in India and Sri Lanka following the 2004 Indian Ocean tsunami.

Nikhil Moro, my current dissertation advisor, was my friend even before he became my primary intellectual critic. During the long process of producing the dissertation, he became my best friend. More than anything else, Moro's brilliant criticism of my ideas, arguments and language enabled my success in the dissertation. I thank him immensely for our lengthy, meticulous, and thought-provoking meetings. I am deeply grateful to Ana Cleveland and Guillermo Oyarce, the other professors on my committee, for sharing their formidable expertise and mentoring me in information science. I thank the National Science Foundation for funding my research.

*Prem* is Hindi for love, which, here, is not a verb but a noun. It is the name of my better half, literally and figuratively, to whom I owe a unique debt of gratitude. Prem, my wellspring of support, has generously endured my long absence from our empty nest in Jaipur, India. To her I dedicate this dissertation. Finally, I appreciate our children, Deepa and Vikas with respective spouses Ajay and Shilpa, and our four grandchildren, Anshita, Arjun, Tanvi, and Tanay, for their support in this challenging but enjoyable journey.

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## CHAPTER 1

### INTRODUCTION

*A close encounter with death can bring a real awakening, a transformation in our whole approach to life.*

S. Rinpoche  
*Tibetan Book of Living and Dying*

*Information alone can save lives.*

World Disaster Report 2005

#### 1.1 Introduction

Mass-fatality management (MFM) through recovery and disposition of human remains in the 2010 earthquake in Haiti is the subject of this dissertation, which examines information seeking as a function of information needs. Information seeking is defined as “a conscious effort to acquire information in response to a need or gap in your knowledge” (Case, 2012, p. 5). An act of information seeking is “controlled by interacting levels of conscious (logical) and unconscious (intuitive) mental activity” (Marchionini, 1995, p. 62), respond, recover, and rebound from a disaster in addition to helping assuage grief during bereavement.

A model of information flow in MFM was developed (Chapter 5). The study reaffirmed the theoretical proposition that need for information guides the information seeking (Case, 2012; Wilson, 1997).

The study uses interviews of people affected by the Haiti earthquake, such as family members of the deceased, responders, and administrators. In addition, it uses field observation and notes from United Nations Cluster<sup>1</sup> and other meetings, and

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<sup>1</sup> United Nations “Clusters are groups of humanitarian organizations (UN and non-UN) working in the main sectors of humanitarian action, e.g. shelter and health. They are created when clear humanitarian

documents such as situation reports.

This dissertation offers a case study of the Haiti 2010 earthquake using qualitative approach. According to Creswell (2009), “Case studies are a strategy of inquiry in which the researcher explores in depth a program, event, activity, process, or one or more individuals” (p. 13). A case study can help develop “general theoretical statements about regularities in the observed phenomena” and “to generate findings of relevance beyond the individual cases” (Fidel, 1992, p. 37). More generally, the aim of qualitative research is to understand experiences and perspectives of diverse individuals (Locke, Spirduso, & Silverman, 2007).

The need for information seeking in MFM arises to bring a sense of closure to the next of kin, to make recommendations to policy-makers in order to alleviate the Zeigarnik (1967) effect (a feeling of incomplete closure), to understand the place of death in disaster management, to alleviate diplomatic tensions, and to facilitate receiving benefits by next of kin. “Management of the dead is an important concern after a disaster and it is a major social responsibility of the community and the government,” asserts National Disaster Management Authority (2010, p. 2).

### 1.1.1 Need for Information Seeking in Disasters

The consequences of past disasters have increased need for information seeking in disaster situations. In the information science (IS) discipline, one of the important subject areas is information seeking behavior. Past disasters underscore the need for a thorough understanding of information seeking in MFM. Recent examples of such

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needs exist within a sector, when there are numerous actors within sectors and when national authorities need coordination support” (OCHA, n.d.), i.e. Health, Shelter.

disasters include the 2011 Fukushima earthquake-tsunami-nuclear radiation disaster, 2010 Haiti earthquake, 2005 Hurricane Katrina, and the 2004 Indian Ocean tsunami. In the *2005 World Disaster Report* of the International Federation of Red Cross and Red Crescent Societies (2005) it is stated that:

People need information as much as water, food, medicine or shelter. Information can save lives, livelihoods and resources. It may be the only form of disaster preparedness that the most vulnerable can afford. And yet it is very much neglected. (p.12)

Holmes was the head of the Office of the Coordination of Humanitarian Affairs of United Nations at the time of Haiti January 12, 2010, earthquake. In an internal memo leaked on February 17, 2010, (Lynch, 2010) Holmes writes, “one month into the response, only a few Clusters have fully dedicated Cluster coordinators, information management focal points and technical support capacity, all of which are basic requirements of a large scale emergency operation” (Farmer, 2011, p. 145).

### 1.1.2 Information Save Lives

“Information alone can save lives,” asserts the International Federation of Red Cross and Red Crescent Societies (2005, p. 9). This is evident by the narrative below. Vijaykumar Gunasekaran of Nallavadu village in Pondicherry, India, was living in Singapore and he found out about the earthquake and the 2004 tsunami from the radio and television. He telephoned his sister in Nallavadu and asked what was happening. She told him that “sea water was sweeping into their home” (International Federation of Red Cross and Red Crescent Societies, 2005, p. 16). Vijaykumar asked his family members to immediately leave their homes and inform other villagers. Gopu, also of

Nallavadu village was living abroad.<sup>2</sup> He also made a similar telephone call to his family. Their families went to the Village Community Center and operated a pre-existing siren to warn villagers. One hundred and fifty houses collapsed and 200 fishing boats were destroyed in Nallavadu because of tsunami, but the information saved the lives of 3,630 people (International Federation of Red Cross and Red Crescent Societies, 2005). Furthermore, the need for information is no less than that of water, food, or shelter (International Federation of Red Cross and Red Crescent Societies, 2005).

### 1.1.3 Information Reduce Suffering

In addition to saving lives, “information reduces suffering in the wake of disaster. Tracing lost family and friends...such information means an enormous amount to survivors left homeless and traumatized” (International Federation of Red Cross and Red Crescent Societies, 2005, p. 8). In the case of Vijaykumar and Gopu, their information seeking not only aided in saving their family and villagers in India during the tsunami, but it also provided comfort for Vijaykumar and Gopu themselves when they were able to provide warning to their loved ones. Information contained in a death certificate because of disasters helps next-of-kin in getting compensation from the government as well as insurance claims (Phillips, Neal, Wikle, Subanthore, & Hyrapiet, 2008).

### 1.1.4 Impact of Disasters

Disasters have political and psychological consequences (see Section 1.1.6 and 1.1.7). With the globalized connected world, with 24x7 live media coverage, disasters

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<sup>2</sup> Nation not identified.

have gained a prominent position in the news. Because disasters are dramatic, people tend to remember disaster situations. For example, people who were near Ground Zero or otherwise affected by 9/11 or have seen live television coverage of the 9/11 disaster, may never forget it. To gauge the severity of a disaster, people seek to know the number of people that died in the disaster.

#### 1.1.5 Disasters Causing Mass Fatalities

Disasters causing mass fatality are increasing in intensity and number, and may become even worse in the future (Quarantelli, 1993). The number of people died because of natural disasters between 1970 to 2010 was 3.3 million with a mean of 82,500 per year (World Bank and United Nations, 2010).

The 2004 earthquake-induced Indian Ocean tsunami resulted in the death of an estimated 223,492 people, including 40,320 who were missing. It included people from 55 nationalities present in 12 countries: Indonesia, Sri Lanka, India, Thailand, Somalia, Myanmar, Maldives, Malaysia, Tanzania, Bangladesh, Kenya, and Seychelles (arranged in decreasing number of deaths). In 2005, an earthquake in the Kashmir region killed an estimated 73,338 people in Pakistan and 1,309 in India. The Sichuan 2008 earthquake caused the deaths of an estimated 87,564 people in China. In the same year, Cyclone Nargis killed an estimated 138,366 people in Myanmar (EM-DAT, 2013). Brown and Delva (2011) quoting Haitian Prime Minister Jean-Max Bellerive, reported on the Reuters news agency website that death toll from the earthquake was more than 316,000. As explained in Section 1.1.2 proper information seeking and information availability would have reduced the number of fatalities.

### 1.1.6 Impact of Disasters Causing Mass Fatalities

A mass-fatality incident caused by a disaster has political and psychological implications (see Section 1.1.7). Proper and timely information dissemination may reduce the impact of disasters causing mass fatality. The performance of governments are judged for example by “the extent to which the cultural and societal sensitivities are applied to respectfully handle the remains can be one factor by which governments are long-after judged by the survivors of disasters” (Gursky, 2012b, p. xxiv).

In addition, improper MFM may even lead to creation of a new nation. In 1970, there were severe floods in what was then East Pakistan that resulted in the death of an estimated 300,000 people and widespread destruction. People of East Pakistan believed that the Pakistan government, located in West Pakistan about 2,000 km (1,250 miles) away did not respond adequately. The 1970 elections resulted in Awami League of East Pakistan getting majority, but Pakistan government did not respect the results. There was civil turmoil and millions of the survivors fled into neighbouring India as refugees. India was dragged into the conflict between East and West Pakistan, resulting in the liberation of Bangladesh in 1971 (World Bank and United Nations, 2010). This example shows the political repercussions of a mass-fatality disaster.

### 1.1.7 Effect of Lack of Information in Disasters

Disaster response is adversely affected by incomplete and inaccurate information. McEntire (2002) studied the coordination problems after March 28, 2000, Fort Worth, Texas, tornado and found that incomplete and inaccurate information affected emergency response. For instance, during the response to that incident, there was an excess of information creating processing delays and there was uncoordinated

information exchanges between emergency operations centers and field personnel. Although McEntire studied the coordination in the aftermath of a tornado, the findings may be applicable in a MFM situation.

Generally, a large section of the population in the world has to face problems even for normal decent day-to-day living, particularly in developing countries. People have little time, energy or inclination to invest resources, including emotional resources, in a rare mass-fatality event.

Lack of information about the missing, or loved ones who did not survive can be tragic for families. After a disaster, an inability to perform last rites may cause a Zeigarnik (1967) effect and post-traumatic stress disorder (American Psychiatric Association, 2000) to the surviving family members. Zeigarnik effect is the remembering of uncompleted tasks more compared to the completed tasks or in simple words unfinished closure or inability to say goodbye. An exposure to an event that threatened death or serious injury to self or other responded with intense fear, helplessness or horror is termed as post-traumatic stress disorder (American Psychiatric Association, 2000). The surviving family members of the disaster deceased may develop existential anxiety and may consider life meaningless.

#### 1.1.8 Lack of Understanding about MFM and Information Seeking in MFM

Researchers have done MFM research mostly in western developed countries, most often after air crashes. McNeil and Quarantelli (2008) assert, "Most of the studies so far undertaken have been done by social scientists in Western type of societies, even though the great majority of disasters occur in developing countries" (p. 2). Mileti (1999) substantiates, "Fatalities in developed countries [because of disasters] have

steadily decreased by 75 % during the past 50 years” (p. 101). That was 1999 and in the succeeding 13 years, disaster deaths in developed countries would have decreased further.

In recent US disasters, including air disasters, there have been fewer than 200 fatalities from any one disaster (Simpson & Stehr, 2003), with the exception of the Chicago heat wave (Klinenberg, 2002), 9/11 (National Commission on Terrorist Attacks Upon the United States, 2004), and Hurricane Katrina (Natural Hazards Center, 2006). There were hardly any MFM studies in any developing nation following natural disasters. However, after the 2004 tsunami, MFM studies were done in developing countries also.

Difficulties in MFM following a sudden onset disaster generally arise because of lack of understanding of how to seek information. There seems to be no documented research on information seeking in MFM. A search on the Web of Knowledge database for topics in (i) “information seeking” and “mass fatality,” or (ii) “information seeking” and “mass fatalities” on January 29, 2013, did not produce any result. Similarly, a search on Google Scholar on the same day also did not produce any relevant literature. Furthermore, a search on Library and Information Science Abstracts with “information seeking” and “mass fatality” or “mass fatalities” in title, key word, abstract, or even anywhere on the same day also did not return any document. There appears to be no researcher who has published information seeking in MFM after disasters.

## 1.2 The Problem

The problem this dissertation addresses is that MFM is too often conducted in a haphazard, by chance, and in a chaotic way, without any strategic planning before a

disaster (Pan American Health Organization, 2004). In the aftermath of 2004 Indian Ocean tsunami, Aswalap (2009) found a lack of a system or protocols for managing information about the dead and the missing and no designated authority to oversee mass-fatality information management in Thailand. According to a United Nations senior official interviewed in Haiti, "There is no fatality management." There is inadequate understanding of information needs and information-seeking in mass-fatality situations. Scholars have found a lack of valid, reliable, and timely information relating to disaster response, which hinders decision-making (Fritz & Marks, 1954).

### 1.3 Purpose

The purpose of this research project was to develop an understanding about MFM, information seeking practices in MFM, and make recommendations to information scientists, disaster researchers, and practitioners for MFM and sound information seeking practices in future sudden mass-fatality disasters. Improved MFM and information seeking practices in MFM may accelerate and promote community response, recovery, and resilience following such events.

Another purpose was to develop a model of information flow in MFM. In addition, the dissertation aimed to develop theoretical and pragmatic recommendations about MFM and information seeking in MFM. The dissertation would help academicians, disaster managers, disaster management trainers, first responders, students, and those that find themselves in an area impacted by a mass-fatality disaster.

The scholarly significance of the research is that it reaffirmed the theoretical proposition that need for information guides information seeking (Case, 2012; Wilson, 1997). This relationship has been explored in the literature. The dissertation enhanced

the understanding of factors that help or hinder information seeking in MFM. It was an early step in knowledge creation in that area. Another scholarly significance of the research is that it helped in development of a model of information flow in MFM to guide agents in alleviating suffering.

The social significance of the research is that gaining an in-depth understanding of MFM and information seeking in MFM may help design appropriate information policies, protocols and systems as well as training programs (Gu & Mendonca, 2005) to accelerate and promote community response, recovery and resilience. Another social significance of this study is to help in alleviating suffering of family members and the community. It offers lessons for various community affected by disasters.

There is ample research on disaster management and information seeking, but little on the topics of MFM. The researcher was unable to locate any publication on information seeking in MFM. The reason may be talking about death is perceived as a taboo (Bertman, 1974). Although death is inevitable but in most cultures people do not like talking about death directly, because it scares them. Scholars have thus far left these important areas relatively unexplored. This is surprising, since in mass-fatality incidents the stakes are higher. According to Case (2007, p. 10), "Higher stakes are more likely to create situations that attract research." The dissertation will attempt to begin fill this gap in the knowledge.

Quarantelli (2005) asks if "any disaster researcher [can] cite any widely held beliefs, for example, about disaster-associated aspects of death" (p. 383). By disaster-associated aspects of death, Quarantelli probably meant deaths in the aftermath of a

disaster. This study attempted to address Quarantelli's challenge about MFM and information seeking in MFM.

#### 1.4 Research Questions

The literature review established a need to research MFM and information seeking in mass-fatality disasters for many reasons: to bring a sense of closure to the next of kin, to make recommendations to policy-makers to alleviate the Zeigarnik effect, to understand the importance of mass fatality in disaster management, to alleviate diplomatic tensions, and to facilitate receiving benefits by next of kin of victims.

In a situation of mass fatality, it is reasonable to expect that next of kin affected will seek information of the whereabouts and fate of family members (Atkin, 1973; Belkin, Oddy, & Brooks, 1982). Seeking information at such times is akin to foraging for food by the hungry. It is well documented that phone lines and Internet communications break down in the aftermath of a disaster (e.g., McEntire, 2007; Nollet & Kayser, 2003). In a light of the Haiti earthquake, the driving questions of this research are how were mass fatalities managed (RQ1)? What were the needs of those affected to seek information about fatalities (RQ3) and how did they seek information (RQ2)?

The research questions helped to find how human remains were recovered, preserved, informed to community, identified, and disposed of. The research questions also helped to establish different ways (i.e., going to the last know place of victim, telephone, visiting hospital) in which those affected sought information. In addition, the research questions helped to find the need (i.e., knowing whereabouts of the person) for seeking the information. Addressing the research questions may help in improving MFM and information seeking practices in MFM.

The research questions as derived from the literature are:

*RQ1: How were mass fatalities managed in the aftermath of the Haiti 2010 earthquake?*

*RQ 2: How did those affected by the Haiti 2010 earthquake seek information about fatalities?*

*RQ3: What were the needs that motivated those affected to seek information about fatalities?*

## 1.5 Concepts and Operationalization

The concepts used in this dissertation and their operationalization are given below:

### 1.5.1 Fatality

Fatality means death resulting from a disaster.

### 1.5.2 Mass-Fatality Incident

A mass-fatality incident “is an event that causes loss of life and human suffering, which cannot be met through usual individual and community resources” (Teahen, 2012, p. 1). It is operationalized in this dissertation by consequence of the Haiti 2010 earthquake.

### 1.5.3 Mass-Fatality Management

Mass-fatality management is operationalized by how the human remains were recovered, preserved, informed to community, identified, and disposed of.

#### 1.5.4 “Haiti”

Haiti is a nation that occupies western one-third of the island of Hispaniola, between the Caribbean Sea and the North Atlantic Ocean, west of the Dominican Republic. The population of Haiti is estimated to be 10 million in 2010 (World Bank, 2011). Gupta and Sadiq (2010) posits, “The extremes of inequality, poverty, and the corruption triangular pillars on which Haiti is standing, coupled with weak government, is the perfect recipe for the catastrophic disaster we have seen” (p. 4).

#### 1.5.5 Earthquake

Earthquake is “used to describe both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth” (U.S. Geological Survey, 2012). Haiti lies in a seismic zone located at the intersection of the North American and Caribbean plates that makes it vulnerable to earthquakes (McEntire, Sadiq, & Gupta, 2012).

#### 1.5.6 Disaster

Disasters are “deadly, destructive, and disruptive events that occur when a hazard interacts (or multiple hazards interact) with human vulnerability” (McEntire, 2007, p. 2). Disaster is operationalized by mass-fatality in the Haiti 2010 earthquake.

#### 1.5.7 Disaster Management

Disaster management is “a process that assists communities to respond, both pre- and post-disaster, in such a way as to save lives, to preserve property; and to maintain the ecological, economic, and political stability of the impacted region”

(Pearce, 2001, p. 6 of Chapter 5). Disaster management is operationalized by the way Haiti earthquake disaster was managed.

#### 1.5.8 “Affected”

Effect (noun) is conceptualized as a change in routine of daily existence caused by the Haiti earthquake. The Brussels-based Centre for Research on the Epidemiology of Disasters defines those affected (adjective, affect is a verb) as, “People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance” (EM-DAT, 2013).

In this dissertation, affected is operationalized by people (i) whose family member(s) died because of the earthquake, or (ii) who were trying to find the whereabouts of their loved once, or (iii) who themselves handled fatalities, or (iv) who were somehow (i.e., administratively) connected with handling fatalities, or (v) who themselves were at the sight of fatalities. Above criteria were used in selecting the purposive sample of interviewees affected by fatalities as discussed in Sections 3.12.

#### 1.5.9 “Victim”

Victim is operationalized as other than responders and administrators, and include family members of a deceased because of earthquake, occupant of a house in which a visitor died because of earthquake, religious leader, and a building subcontractor.

#### 1.5.10 Information

Information is conceptualized as something a person knows or wants to know in

a particular cultural-situational context that may help the person in the decision-making. Information is operationalized by the statements made by the interviewees.

#### 1.5.11 Information Seeking

Information seeking “is a conscious effort to acquire information in response to a need or gap in your knowledge” (Case, 2012, p. 5). Information seeking is operationalized by the actions (i.e., by going to the last known place of a person, going to hospital, telephone) interviewees took.

#### 1.6 Limitations

No research is perfectly designed and all have limitations and trade-offs (Marshall & Rossman, 2011). The data for this study were collected for the MFM and the same data were used for information seeking in MFM, because of this there is a limitation of confirmation bias.<sup>3</sup> In addition, at the time of data making, the researcher has designed this study to accommodate the existing data.

The researcher made efforts in both the phases of field research to interview any administrator of Central National Equipment, the public works agency of the Haitian government that managed mass fatalities or an administrator of Haitian government without success. The efforts included contacting them through UN administrators, UN Formed Police Unit official, University General Hospital morgue director, university professors, and visiting their offices. The views of Haitian government on seeking information and managing mass fatalities are not reflected in this dissertation.

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<sup>3</sup> Confirmation bias “is a tendency, when testing an existing belief, to search for evidence which could confirm that belief, rather than for evidence which could disconfirm it” (Jones & Sugden, 2001, p. 59).

It is assumed that interviewees were truthful and provided the information honestly. It is also assumed that the researcher correctly understood what the interviewees told him. Seven interviewees were requested to vouch for the correctness of their interview transcripts, of which three confirmed the correctness, while other four did not respond. This validated the assumption. Email addresses of the remaining 21 interviewees were not known.

As the researcher does not speak Creole, a translator was employed across the two phases of interviewing (February and May-June 2010). Seven of the 28 interviewees did not speak English. There may be some meaning loss in translating those seven interviews, but in any case, a reasonable approximation of an interviewee's words and intents is deemed sufficient (Marshall & Rossman, 2011).

That different individuals were translators in two phases might be seen as a limitation. This limitation was mitigated by sending one Creole speaking interviewee's audio-record file to an emergency management alumnus of the University of North Texas originally from Haiti. He transcribed the interview. There was a similarity of translation provided by the alumnus and the translator in Haiti.

Marshall and Rossman (2011) assert that in qualitative research, "gold standards' such as generalizability, replicability, control groups, and the like are not the right criteria to aim for" (p. 77). This being a qualitative study, the findings may be partially generalizable or transferable. As an example, findings of this study may not be generalizable because of cultural differences with another society. Additionally, generalizability is also a limitation because of the single case study method used in this dissertation.

Another limitation is that the researcher is able to search the literature in the English and websites that have multi-language content including English. Yet another limitation of the study is that it is based on self-reported expressions, which however may be addressed by checking self-reported expressions of one interviewee with that of another. This limitation is also likely to be controlled to by triangulation (Maxwell, 2005) by which data is made from more than one source including interviews, observations, and documents.

The internal and external factors are recognized in the model developed on information flow in MFM. This dissertation was not designed to go in details of those factors, but gives direction for future research.

## 1.7 Chapter Summary

This dissertation examined MFM through recovery and disposition of human remains in a case of the Haiti 2010 earthquake. It also examined information seeking in the MFM as a function of information needs. In addition, the study reaffirmed the theoretical proposition that need for information guides the information seeking. Further, a model of information flow in MFM was developed. The investigation has broadened our understanding of MFM and information seeking in MFM. Disasters causing mass fatalities are increasing in intensity and number, and may even become worse in the future. However, information can save lives. This study is significant since there appear to be lack of literature on MFM and no literature on information seeking in MFM. The researcher used qualitative approach using Haiti earthquake as a case study. The next chapter reviews the literature on information seeking, MFM, and information seeking in MFM.

## CHAPTER 2

### LITERATURE REVIEW

Literature in information science (IS) and disaster management (DM), as relevant to this study, was examined. In IS, the review starts at a broader level in information, progressively narrowing to cover IS, information practices, information needs, and information seeking. In addition, the review also discusses the meanings of disaster, and then progressively narrows to DM and mass-fatality management (MFM). Thereupon, the literature review argues in favor of research in managing mass fatalities and information seeking in MFM (Figure 1).

“We are enveloped in information, and saturated by it. To a certain extent, we are blinded by it. The sheer volume of information can obscure our vision and hinder understanding” (Dochartaigh, 2012, p. 1) in the information age. Johnston and Kelley (2013, February) asserts that now the quantities of data coming in two years are equivalent to data collected in whole of human history. Therefore, the need to avoid irrelevant information is as important as to get relevant information, if not more.

#### 2.1 Information

Information is essential to our survival. The word information is derived from the Latin word *informare*, which means "give form to" (Machlup, 1983). Information gives structure to our everyday lives; it is the “core of existence” (Gleick, 2011, p. 10). Spence (2011) points out we are living in an information society.

Scholars have long debated how information is defined. According to the constructionist approach in communication theory, people use information to create their own reality (Dervin, 1983). Information is whatever somebody thinks (Dervin,

1983). Similarly, Dretske (1981) expands this idea stating, “Beauty lies in the eye of the beholder, and information is in the head of the receivers” (p. vii). The meaning of information is “determined in social and cultural context” (Capurro & Hjørland, 2003, p. 397) by individuals. Recipient intent is intended to change the image or perception of the problem is information (Belkin & Robertson, 1976). All processes produce information: for example, baking a cake gives information about the ingredients (Losee, 1997). Also, information originating from one system affects another system (Madden, 2000).

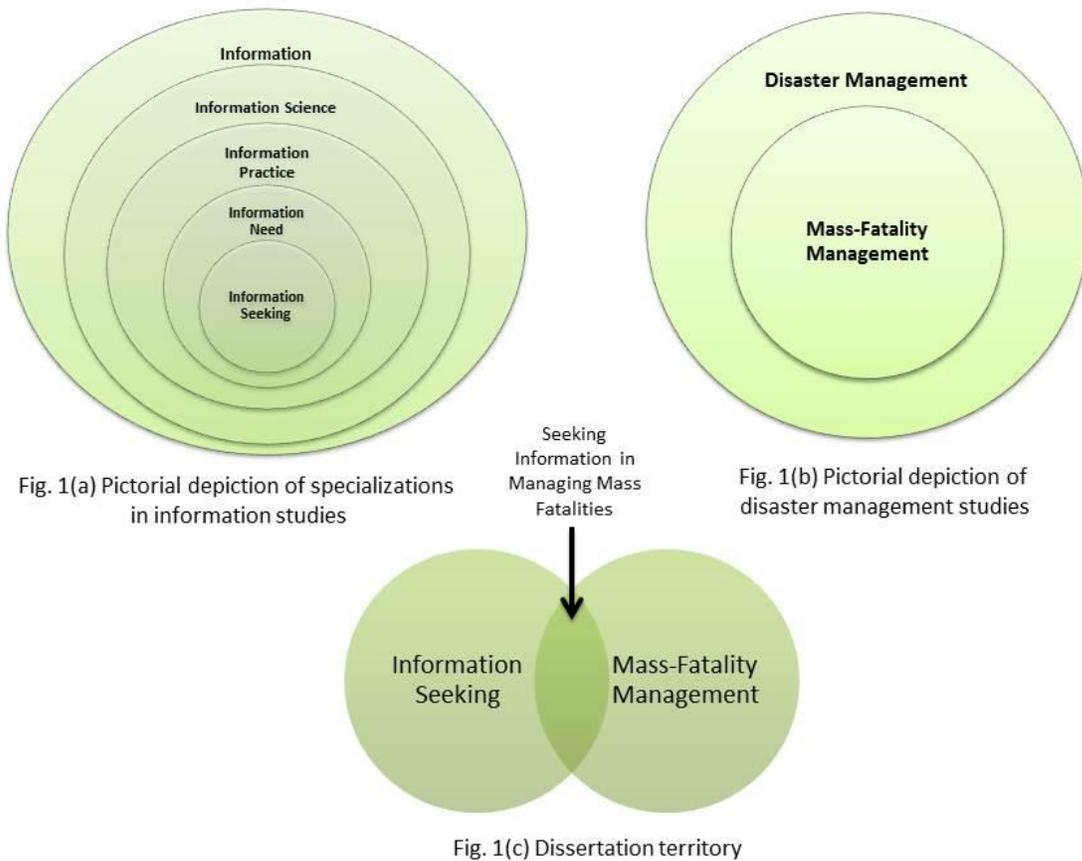


Figure 1. Information seeking and mass-fatality management.

Various authors have considered information as asset (Oppenheim, Stenson, & Wilson, 2003), as thing (Buckland, 1991), as process (Buckland, 1991; Losee, 1997), as text (Belkin & Robertson, 1976), and as knowledge (Buckland, 1991). Information can also be used for uncertainty reduction, which has been studied by many scholars (e.g., Atkin, 1973; Belkin et al., 1982). Indeed, a Delphi study with 57 information science experts from 16 countries came out with 44 definitions of information (Zins, 2007a).<sup>4</sup> In a mass-fatality disaster, a victim would seek whereabouts of family members, which is information.

## 2.2 Information Science

Humans have communicated by sound, gestures, body language, and other means from the time of hunter-gatherer societies. Drums, smoke signals, and other means have been used to communicate information (Gleick, 2011). The ancients knew how to use information. What is not ancient about information is the theoretical and scientific understanding of information that constitutes IS.

According to Madden (2000), “information science” was coined in 1955 by T.D. Wilson. Borko (1968), who gave one of the earliest definitions of IS, emphasized on “the means of processing information for optimum accessibility and usability” (p. 3). According to Bates (1999), “Information science is the study of the gathering, organizing, storing, retrieving, and dissemination of information. This definition has been quite stable and unvarying over at least the last 30 years” (p. 1044). According to Capurro and Hjørland (2003), another “of the most frequently used definitions of

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<sup>4</sup> For a comprehensive history of information, see Gleick (2011) and for a brief history, see Black (2006).

information science” is: “Information science is concerned with the generation, collection, organization, interpretation, storage, retrieval, dissemination, transformation, and use of information, with particular emphasis on the application of modern technologies in these areas” (p. 388).

Schrader (1983) found 700 definitions of IS. Most recently, Zins (2007a) Delphi study identified 50 IS definitions. There is no agreement among the experts about a single definition of IS. However, according to Saracevic (1999), “Debates over ‘proper’ definition of IS, as of any field, are fruitless, and in expectations naïve” (p. 1051). In place of debating about the definition of information, it is important that IS field progresses in addressing problems and methods (Saracevic, 1999). In addition, the IS discipline is constantly changing (Zins, 2007b). IS is about solving problems; it is not set in granite (Debons, 2008).

Nevertheless, the 36 institutions in 11 countries constituting the consortium of information schools, branded as iSchools organization (iSchools, 2012b), have agreed upon the definition of the IS discipline. They argue that “the study of information focuses on the intersection of information, technology, and people, which requires a broad interdisciplinary approach to those phenomena, the relationship between them, and their relationships to other aspects of culture and human endeavor” (iSchools, 2012a). Debons (2008) has tried to put the definition of IS in simple words: “The study of how best to use technology together with the knowledge of other sciences in extending human awareness of the world; finding meaning and understanding applied to life’s demands” (p. 3).

Interdisciplinarity in IS is problem-centered (Wilson & Edelman, 1996) and

“predetermined” (Saracevic, 1999, p. 1059). The literature (Frodeman, Klein, & Mitcham, 2010; Klein, 1990; Morillo, Bordons, & Gomez, 2003; Nissani, 1997) has discussed many benefits from interdisciplinary work, for instance innovation, which is not possible through individual disciplines. Interdisciplinary in IS is important because many problems such as poverty and global warming cannot be solved with approaches of a single discipline (Saracevic, 1999).

Indeed, in recent times, funding agencies like the National Science Foundation have been promoting interdisciplinary research. Bates (1999) defines the interdisciplinary field as that which “cuts across, or is orthogonal to, the conventional academic disciplines” (p. 1044). The IS discipline is a meta-field, that cuts across many disciplines and considers various information-processing methods (Bates, 1999). In the IS discipline, an important sub-discipline is information practice.

### 2.3 Information Practice

A practice is an organized way of doing a human activity. In addition, a practice helps in understanding the logic of human activity. Furthermore, a practice occurs within a specific field of knowledge (Lloyd, 2010). For instance, we have distinct communities of practice in various disciplines, like engineering, medicine, and law.

Wilson (1997) defines information practices to include “instances in which helpful or unhelpful information comes or is given without the initiative or actions of another agent” (p. 39). Information practices designate social (not individual), collaborative, communicative, and contextual processes of information needs and information seeking (Savolainen, 2007; Wilson, 2009). In IS, these practices are referred as information behavior. However, Savolainen (2007) criticizes this term, arguing that it is

grammatically incorrect, because “‘information does not behave’—only people do” (p.116). Furthermore, Savolainen (2008) states, “Compared to information behavior, the major distinctive characteristic of the information practice approach is that it represents ‘a more sociological and contextually oriented line of research’” (p. 4).

According to Savolainen (2007), information practice includes formal and informal communication and "information practice is mainly inspired by the ideas of social constructivism" (p. 109). On the other hand, he posits, "information behavior" is based on a cognitive viewpoint.

Bates (2010) agrees with Savolainen and states that Savolainen may have started a new phase in information research by asserting that in place of information behavior, qualitative research should be referred to as “information practice.” Bates (2010) explains the difference between information practice and information behavior:

The concepts of information behavior and information practice both seem to refer to the ways in which people ‘deal with information.’ The major difference is that within the discourse on information behavior, the ‘dealing with information’ is primarily seen to be triggered by needs and motives, while the discourse on information practice accentuates the continuity and habitualization of activities affected and shaped by social and cultural factors. (p. 126)

The concept of information practice is gaining acceptance in the IS literature (Lloyd, 2010). Talja (2006) posits that information practice represents “a more sociologically and contextually oriented line of research” (p. 123). Therefore, in a disaster, social and cultural traditions would influence information practices.

Because of an attitude of denial, the importance of information practices in disaster management is not always recognized. Governments, organizations and people largely think that a disaster will not strike them. However, there are exceptions and some communities invest considerable resources in disaster preparedness,

prevention, and mitigation. Many long-standing successful organizations believe that because they have been successful and never had a disaster, one will not occur.

Therefore, they may not invest in disaster planning and preparedness practices.

However, according to Perrow's normal accident theory (Perrow, 1999) complex systems will fail no matter what; in other words, the question is not whether complex systems will fail or not, but when they will fail. According to Weick and Roberts (1993), "Perrow suggested that technologies that are both tightly coupled and interactively complex are the most dangerous, because small events can escalate rapidly into a catastrophe" (p. 377). This has happened in the 2011 Fukushima, Japan, earthquake-tsunami-nuclear radiation disaster and the 1984 Bhopal chemical disaster (Shrivastava, 1986), both of which were MFM disasters. When governments deny the possibility of a disaster, there are not clearly defined policies about information practices, including information needs. When there are no information policies, the question of conducting drills for information practices, including information needs does not arise. The study of information practice consists of two components: information needs and information seeking.

## 2.4 Information Needs

Information needs arise when people recognize that some information is missing and that information will help in completing their perception of reality. The concept of information needs may be defined as an awareness of a gap in the knowledge. There are many models of information need. The major models of information needs are: information as a question of Taylor (1986), as an anomaly of Belkin (1980) and Belkin et

al. (1982), as a gap of Dervin (1983, 1992), and as an uncertainty of Kuhlthau (1994, 2004).

According to Taylor (1986), depending on the needs awareness, a person may form questions at four levels. These are visceral, that is below consciousness; conscious, that is aware of the needs but not specific; formalized, that is properly articulated; and compromised, that is questions are converted into terms of systems. Belkin (1980); and Belkin et al. (1982) posit an anomalous state of knowledge, in which information needs arise because of an anomaly in the awareness of the individual who is not able to articulate how to resolve the situation. According to Dervin (1983, 1992), information needs arise because of a discontinuity or gap in somebody's knowledge that may be filled by using a situation-gap-use triangle. According to Kuhlthau (1994, 2004), uncertainty is a cognitive and affective state when information needs are vague.

The consequences of past disasters, such as deaths and destruction, have increased need for information in disasters. In a disaster, there are information needs in victims for whereabouts of family members, how to communicate with loved ones, food, water, shelter, and medical facilities. Information needs are the driving force to seek information in a particular situation (Case, 2012; Wilson, 1997).

## 2.5 Information Seeking

In the IS discipline, one of the important subject areas is information seeking behavior. Seeking information may solve a problem, help in completing a task, or answer a question. Early studies on information were labeled "use studies" (Davis & Bailey, 1964). Other labels for these studies were, "information seeking and gathering" and "information needs and uses." Later, Bates (2010), referring to the writing of Menzel

(1966), asserts that the "information seeking research" term was used to include various types of research on people's interaction with information. Marchionini (1995) writes that information seeking behavior is "controlled by interacting levels of conscious (logical) and unconscious (intuitive) mental activity" (p. 62).

According to Case (2012), "*Information seeking* is a conscious effort to acquire information in response to a need or gap in your knowledge" (p. 5, emphasis in original). In information seeking, one is guided by both conscious needs and subtle unconscious psychological desires or urges. Some assert that "information seeking," relates only to the explicit efforts to locate information.

Bates (2010) asserts, "Information behavior" is the most popular term used in information sciences. "Information behavior describe the many ways in which human beings interact with information, in particular, the ways in which people seek and utilize information" (Bates, 2010, p. 2381). Case (2012)<sup>5</sup> contradicts that claim, stating information seeking is the "most commonly discussed" (p. 5) concept among information, information need, information seeking, and information behavior. It is hard to observe information seeking behavior, which resists generalization. Information seeking varies depending on people, situations and interest (Case, 2007). That is why researching information seeking is challenging.

Wilson (1981) writes about a general information seeking model and expanded his earlier general model of information behavior (Wilson, 1997) so that the model could be applied to information behavior generally. According to Wilson (1997),

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<sup>5</sup> Case (2012) in his book *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior* gives references in 74 pages single space, small print.

At the root of the problem of information seeking behavior is the concept of *information need*, which has proved intractable for the reason advanced by Wilson in 1981; that is, *need* is a subjective experience that occurs only in the mind of the person in need and, consequently, is not directly accessible to an observer. (p. 552, emphasis in original)

Furthermore, “information need was an unhelpful concept for research purposes,” asserts Wilson (2005), whereas information seeking behavior is observable. This is contrary to the view that it is difficult to observe information seeking behavior stated in the earlier paragraph (Case, 2007).

In a disaster, there is a need of real-time accurate information of a diversified nature to respond. The need for information guides the information seeking behavior (Case, 2012; Wilson, 1997). Section 1.1.7 argued that a lack of information creates problems in responding to a disaster. Therefore, information seeking is an important discipline for DM.

## 2.6 Disasters

One of the oldest perceptions to guide DM was that disasters were an “evil star,” a bad omen, or acts of the supernatural. Smith (1996) explains that an act of God is a fatalistic “syndrome whereby individuals feel no personal responsibility for hazard response and wish to avoid expenditure on risk reduction” (p. 70). Others believe that it is karma from previous lives and this life that results in suffering from disasters. The strength of such perception is that people do not complain about a disaster; remain satisfied, and even happy. The weakness is that since it is an act of God, nothing can be done about it.

Prince (1920) is generally considered as the first disaster social scientist (Drabek, 2003; Drabek & McEntire, 2002) with his dissertation on the Halifax shipping

explosion of 1917. His finding was that catastrophe brings change including legislation (Dynes & Quarantelli, 1993; Scanlon, 1988). The earliest definition of the concept of disaster was given forty years later by Fritz (1961). According to Fritz, a disaster is an accidental event “concentrated in time and space” resulting in loss of lives, property, and the “social structure” (p. 655). Contemporary researchers have expanded this definition.

Kreps (1998) qualifies Fritz’s views by adding that disasters are defined by forewarning, magnitude of impact, scope of impact, and duration of impact: “disaster implies worst case scenarios that are sociologically credible” (p. 34). Other definitions by Kreps, Quarantelli, McEntire, and the United Nations International Strategy for Disaster Reduction (ISDR) are similar. Quarantelli (1998) defines a disaster as a natural or man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to societies, ecosystems, and the environment.

McEntire (2007) writes:

Disasters are defined as deadly, destructive, and disruptive events that occur when a hazard interacts (or multiple hazards interact) with human vulnerability. The hazard is an agent or threat such as earthquake, industrial explosions, or terrorist attacks. Vulnerability, on the other hand, refers to the proneness of people to disasters based on factors such as their geographical location, exposed property, and level of income. (p. 2)

The ISDR defines disaster as “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (United Nations International Strategy for Disaster Reduction, 2011).

### 2.6.1 Phases of Disasters

The Department of Homeland Security in 2011 introduced prevention and protection as phases in disaster management. Generally, there is an agreement in disaster and emergency management literature about four phases of disasters: mitigation, preparedness, response, and recovery.

McEntire (2007) writes, “Mitigation refers to two things, disaster prevention and loss reduction” (p. 3). Mitigation means to remove the vulnerability risk factor. For example, to mitigate the risk of building collapsing from a certain intensity of an earthquake, buildings may be structurally constructed to withstand the risk of that particular intensity of earthquake. It may be hard to mitigate all types of disasters. For example, it may be difficult to mitigate different types of terrorist attacks. Therefore, society should be prepared and vigilant.

McEntire advocates in favor of preparing for the risk factors that we are not able to mitigate, or to put in other words, “preparedness implies efforts to increase readiness for a disaster” (p. 3). The response phase is defined as an “activity in the immediate aftermath of a disaster to protect life and property” (p. 3). Response phase deals with the actions that need to be taken immediately (say within 72 hours) of the occurrence of a disaster, for example, warning, search and rescue, and other such activities. The dissertation is concerned with the response phase. In the recovery phase, the conditions are improved to bring back to normal operations of daily living that existed before the occurrence of the disaster or even better.

### 2.7 Disaster Management

DM is concerned with all of the four phases: mitigation, preparedness, response,

and recovery. Pearce (2001) defines disaster management as “a process that assists communities to respond, both pre- and post-disaster, in such a way as to save lives, to preserve property; and to maintain the ecological, economic, and political stability of the impacted region” (Chapter 5, p. 6). Furthermore, DM is a cyclical and collaborative process in which the gathering, organization and dissemination of information is critical (Sagun, Bouchlaghem, & Anumba, 2009).

There have been advancements in DM<sup>6</sup> in the last decade, when Fukushima, Haiti, Katrina, and the tsunami were covered live 24x7 by the electronic media. The Emergency Management Institute of the Federal Emergency Management Agency organizes an annual Higher Education Conference in June.<sup>7</sup> Similarly, the Natural Hazards Center of the University of Colorado at Boulder also organizes an annual Natural Hazards Research and Applications Workshop in July.<sup>8</sup>

In disaster management, the emphasis is on management rather than disaster. Management in a sense refers to strategic management, which could involve planning and implementation. Strategic disaster planning is done before a disaster strikes, whereas strategic implementation is done to execute the strategic plan. In the absence of strategic planning, disasters are managed or mismanaged in a chaotic, by chance,

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<sup>6</sup> For a list of 50 most recommended books by graduate faculty and disaster researchers in the United States for graduate students of disaster management see Gupta (2005a). For global higher education and certification opportunities in emergency management see Gupta (2010d). For a status report on emergency management higher education in USA, see Cwiak (2012). From the disaster research point of view, the *Handbook of Disaster Research* Edited by Rodriguez, Quarantelli, and Dynes (2007) is a noteworthy publication. This handbook covers 72 pages of references in single space, small print. Blanchard (2008) has compiled a 1366-page Guide to emergency management and related terms, definitions, concepts, acronyms, organizations, programs, guidance, executive orders & legislation: A tutorial on emergency management, broadly defined, past and present.

<sup>7</sup> Details of the 2013 Conference are at <http://training.fema.gov/EMIWeb/edu/educonference13.asp>.

<sup>8</sup> Details of the 2013 Workshop are at <http://www.colorado.edu/hazards/workshop/current.html>.

and haphazard manner.

Below the strategic management level, there is operations management and then tactical management. Operations management is concerned with management of various activities such as communications, search and rescue, and shelter. Tactical management is concerned with execution of each single piece of work. For example, responding to the needs of an individual victim. DM includes management before, during, and after disasters. The aim of management is to improve effectiveness and efficiency.

### 2.7.1 Strategic Management in Disasters

Crews (1999) posits, “Emergency management is primarily a strategic activity” (p. 24). Drabek (2003) found, “Disaster response effectiveness requires that local emergency managers implement a strategic approach that reflects their awareness of ‘the big picture’” (p. 196). He recommends that emergency managers think strategically.

Heath (1999) recommends a strategic preparedness for DM, not only among response organizations, but also among the vulnerable communities. Strategic management is a long-term process that helps in maintaining the commitment of the organization to its vision and mission, cultivating a culture that helps in keeping the organization focused on achieving its objectives (Choi, 2008). Strategic management helps in developing effective decision-making processes (Peter & Waterman, 1982).

### 2.7.2 Decision-Making in Disasters

An important aspect of strategic management is decision-making. In a rational-decision making process, the relevant information is gathered, alternative solutions are

thought of, and an appropriate decision is made. However, in a disaster, decisions are made under bounded rationality (Simon, 1997), meaning in the absence of full information. The decision maker in a disaster is not able to achieve full rationality because the situation and the information is changing and the decision maker is not able to get all of the necessary information (McEntire, 2007). During disasters, decisions have to be made under conditions of uncertainty. This uncertainty is caused by unavailability of accurate and timely information about the disaster situation, needs assessment, resources needed, and their availability.

Decision-making under uncertain disaster conditions is very complex and a multifarious process, and decisions have to be made under intense time pressure (Dror, 1988). In addition, decision-making under disaster conditions should be viewed “as a human emergency activity directed to helping human beings in acute misery” (Dror, 1988, p. 273). Furthermore, Dror (1988) identifies a need in disaster for a continuous estimation and current portrayal of information. This information is “best displayed using interactive graphics and information systems that are simultaneously available to the principal decision making and analysis situation in DDC [Decision-making under disaster conditions]” (p. 268).

### 2.7.3 Information in Disasters

Difficulties in obtaining valid and reliable information relating to disaster response was documented as early as 1954 (Fritz & Marks). Celik and Corbacioglu (2010) assert, “Multiple organizations from different jurisdictions and sectors with different responsibilities...create an emergent and complex system in response to disasters” (p.

151). The United Nations Foundation (2011) also recommends a framework for institutionalizing collaboration and information sharing.

“Information alone can save lives,” asserts the International Federation of Red Cross and Red Crescent Societies (2005, p. 9). Furthermore, the need for information is no less than that of water, food, or shelter (International Federation of Red Cross and Red Crescent Societies, 2005).

#### 2.7.4 Information Management in Disasters

The information flows in four ways in a disaster: within an organization, among organizations, citizen to organizations, and organizations to citizens (Quarantelli, 1997; Sagun et al., 2009). Therefore, the role of information management is to increase the information processing capability and reduce the information ambiguity (Detlor, 2010). Information management is at the core of decision-making. Detlor (2010) defines information management as “the process and systems that create, acquire, organize, store, distribute, and use information” (p. 103). He continues, “The goal of information management is to help people and organizations access, process, and use information efficiently and effectively” (p. 103).

In most disaster cases, a breakdown in communication flow occurs because of problems with content and flow of information rather than dearth of equipment or technological insufficiencies. Relationship networks are important for information seeking behavior for use of formal and informal sources of information in situations of collective preoccupation, argues Arguirre (2002). Disasters causing mass fatalities have become prominent because of the 24x7 live media coverage.

## 2.8 Mass-Fatality Management

According to McEntire (2007), “A mass fatality incident is any situation where there are more bodies than can be handled using existing local resources” (p. 159). Jensen (2000) defines a mass-fatality incident as “any event that produces more fatalities than can be handled using local resources” (p. xi). Gursky (2012a, p. 221) similarly posits that, “By definition, a mass fatality event is one that overwhelms response capabilities in scale and scope.” Furthermore, Teahen (2012) asserts, “A mass fatalities incident is an event that causes loss of life and human suffering, which cannot be met through usual individual and community resources” (p. 1).

According to these definitions then, the number of fatalities alone does not characterize a mass-fatality incident. If the local resources are adequate to handle the number of deceased, an incident may not be considered a mass-fatality incident. However, with a larger number of deaths, complexity increases (Scanlon & McMahon, 2011) and more resources would be needed to manage the incident. Other significant factors characterizing mass-fatality incidents include the condition of the dead and the way the deaths occurred (Jensen, 2000). The complexity also increases with the speed of recovery of remains, conditions of remains, and the lack of information (like manifest of a plane) describing who could be deceased (Scanlon & McMahon, 2011; Tun et al., 2005).<sup>9</sup>

The response to mass-fatality incidents consists of two phases, the first of which involves rescuing victims and stabilizing the incident while the second phase focuses on recovering from the incident and identifying victims and collecting evidence (National

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<sup>9</sup> These paragraphs are modified versions from (McEntire et al., 2012).

Institute of Justice, 2006).

MFM typically begins once there is no further threat to life (Jensen, 2000). However, Neal reported that an Indian official in-charge of a response team to the 2004 tsunami said, “Their role was to take care of the dead so that they can then take care of the living. There were bodies all around and the body odor was unbearable, *it was necessary to take care of the dead before taking care of the living*” (Yandek, 2011, emphasis added). It appears that depending on the situation both positions may be correct. Generally, first, there will be the search and rescue for people whose lives are under threat and may be saved. Only after that, MFM may begin. However, seeing human remains and their odor may be repulsive and emotionally disturbing to the responders who want to save lives. Therefore, in cases where rescuers and medical personnel are psychologically unable to take care of the injured people, then first human remains have to be disposed of, before the injured can be attended. Indeed, “sensory or emotional events that are especially difficult for the psyche” (Ritchie & Benedek, 2012, p. 286) are considered psychological toxins.

### 2.8.1 Elements of MFM

The response to a mass-fatality incident consists of many actions that must be performed in such a manner as to ensure that the deceased are treated with dignity and in accordance to local customs and laws (Jensen, 2000; Teahen, 2012). The literature suggests that there are several elements related to MFM. For instance, in the aftermath of the Indian Ocean tsunami, Oyola-Yemaiel and Gupta (2006) examined and described the process of handling bodies in India and Sri Lanka. The authors studied the following stages of dealing with human remains: recovery, transportation, preservation,

communication with the community, identification and the return of remains to family members. Identification of human remains is a fundamental human right of the family members (de Cosmo, 2012).

The management of the dead begins with recovery of remains, which may be full body or body fragments only. The remains are then transported and preserved to identify. Depending on the facilities available, preservation may be for very short duration or could be prolonged. Different ways are used to communicate to the community about the identification of human remains. The identified remains are released to the family members after a legal procedure. Attempts are made to identify the unidentified remains; however, after some time following the local due process, unidentified remains will be disposed of by the local administration.

Gupta (2009) recorded a model regarding decision tree in the process of finding and disposing of human remains by authorities (Figure 2). The disposition of human remains poses serious problems for the authorities. The human remains may be found or missing. The human remains may be intact body or fragments. The human remains may be positively identified and may not be identified. If the human remains are positively identified and there are claimant family members, the human remains may be given to them. However, if there are no claimants or human remains are not identified, the authorities have to decide how long to preserve the remains and what type of religious rituals, if any, to be performed at the time of disposition.

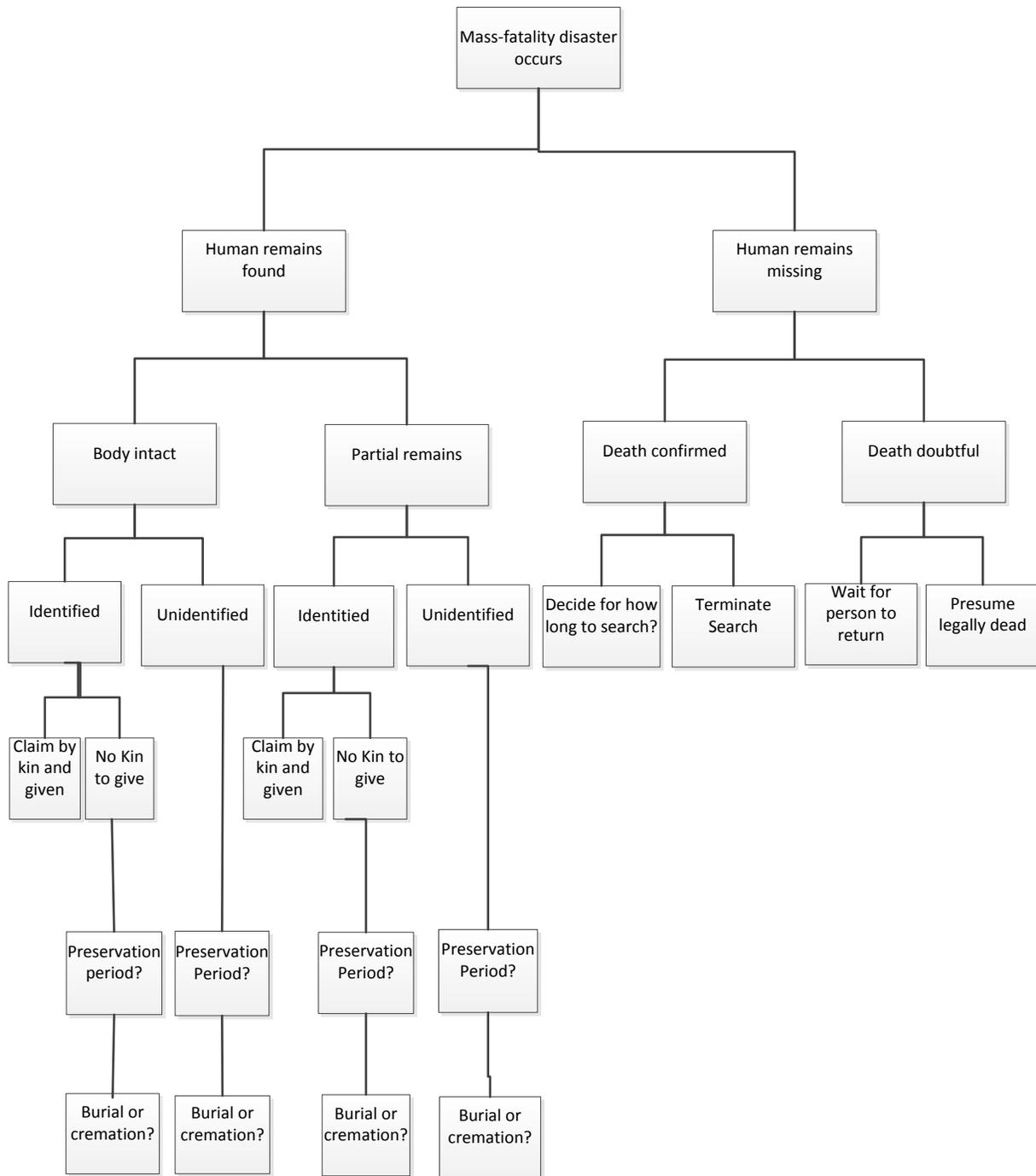


Figure 2. Decision tree in the process of finding and disposing of human remains by authorities.

Figure adopted from Gupta (2009). *Cross-cultural analysis of response to mass-fatalities following 2009 Cyclone Aila in Bangladesh and India. Quick Response Report 216* Retrieved from [http://www.colorado.edu/hazards/research/qr/submitted/gupta\\_2009.pdf](http://www.colorado.edu/hazards/research/qr/submitted/gupta_2009.pdf)

## 2.8.2 Information Management Guidelines in MFM

Because of the challenges of information seeking in MFM, the National Disaster Management Authority (2010)<sup>10</sup> in India has issued the guidelines:

*The information management is the most sensitive and highly important step, involving a multi-disciplinary, multi-stage and time-consuming approach for effective coordination of all steps related to management of the dead. Each sub-stage of physical management of the dead is intimately connected with the retrieval of various categories of information from relevant parties which can be utilized for involving the bereaved public for managing the dead. The collection, storage, analysis and dissemination of information shall be undertaken under the supervision of a nodal officer or nominated agencies at district, state or central level through an effective communication network while maintaining chain of custody to avoid misplacement of information and the availability of evidence. This will help in proper and timely transfer of information to all the stake-holders along with reducing the stress experienced by affected communities, defusing rumors, and clarifying incorrect information. (pp. 31-32, emphasis in original)*

There appear to be no other guidelines for information management in MFM issued by any other nation. In the United States, some states have done MFM planning. For a review of MFM plans of nine states in the United States, see Stanley (2010). There may be information management guidelines on MFM in war situations; but they are beyond the scope of the present study. In addition, the International Criminal Police Organization has issued guidelines for disaster victim identification (INTERPOL, 2009), however, they cover only identification of human remains.

## 2.8.3 MFM Studies after the 2004 Indian Ocean Tsunami

Many of the previous MFM studies on natural disasters emerged after the Indian Ocean tsunami of December 26, 2004 (e.g., Brenner, 2006; Gupta, 2005b, 2005c, 2006; Morgan, Sribanditmongkol, Perera, Sulasmi, & Van, 2006; Oyola-Yemaiel &

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<sup>10</sup> The National Disaster Management Authority headed by the Prime Minister of India, is the Apex Body for Disaster Management in India, similar to US Federal Emergency Management Agency, established under the Disaster Management Act, 2005.

Gupta, 2005, 2006; Perera, 2006; Scanlon, 2006a, 2006b; Scanlon, McMahon, & Haastert, 2007; Tun et al., 2005). Gupta (2005b, 2005c, 2006) and Oyola-Yemaiel and Gupta (2005, 2006) have described handling of remains after the 2004 tsunami in India and Sri Lanka. These authors describe the human remains processes of recovery, transportation, preservation, communication with the community, identification, and return of human remains to family members. Gupta (2009) described MFM after the 2009 cyclone Aila in Bangladesh and India, and after the 2010 Haiti earthquake (Gupta & Sadiq, 2010). McEntire et al. (2012) describe dealing with unidentified bodies in Haiti with a cross-cultural analysis.

Morgan et al. (2006) examined the management of bodies following the South Asian tsunami in three countries - Thailand, Indonesia, and Sri Lanka. The authors found that because there was no refrigeration immediately after the disaster, local authorities used dry ice and temporary burial (Morgan et al., 2006). In addition, these authors found that lack of local mass-fatality plans hindered the response to the Indian Ocean tsunami (Morgan et al., 2006).

Perera (2006) studied the legal implications of mass burials of unidentified victims in Sri Lanka and found that many of the unidentified victims of the South Asia tsunami in Sri Lanka were buried in mass graves. Therefore, he recommended that the Sri Lankan government develop a national emergency management plan addressing the problem of victim identification for future mass-fatality incidents (Perera, 2006).

Brenner (2006), and Scanlon (2006b) write about identification of human remains by fingerprint records, dental records, and DNA profiling.

MFM studies are from the perspective of public administration, forensic science, legal, and other disciplines. As stated in Chapter 1, the author has not discovered any study on information seeking in MFM.

## 2.9 Need for Research in Managing Mass Fatalities and Information Seeking in MFM

Researchers have done MFM research mostly in western developed countries, most often after air crashes. McNeil and Quarantelli (2008) assert, "Most of the studies so far undertaken have been done by social scientists in Western type of societies, even though the great majority of disasters occur in developing countries" (p. 2). Mileti (1999) substantiates, "Fatalities in developed countries [because of disasters] have steadily decreased by 75 % during the past 50 years" (p. 101). That was 1999 and in the succeeding 13 years, disaster deaths in developed countries would have decreased further. In recent US disasters, there have been fewer than 200 fatalities from any one disaster (Simpson & Stehr, 2003), with the exception of the Chicago heat wave (Klinenberg, 2002), 9/11 (National Commission on Terrorist Attacks Upon the United States, 2004), and Hurricane Katrina (Natural Hazards Center, 2006).

There were hardly any MFM studies in any developing nation following natural disasters before the 2004 tsunami. Field research is therefore required on MFM following large-scale fatalities in the aftermath of a disaster to improve the performance of this function in the future (Morgan et al., 2006). Clearly, information can make or change the image or perception of the problem in the recipient of the information.

Pipes (2007) highlights a lack of literature on the study of disaster information behavior after analyzing journals in both the fields of information sciences and emergency management. Bates (2010) reviewed the history of research on information

behavior over the last 60 years but did not mention any research on information seeking in disasters. However, there is an *Information Seeking Behavior and Viewpoints of Emergency Preparedness and Management Professionals Concerned with Health and Medicine: Final Report Prepared for the National Library of Medicine* by Turoff and Hiltz (2008). This is a Delphi study of 34 professionals in libraries, academia, emergency management, and health care to find out the sources used and unmet needs. The report deals with health-related issues in emergencies in general, but not in mass-fatality situations.

Although we have a few studies about information in disasters (e. g., Aswalap, 2009; Pipes, 2007), there appears to be no research on the subject as it pertains to information seeking in MFM. As stated in Section 1.1.8, a search did not reveal any literature on information seeking in MFM.

MFM is interdisciplinary. It has been researched from positions of criminal justice, emergency management, forensic science, geography, journalism, legal, medical, public administration, political science, and sociology, among others. The American Medical Association published the book *Death in Large Numbers: The Science, Policy, and Management of Mass Fatality Events* (Gursky & Fierro, 2012) and it covers MFM in disciplines of financial management, forensic science, legal, military studies, operations management, personnel management, planning, policy studies, psychology, and public health; but not IS. It appears that MFM has hardly been studied from an IS or information seeking perspective.

It is important to advance MFM and information seeking in MFM for the following reasons:

- To reduce the suffering of the family members of the deceased by allowing them to promptly learn the whereabouts of the remains.
- To enhance researchers' understanding and therefore enable them to make recommendations to the policy makers for alleviating the Zeigarnik (1967) effect.
- To create guidelines to deal with mass fatalities following natural disasters. Currently, the only guidelines available are in the *National Disaster Management Guidelines - Management of the Dead in the Aftermath of Disasters* issued for India by National Disaster Management Authority (2010). There is little information about this increasingly important function in emergency management. Improved information on MFM will assist in creating guidelines for dealing with fatalities following natural disasters.
- To reduce the political impact of the disaster by better public relations through the media. Scanlon and Hunsberger (2011) note, "Inevitably, mass death also attracts media attention, even for relatives of the dead" (p. 109).
- To address death which has been inadequately addressed possibly because talking about death is perceived as a taboo (Bertman, 1974).
- To alleviate diplomatic tensions that may result from burying international tourist fatalities in mass graves (Morgan et al., 2006).
- To facilitate receiving compensation of death benefits by next of kin (Phillips et al., 2008).

According to Morgan et al. (2006), guidelines exist for MFM in a context of transportation accidents (e.g., Davis & Scraton, 1999; Gupta, 2011; Meyer, 2003) and terrorist attacks (e.g., National Institute of Justice, 2006). These guidelines may be used in transportation accidents and terrorist attacks because they are generally confined to localized and well-defined geographical areas. However, these guidelines are not always transferable to mass-fatality incidents engendered by natural disasters spread over broad geographical areas and sometimes in multiple countries (e.g., 2004 Indian ocean tsunami). Therefore, there is a need for research on MFM and information seeking in MFM, including research across geographical regions.

Majorities of the earlier studies on MFM were from the perspective of public administrators and explored how human remains were recovered, preserved, identified, and disposed of. The author's earlier research also was from a position of public administration.

Evidently, there is a need for information policies and practices in MFM. While developing policy is not an objective of this dissertation, policies are needed to provide guidelines on what information about mass-fatality is to be collected and what information is not to be collected, how the information is to be collected, whether to process the information, and with whom the information should be shared. Policies regarding information seeking in MFM should be available before a disaster strikes.

Furthermore, with the notable exception of Scanlon and his colleagues' important research (Marion & Scanlon, 2011; Scanlon, 1998, 2006a, 2006b, 2009; Scanlon & Hunsberger, 2011; Scanlon & McMahon, 2011; Scanlon et al., 2007; Stoney et al., 2011), there are only a few MFM studies on natural disasters. Moreover, extant MFM

studies do not appear to cover information seeking. Scholars have called for more research (e.g., Morgan et al., 2006). The above literature review shows that there is a need for research on MFM and information seeking in MFM.

## 2.10 Chapter Summary

Information can make or change the image or perception of the problem in the recipient of the information. Literature on information, information science, information practice, information needs, and information seeking in information science discipline was reviewed. Literature on disasters, disaster management, and mass-fatality management was reviewed from the emergency management discipline. Literature review showed need for research in managing mass fatalities. In addition, at the intersection of information science and emergency management, literature on information seeking in disasters and MFM was reviewed. The literature review revealed that there was no published literature on information seeking in MFM. The literature review showed the need for research in managing mass fatalities and information seeking in MFM. The next chapter covers the research method used for this research.

## CHAPTER 3

### RESEARCH METHOD

Chapter 1 identified the problem area of managing mass-fatalities and information-seeking challenge. The lack of valid, reliable, and timely information leads to haphazard mass-fatality management (MFM). Chapter 2 discussed the need for research in managing mass fatalities and information seeking leading to the research questions. This chapter presents research method and procedure.

The researcher examined the Haiti 2010 earthquake as a case study. He used quick response research (QRR) method funded by the National Science Foundation (NSF) in doing field research in Haiti in two phases. Partially structured, open-ended, in-depth interviewing was the primary technique used for research. The interviewees included five family members of deceased, a morgue administrator, seven physicians or surgeons, three police officials, and two UN officials. Interview venues included the Titanyen mass-burial site, hospitals/dispensaries, UN Stabilization Mission in Haiti premises, the US Embassy premises, a makeshift camp, and outside a house where a body was there at the time of interview. A translator from Creole to English and vice versa was present during the interviews.

The researcher used 28 interviews conducted in Haiti. After transcribing all the interviews, they were coded using MAXQDA qualitative data-analysis software (Appendix F and G). Coded material was analyzed to find categories and themes. Subsequently, he documented findings (Chapter 4), developed a model of information flow in MFM (Chapter 5), and discussed conclusions and recommendations (Chapter 6).

This chapter begins with research questions and then moves into a brief discussion of research paradigm, which may be positivist or interpretivist, and of methodology, which may be qualitative, quantitative, or mixed. The dissertation is prosecuted in the interpretivist paradigm and qualitative tradition, using a method of case study described by Yin (2009). The chapter includes a discussion of procedure by which the case study was executed.

### 3.1 Research Questions

This study examined MFM and information seeking in MFM used by the people affected by the Haiti 2010 earthquake. In order for a question to be researchable, it should be possible to answer the question by empirical evidence (White, 2009). Further, in a qualitative tradition, the research question needs to be open-ended. In a closed-ended question, the interviewee has limited choices in replying the question. For example, a closed-ended question may be answered by yes or no or in a specific number or selection from some given words. This is not the case in an open-ended question. In response to an open-ended question, the interviewee is free to tell whatever he or she thinks and feels, without any restrictions and as long as the interviewee wants to talk. The research questions as derived from the literature were:

*RQ1: How were mass fatalities managed in the aftermath of the Haiti 2010 earthquake?*

*RQ 2: How did those affected by the Haiti 2010 earthquake seek information about fatalities?*

*RQ3: What were the needs that motivated those affected to seek information about fatalities?*

The answer to the above research questions may help in improving MFM and information-seeking practices in MFM.

The EM-DAT International Disaster Data Base considers those affected<sup>11</sup> as, “People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance” (EM-DAT, 2013). “*The definition of “affected” is open to interpretation,*” opines Guha-Sapir, Hargitt, and Hoyois (2004, p. 17, emphasis in original). These authors state that people affected are “among the most loosely reported figures” (p. 17). They further state, “Certain countries may wish to maximize sympathy or humanitarian aid and hence exaggerate the reported number of people reported to be affected” (p. 17). Other countries may reduce the number of people affected to reduce the political impact of the disaster. Similar considerations may affect reporting of fatality figures.

In the dissertation, affected people are understood as those

- Whose family member died because of the earthquake
- Who were trying to find the whereabouts of their family members
- Who themselves directly handled fatalities
- Who were somehow (e.g., administratively) connected with handling fatalities
- Who themselves were at the sight of fatalities

The above criteria were used in selecting the purposive sample of interviewees as discussed in Sections 3.12 and 3.13, and presented in Tables 1 and 2.

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<sup>11</sup> For other concepts used in the research questions and their operationalization, see Section 1.4.

### 3.2 Type of Study

The study was a field research project that examined managing mass fatalities and information-seeking practices among family members of the deceased, emergency responders, administrators, people who handled human remains, morgue administrators, physicians and surgeons, priests, and volunteers<sup>12</sup> in the context of MFM following the 2010 Haiti earthquake. The study reaffirmed the theoretical proposition that need for information guides information seeking (Case, 2012; Wilson, 1997). A fieldwork is conducted in person in a natural setting outside of a laboratory, mainly through face-to-face interviews. “Field work in the post-disaster setting,” stated Kendra, director, Disaster Research Center, University of Delaware, “requires extensive travel, substantial resourcefulness, and the capacity to overcome setbacks and reversals all while maintaining focus on the theoretical and practical conduct of the project” (J. Kendra, personal communication, February 11, 2010).

### 3.3 Research Hierarchy

This dissertation has benefitted from the research hierarchy proposed in the book *Research Methods in Information* by Pickard (2007).<sup>13</sup> The reason for following this research hierarchy is that it has been used in information science and it provides a system of study proposed here. Generally, the theoretical discussion determine the method (White, 2009). The research process in Pickard (2007) describes the place of

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<sup>12</sup> A volunteer for the purpose of this dissertation is defined as one who does unskilled work. For example, a physician working voluntarily is not classified as a volunteer, but a physician.

<sup>13</sup> Pickard’s book is one of the few methods textbooks in information science that covers full gamut of research, although not in depth. A book fully devoted to qualitative research in information science is *Qualitative Research in Information Management* by Glazier and Powell (1992).

method in research design in information science. At the top of the process is the research paradigm, which determines the methodology, which in turn may imply research method, which then finally determines the research techniques.

### 3.4 Research Paradigm

Kuhn (1996) defines paradigms as “universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners” (Preface). The scientific achievements are a product of “two essential characteristics,” one of which is that they are “unprecedented” and the other is that they are “open-ended.” By those measures, research in managing mass fatalities and information seeking in MFM may be consistent with scientific achievement.

Consequently, the dissertation is offered in a Kuhnian paradigm.

Next, Pickard (2007) distinguishes the interpretivist paradigm from the positivist. In the interpretivist paradigm, in which the dissertation is located, claims of knowledge tend to be researcher-dependent and limited to a context (Piantanida & Garman, 2009) and based on valid and reliable interview data, reliable transcription<sup>14</sup> of the interviews, and well-reasoned interpretation of the interview data. In addition, Corbin and Strauss (2008) recommend, “It might be useful . . . for a researcher to include a short explanation of his or her own research perspective and response to the research process. This enables readers to judge how personal reactions might have influenced the investigator and interpretations placed on data” (p. 309). Accordingly, a researcher

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<sup>14</sup> "Transcription (lat. trans-scribere = 'to write over') is the transfer of an audio or video recording into a written form" (Dresing, Phel, & Schmieder, 2012). Transfer of hand written notes into machine-readable form is also considered transcription in this dissertation.

identity statement is given in Appendix A. On the other hand, in the positivist paradigm, claims of knowledge are generally researcher-independent and more generalizable. Qualitative research tends to be more commonly situated in interpretivist paradigm (Piantanida & Garman, 2009).

### 3.5 Research Methodology

The literature overwhelmingly states that research question determines the methodology (e.g., Krathwohl, 2009; Krathwohl & Smith, 2005; Salkind, 2012). However, Piantanida and Garman (2009) take a contrary view that methodology depends up on the experience and skill of the researcher. A researcher, who has expertise in a particular methodology, will select the research question, which could be answered by that particular methodology. Both approaches are valid, but the first is used in this dissertation.

Corbin and Strauss (2008) define methodology as “a way of thinking about and studying social phenomena” (p.1). Another view is, “methodological considerations aim to ensure that the chosen research methods are valid, reliable, rigorous, and appropriate to the research question” (Finn, 2005, p. 16). A methodology is a broader concept. Many factors go in the design of research. The research methodology could be quantitative, qualitative, or mixed methods research.

#### 3.5.1 Qualitative Analysis

Qualitative analysis is “a process of examining and interpreting data in order to elicit meaning, gain understanding, and develop empirical knowledge” (Corbin & Strauss, 2008, p. 1). It allows the researcher to approach a problem inductively, use

emergent approaches to find significance, and address complex phenomena or natural situations. Because “qualitative research is especially appropriate for studies where little empirical research exists” (Locke et al., 2007, p. 267), it offered an appropriate option to prosecute this dissertation. In addition, the researcher identity and felicity with fieldwork supported a qualitative methodology (Maxwell, 2005), which needs to use inductive reasoning.

MFM and information seeking in MFM is not understood since there is not a body of knowledge in this area. In addition, the phenomenon is very complex. Based on the research questions, a qualitative analysis was most appropriate, since “qualitative research is especially appropriate for studies where little empirical research exists” (Locke et al., 2007, p. 267). The researcher examined managing mass fatalities and the information seeking (Savolainen, 2007; Wilson, 1997) of the people who were affected by the 2010 Haiti earthquake (Gursky & Fierro, 2012; Jensen, 2000; Teahen, 2012).

### 3.5.2 Quantitative Research

The competing methodology is quantitative, used typically in studies that offer statistical generalizations. Quantitative methodology, which is not used in this dissertation, tends to use deductive reasoning.

### 3.5.3 Mixed-Methods Research

Another competing methodology is mixed method that is becoming “fashionable” (Bernard & Ryan, 2010, p. 161), involves both quantitative and qualitative methodologies.

### 3.6 Research Method

In qualitative studies, the researcher has a choice of methods (Creswell, 2006; Krathwohl, 2009; Richards & Morse, 2007). Case (2012) distinguishes methodology from method: Methodology consists of “principles, logic, and evidence [to] best advance our goal of learning (and most likely recording) knowledge about an area or object of study . . . The specific ways, tools, and techniques of observation and measurement are what we call ‘methods’” (p. 202). This dissertation used a method of case study.

### 3.7 Research Technique

“A technique is the approach taken to data collection, the way in which empirical evidence will be harvested from the source,” explains Pickard (2007, p. xvii). Questionnaire, experiments, and interviews are research techniques. For the current research, the principal technique was interviews of the affected people by the Haiti earthquake. Other techniques for this qualitative research were field observation notes, notes of meetings in Haiti, and situation reports. The details of the interview techniques used are documented in Section 3.15.

### 3.8 Case Study

A case is a bounded system, and a case study is an investigation “over time, through detailed, in-depth data collection involving *multiple sources of information* (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case *description* and case-based themes” (Creswell, 2006, pp. 73, emphasis in original). In addition, case studies are a strategy of inquiry in which the researcher

explores in depth a program, event, activity, process, or one or more individuals (Creswell, 2009). Furthermore, Krathwohl (2009) states, “Case studies are bounded by a particular individual, situation, program, institution, time period, or set of events” (p. 353).

The purposive sample enabled the study of MFM and information seeking by those affected by the Haiti earthquake. The case study used different techniques to make data. These were interviews, field observations, documents, history, and archival records. Different techniques were used to make data to establish evidences from different sources to establish authenticity. For this case study, more than one way of data collection was used to take advantage of different ways of collecting data. The case study was a triangulation method, and it helped in obtaining different perspectives to the same research question or problem. Yin (2009) posits that the case method of data collection are like crime investigation. Two of the main components of data collection were interviews and field observations and both were used in this study.

In the words of Salkind (2012), the researcher was “interested in gaining an in-depth understanding of behavior and the reasons for that behavior” (p. 11). Additionally, he was interested in understanding experiences and perspectives of diverse individuals (Locke et al., 2007) and to partially generalize MFM and information seeking in MFM. Gaining an in-depth understanding of managing mass fatalities and information seeking in MFM would help design appropriate information policies and protocols as well as training programs to accelerate and promote community response, recovery and resilience. It would also help in alleviating suffering of family members and the community.

Comfort, Cigler, and Waugh (2012) posit, “case studies are the traditional method of studying disaster events” (p. 546). According to Yin (2009), an extreme event offers an excellent subject for a case study. If the January 12, 2010, earthquake in Haiti killed an estimated 316,000 people as reported by Brown and Delva (2011) quoting Haitian Prime Minister Jean-Max Bellerive on the Reuters news agency website, it was a gigantic mass-fatality sudden-onset natural disaster in any single location. The earthquake was “one of the most extensive mass fatality events in modern times,” according to Kauffman and McGuire (2012). Chertoff (2012), the former US homeland security secretary, wrote, “The people of Haiti experienced one of the worst natural disasters and mass fatality events on record” (p. xii). Thus, Haiti offered an appropriate subject for this case study, which was executed by examining data made during fieldwork.

### 3.9 Fieldwork

The study used exploratory field research. According to Case (2012), exploratory studies are common in information seeking research. In exploratory studies such as this one, the researcher advances a discipline on a path not taken, in this study the path of information seeking in MFM.

In the fieldwork the researcher used naturalistic settings in which the event occurred such as places where people lived, worked, or went about daily life activities. As is typical, it was executed through interviews and observations. Fieldwork is not done in a laboratory or in the office of the investigator. Sections 3.11.3 and 3.11.4 give details of the fieldwork done for this dissertation. Stallings (2007) writes, “The

prototypical method of disaster research has been the field study” (p. 56). One of the types of fieldwork is quick response research, which is used in this study.

### 3.10 Quick Response Research

Michaels (2003) defines quick response research (QRR) “by the information collection phase occurring during or immediately after a damaging event” (p. 41). Over 600 QRR field studies have been documented by the Disaster Research Center (2012) of the University of Delaware<sup>15</sup> and 230 QRR reports by the Natural Hazards Center (2012) of the University of Colorado at Boulder (NHC),<sup>16</sup> two of which are quick response reports number 216 (Gupta, 2009) and 219 (Gupta & Sadiq, 2010) by the author. The NSF used to term QRR as Small Grants Exploratory Research (Gupta, 2005c, 2006; Oyola-Yemaiel & Gupta, 2005; 2006, came out of this type of funding), now calls it Rapid Response Research (one of which was this research funded by the NSF). QRR, which is an established practice for at least five decades, is used in this dissertation.

QRR is used to make and study data whose nature is ephemeral or perishable. Such data would be lost if not recorded shortly after the event. It was necessary to make the data as soon as possible because interviewees’ experiences and perspectives of disasters can be compromised with time. The farther in time one gets from the disaster, the harder it is to make data through interview and observation because informants would increasingly forget details, or report a different story, or

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<sup>15</sup> See <http://www.udel.edu/DRC/projects/Quick%20Response.html>

<sup>16</sup> NHC lists QRR reports since 1986 and reports after 1995 are freely downloadable from <http://www.colorado.edu/hazards/research/qr/>.

move. On the other hand, one could make data too early when prospective interviewees would be concentrated on responding to a disaster and show low priority to responding to the researcher. It has been said that data making is like detective work (Marshall & Rossman, 2011), as in a crime scene investigation. The details of the data made by QRR are given in following sections.

### 3.11 Data Making

#### 3.11.1 Data

Macpherson (2005) writes data are “raw descriptors and observations of facts and figures that are in some way meaningful” (p. 33). Interview transcripts, field observation notes, and notes of various meetings in Haiti, all of which contain MFM and information-seeking experiences of the interviewees and descriptions of situations, are the primary sources of data for this study. Third party published documents including situation reports, media reports, and published anecdotes related to the 2010 earthquake are the secondary sources.

Data are understood in various ways. One study found 43 definitions of data (plural) or datum (singular) used by scholars (Zins, 2007b). In this dissertation data are considered, to the extent defensible, as “primitive symbolic entities, whose meaning depend on it integration within a context that allow their understanding by an interpreter” (Zins, 2007b, p. 485).

White (2009) offers a distinction between data and evidence. He writes, “Writers on argumentation invariably refer ‘data’ or ‘evidence’. Some use one term and not the other, while others use them interchangeably.” In the information science literature, data is the more commonly used term, and therefore the dissertation used it.

### 3.11.2 Data Making

Richards and Morse (2007) argue that data may not lie somewhere for a researcher to collect.

Talking of “collecting” data denies the agency of the researcher... *Making data* is a collaborative, ongoing process in which data are interactively negotiated by the researcher and participants, the data are rarely fixed and unchanging, never exactly replicating what is being studied. (p. 107, emphasis in the original)

Thus, the dissertation used the term “data making” in a context of the primary sources and “data collection” for the secondary sources. Further, it used the term “interviewee” because; the commonly employed term “interview participant” in information science literature may mean both interviewer and interviewee. Generally, “respondents” is a preferred term in quantitative studies (Bernard & Ryan, 2010). Rubin and Rubin (2012) suggest using “conversational partners” since it shows the importance of “working with interviewees as partners rather than treating them as objects of research” (p. xv), which is what the researcher has done, but doing so does not preclude using the term “interviewee.”

Further, the case study is an example of a triangulated method (Maxwell, 2005) that helps in obtaining different perspectives. It intermixes interviews, field observations, and documents. “Usually, the best study design uses more than one research method, taking advantage of their different strengths” (Babbie, 2010, p. 116).

Useful anecdotes, such as the following narrated in *Haiti After the Earthquake* by Farmer (2011), are among the sources of secondary data.

My husband and I kept on dialing the phone numbers of friends and relatives in Haiti and getting no response. While keeping an eye on the television and an ear to a local Haitian radio program...my oldest daughter, Mira, asked if her grandmother was okay. We tried to reassure her as best as we could, but we did

not know ourselves whether my mother-in-law—who often traveled from Les Cayes to Carrefour—was alive, or whether anyone we knew was alive.

The routine became (1) dial phone numbers of friends and relatives in Haiti; (2) go online—including social networking sites—for a bit more information; (3) dial friends and relatives all over the United States and Canada, who were also dialing and checking networking sites, and ask, “Have you heard from anyone?” They had not. (p. 252)

All major conclusions were based on data made from primary sources. If such data competed with data collected from secondary sources, the data from primary sources prevailed.

Originally, the author went to Haiti in both phases to study MFM from a perspective of an administrator. Later in addition to MFM, he also studied information seeking in MFM. Accordingly, he mined that data and pursued the dissertation in information science and information seeking also. Data mining is defined, as “the analysis of . . . observational data sets to find unsuspected relationships and to summarize the data in novel ways that are both understandable and useful to the data owner” (Hand, Mannila, & Smyth, 2001, p. 1).

To mine the transcripts for addressing the research questions two and three, the researcher disregarded the data that were irrelevant to the questions. The useful information was retrieved in order to discover categories or relationships among data. He estimated that 25 of the 28 interviews were relevant to address the research questions two and three. He believed that a substantial component of each of the 25 interviews was about information seeking and used that in the dissertation.

An advantage of using data of one study for another is that it saves time and cost of data making, and makes available data that otherwise cannot be made. This is especially applicable in QRR. For example, one could not recreate an identical disaster.

Disadvantages are the confirmation bias as stated in Section 1.5, and that the researcher is limited by the available data.

### 3.11.3 Access to Field

For the fieldwork, access and timing were the two important issues (Stallings, 2007). After an international catastrophe, a researcher just cannot go to a foreign nation and hope to conduct interviews. To access prospective interviewees, it is advisable to approach with a local contact person that is knowledgeable of the disaster situation, local culture, and speaks local language. The researcher made many efforts to access the field and appointed a local consultant and translator to facilitate access to prospective interviewees. A narrative on access is in Appendix B.

### 3.11.4 Timing of Field Entry

In Section 3.10, it was stated that as the name implies, quick response research was to be done immediately after the disaster to make ephemeral data. The researcher wanted to go to Haiti as soon as possible after the earthquake. Originally, flights from Dallas Fort-Worth airport in Texas, USA to Port-au-Prince in Haiti were booked for January 23, 2010. However, commercial flights were repeatedly cancelled because of damaged airport and priority to humanitarian flights.

As soon as commercial flights resumed, Gupta and Sadiq<sup>17</sup> departed on February 23, 2010, and remained in Haiti for six days. The researcher conducted 17

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<sup>17</sup> In the fall of 2009, Gupta submitted a QRR proposal to the NHC for “pre-approval” to do research in sudden, catastrophic, mass-fatality, disaster-hit areas anywhere in the world, in response to the NHC’s NSF-funded QRR Program. The program intended to prepare researchers to travel quickly to disaster-affected areas in 2010. Gupta learned of the approval of his proposal by telephone on January 12, 2010, and coincidentally, later that same day the Haiti earthquake happened. The next day, Gupta asked NHC

interviews (see Section 3.15) in February 2010 after obtaining signatures of the interviewees on the informed consent forms (see Section 3.20 for ethical considerations). A copy of the letter of approval for interview protocol with stamped and approved informed consent form by the University of North Texas Institutional Review Board is in Appendix C.

The author gives details about timing of field entry in Appendix D. Along with the narrative on access in Appendix B; it may help the readers understand how the fieldwork was executed in challenging circumstances. Research in international catastrophes asserts Kendra, director, Disaster Research Center at the University of Delaware, is “professionally, technically, and emotionally demanding” and requires resourcefulness and “the capacity to overcome setbacks and reversals” (J. Kendra, personal communication, February 11, 2010).

Gupta along with McEntire<sup>18</sup> and Sadiq returned to Haiti on May 31, 2010, under the NSF Rapid Response Research grant award<sup>19</sup> to follow up on prior data making fieldwork and remained there until June 6, although other team members departed from

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to activate the grant, which would enable him to go to Haiti. The NHC informed him that because of the scale of the Haiti earthquake, a graduate student could go if teamed with a faculty member. Consequently, Gupta as the principal investigator (PI), teamed with Abdul-Akeem Sadiq, then lecturer in the Department of Public Administration at the University of North Texas.

<sup>18</sup> After the Haiti earthquake, the researcher expected that NSF would invite Rapid Response Research (RAPID) proposals. The researcher proactively contacted Dennis Wenger, NSF program officer for disaster management research to find out when NSF will issue Dear Colleague Letter, because a proposal is to be submitted shortly after the issue of Dear Colleague Letter. On February 19, 2010, NSF issued a Dear Colleague Letter: Guidance on Rapid Response Research (RAPID) Proposals: Effects of the January 2010 Haitian Earthquake (<http://www.nsf.gov/pubs/2010/nsf10024/nsf10024.pdf>) asking proposals by March 5, 2010. The researcher immediately started preparing the proposal. NSF requires that a faculty member be a principal investigator (PI). David McEntire, associate professor in the Emergency Administration and Planning Program of Department of Public Administration, University of North Texas (UNT) agreed to join Gupta as a PI. Gupta, being a Co-PI, also invited Sadiq to join as another Co-PI. Subsequently UNT changed the policy prohibiting a student from becoming a Co-PI.

<sup>19</sup> # 1034799

Haiti on June 3. The fieldwork was conducted in two phases in February and May-June of 2010, both funded by NSF grants.<sup>20</sup> It included sampling affected individuals, making data by interviewing them, and transcribing the interviews.

### 3.12 Sampling

A purposive sample of 28 interviewees between the two phases, identified with a networking and snowballing technique, provided the data. It consisted of interviewees that were: (1) knowledgeable about the topic being researched, (2) willing to participate in the research, and (3) representative of a wide range of viewpoints (Rubin & Rubin, 2012). The purposive sample ensured that the researcher chose “*those cases from which one can learn the most*” (Krathwohl & Smith, 2005, pp. 128, emphasis in original).

To qualify, an interviewee needed to satisfy one of these criteria in a light of the earthquake: (a) victim, (b) responder, or (c) administrator.

In the course of conducting the interviews, the researcher asked the interviewee whom else he might speak with to make data, and thus applied the snowballing technique (Mutchnick, Berg, & Ireland, 2009). Even before departing on the first phase, he developed contacts in Haiti and appointed a local consultant in Port-au-Prince to make appointments with prospective interviewees, and thus applied the networking technique.

The purposive sample, which was non-random and non-probabilistic, was chosen with a procedure governed by the circumstances of the fieldwork. First, a list of contacts in Haiti was developed using advice from network of personal and professional

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<sup>20</sup> # CMMI 0734304 and 1034799

sources. Second, one of those contacts was appointed as a local consultant in Port-au-Prince. Third, the sources and the consultant were all tapped for potential interviewees that met the criteria described earlier. Fourth, a translator<sup>21</sup> (Creole and English speaking) was appointed in Port-au-Prince. Fifth, the researcher traveled to Port-au-Prince and met with the interviewees. Sixth, the interviews were transcribed<sup>22</sup> as data. Finally, the data were examined for the research questions.

During the first phase (February 23 to 28, 2010), the researcher traveled to Titanyen. Titanyen is about 24 km (15 miles) northeast from the Port-au-Prince, without nearby human habitation, slightly away from a hill, where trenches dug and human remains mass buried. A small signboard placed away from the highway gives direction to the Titanyen mass-burial site where largest number of unidentified human remains from a natural disaster were buried in recent times. Figure 3 depicts the signboard. One is likely to miss the signboard since it is not conspicuous, may be by design.

The consultant had arranged interviews near Titanyen, the first of which was with a private hospital physician and another with a Voodoo religious leader. The researcher conducted these two interviews. The consultant had also arranged other meetings. However, the researcher did not accept all of the interviewees that the consultant recommended as appropriate. Based on the researcher's experience of interviewing 158 interviewees in MFM research in Bangladesh, India, and Sri Lanka over a four-year

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<sup>21</sup> A translator is used in this dissertation as a person who spoke Creole and English and helped in conducting interviews with persons who spoke Creole, but not English.

<sup>22</sup> Transcribe is the act of transferring an audio recording of an interview and a hand written note into machine readable form.

period in 2005-2009 and his intuition,<sup>23</sup> he determined a potential interviewee as useful.



*Figure 3.* A small signboard direction to the big mass-burial site Titanyen. Feb. 25, 2010. Photograph by author.

He took initiative and interviewed Pierre Yves Jovin, chief director, morgue of the University General Hospital, Port-au-Prince, which was not thought of by the consultant. He was aware of the Disaster Mortuary Operational Response Team (DMORT)<sup>24</sup>

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<sup>23</sup> “The result of one’s experience which enables the information professional to draw conclusions based on one’s wisdom and accumulated knowledge based upon study and experience” (Grover, 1992, p. 195).

<sup>24</sup> The DMORT is a US federal-level response team designed to provide mortuary assistance in the case of a mass-fatality incident or cemetery related incident. The DMORT has 1200 trained and capable volunteers who respond at a moment’s notice to assist those in need. A DMORT team was deployed outside USA for the first time in Haiti (Gupta & Sadiq, 2010; Kauffman & McGuire, 2012).

deployment in Haiti before he reached Haiti for the first phase of fieldwork. He contacted DMORT official on phone upon reaching Haiti, and was able to interview the person subsequently. Similarly, he asked the consultant to take him to the United Nations Stabilization Mission in Haiti<sup>25</sup> and was able to interview three relevant interviewees there. One UN administrator, one university administrator, two volunteers, and two family members of the deceased (university administrator is also one of the family members of the deceased), apart from morgue director also handled human remains. These are examples from the purposive sample.

### 3.13 Interviewees

The interviewees with whom the researcher spoke played important decision-making roles in MFM, information seeking in MFM, and represented a broad range of organizations and individuals. In both the phases put together, the researcher conducted 28 interviews. A list of interviewees with their affiliation, occupation/role in MFM, age, language of interview, approximate interview duration, and whether interview was audio-recorded or not is given in Table 1.

Seventeen interviewees of the first phase signed the informed consent form along with the researcher as a principal investigator (a specimen of the informed consent form is in Appendix C). As the form in Appendix C was valid for only up to March 5, 2010, on an application by the researcher the University of North Texas Institutional Review Board approved a new form valid until March 5, 2011, with addition

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<sup>25</sup> Locally known as MINUSTAH, the acronym is in French for the Mission des Nations Unies pour la Stabilisation en Haiti.

Table 1

*Details of Interviewees*

Interviewees							
Identity	Affiliation	Occupation/ role	Gen der	Age	Langu age	~ Int. minut es	Audio- record
Interviewee #1	None	Tree cutter	M	20s	Creole	30	No
Interviewee #2	Voodoo practice	Voodoo Priest	M	50s	Creole	30	No
Interviewee #3	Private Hospital	Physician	F	20s	Eng.	50	No
Interviewee #4	DMORT	Official	F	50s	Eng.	40	No
Pierre Yves Jovin	Univ. Gen. Hospital	Morgue Director	M	50s	Creole	65	Yes
Interviewee #6	None	Volunteer	M	30s	Both	75	No
Rapael Guito	Enterprise Funeraire Pax Univers	Funeral home	M	50s	Creole	40	No
Lyonel Milfort M	Enterprise Funeraire Pax Univers	Funeral home	M	40s	Creole	40	No
Rodrigue Darang	Université d'Etat d'Haiti & Gen. Hosp.	Forensic pathologist	M	50s	Creole	50	Yes
Interviewee #10	Security services	Administrator	M	50s	Eng.	55	No
Interviewee #11	Saude Em Portugues	Physician	M	40s	Eng.	40	No
Interviewee #12	Saude Em Portugues	Nurse	M	30s	Eng.	40	No
Interviewee #13	University	Student	F	20s	Eng.	30	No
Interviewee #14	Private business	Bldg contractor	M	40s	Creole	30	No
Interviewee #15	Pure Water for World	Non-profit	M	20s	Both	75	No
Yakov Koyfman	Delaware Neurosurgical Group	Neurosurgeon	M	50s	Eng.	30	No
Douglas M. Johns	Church of the Savior, United Methodist	Pastor	M	50s	Eng.	35	No
Matt Hewett	UN OCHA	Administrator	M	40s	Eng.	70	No
Interviewee #19	Ass'n des Chauffeurs Guides d Haiti	Volunteer	M	40s	Both	75	Yes
Ghislaine Mimi Douze	World Care Center	Non-profit	F	30s	Eng.	55	Yes
Interviewee #21	Centers for Disease Control & Prevention	Physician	M	40s	Eng.	30	No
Interviewee #22	Indian Formed Police Unit, MINUSTAH	Official	M	50s	Eng.	40	No
Interviewee #23	Indian Formed Police Unit, MINUSTAH	Policeman	M	30s	Eng.	60	No
Interviewee #24	Voodoo practice	Voodoo Priest	M	50s	Creole	30	No
Tom Kou Louis	University of Miami Hospital in Haiti	Official	M	50s	Eng.	30	No
Interviewee #26	MINUSTAH	Administrator	M	50s	Eng.	40	Yes
Interviewee #27	Indian Formed Police Unit, MINUSTAH	Policeman	M	30s	Eng.	45	No
Interviewee #28	Universite de Port- au-Prince	Administrator	M	50s	Eng.	42	Yes

of two other researchers. Eleven interviewees of the second phase signed the new approved form.

Informed consent form provides for keeping anonymity of the interviewee. However, nine interviewees consented to reveal their identity in any publication and it is revealed in this dissertation, if appropriate.

The 28 interviewees listed in Table 1 were classified in three groups of victims, responders, and administrators in Table 2. The classification of interviewees was not self-exclusive. In other words, some interviewees were classified in two groups since they performed dual roles. Ten (36 %) interviewees were from the first group of victims, 16 (57 %) in second group of responders, and seven (25 %) in the third group of administrators. Totals do not tally because five (18 %) interviewees performed dual roles and were classified in both the groups. Between 10 volunteers and 16 responders there are two overlaps, between 10 victims and seven administrators, there are again two overlaps; and finally within responders category there is one interviewee who is both DMORT official and physician and therefore is counted twice in last column of Table 2.

The first group of victims had five interviewees from family members of the deceased, a person in whose building a visitor died because of the earthquake, two Voodoo religious leaders, one protestant religious leader, and a building subcontractor. The second group of responders had three police personnel, six physicians or surgeons (3 internal medicine, 1 forensic pathologist, 1 neurosurgeon, and 1 psychiatrist), one hospital administrator, one nurse, one DMORT official, two nonprofit officials, and two volunteers. The third group of administrators had one chief director of morgue, one

Table 2

*Classification of Interviewees*

Classification	Number of Interviewees		TOTAL
	Phase I	Phase II	
<b>A. Victims</b>			
Family member of deceased	2 <sup>a</sup>	3 <sup>b,c,d</sup>	5 <sup>a,b,c,d</sup>
Person whose home a visitor died	1		1
Religious leader (2 Voodoo <sup>e</sup> , 1 Protestant)	2	1	3
Building subcontractor	1		1
<b>B. Responders</b>			
UN Formed Police Unit personnel		3 <sup>c</sup>	3 <sup>c</sup>
Physician/Surgeon/Hospital official <sup>f</sup>	5 <sup>g</sup>	2	7 <sup>g</sup>
Nurse	1		1
DMORT official	1 <sup>g</sup>		1 <sup>g</sup>
Nonprofit official	1	1 <sup>b</sup>	2 <sup>b</sup>
Volunteer	1	1	2
<b>C. Administrators</b>			
Chief Director, morgue	1		1
Funeral home owner/administrator	2		2
UN administrator		2	2
University administrator		1 <sup>d</sup>	1 <sup>d</sup>
Security administrator	1 <sup>a</sup>		1 <sup>a</sup>
<b>TOTAL (n = 28)</b>	<b>17<sup>h</sup></b>	<b>11<sup>h</sup></b>	<b>28<sup>h</sup></b>

Note. <sup>a</sup> One family member of the deceased was also a security administrator.

<sup>b</sup> One family member of the deceased was also running a nonprofit organization.

<sup>c</sup> One family member of the deceased was a police person.

<sup>d</sup> One family member of the deceased was also a university administrator.

<sup>e</sup> A religion practiced prevalent in a section of population of Haiti, that is a combination of Roman Catholic rituals and animistic beliefs, involving magic and communication with ancestors.

<sup>f</sup> 3 Internal medicine physician, 1 Forensic pathologist, 1 Neurosurgeon, 1 Psychiatrist, and 1 hospital official.

<sup>g</sup> One physician was also a DMORT official.

<sup>h</sup> Totals do not tally since five interviewees are classified in two groups.

funeral home owner, one funeral home administrator, two UN administrators, one university administrator, and one security administrator.

From MFM perspective, the main roles were played by the responders and administrators, while victims were involved in some of the MFM activities, but not all.

From an information seeking perspective, these three groups have different roles. The first group is largely concerned with information seeking and less with information providing. The second and third groups are not only involved in information seeking, but they have also to provide information. The collection of data from different sources is in conformity with the “where possible, obtain data from variety of sources representing different points of view” (Babbie, 2010, p. 356).

### 3.14 Setting of Interviews

The interviews were conducted in a setting in which the interviewees were found or that they preferred, because setting influences the responsiveness of the interviewee (LeCompte & Goetz, 1982). Table 3 gives the details of the settings.

The setting of a maximum number of interviews, six, was a hospital or dispensary. Figure 4 gives an example of the setting of a temporary dispensary for an interview. The dispensary depicted in the photograph was set up in Port-au-Prince by a non-profit organization. Figure 5 depicts a physician reading a University of North Texas Institutional Review Board (see Section 3.20 and Appendix C) approved informed consent form before agreeing for the interview.

Table 3

#### *Setting of Interviews*

Setting	Number of interviews		Total
	Phase I	Phase II	
Titanyen mass burial site	1		1
Home of a woman where a visitor died because of earthquake and body was still in the fallen building during fieldwork	1		1
Outside of a fallen church in which lay three bodies during fieldwork	1		1

Makeshift camp	1		1
Voodoo priest home/sanctorum	1	1	2
Hospitals/dispensary	5	1	6
Funeral home	2		2
United Nations Stabilization Mission in Haiti (MINUSTAH) premises		3	3
UN Formed Police Unit compound		3	3
US Embassy in Haiti	1	1	2
Central National Equipment		1	1
NGO Office	1		1
Hotel/Restaurant	1	1	2
Port-au-Prince International Airport	1		1
In flight from Port-au-Prince to Miami, FL	1		1
Total	17	11	28



*Figure 4.* A temporary dispensary operated by the non-profit Saude Em Portugues in Port-au-Prince. Feb. 27, 2010. Photo by author.

The setting of three interviews each was the United Nations Stabilization Mission (whose abbreviation from the Creole is MINUSTAH) premises in Haiti and the UN Formed Police Unit compound. Two interviews each were conducted at the US Embassy premises in Port-au-Prince, a funeral home, two Voodoo priests' homes (both of which were also sanctorum), one interview in a hotel, and another in a restaurant.



*Figure 5. A physician reading the IRB form (Appendix C) before agreeing to interview. Feb. 27, 2010. Author<sup>26</sup> is on the right.*

An interview each was also conducted in the following settings: The Titanyen mass burial site; a spot outside a collapsed house (in which lay a body); a spot outside

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<sup>26</sup> The nose mask, face net, and gloves worn by the author in this interview were an exception because of the hospital setting. The interviewee, a physician appreciated the safety precautions.

a collapsed church (in which lay three bodies); a makeshift camp; a spot outside the premises of Central National Equipment;<sup>27</sup> the premises of an NGO office; the waiting lounge at the Port-au-Prince airport; and on a flight from Port-au-Prince to Miami, Florida. This description is offered because, according to LeCompte and Goetz (1982), describing settings increases reliability.

### 3.15 Interviewing

Interviews, which are defined as conversations directed by the researcher, may be structured or partially structured. If a researcher asks structured questions, the interviewee will respond relatively without elaboration, assuming that any elaboration may hinder the research. In partially structured interviews, also known as responsive interviews (Rubin & Rubin, 2012), asking the interviewee to explain in-depth or describe experiences enables the interviewee to share what is important to him or her without restrictions (Corbin & Strauss, 2008). It also enables the researcher to gain insights. In-depth interviews allowed for intense exploration of a subject with a knowledgeable or experienced person. A translator was present at all interviews to translate from any Creole to English and vice versa, although his services were needed only in seven interviews.

In all, the researcher conducted 28 partially structured, open-ended, in-depth interviews with 28 persons. Each interview lasted approximately 30 to 75 minutes, with a mean duration of 45 minutes (Duration of each interview is in Table 1). Every interviewee was interviewed in one conversation session only. He asked all of the

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<sup>27</sup> Central National Equipment is the public works agency of the government of Haiti that disposed of human remains without any attempt for identification.

questions in the first phase (February 23-28, 2010) of 17 interviews, all while Sadiq was present. These questions reproduced from the NHC and National Science Foundation funded project proposal are in Appendix E. The questionnaire, which ensured that the key topics were explored during the interviews (Taylor & Bogdan, 1984), was tweaked in order of questions and verbalizing of the questions during the partially structured interviews.

In the second phase (May 31- June 6, 2012), he conducted eight interviews on his own and three others jointly with McEntire and Sadiq. During the interviews he asked questions given in Appendix E, but the questions are not “that must be asked with particular words in a particular order” (Babbie, 2011, p. 340), they only provide a “general plan of inquiry including the topics to be covered” (Babbie, 2011, p. 340).

The researcher responded to what he heard during the interviews, formulated follow-up questions based on what he heard and the situation of the interviewee (Taylor & Bogdan, 1984). In the in-depth interviews, the interviewee became a conversational partner. Rubin and Rubin (2012) explain, “Conversational partnerships are built on trust, understanding, and mutual respect. The interviewee demonstrates trust by answering in depth, honestly, and openly . . . . In general, you need to show respect for your conversational partners through manners, dress, and tone” (p. 92). The researcher made data from all of the interviews.

### 3.16 Language of Interviews

Seven interviews, six in the first phase and one in the second phase were conducted with the help of the translator as the interviewees spoke in Creole (Table 4). Two of them were audio-recorded (apart from four audio-recorded interviews in which

the interviewees spoke English). In other cases, the interviewees did not allow the interview to be tape-recorded or it was culturally inappropriate to tape record. For example, an interview conducted at Titanyen, the mass-burial site, with a person whose two brothers died because of the earthquake.

There is a possibility of communication loss in translation<sup>28</sup> because there may be Creole words that are untranslatable in English. Marshall and Rossman (2011) assert, "What we should aim for is a reasonable approximation of the interview partner's words and intent" (p. 162). Nevertheless, to check the reliability of the translation by the translator employed in Haiti, the researcher gave an audio recording of one of the interviews in Creole to a University of North Texas emergency administration and planning alumnus originally from Haiti. This alumnus transcribed in English from the audio file of the interview in which the interviewee spoke in Creole and translator in Haiti converted in English. The transcription prepared by the researcher with the help of the translator in Haiti was compared with the transcript prepared by the alumnus for translation validity. The translator in Haiti did reliable translation.

Table 4

*Language of Interviews*

Language	Number of Interviewees		TOTAL
	Phase I	Phase II	
Number of interviewees	17	11	28
English	11	10	21
Creole	6	1	7

<sup>28</sup> Translate means converting audio in Creole to audio in English and vice-versa. "Transcription (lat. trans-scribere = 'to write over') is the transfer of an audio or video recording into a written form" (Dresing et al., 2012).

### 3.17 Transcribing

The researcher has begun to transcribe the audio-recorded interviews. He transcribed one interview of the first phase. It generally takes approximately ten times in transcribing an interview compared to the time spent in the interview (Pickard, 2007). The transcriber has to listen to the audio recording and sometimes listen more than one time for transcription. After transcribing the interview, the researcher realized it would be better to use the services of a professional transcriber, who was subsequently employed. He finally checked each verbatim transcription. With the help of the professional transcriber, he got eight of the 11 second phase interviews transcribed. Subsequently, he transcribed 19 remaining interviews.

The researcher had taken detailed handwritten notes of all the interviews, including the audio-recorded interviews. Two interviews in first phase and four in second phase were audio recorded.

The manuscripts of field observation notes were also transcribed. In the transcriptions of interviews he attempted Dragon Naturally Speaking Speech Recognition Software Version 12 to save time and it proved adequate for the task. Transcription of the interviews was done in 158 pages.

To check that the researcher correctly understood what the interviewees said and made correct notes, the researcher tried to send the transcription of interviews to the interviewees for member checking. The researcher had noted the email addresses of the interviewees when they gave. Some of the interviewees were not having or using emails. Even Darang, professor at the Université d'Etat d'Haiti and forensic pathologist, University General Hospital neither had an email address nor was using email for

communication. The researcher also tried to locate email addresses of the interviewees on the Internet.

The researcher sent transcripts of interviews to eight interviewees with a request to check the transcripts and correct if the researcher has miss understood something that they said. One of the emails bounced because the interviewee who was on an assignment in Haiti completed his assignment and his email was no longer valid. Three interviewees responded and confirmed the correctness of the transcript, except for a few insignificant words that are not connected to the research questions. In-between two phases of field research in Haiti, the researcher interviewed Bert Hayslip, professor of psychology, who has been teaching psychology of death and dying course for 35 years at the University of North Texas on March 25, 2010 and audio-recorded the interview. Hayslip also confirmed correctness of the transcript. This indicates that the researcher correctly understood what the interviewees said.

### 3.18 Data Coding

Coding is a step by which data are made available for analysis. “A code in a qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language based or visual data” posits Saldana (2009, p. 3). To explain a code, Saldana uses the analogy of a book title, which represents and captures essence and primary content of a book. However, coding is not simple labeling but a step that helps in linking. Further, Richards and Morse (2007) assert coding “leads you from the data to the data, and from the idea to all the data pertaining to that idea.”

According to Krathwohl (2009), “in qualitative research, coding is the process of selecting what is important from the rest . . . and naming it.” Further, Saldana (2009) recommends “code what strikes you” (p. 18). In addition, Charmaz (2006) posits, “Through coding we make discoveries and gain a deeper understanding of the empirical world” (p. 70).<sup>29</sup> After making data through interviews, field observation notes, and other documents, data were transcribed, and then coded for analysis.

The researcher assigned tags or labels to certain words in the data while coding. For example, he interviewed a person whose wife died because of the earthquake. The wife, whose remains were never found, was a teacher in a school and their son a student in the same school. During the interview, the widower said, “My son said, daddy my mother is still inside the building because she did not come out. My son could not explain what happened.” This sentence was coded for information seeking. The interviewee’s son was seeking information about his mother.

The researcher had an opportunity to advance his skills of coding, data analysis, and finding themes and categories from Barney Glaser when he participated in the Grounded Theory Troubleshooting Seminar led by Glaser in New York City in October 2012. Glaser is the co-founder of the grounded theory methodology with Anselm Strauss in the 1967 book *The Discovery of Grounded Theory: Strategies for Qualitative Research* (Glaser & Strauss, 1967). In one of the sessions the transcript of the interview the researcher conducted with Jovin, chief director, morgue of the University General Hospital, Port-au-Prince was given for coding to 13 participants and four fellows with PhDs who came from seven countries. The participants shared their coding of the

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<sup>29</sup> Recommendations for reducing problems in coding are given on page 69 of Charmaz (2006)

transcript and then Glaser gave his own coding of the transcript and explained the coding process, data analysis, and finding themes and categories.

Literature on coding has varying points of view about how many codes a researcher needs to identify. To start with, one may have 80-100 codes, then organize them in 15-20 categories, and distill them in 5-7 major concepts (Lichtman, 2006). Another view is start with 5-6 provisional codes, expand them to 25-30 categories, and finally combine them into 5-6 major themes (Creswell, 2007). Some authors advise that finally themes or concepts need to be minimized. For reporting qualitative work, three of something major is an elegant quantity (Wolcott, 1994).

According to Corbin and Strauss (2008), computer-assisted qualitative data analysis software (CAQDAS) is useful in coding and data analysis. For a brief review of what are CAQDAS, how they work, latest developments about CAQDAS, which are leading CAQDAS, what one may expect by using CAQDAS, and how they are different from quantitative data analysis software like SPSS, please see Appendix F.

The researcher coded all the transcribed interviews in MAXQDA CAQDAS. Six hundred three segments (excerpts) of transcripts were coded in 68 open codes or first cycle codes (see Section 3.19), including hierarchical codes (codes within codes). There were in-vivo codes, which use the interviewee's verbatim to name a code. Coding was done to reply research questions and to identify categories and themes.

Appendix G contains a screen shot (Figure G.1) of the MAXQDA in use. The screen shot shows the number 603 in the top left Documents window for the total number of segments coded. Bottom left Code system window also shows 603 segments coded. The screen shot shows an example of coding of the transcript of interview with

Matthew Hewett, then Manager, Information Management Unit, Office of the Coordination of Humanitarian Affairs, UN in Haiti.

The researcher got his coding audited by another scholar to ensure the consistency in meaning and application of the codes. For this, two selected transcripts, codes, and their definitions were given to another scholar for checking inter-coder reliability. That scholar recently earned Ph.D. in Interdisciplinary Information Science from University of North Texas. There emerged nearly a hundred percent coding reliability.

### 3.19 Data Analysis

Analysis of codes helped in identifying categories and themes. “Analysis is the search for patterns in data and for ideas that help explain why those patterns are there in the first place . . . analysis is the essential qualitative act” asserts Bernard and Ryan (2010, p. 109). While Yin (2009) posits that “data analysis consist of examining, categorizing, tabulating, testing, or otherwise recombining evidence, to draw empirically based conclusion” (p. 126). Furthermore, Krathwohl (2009) writes that “analysis is the process that facilitates making interpretations from fieldwork, observations, and interviewing” (p. 313). A theme is a sentence or phrase that describes tacit and subtle processes. For example, a code may be security and theme may be a false sense of security (Roseman & Rallis, 2003). A category is the overarching group of codes.

Creswell (2009) provides a step-by-step procedure of data analysis and interpretation. In addition, Eisenhardt (1989) lists steps as analyzing within-case data, searching for cross-case patterns, shaping hypotheses, unfolding literature, and reaching closure. The researcher used guidance given by these authors in his data analysis.

The coding and analysis are inseparable activities. Coding was done in three cycles with the help of MAXQDA CAQDAS. After the first cycle of coding ended, the author analyzed them in the second cycle of coding to delete, merge, put in different hierarchical level, or renamed the codes. The researcher analyzed codes with the perspective of managing mass fatalities and information seeking in MFM. Sixty-eight codes had 39 in vivo codes, 8 hierarchical codes, and 3 sub-hierarchical codes. In the third cycle, he identified various categories and themes. At the end of third cycle, there were nine categories of codes: MFM, information need, information seeking, external factors, internal factors, action, articulation, critique, and recommendations (see Figure G.1 in Appendix G).

Unlike the quantitative software like SPSS, CAQDAS is unable to give results. For example, CAQDAS only helped in data analysis, but the researcher interpreted the data. The researcher searched for repeated categories in the data trying to find significant and meaningful data. Data analysis confirmed the category within which the data were placed, and that served as an organizing framework for developing categories and themes (Bryant & Charmaz, 2007; Charmaz, 2006; Corbin & Strauss, 2008; Glaser & Strauss, 1967).

### 3.20 Ethical Considerations

Section 7009 of the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act mandates each institution that receives NSF grant to provide training and oversight in the responsible and ethical conduct of research by graduate students (National Science Foundation, 2010). The Institutional Review Board at the University of North Texas approved the data making

for ethical conduct of research and all the interviewees signed on the approved informed consent form (see Appendix C and H for details).

### 3.21 Validity and Reliability

Validity of data was achieved through voluntary interviews with knowledgeable participants (Stenbacka, 2001). The researcher did not offer or give any compensation to the interviewees. This reduced the possibility of getting interviewees motivated for only receiving the compensation and in a hurry to complete the interview for compensation.

LeCompte and Goetz (1982) suggested investigators may approach validity and reliability by “conscientious balancing of the various factors enhancing credibility” (p. 55). The access and timing of the fieldwork is adequately described in Appendices B and D along with appropriate identification and description of the participants in Table 1 and 2. The details of the settings of the interviews are described in Table 3.

According to Maxwell (2005), validity is “correctness or credibility of a description, conclusion, explanation, interpretation, or other sort of account” (p. 106). Options for testing the validity provided by Maxwell include: (i) intensive long-term involvement, (ii) “rich” data, (iii) respondent validation, (iv) searching for discrepant evidence and negative cases, (v) triangulation, and (vi) comparison. This dissertation used options (i), (ii), and (iii) as explained below.

The researcher had an intensively long-term engagement with people affected by earthquake fatalities in Haiti through an extensive and multiple interviews on the spot. His involvement in the research begin from the time the earthquake struck Haiti on January 12, 2010. His long-term involvement and intensive interviews of 28 participants

have enabled to collect “rich data.” Here rich means varied description of what was going on. The data are rich in statements of claim and experiences of interviewees and the notations researcher made of the non-verbal clues, emotional responses, and first person accounts.

Respondent validity is the criteria for selection of interviewee identified in Section 3.12. An example of such a respondent is the woman whom the researcher interviewed. A guest had come to meet her in her home, when the earthquake occurred. The guest died because of collapse of the building. The researcher interviewed the woman while the body of the guest was still lying in the building.

Reliability is the reproducibility of findings when the study is replicated using the same data and it was checked in this study by having another individual replicate the researcher’s efforts of coding, translation, and interpretation of transcripts. The researcher checked the reliability of translation by having another person translate one of the audio-recorded interviews in Creole and transcribe in English and comparing with the translation done at the time of interview in Haiti. According to LeCompte and Goetz (1982) expectation of reliability is increased by data making, selection of interviewees, setting of interviews, inter coder reliability, data analysis, and researcher credibility, all of which are done in this dissertation in Sections 3.11, 3.12, 3.14, 3.18, 3.19, and 3.22 respectively. Therefore, it is submitted that the study has a high reliability.

### 3.22 Researcher Credibility

LeCompte and Goetz (1982) assert, “The value of scientific research is partially dependent on the ability of individual researchers to demonstrate the credibility of their findings” (p. 31). Patton (2002) posits, “Credibility of a qualitative inquiry depends on . . .

rigorous methods of doing fieldwork . . . on the credibility of the researcher . . . [and] fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling, and holistic thinking” (pp. 552-553). Further, the credibility of the researcher is “dependent on training, experience, track record, status, and presentation of self” (p. 552).

With regard to training, the researcher has earned 86 graduate coursework credit hours (48 is the requirement). He has experience of conducting mass-fatality research in Bangladesh, India, and Sri Lanka during which he conducted 158 interviews, prior to the Haiti fieldwork. The present research is in continuation to his earlier research on MFM (Gupta, 2005b, 2005c, 2006, 2009, 2010a, 2010b, 2010c; Gupta & Sadiq, 2010; McEntire, Sadiq, & Gupta, 2011; McEntire et al., 2012; Oyola-Yemaiel & Gupta, 2005, 2006). His track record is evident in 16 references (10 single author and 6 co-author) to his work related to the dissertation apart from other publications. Status and presentation of self is in Appendix A.

### 3.23 Findings

In reporting the analysis of interviews, the researcher kept the identity of interviewees anonymous and aggregated the interview findings when conducive to recognize categories. Nine interviewees agreed to have their identity disclosed in any publication and identity of some of the interviewees was revealed, when it added value to the dissertation.

Yin (2009) writes that for a case study to be exemplary it has to be significant, must be “complete,” it must consider alternative perspectives, must display sufficient

evidence, and must be composed in an engaging fashion. The researcher has endeavored to do an exemplary case study.

There are five principles of generalizability: proximal similarity, heterogeneity of irrelevancies, discriminant validity, empirical interpolation and extrapolation, and explanation (Patton, 2002). The principle of proximal similarity states that generalization is confident “where treatments, settings, populations, outcomes, and times” are similar to the original research” (Patton, 2002, p. 581). Patton explains other four principles of generalization also.

Transferability and extrapolation will be possibilities of the findings under certain conditions. Transferability of findings is possible in similarity of contexts. Extrapolation is possible “under similar, but not identical, conditions. Extrapolations are logical, thoughtful, case derived, and problem oriented rather than statistical and probabilistic” (Patton, 2002, p. 584).

The researcher found how mass-fatalities were managed, and how and why did those affected by Haiti 2010 earthquake sought information about fatalities. What were the processes they used to seek information? What helped and what hindered in information seeking? The research culminated in theoretical and practical recommendations for future MFM and information seeking in MFM. The researcher expects that there will be some degree of social change after disseminating the findings. The expected outcome of this research is to raise the awareness of the people on this important social topic, and alleviate the suffering of family members and the community after sudden mass-fatality disasters strike in future.

### 3.24 Chapter Summary

The research questions for the proposed research are, how the mass-fatalities were managed and what were the needs of those affected to seek information about fatalities and how did they seek information? Based on the research questions a case study method was used. The data made with the help of 28 face-to-face interviewees, field observation notes and notes of meetings in Haiti were coded in MAXQDA CAQDAS and analyzed to answer the research questions. Next chapter presents findings of the research.

## CHAPTER 4

### FINDINGS

Chapter 1 introduced the field of managing mass fatalities and seeking information in managing mass fatalities. Chapter 2 discussed the existing research in the areas of information seeking and mass-fatality management (MFM), but found little literature addressing information seeking in MFM. It also stated three RQs. Chapter 3 delineated the research method and procedure. The data made with the help of 28 in-depth interviews and other sources were mined to respond to the research questions. This chapter presents the findings in response to the research questions.

#### 4.1 Mass-Fatality Management

This section responds to the first research question, how were mass fatalities managed in the aftermath of the Haiti 2010 earthquake? A senior UN administrator interviewee stated simply, “There was no fatality management.”

Out of 28 interviewees, 14 were Haitians. The other 14 interviewees were foreigners on assignments before the earthquake, or came to Haiti for responding to the disaster, or family member living abroad and came to Haiti to recover deceased. Among 93 % of the Haitian interviewees ( $n = 14$ ) expressed reconciliation with the MFM. Reconciled means they had accepted something unpleasant but did not complain. They reconciled because of the following stated reasons:

- Massive destruction of buildings, including the National Place (official residence of the president of Haiti) and 27 (96 %) of 28 government buildings in Port-au-Prince (Sims, 2013)
- Destruction of most of the hospitals

- No electricity
- No working telephones
- Impassable roads
- Non-availability of gasoline
- Poverty
- Death of 18,000 civil servants in the earthquake (Nelson, Sigal, & Zambrano, 2011) of the 60,000 civil servants (senior UN administrator interviewee)
- A non-functioning government prior to the earthquake

The research findings are presented based on the elements of mass-fatality management (MFM) as described in Section 2.8: fatalities, recovery, preservation, communication, identification, disposition, and the Zeigarnik (1967) effect. Some of those elements overlap and sometimes the findings relating to those elements are repeated. Before going into the individual elements of MFM, a summary of findings is provided below.

In response to the question how mass fatalities were managed, a senior UN administrator said:

For the next [after the earthquake] 96 or 100 hours or maybe five days, I would say, fatality management was more to do with the piece meal kind of a management, where we were sending people as is where is, with no effective command and control in place. . . . Nobody was very much interested in managing the fatalities there. . . . There was no fatality management in place. . . . There was no fatality management.

The earthquake resulted in death of an estimated 316,000 people according to the government of Haiti as reported by Brown and Delva (2011) on the Reuters news agency website. People died in crushed buildings and trapped vehicles. An interviewee

said, “As we drove along, there were piles of bodies at corners, everywhere.” Another interviewee described how people trapped in the buildings were trying to free themselves, “I saw people carrying bodies on the street. I saw people still trapped in the buildings crying. They were trying to move outside but could not. Everybody was screaming, crying, and there was complete disorder.”

The researcher witnessed people blocking roads and sleeping on the roads following the repeated aftershocks of the earthquake. An interviewee said she saw people blocking roads with physical barriers and sleeping on one side of the road with bodies on other side of the road and feral dogs running around the bodies. The human remains started decomposing and the smell of decomposing bodies was all around Port-au-Prince. When the smell became unbearable, people started dousing bodies with gasoline and burning them in situ.

The Haitian government was overwhelmed with all of the bodies. According to the senior UN administrator interviewee, “The Haitian Ministry of Health was legitimately overwhelmed and needed to devise a plan immediately. A plan was devised. The Ministry of Health with international partners created a pragmatic decision to create a mass burial.” Accordingly, the Central National Equipment (CNE), the public works agency, was ordered to remove the human remains and bury them in Titanyen.

The mass burial of unidentified human remains may have been inappropriate because it may cause the Zeigarnik (1967) effect and post-traumatic stress disorder (see Section 1.1.7). However, several of the respondents noted that Haiti as a society did the best it could with the situation it was facing. Rodrigue Darang, professor of medicine, Université d'Etat d'Haiti, Port-au-Prince and forensic pathologist, morgue,

University General Hospital, Port-au-Prince, who was interviewed and agreed to reveal his identity<sup>30</sup> in publications, said, “CNE did was beyond their capacity.”

A physician working with the Centers for Disease Control and Prevention said, “Human emotion element and cultural factors are important. How to keep people calm under sever circumstances is difficult to manage.” Nevertheless, a UN Formed Police official said, “Here people are not so bad. For seven to eight days, people were not having food but still they formed a queue and took food in an orderly manner. Many hungry people waited for three to four hours in the queues.”

The nation operates under difficult circumstances normally, and the disaster killed about 18,000 (30 %) civil servants (Nelson et al., 2011) out of 60,000 (senior UN administrator interviewee) and destroyed 27 (96 %) of the 28 government buildings in Port-au-Prince, including the National Palace (Sims, 2013). The President had to seek shelter in a police station, according to two interviewees and Farmer (2011). For the most part, those interviewed were sympathetic to what Haiti was dealing with after the earthquake. Evidently, MFM in Haiti was, for the most part, improvised and conducted according to norms of necessity versus any principles of preference (McEntire et al., 2012).

#### 4.1.1. Fatalities

Findings on fatalities are presented in subsections of (i) falling of structures, (ii) number of fatalities, (iii) the never-to-be-forgetten scene, (iv) “body, top of body, body on

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<sup>30</sup> Nine of the 28 interviewees agreed to reveal their identities in the informed consent form (approved by the Institutional Review Board of the University of North Texas) all signed. All interviewees’ details of affiliation, occupation/role, age, gender, length of interview, and interview recording method are given in Table 1 in Section 3.13.

top of body" (words of an interviewee) and (v) making light of misery.

#### 4.1.1.1 Falling of Structures

The earthquake felled civil structures like packs of cards (Figure 6). Crashed structures included government offices, hotels, business buildings, hospitals, schools, churches, and houses. Residential places including luxury hotels like the Montana<sup>31</sup> and the National Palace crashed too. Some falling structures fell on moving vehicles, trapping and killing passengers. The falling structures crushed to death hundreds of thousands.

Leogane city, about 30 km (19 miles) southwest of Port-au-Prince, was near the epicenter of the earthquake. Matt Hewett, Manager, Information Management Unit, Office of the Coordination of Humanitarian Affairs, United Nations said "80% of the structures there [Leogane] were destroyed." This was corroborated by other interviewees and by the Earthquake Engineering Research Institute (2010).

#### 4.1.1.2 Number of Fatalities

The number of dead remained controversial in March 2013 and would probably remain forever. Brown and Delva (2011) reported on the Reuters news agency website, "The death toll from Haiti's devastating 2010 earthquake was more than 316,000, Prime Minister Jean-Max Bellerive said on Wednesday, raising the figures from previous estimates on the first year anniversary of the disaster. . . . Previous estimates from Haitian authorities had put the quake dead at around 250,000."

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<sup>31</sup> At Hotel Montana about 200 of the 300 guests, mostly foreigners (including UN personnel), died.



*Figure 6.* Destruction of civil structures by the earthquake in Port-au-Prince, Feb. 27, 2010. Photo by author.

According to an interviewee, the number of dead given by the government excluded bodies buried or cremated by individuals or groups other than CNE. According to Darang, “the dead are well over 300,000.” According to a UN Formed Police Unit official, “The dead figures are exaggerated, not more than 150,000 people died according to our estimates.” According to a senior UN administrator, 280,000 died. A university of Port-au-Prince administrator said CNE gave the figure of dead students as

1,000, while the university had placed its employees to count bodies at the time of loading of CNE trucks and they reported 97 dead student bodies.

Two brothers of an interviewee of this study living in Titanyen died in the earthquake. The interviewee, whom the author met at the Titanyen mass burial site, said he had witnessed CNE earthmoving equipment dumping bodies and he was unaware of any recordkeeping of the numbers. A majority of the interviewees also said they were unaware of human remains recordkeeping.

Peralta (2011) reported on the NPR website that according to a draft United States Agency for International Development, study not publically released, no more than 85,000 died. The study was conducted by anthropologist Timothy Schwartz. Schwartz gives his arguments about various death counts on his blog.<sup>32</sup> For a discussion of the dispute in the number of dead in Haiti, see O'Connor (2012) also.

Estimating number of people killed after a disaster is a challenging and obviously disputable task. Another example is the number of deaths because of 1999 landslides in Venezuela. Rogellio Altez, anthropologist at the Universidad Central de Venezuela investigated death records and concluded less than 700 died, while EM-DAT database states 30,000 died, and the World Bank reports 50,000 fatalities (World Bank and United Nations, 2010). For challenges in reporting disaster death numbers, see Kelman and Jankman (2007).

Although the number of fatalities is disputed and “the exact death toll from the 2010 Haiti earthquake will never be known, it’s clear the loss of life made that disaster the deadliest in the Western Hemisphere during modern times” (Kendra, Thomas, &

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<sup>32</sup> [http://open.salon.com/blog/timotuck/2011/05/29/haitis\\_questionable\\_earthquake\\_death\\_toll](http://open.salon.com/blog/timotuck/2011/05/29/haitis_questionable_earthquake_death_toll)

Miles, 2012).

#### 4.1.1.3 The Never-to-be-forgotten Scene

One interviewee, whose cousin died inside the National Palace, described Port-au-Prince at 6 a.m. a day after the earthquake: “I could not believe. I walked for two miles and I stepped on 1,000 dead bodies.” Douglas M. Johns, Pastor, Church of the Savior, United Methodist, Cincinnati, Ohio, said of the scene described to him by families, “At times, they described how they pulled the children out of the fallen rubble of the buildings. Sometimes the body was mutilated and they gave up.”

An interviewee, whose mother died in the earthquake, observed, “As we drove along, there were piles of bodies at corners, everywhere and so forth.” She described the poignant scene in these words:

We were driving our car through here. And as we try and they barricaded this strip. So we can't go through that, and this side of the street people were lined up and sleeping on the street, you know, lined up and just sleeping, because they have been told that don't sleep inside [because of aftershocks], and this side and how pathetic, three here [bodies], two here . . . Immediately you cross the street, and you know.

These roads are so tiny. And I remember thinking it got to be hitting me, because if I am sleeping on this side, even if I am told to sleep on the street, I just could not get it, even if I am told to close the street. I couldn't do it right here, you know. So two here [bodies], three here, four here, and I am on the this side of the road with the rows of the people with the kids and whatever and sleeping on the other side and in the middle the dogs are going through the dead bodies, you know. The dogs are roaming the streets everywhere and over there, you know, and I remember just thinking, I am never going to forget this scene.

#### 4.1.1.4 “Body, Top of Body, Body on Top of Body”

Pierre Yves Jovin, chief director, morgue of the University General Hospital<sup>33</sup>,

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<sup>33</sup> University General Hospital is a teaching hospital and the biggest in Port-au-Prince.

Port-au-Prince, said:

I came at 8 a.m. next day [after the earthquake]. I found the yard and the parking area overloaded with dead bodies, the cadavers. When I came into the office to work, there were 800 tags with the numbers for the dead bodies. All the 800 tags were used. And the Director gave us 500 more tags and they were also used. Afterwards, I have to make three times 900 more tags and they were used between 8, 8:30 a.m. and 3 p.m. on Jan. 13. When I saw the atmosphere and that bodies keep on coming, the office was closed. The bodies were piling up.

Records of incoming bodies to the morgue of the University General Hospital were not kept until January 21 because of large numbers of incoming bodies. Jovin kept a record of incoming bodies to the morgue that added to 12,700 as of February 25, the day researcher interviewed him. Darang said, “Morgue was full. The parking lot, the whole parking lot was full of bodies and then came more to the parking lot.”

An interviewee spoke about his cousin, “His wife called everybody concerned. At 3:00-3:30 p.m. [on the day of earthquake], he was there inside the National Palace. He was President's bodyguard. His body is inside the National Place and must be rotting. At the National Palace, there is nobody.” Another interviewee, a physician said, “One could smell and see bodies. I could still see dead bodies. When I came today [February 27, 2010], I saw a body dangling from a building hanging out and a skull lying.”

The transport of human remains was described by an interviewee as, “the truck was full of dead bodies, I could see them, I mean it was like that I could see body, top of body, body on top of body.”

#### 4.1.1.5 Making Light of Misery

A female-interviewee who agreed to reveal her identity said in an audio-recorded interview (Six of the 28 interviews were audio-recorded as mentioned in Sections 3.16 and 3.17. All interviews were recorded by hand and later transcribed):

A man has died while having sex with a woman and a brick fell. But, they made it like the show, people would come in and watch. So, they have been insensitive, but they were experiencing this major thing . . . And they left it exposed...They would tell you, want to come and see. I said, no. It is not funny . . . they made a show out of it. Actually, they put a little video that was being shown all around.

#### 4.1.2 Recovery

Findings on recovery of Haitians remains and foreigners remains are presented separately in this section because they were treated differently by responders and administrators.

##### 4.1.2.1 Human Remains of Haitians

Family members, friends, neighbors, relatives, colleagues, and passers-by recovered human remains. According to a physician interviewee, “Initially people first tried to search and rescue, and then when bodies were found they kept bodies on streets.” People who work on removing rubble also recovered human remains. Some people took human remains to the University General Hospital, Port-au-Prince, or hospital in United Nations Stabilization Mission in Haiti (MINUSTAH) compound, or funeral homes, where they quickly outstretched the capacities.

Many people removed human remains from the roads and put them on the sidewalks. A UN official said, “I picked up dead bodies that time myself, about 30 or 40.” Because of the lack of earth-moving equipment debris removal was a very slow process. During the researcher’s first field visit, seven weeks after the earthquake, he witnessed human remains in a building near a main road. During the second visit, nearly five months after the earthquake, many interviewees said that there were still human remains in many fallen buildings. According to Darang, professor of medicine,

Université d'Etat d'Haiti, Port-au-Prince and forensic pathologist, morgue, University General Hospital, Port-au-Prince, “Even now, there are some places where the houses are destroyed and there are still bodies below the debris and we will not know unless all the gravel is removed.”

While the retrieval of bodies was immediately possible in some circumstances, it was unmanageable in others because of unstable rubble, limited entry and exit points, or the lack of proper tools and equipment.<sup>34</sup> Thousands of bodies were recovered within hours and days, while others were extracted weeks and months after the earthquake. Human remains were not removed from collapsed structures long after the earthquake. For instance, one man described his heart-wrenching experience of searching for his wife as follows:

I was in my house . . . and was going to pick up my kids from school. At 4:55 p.m., the earthquake came, and my wife was inside the school [and] my son was in the same [building]. . . My son said he and his mother were on the first floor before the earthquake. His mother wanted to talk to the principal, whose office is on the second floor. My son went to the bathroom and the earthquake happened . . . He went outside . . . and [saw] the school was totally collapsed. . . . After fifteen to twenty minutes, I saw my son coming alone without his mother. . .

I took the car and went to the school. . . I saw people carrying bodies on the street. I saw people still trapped in the buildings crying. They were trying to move outside but could not. Everybody was screaming, crying, and there was complete disorder. . .

I formed a team of five people and began to help move bodies. . . I never found the body of my wife. For two months, nobody did anything. Every second and third day, I passed by the school to see if there was any change. . . But nobody helped. I went many times but I never saw my wife's body. My wife died inside the

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<sup>34</sup> Some of this material in this chapter was adopted from Gupta and Sadiq (2010) and McEntire et al. (2012) with additional inputs.

school. . . I asked the school what they plan to do with the bodies inside the school. . . They said they cannot do anything.

The human remains of his wife were never recovered. An interviewee's mother died in the aftermath of the earthquake. Apart from the mother, her other family members also died. She said of the deaths and the body of kin that were never found,

My cousin . . . daughter was at home during the day of the earthquake and . . . his daughter died. His ex-wife remarried, so she had three other children plus his daughter. She and two of the kids died. One boy was sent to the Dominican Republic with a bad liver or something . . . Ah, and her mom and aunt died. So his daughter's body fell in a four story building. She was on the third floor or something, but there were two hotels that were next to the house, that fell on top of her. So they never did recover her body, they still have, like right now, he never got her body . . . they are still finding bodies. That's the body we never found. . . . So that's happening daily.

If the bodies were extracted initially, they were most often laid (and sometimes piled) on sidewalks and streets in front of damaged buildings. One respondent described twenty-five bodies lying on the road in a space of just five meters (16 feet). A visitor died at a home. The host informed the family members of the deceased. However, the family members did nothing. The host was not aware about CNE, the public works agency that was mandated to remove human remains. According to an officer of the Indian Formed Police Unit of the UN, most of the human remains could not be immediately removed. Twenty-five students died inside a school classroom and there was no one to remove the human remains. There were three human remains inside a fallen church and CNE was supposed to remove the human remains, but it did nothing.

#### 4.1.2.2 Human Remains of Foreigners

Foreigners' human remains were treated differently. Many governments sent

teams to Haiti to obtain the human remains of their citizens and brought to their respective countries for giving to family members. The UN contracted with Kenyon International Emergency Services, a company that specializes in MFM. Kenyon arrived in Haiti on January 14, 2010, and helped the UN and other clients recover, identify, and return the bodies and personal effects of the deceased foreigners. Kenyon was instrumental in the successful recovery of deceased UN workers killed in Hotel Montana. Kenyon continued its MFM responsibilities until July 2010.

The United States government became involved in the retrieval of Americans who perished in the earthquake. Two days after the earthquake, a team of representatives from the Department of Health and Human Services arrived in Haiti. A sizable portion of the crew immediately went to work to help with rescue operations and treat Haitians in portable hospitals, clinics and functioning hospitals. Four individuals affiliated with DMORT<sup>35</sup> started to assess mass-fatality concerns, but they arrived with no formal mission or official US role for this responsibility.

During the initial period of operations, many individuals and organizations asked the assessment team what should be done with deceased Americans. The team began communicating these inquiries to the US embassy in order to convey needs and resolve legal and financial concerns about Department of Health and Human Services DMORT's working in a foreign nation. For days, there were no definitive answers and the situation was extremely dynamic. About this time, a Congressional Representative arrived in Haiti and started to pressure the US government to act. He traveled at the request of American families who lost students while on a study abroad visit from Lynn

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<sup>35</sup> See footnote in Section 3.12 for information on DMORT.

University. The attention he brought to the issue was enough for decision makers to activate DMORT nearly one full month after the Haiti earthquake. According to a DMORT administrator interviewed on February 25, 2010:

DMORT deployment was for the first time in history outside USA. DMORT Region III team came to Port-au-Prince on February 12. DMORT standard team consists of 50 members. In Haiti, 25-member team was deployed.

DMORT team did search and rescue for the dead. The DMORT mission is to find out and recover deceased American citizens who perished in the earthquake.

As of now, 35 cadavers have been recovered. We search at the sites where Americans were there: Hotel, market places, and neighborhood. We expect to find more than 50 cadavers.

We are sending small teams of 4-5 experts on the sites where very likely American were there. These teams do search and rescue of cadavers and include anthropologist and dental forensic.

As directed by the President of the USA, we are working exclusively for the Americans.

The goal of the DMORT team was to facilitate body collection and repatriation to America. In many cases, notes and calls from Haitian citizens and hospitals relayed information about dead Americans and where remains could be picked up. However, Americans also remained trapped under rubble, as was the situation at the Hotel Montana. Soldiers from the 113<sup>th</sup> Mortuary Affairs out of Fort Lee, VA conducted search and recovery operations at this location. They had the proper training and equipment to extract corpses from collapsed buildings. Regardless of where the bodies were initially found, they were taken to a morgue set up by DMORT at Port-au-Prince.

#### 4.1.3 Preservation

Findings on preservation are presented in subsections of (i) human remains of

Haitians, (ii) human remains of foreigners, (iii) University General Hospital morgue improvement because of disaster, (iv) competition for space in morgues, and (v) the scene inside a funeral home morgue.

#### 4.1.3.1 Human Remains of Haitians

Human remains preservation facilities were limited in Haiti. People kept human remains on the roads and blocked them from traffic. People also kept human remains on the sidewalks, parking places, or wherever they could find open spaces nearby the place of recovery of human remains. The purpose might not be to preserve, but CNE had limited capacity and was not able to take away all the human remains. At some places, there were human remains on one side of the road and other side of the road people used for sleeping.

Even otherwise, no nation would likely have human remains preservation facilities for the number of deaths that occurred in Haiti. What to talk of most poor nation in the Western hemisphere, Haiti, at the time of 9/11, New York City "disaster contingency plans for morgue overflow was developed in preparation for incidents involving approximately one thousand fatalities" (Wachtendorf, 2004, p. 165). The earthquake destroyed many morgues and about 50 hospitals (Government of the Republic of Haiti, 2010). Most of the recovered human remains were disposed of by CNE without any effort for preservation.

#### 4.1.3.2 Human Remains of Foreigners

Efforts were made to preserve human remains of foreigners. For this purpose, different countries sent their own teams (i.e., DMORT by US) to search for human

remains of their nationals and for repatriation to their home nation.

A senior UN administrator said:

We never had a refrigerated container to keep bodies except for the one that was there in the hospital, which we maintained for IT and personnel. But that was already overflowing with bodies from outside, seeing the scale of destruction. . . . two refrigerated containers, which were having their IT equipment . . . emptied . . . and put bodies there. We also emptied one, which was carrying food. . . . We emptied that and put bodies in there.

Once a fatality has taken place and there is no mortuary over here, so these bodies had to be flown all the way to Santo Domingo for getting the mortuary services intact and embalming the bodies, and then getting them back here, getting the paperwork intact, and flying them out. Such a long drawn process, which continues, it doesn't end in three or four days. It takes over three months or four months to get over the process. . . .

Every nationality has its own reservations about the customs and traditions to be followed to keep a dead body. As you are aware, the UN lost its own personnel, which included Muslims, Christians, and Hindus. So there were issues about keeping the bodies together, keeping the bodies in separate places, keeping in the bodies in a refrigerator, or in other conditions. . . .

We have to get these bodies preserved before they get destroyed. Therefore, we cannot really pay heed to all the customs and traditions. Because, we had to be practical about the fact that we had one refrigerated container and certain temperatures we have to maintain for the fatalities. When we talk about temperatures, we need that kind of generator supply to come to provide electricity. . . . Seeing that it doesn't rot or doesn't decompose . . . say 24 hours to say 96 hours or maybe more than that.

I really didn't have the time to see how long they were kept, but we tried to, I think within the next ten days we nearly made arrangements, by the time Kenyon had come in, and we had made arrangements to move them.

Human remains of two Americans and 20 Canadians were brought to the University General Hospital morgue for preservation. There is also a non-discriminatory contrary report about preservation of human remains of foreigners. An interviewee said, "There was no discrimination in treatment of dead bodies. White dead bodies were treated like anybody else. I personally saw two white dead men along with all others." It

is possible that non-UN foreigners and countries that did not had any representation or did not send their representatives for recovery of their human remains might not have been preserved, similar to the Haitians.

#### 4.1.3.3 University General Hospital Morgue Improvement because of Disaster

The morgue at the University General Hospital registered 2,200 human remains between 8 a.m. and 3 p.m. on the day after the earthquake. Then they closed morgue and did not accept human remains, as it was beyond their capacity. The morgue re-started registering human remains on January 21 and as of February 25 had registered 12,700 human remains. Some of the human remains came from other morgues and hospitals. The human remains were preserved for about a week in the morgue.

Because of the earthquake, the preservation function at the morgue of the University General Hospital improved from archaic. In the words of Jovin:

Before the earthquake, the morgue was not functioning well. The morgue here was considered to be of the lowest category before the earthquake. After the earthquake, international communities begin to come here, particularly from the Red Cross. There were other organizations, which came here. They begin do classes for people who were working here, seminars, and others, teaching on how to run this place. They gave donations of materials, sanitary and other materials and body bags.

Here the techniques we were using were archaic. They taught us, and gave us formulae, explained paperwork, the new registration procedures, and the morgue operations. The morgue has better appearance now. It was a daily war with so many bodies coming. There won't be a day when the cadavers did not come. As for the direction of the morgue, we are daily counting and filing to make sure that the cadavers have a different sheet.

#### 4.1.3.4 Competition for Space in Morgues

There were some morgues in private funeral homes still working after the earthquake. However, they soon became full and there was a kind of competition over

space in the morgue to store human remains. There was no electricity in Port-au-Prince immediately after the earthquake, which made it difficult to maintain cooler temperatures for preservation of human remains. At least at one private morgue when it stopped accepting human remains, people brought and threw human remains outside the morgue, thinking the morgue would do something for the human remains.

An interviewee's mother died in the earthquake. The mother owned a funeral home and "she had embalming through waiting. She had for herself and they found it. We gave her the shot." They took the human remains to a private morgue and that was the last body the morgue accepted. The interviewee provided a generator and gas to the morgue for preservation. However, the morgue used the gas for other purposes, the body was leaking, and there were flies around the body.

#### 4.1.3.5 The Scene Inside a Funeral Home Morgue

The interviewee is looking for a coffin for her mother's body. One of her relatives takes her to different places to see the coffins. He takes her to one more funeral home. She describes the scene of preservation of human remains inside a morgue of that funeral home. An employee invites her in the funeral home.

He opens the door . . . and says, come on in and discuss the one we have right here, and says, come on in, come on in, casually. And I walk in . . . and you smell it, like oh (makes a sound). And I look at where he is pointing to the coffin, and my eyes drawn to the floor. And he has like thousands, thousands, thousands of bodies in his funeral home, thousands of them. And I was like so hurt. I said what are you doing. He said no it's okay, these bodies are of the neighbors, I don't want, you know, people would start taking them and you know start burning them.

#### 4.1.4 Communication

In the immediate aftermath of the earthquake, there were no landline or cell

phones working and there was no electric supply. Most of the roads were also blocked with fallen buildings and broken vehicles. Gas stations were also not working except for the UN gas station in MINUSHTA compound, presumably because UN has more financial and technological resources and the gas station was not for profit.

A female physician in a private hospital had finished her work at 4:30 p.m. on January 12, 2010. She was driving towards home and earthquake happened. She stopped the car. She was inside the car and waited for the earthquake to stop. Afterwards she again started driving towards her home. She saw that her house has fallen because of the earthquake. She said she understood earthquake. She checked for her family. She did not see her mother at the fallen home. She searched for her mother in the market. Telephone facilities (landline and cell phone) were down. At about 6 p.m. her mother showed up in their neighborhood alone.

Another female interview who was in US, and her mother was in Port-au-Prince, was not so fortunate. She said her communication story thus:

I tried to reach her, I couldn't reach her, the phones were not working, I knew some other people in Haiti, and I tried to call. Lines were busy and one thing I did know, if anything happened, they would call. . . .Because my mom knows lots of people . . . So no one called. . . .

Then I felt uneasy . . . because I haven't heard from anyone and the phones weren't ringing. . . . There is a cousin of mine who called and she said that her aunt was running out of the hotel, because my mom has a hotel and then, what I heard was that she died.

It was about 8 o'clock and someone else called and said my dad is dead, my cousin is dead, your mom's dead . . . I have already kind of felt it. As the evening went on, I would have heard from her, she would have found a way to get in touch with us.

It wasn't actually confirmed till next day at one o'clock in the afternoon. . . . the communication was so bad. . . . the nature of the communication . . . . When we were coming . . . we just couldn't get communications to Haiti.

I heard couple of people that were on the Facebook, we didn't know what was what.

Here is another perspective on communication problems in the Haiti mass-fatality situation:

My husband and I kept on dialing the phone numbers of friends and relatives in Haiti and getting no response. While keeping an eye on the television and an ear to a local Haitian radio program...my oldest daughter, Mira, asked if her grandmother was okay. We tried to reassure her as best as we could, but we did not know ourselves whether my mother-in-law—who often traveled from Les Cayes to Carrefour—was alive, or whether anyone we knew was alive.

The routine became (1) dial phone numbers of friends and relatives in Haiti; (2) go online—including social networking sites—for a bit more information; (3) dial friends and relatives all over the United States and Canada, who were also dialing and checking networking sites, and ask, “Have you heard from anyone?” They had not. (Farmer, 2011, p. 252)

#### 4.1.5 Identification

Findings on identification are presented in subsections of (i) no effort to identify Haitian human remains, (ii) identification of human remains of foreigners, (iii) wrong identification, (iv) plan for identification, and (v) RFID technology for identification.

##### 4.1.5.1 No Effort to Identify Haitian Human Remains

Family members, friends, neighbors, and passersby identified human remains in some cases. Nevertheless, the vast majority of human remains remain unidentified because of a variety of factors. Generally, in a mass-fatality situation, after recovery and preservation, local administrator communicates with community for identification of human remains, if the community has not already identified the human remains. Local administration makes an effort for identification of the human remains for a period depending on the situation, number of fatalities, resources, tradition, culture, available

technology, and other factors. People get impatient if the bodies of their loved ones are not identified.

Considering the severity of the situation for about 24 hours after the earthquake the government ordered CNE to disposition human remains. Darang said, “I am the pathologist to identify the bodies when asked by performing autopsy and other means, but there was no rule or order for identification of the bodies or any decision of the government.”

CNE made no effort to identify human remains. According to Darang, “CNE had no capability or capacity for identification of human remains.” CNE is the government public works agency having earth moving and other equipment for construction (including destruction) of roads and other structures. CNE had offered to demolish the damaged National Palace (Charles, 2012).

Some bodies did not possess any form of identification whatsoever, and this may have been common among a sizable group of impoverished Haitians. It was reported that a few of those retrieving bodies accessed the wallets of victims and removed their contents (but did not return personal belongings to the original pockets). An administrator of University of Port-au-Prince described such a situation:

There was a group of people from the streets looking for money, and while they were identifying the dead people, they just . . . put their hand in the pocket of the dead . . . [if] they find the money, they take the money and throw the [ID] card . . . Then somebody else takes it [the ID card] and brings it to us. In this way, we could identify some of the dead.

The earthquake destroyed the prisons and the prisoners escaped. Because there was no electricity, the thieves took the opportunity to robe some of the people. The local people killed some of the thieves. Jovin said:

There are some cadavers of thieves here and they are from . . . downtown Port-au-Prince or in other areas . . . They tried to rob, and they were killed . . . . When those cadavers show up here, brought here by the police, those cadavers are not identified, they are bagged and buried. They do not bother to identify them.

Looting of bodies in Haiti can be described, according to the Quarantelli (1994) classification, as minor. Individuals looted covertly under opportunistic conditions, but it was socially disapproved by Haitians.

The loss of entire families or an inability to bury the dead in individually marked graves likewise made identification difficult or futile anyway. Furthermore, one senior UN official said there was a lack of professionalism to follow the basic norms, as to “when you take a body, how you identify it, whether you take a photo or not, where you should keep immediate belongings, should they be kept in a vault or not?” The difficulty of accessing bodies also made identification problematic. One respondent replied that “it was definitely too late, you could not even see the faces of the body.” Therefore, identification was pursued in select situations where relatives sought a traditional funeral service. For most of the deceased, identification was either not attempted or was regarded an overwhelming task to accomplish.

The dispersed location of the fatalities was also a problem in the disaster. When the earthquake occurred, people were involved in daily activities (such as work, school or shopping) that required them to be in locations far from their homes and relatives. Therefore, the deceased were located in many areas throughout the capital city and countryside. This fact, along with the inadequate identification or the loss of entire families in the disaster, made the return of bodies to relatives extremely difficult.

#### 4.1.5.2 Identification of Human Remains of Foreigners

Generally, efforts were made to identify human remains of foreigners. There is an International Criminal Police Organization disaster victim identification protocol (INTERPOL, 2009). However, neither chief director, morgue, Jovin nor professor of medicine and forensic pathologist of morgue, Darang were aware of it. Many foreigners who died in Hotel Montana were identified. The Canadian embassy contacted a funeral home that in turn contacted Darang. Twenty human remains of Canadian were brought to the morgue of the University General Hospital and a representative of the Canadian embassy identified and signed for them. A robber allegedly killed an American and his body was brought to the University General Hospital for autopsy. Similarly, human remains of a nine year old student were recovered from the school rubble and brought to University General Hospital. The body was identified as that of Jack Marc.

UN employees are covered under insurance and for identification of their human remains, Kenyan International Emergency Services were hired. A UN administrator said, "We still have ten bodies that need to be identified [as of June 4, 2010], we are waiting for DNA results and all those things. So it's a long drawn process."

The portable morgue unit at the airport had refrigerated trucks and containers, powered by fuel from the US military, which were used to store bodies. The forensic professionals were divided into teams and worked on a 24 hour schedule (with 12 hour shifts) to process the remains. The DMORT process included an X-ray of the remains in the body bag, an admitting and numbering of the corpse, a catalog of personal effects, the taking of photos and finger printing, pathology, and anthropological exams, dental observation, and collection of DNA specimens. According to a DMORT official:

The DMORT team consisted of forensic mortuary services, forensic pathologist, anthropologist, dentist, finger print specialist, DNA specialist, X-ray technicians, and photographer.

All the 35 American bodies recovered by DMORT have been identified. Dental records were the major source of positive identification. Some fingerprints also revealed identifications. Anthropologist also helped in identification.

Technology is available for identification in mass fatality situations, but cost may prohibit its use in some cases. To identify the cadaver, multiple methods may be used. In Katrina, radio frequency identification chips were implanted for identification of cadavers. Unidentified cadavers are given to the local authority who ask local examiner to identify the cadaver.

While the DMORT team in Port-au-Prince acquired the post-mortem information, an ante-mortem team in Florida collected similar information from family members who claimed to have lost relatives in Haiti. This included data about body height and weight, hair color, tattoos, jewelry, DNA, and medical or dental records. By the time they finished operations in Haiti at the end of March, DMORT had processed over 200 American bodies.

#### 4.1.5.3 Wrong Identification

There were reported cases of wrong identification in past mass-fatality disasters. For example, Scanlon (2008) reported that at least in two cases bodies of tsunami deceased in Sri Lanka were identified and repatriated to London. The staff of London West coroner found their identification incorrect. A University of Port-au-Prince administrator said, "We had lot of [Identification] cards that students bring back to make new cards. But there may be ID cards of the dead people also. We register a lot of claims like that, from the students or the people that some students are dead. Then they come and said, hello I am not dead."

#### 4.1.5.4 Plan for Identification

Perera (2005) studied the legal implications of mass burials of unidentified victims in Sri Lanka after the Indian Ocean tsunami and found that many of the unidentified victims were buried in mass graves. Therefore, he recommended that the Sri Lankan government develop a national emergency management plan addressing the problem of victim identification for future mass-fatality incidents (Perera, 2005).

It is not only Sri Lanka or Haiti; many countries do not have this type of plan. For example, in the United States after 9/11 “the need for debris removal and remains recovery was identified,” but “it became evident that there were no plans to address that need” (Wachtendorf, 2004, p. 169). At the time of 9/11, New York City had morgue overflow capacity for about one thousand bodies according to an official of the Chief Medical Examiner (Wachtendorf, 2004). For a fuller review of human remains identification effort after 9/11, see *Who They Were: Inside the World Trade Center DNA Story: The Unprecedented Effort to Identify the Missing* by Shaler (2005) who was director of the Forensic Biology Department, Office of the Chief Medical Examiner of New York.

#### 4.1.5.5 RFID Technology for Identification

On asking if she thought RFID technology should have been used for identification of human remains, a female physician interviewee said yes. Another interviewee, a DMORT official, added:

Human beings should also be treated with respect. There is technology available for positive identification for use in multiple mass deaths of tens of thousands. After Katrina RFID chips were implanted so that later the identity of the person may be find out. To identify the cadaver, multiple methods may be used. RFID could be used in large scale in US, but cannot be used in Haiti.

Darang told the researcher that he is not aware of the RFID chip technology for identification of human remains. Details of use of RFID chip technology are in Appendix I. The researcher helped direct at the time of interview Darang to web resources about RFID and disaster victim identification protocol. Interviewee shares his experiences and when interviewer gives something in return, it is termed as reciprocity (Corbin & Morse, 2003).

#### 4.1.6 Disposition

Findings on disposition are presented in subsections of (i) unidentified mass burial commingled with debris, (ii) trenches and bodies, (iii) burning of human remains, (iv) no money for burial, (v) no cremation facility, (vi) improvised rituals: Catholic and Voodoo, (vii) disposition of human remains of foreigners, and (viii) use of cadavers for transplant.

##### 4.1.6.1 Unidentified Mass Burial Commingled with Debris

Disposition of human remains was done in a pathetic way. Most of the human remains were mass buried, commingled with debris, without any effort to identify, in the trenches at Titanyen. Yet some human remains remained crushed and buried in the fallen structures at the time of second field visit to Port-au-Prince 20 weeks after the earthquake. Probably those human remains will remain part of debris until debris will be removed and even beyond that. An interviewee's cousin who was bodyguard of president of Haiti died in the earthquake inside the National Palace and he said that his remains were rotting there. The National Palace was razed after 32 months of the

earthquake in September 2012 and debris were getting removed (Archibold, 2012; Charles, 2012), probably with human remains.

A UN administrator said, “The Ministry of Health with international partners created a pragmatic decision to create a mass burial.” One physician interviewee said, “Mass burial is the necessary outcome of the tragedy.” The government appointed CNE to lead human remains disposal efforts. The CNE and many other international governmental or non-government agencies collected bodies with human labor, and dump trucks.

According to Jovin: “At around 5 p.m. [on January 13, 2010] government passed rule or law saying that all the bodies have to be commune disposed and taken to Titanyen for burial.” A female physician of a private hospital near Titanyen, who worked voluntarily with physicians at the University General Hospital for a week after the earthquake said, “On 14th January, CNE trucks started coming and took away bodies. Bodies were first removed from the main streets, then businesses, and then from the houses. CNE removed bodies in and around the University General Hospital in about five days.”

The CNE deployed trucks, bulldozers, backhoes, and other earth moving equipment for making trenches, collecting human remains, and taking them to Titanyen for dumping. Probably it is inappropriate to label the process followed in Haiti as burial. Bert Hayslip, professor of psychology, has been teaching the Psychology of Death and Dying undergraduate course for 35 years at the University of North Texas. The researcher interviewed him on March 25, 2010. He said:

We typically think of burial as [of] the individual. It is the process. Oh it is a ritual, and we go through in most cases to allow us connect with that particular person

who died so you are grieving that persons death, and you know where their body is, you can go to visit them, talk to them, or plant flowers.

#### 4.1.6.2 Trenches and Bodies

The burial term is used in this dissertation because of lack of an alternative appropriate term. The CNE used bulldozers and backhoes to create a long, deep trenches of the size of about 3 meters wide at top and 2 meters wide at bottom with a depth not more than 2 meters. Please see Figure 7 for an example of an empty trench. After dumping the human remains with debris in the trenches, CNE earthmoving equipment would cover the trenches with the debris. The process of disposition that started on January 14 was continuing during the first field visit (February 23 through 28, 2010) of the researcher.

During the course of field research, the author went to Titanyen a number of times. During the first visit, the author witnessed dead bodies in the open trenches and among the rubble. Three examples of human remains disposition are in Figures 8, 9, and 10. The researcher went to Titanyen two times on February 24, 2010. The scene during the second visit was different from the first visit. In the intervening period of visits, CNE workers came with earth-moving equipment and covered human remains. At other times, the researcher saw more human remains with the rubble lying there.

When asked about what was taking place, a heavy equipment operator replied that “it had to be done” (as cited by Ghosh, 2010). However, not all victims were treated similarly. According to a Time magazine article, “Some dump trucks seem to have simply unloaded their cargo of corpses and rubble into the open [elsewhere]. Some halfhearted attempts at burial have been left incomplete. The result is a scene from a

bad horror film: mounds of red earth, with body parts sticking out at grotesque angles. Some bodies are totally exposed, putrefying into a shade of yellow” (Ghosh, 2010). Some survivors consequently felt “numb” because they did not know where their loved ones were buried and they believed the treatment of bodies was insensitive.



*Figure 7.* A trench dug for mass burial in Titanyen. Feb. 24, 2010. Photo by author.

#### 4.1.6.3 Burning of Human Remains

The efforts to retrieve, store, identify, and dispose of bodies was seemingly slow or non-existent. After some time the human remains start decomposing and stink become unbearable for the people and at that time, people were just putting gasoline on human remains and burning in situ. Haitians described a pungent odor that had to be rid

of and felt this was the only way to resolve the situation. It was akin to involuntary cremation. Nevertheless, for the vast majority of the bodies, in situ cremation did not occur. According to Darang, legally it was burning and not cremation.



*Figure 8.* An example of casual disposal of human remains. Feb. 24, 2010. Photo by author.

According to a physician interviewee, “Sometimes the families themselves burned bodies of their relatives.” Sometimes, the people stay around the area that burn human remains because of the smell. An interviewee said, “As we drove along, there were piles of bodies at corners, everywhere and so forth. A couple of them were burning.” In one neighborhood, she said, “They burnt so many dead bodies that . . . they

said do not burn any more bodies in this neighborhood, we are not accepting that. And in that little neighborhood they were able to get that done.” The interviewee added, “But I don't know what is worse, burning bodies or lying bodies.”



*Figure 9.* Another example of casual disposal of human remains. Feb. 26, 2010. Photo by author.

#### 4.1.6.4 No Money for Burial

An interviewee said:

The family that got a chance to stay alive did not have money to make the funeral. They did not want to spend money to take them to morgue, they just leave and people to take them to clean the street, and it is their responsibility to clean the street, and to make sure that there is nobody lying there to smell.

This was corroborated by another interviewee in whose home a visitor had died. The interviewee informed the family member of the deceased, but the next of kin did not come to retrieve the body. At the time of the interview the body was lying with the debris in the fallen home.



*Figure 10.* A third example of casual disposal of human remains. Feb. 26, 2010. Photo by author.

#### 4.1.6.5 No Cremation Facility

In mass-death incidents generally, normal death processes are not followed (Pine, 1969). The disposition of bodies through normal death processes was rare in Haiti. However, some families took human remains of their next-of-kin in the cart, or

truck, or otherwise and treated with care for disposition. Nevertheless, sometimes attempts to follow traditions, religious practices, or wishes of the deceased do not end in desired results.

For example, an interview's mother wanted cremation after her death. The mother died in the earthquake. The daughter went to Pax Villa, located on the Airport Road in Port-au-Prince, the privately owned licensed crematorium that uses gas as a fuel. However, the earthquake destroyed the crematorium and she has to look for a funeral home. She told the story about disposition of her mother's body:

We went to a funeral home and we have to sign in . . . bodies will come in plastic bags. . . . what if we have a coffin? . . . You won't probably find a coffin. You have to probably bury in a sheet that we would put in there. . . . So we try to figure out, how to get coffin . . . . We decided it going to be on the 20<sup>th</sup> [January]. . . . they told us we really could not think of any service or anything because they had, I think they had said something like 12,000 funerals that, I want to say a day, but it could not possibly have been a day, it must have been that week. So I can't be clear on that . . . It was more just like an assembly line. So we picked up the place where we wanted to have . . . we left then to find a coffin. . . . they were making [coffin] on the side of the road and it was business for them, coffin, coffin, coffin, coffin. . . . I booked the coffin. . . . mom . . . ended getting buried . . . in a coffin, whole body leaked through the whole service. . . . I am smelling it. Yeah, it was the same smell . . . that was in the streets.

#### 4.1.6.6 Improvised Rituals: Catholic and Voodoo

It appears that apart from not making any effort for identification of the human remains, hardly any effort was made for performing rituals.<sup>36</sup> One common memorial service was performed at Titanyen one month after the earthquake in the presence of the president of Haiti, and Catholic and Voodoo priests. A Voodoo priest, the researcher interviewed, said he was part of the memorial service arranged by the government a

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<sup>36</sup> In this dissertation, ritual means ceremony without body, while funeral means the ceremony accompanied with body.

month after the earthquake. Posters, handouts, and radio gave public notices of this memorial service. At the time of author's visit the holy cross that has been placed during the memorial-service, along with the plastic flowers, were still there. The interviewee Voodoo priest also performed rituals at Titanyen eight, and 15 days after the earthquake, along with other volunteers, including a local Titanyen physician the researcher interviewed.

An interviewee said:

The Catholic church performed the ceremony. The Protestant church also. The Protestant church performs the ceremony for all the bodies, unidentified or otherwise. The archbishop of Port-au-Prince died in the earthquake. So, because of him, during his funeral, the ceremony was for everybody. I think the president was the chairman of the ceremony.

Jovin, chief director, morgue, University General Hospital said:

Only cadavers that had for which family or friends came and identified these, and were removed from the piles, those cadavers were tagged and either put in one of the body bags or put in a box that the family has provided or the coffin, and they were taken to the nearby cemetery. Usually people use cemeteries of the state. Some people decide to have their own cemetery in their backyard.

Where and when possible, bodies of the deceased were buried or cremated according to the family's wishes. In Haiti, this commonly occurred according to traditional Catholic religious practices. However, there were also funeral ceremonies performed by Voodoo priests. These ceremonies were important to certain individuals since "in the Voodoo belief . . . the souls of people buried without the correct rituals remain close at hand and put a hex on the area" (Ghosh, 2010). One such Voodoo priest noted that 4,000 to 5,000 bodies were taken to a cemetery in Dajao. He said:

The ceremony of last rites was performed in the streets and not in church. . . .The Voodoo ceremony tries to free the spirits from the dead bodies. . . .The ceremony was performed by myself with other people. . . . We started on January 15 . . . and continued. More

bodies were found, they were brought, and prayers continued. The last day of the ceremony was January 30<sup>th</sup>. . . . All the witch doctors came together, all prayed for the people who had passed away.

When asked about the particulars of the ceremony, he mentioned that he meets the family at the cemetery, calls for the spirit to protect the body, and burns incense so that the body could smell the incense and other people could not take away the spirit.

#### 4.1.6.7 Disposition of Human Remains of Foreigners

As normally happens after a mass fatality incident, disposition of human remains of foreign nationals was done differently than Haitians. In most of the cases efforts were made to identify human remains of foreigners and disposition was done by that country's representatives. In most of the cases, the foreign embassies or consulates or honorary consulates took the responsibility of recovery and repatriation for disposition. After the Indian Ocean tsunami in Thailand, teams of 30 countries went to take care of the deceased of their nationalities (Scanlon, 2008). This is because Thailand is a popular tourist destination and the tsunami occurred during the Christmas peak holiday period. Some countries sent specialized crews for identification and repatriation of human remains of their nationals to Haiti, for example US deployed DMORT.

When a positive match could be made (and there was absolute certainty that the remains were those of an American citizen), the remains and a tracking log were flown by the US Air Force to a base in Dover, Delaware (the designated location to receive and process all of the remains of soldiers and diplomats who die abroad). At this point, the bodies were returned to families or sent to local funeral homes for proper ceremonies and burials.

According to a UN administration,

MINUSTAH dealt with the U.N. dead bodies only, sending them to the concerned country. If they did not have the representatives, their bodies were escorted to their home countries and with full honors. . . . When we moved them to other countries, it took over a long period of time. It still continues.

#### 4.1.6.8 Use of Cadavers for Transplant

Cadavers have been used for medical science development for centuries (Roach, 2003). Bodies other than disaster deaths have been stolen from the graves and sold illegally to medical schools (Carney, 2010; Cheney, 2006). The researcher told a physician interviewee from the Centers for Disease Control and Prevention that dead bodies are clandestinely sold for \$10,000. The researcher asked him if dead bodies or body parts could be used in some way. He said that there was zero role in commercial utility of dead bodies. No cadavers were used in medical schools. No medical schools in US would buy the cadavers. It would be preposterous to think of buying dead bodies. The university would lose accreditation. As a US federal government employee, he had to understandably maintain that position. However, the research literature mentioned above states specific names and the funeral home people who are in jail for selling bodies.

Yakov Koyfman, a neurosurgeon, was forthright and said:

I do not know about use for patients of unidentified bodies of mass-fatalities disaster. We preserve bones for grafting. Illegally bones are processed and sold but not according to the rules. I was concerned about this and I notified the patient of mine. Sometimes the bones are not processed properly. There is a one in 70,000 risk of disease to a patient.

I know surgery with illegal parts exist. I cannot imagine how unidentified bodies of mass-fatalities disasters could be used for patients. Bones could be properly preserved for long periods. Would people do this is a question. Theoretically, preservation is done of fresh material. There may be some time limit after which body parts may be useless. Bodies are harvested in non-sterilized conditions. There are legal and ethical issues of harvesting human

bodies and parts. Some harvesting of the material could be done for long. It depends upon the situation, temperature, local conditions, and the health condition of the deceased. All of this is a gruesome matter.

The researcher sent an email to Mary Roach:

“In *Stiff* [The Curious Lives of Human Cadavers], you wrote, ‘Cadavers are our superheroes . . . . What a shame to waste . . . not to use them for the betterment of humankind’ (p. 10). Do you know of any research anywhere on use of unidentified mass fatality disaster cadavers for humankind? What do you think about the use of mass fatality disaster cadavers for humankind?”

She replied by email:

That's an interesting question. I think a disaster scenario is too emotionally charged and media-saturated for this to go smoothly. It would seem, to many people, like adding insult to injury. Especially in a country, like Haiti, that probably does not have much tradition of body donation. Perhaps in Europe it would be perceived as a positive, humanitarian practice, but even then I think it would be tough. (M. Roach, personal communication, February 3, 2013).

#### 4.1.7 Zeigarnik Effect

The Zeigarnik (1967) effect relates to unfinished closure. When a person's kin is missing, the person is not sure whether the missing person is really missing and may actually show up or the person is dead. The kin has an information need and makes all the efforts to seek missing information. The missing information hunts the kin and creates Zeigarnik effect. The Zeigarnik effect in turn may lead to post-traumatic stress disorder (American Psychiatric Association, 2000; Stoddard, Pandya, & Katz, 2011).

A physician from Centers for Disease Control and Prevention working in the American Embassy at Port-au-Prince told the researcher, “People get impatient if the bodies of their loved ones are not identified. In his laboratory here, he observed that Haitian employees who have lost love ones have particular type of numbness because there was no proper funeral. No closure to dead.”

Another physician from Saude Em Portugues (In Portuguese language that translates to “Health in Portuguese”), a non-profit, stated:

SAG [a non-profit] in consultation with us provided medical and psychological support in the area of Chanps de Mars. They provided primary care. SAG has five psychologists. SAG first evaluates the problem of the patient and then it arranges consultation. We help in PTSD. We also helped in triage of victims. We also provided mental health facilities and tried to give the needed consultation.

A policeperson of the Indian Formed Police Unit of the UN, whose wife died in a school crash and her human remains were never found, said:

The church made a ceremony of all the victims of the earthquake, and there were prayers. This was just a general ceremony because there were no dead bodies. It was a circumstantial ceremony nothing special. Every family meeting, with one Catholic father. Nothing is special, no flowers, no ceremony, to say last goodbye.

A Voodoo priest said about his parish, “I did counseling for the people whose family members died. . . . We have to counsel each other. . . . We need to be stronger.” Similarly, Johns, Protestant Pastor, said about his work, “[I] allow the family members to talk about the loss, rather than stopping them to talk about the theology of disasters and the presence of God. This is the grieving process.”

On the problem of mass burial of unidentified human remains, Hayslip, professor of psychology at the University of North Texas said:

From an emotional perspective, it is probably not a very good thing. . . . lot of people would view it very disrespectful . . . depersonalizing . . . for people who had lost individuals. There is no way they are ever going to be able to identify the person who died. So, it is going to interfere with their grieving. That’s the major, psychologically, that’s the major issue for me.

We typical think of burial as the individual, it is the process . . . it is a ritual, and we go through in most cases to allow us to connect with that particular person who died. So, you are grieving that persons death, and you know where their body is, you can go to visit them, talk to them or plant flowers, or do whatever it is that you think is important to you, to mark, maintain some sort of connection with that person. Of course, in this case, it is impossible that is

another reason why it interferes with the grieving, depersonalizing sort of way of handling individuals.

If we are using front-loading trucks to move cadavers, the way you move freight, it is pretty depersonalizing. You know they are all piled on one another, and yes, they may be decomposing. However, if someone dies, and his body is found later, it would have been decomposed obviously. It is still important for the family to say, here are the remains, and they lie here, and that kind of gets me closure.

It depersonalizes death. It interferes with the grieving process that may be necessary in the light of number of people who were killed. And because the fact that they lacked the resources to deal with each and every person on an individual basis, interferes with the grieving of the individuals and the very issue of dignity is lost when people are dealt with once they died in impersonal way.

It's probably going to . . . leave all sort of reaction among the people who are left behind. Anger. It is going to intensify their grief . . . it could cause some more serious psychological problems. It certainly going to impact the family . . . because there is no place to go except the one burial to honor the father or mother or whoever was killed. How do you do that when you are not sure where they are or even if they are there?

[It] probably going to have societal implications down the road. [In] Many cultures they attach a great deal of significance to the rituals associated with burial . . . so that your soul could be released to haven . . . until you have had a proper burial . . . and did not have ample opportunity to say good bye. So in terms of impacting the mental health of the people who are left behind is something that would probably be something you would like to think about, devoting more efforts and resources to the identification of people even if it requires more time etc.

Was it handled appropriately, were people given proper respect and dignity, were they treated like cattle, whether they were treated impersonally, how were people's needs who were grieving were met?

A university administrator spoke of what he said was an extreme case of post-traumatic stress disorder. One of his cousins, a student, was trapped for hours in the fallen blocks after the earthquake. When his brother who was also a student came to know about this, the brother lost his mental balance and was admitted to a mental hospital and died after two days. The cousin who was trapped in the blocks survived.

The university administrator had experienced as well, Zeigarnik effect in the loss of his cousin, as evident from his comment, “He was so nice person, a resonant person, intelligent person, he was student of the faculty of human science, and I really loved him and therefore, I never visit that family because I do not want to face the reality until now.”

#### 4.2 Information Seeking

This section responds to the second research question, how did those affected by the Haiti 2010 earthquake seek information about fatalities? Information seeking is the way people sought information in the aftermath of the Haiti earthquake. Immediately after the earthquake there were no telephones - landline or cell phone - working, there was no electricity, no gasoline, and most of the roads were blocked by fallen structures and broken vehicles. People sought information regarding their family members and friends by going to the places the person last known to have been, market places, hospitals, media, or contacting other people who may know about their whereabouts.

Examples of how interviewees sought information about the fatalities are given below, verbatim:

- People went to the market or the place the person was going, and they looked for the person. They looked for the body, but they did not find the bodies. If a person was missing, they called on his cell phone number for two-three days, and if there was no response, they assumed that the person is dead.
- I searched for my mother in the market. Telecommunication facilities were down. At about 6 p.m. my mother showed up in the neighborhood.
- After the earthquake, I came down to look around. At 6 a.m. [next day], I went out to see the city. . . . My cousin was in the security of the president. He calls his wife between 8 and 1/2 and 9 in the morning. . . . At 3:00-3:30 PM, he was there inside the National Palace. . . . At 4:55 PM, he is dead

inside the National Palace. . . . His wife called everybody concerned. His body is inside the National Place and must be rotting. At the National Palace, there is nobody.

- In another extended family, 11 family members were missing and they do not know whether they are dead or not.
- I tried to reach her, I couldn't reach her, the phones were not working, I knew some other people in Haiti, and I tried to call. Lines were busy. . . . A cousin of mine who called and she said that her aunt was running out of the hotel, because my mom has a hotel and then, what I heard was that she died. . . . Her aunt, could be my mom. . . . It was about 8 o'clock and someone else called and said my dad is dead, my cousin is dead, your mom's dead. Finally, it was confirmed the next day, It wasn't actually confirmed till next day at one o'clock in the afternoon.
- We tried to get more information like, you know, once you want to know what happened. What did happen, so for the nature of the communication, and we couldn't get back through enough time to find out. So we immediately thought of thinking ways to get to Haiti.
- We had gone to all the morgues, so that they could store a person, . . . They kept on calling on, so when we were coming in the bus and so forth . . .
- First thing I want to see is my mom's body. My sister said [on the telephone], 'Take a picture, and send to me.
- That's the body we never found. Oha, that's the body we never found. So that's happening daily.
- The locations of the bodies are unknown. There are still bodies in collapsed structures.
- There were many dead bodies brought and there was no one from their families.
- I saw my son coming alone without his mother. My son said, daddy my mother is still inside the building because she did not come out. My son could not explain what happened.
- My son and his mother were together on the first floor before the earthquake. His mother wanted to talk to the principal, whose office is on the second floor. My son went to the bathroom and the earthquake happened. Immediately afterwards, my son went outside. My son is ten-

years-old. My son said that he saw nothing. He turned his face to his school after ten minutes and saw that the school totally collapsed.

- I asked big people, muscular people, I asked them but they could not see my wife.
- I went to see my mother; I met her in the street.
- I never found the body of my wife. For two months, nobody did anything. Every second and third day, I was passing through the school to see if there was any change. I also met the principal of the school. But nobody helped. I went many times but never saw my wife's body. My wife died inside the school. No government people ever asked me anything. I asked the school what they plan to do with the bodies inside the school. The director was in the USA, and they said that they cannot do anything. Till now nobody told anything about where they have put the body. I heard that all the bodies were put in Titanyen.
- We have taken an aerial survey after one hour of the earthquake.
- We at the university friends, we are elaborating, a conceptualizing a kind of form to see whether these students themselves could help us identifying who died at the university.

When asked, what his feelings and thoughts were, an interviewee whose wife died because of the earthquake and her body never recovered, said,

I still have the same feelings. I am not strong enough. You face problem, big problem. You know one person with whom you share everything. I'm feeling feeble. I don't feel stronger. Until now nobody has helped, although three months has passed and it is a big problem. Haiti cannot help itself. We cannot do anything for ourselves. Earthquake left me with this spirit, and I still have the same feeling. . . . After almost three months without information, I went to visit a Canadian church. I kept on calling, e-mailed, and felt myself and my family as victims.

Despite no electricity, telephone, gasoline, and other functioning infrastructure, the Signal FM radio station continued broadcasting round the clock; "The station helped locate missing people, spread news to families searching for lost loved ones, and delivered messages to Haitians across Port-au-Prince" (Henninger, 2010).

People also started searching on the Facebook, Twitter, and other social media websites. In the wake of Haiti earthquake, it became a testing lab for new emergency communication media systems (Nelson et al., 2011). Nelson et al. (2011) write:

The relief efforts quickly became a living laboratory for new applications such as SMS (short message service) texting, interactive online maps and radio-cell phone hybrids. These tools were applied to urgent tasks such as guiding search-and-rescue teams, locating missing persons . . . .

Haiti became the first real-world crisis laboratory for several media platforms that had only recently emerged. These were applied to support rescue efforts, assist displaced populations and coordinate massive relief operations. The Haitian earthquake marked the first large-scale application of new approaches to create dialogue between citizens and relief workers, such as crowdsourcing and projects that combined the reach of cell phones and radio technology. . . .

The Haitian experience strongly suggests that digital media and information technology can significantly improve humanitarian response with the right applications, coordination and program management. . . .

A four-digit code that enabled cell phone users to send free messages to central information centers about missing persons and emergency needs. . . .

A number of different groups created independent new sites and applications to organize this [locating missing persons] information. These included The New York Times, CNN, the Haitian Earthquake Registry ([haitianquake.com](http://haitianquake.com)), The Miami Herald and Google.

Some websites, like Ushahidi, did excellent work in helping people in their information seeking. Providing resources for information seeking or information giving is another side of the coin of information seeking. Information provider has also to seek information to give information. Krikelas posits, "Individuals are typically both senders and receivers of information, and that neither role is independent of the other" (Case, 2012, p. 141). Information giving is "the act of disseminating messages [which] may be communicated in written (graphic), verbal, visual, or tactile forms" (Krikelas, 1983, p. 13).

The Joint Research Centre of the European Commission, Institute for the Protection and Security of the Citizens, Global Security and Crisis Management Unit helped in creating real-time GPS maps and put them on the website. MapAction team with staff and volunteer left London a day after the earthquake and put on the websites GPS maps, including for search and rescue. Many of these efforts were done outside Haiti by international NGOs, UN organizations, European Union organizations, and Haiti diaspora. Haiti diaspora people who are working and living outside Haiti tried to help Haiti in this tragedy. They were very active in contributing with their money and technical skills to help people seek information related to the tragedy.

#### 4.3 Information Needs

This section responds to the third research question, what were the needs that motivated those affected to seek information about fatalities? The information needs of the affected people were to find out the whereabouts of family members and ways to communicate with them. If they were not able to know the whereabouts of the family members or were unable to communicate with them, then affected people wanted to know the whereabouts of missing people or their human remains and their disposition.

Wilson (1997) asserts, “. . . [Information] *need* is a subjective experience that occurs only in the mind of the person in need and, consequently, is not directly accessible to an observer” (p. 552, emphasis in original). Because information needs are in the minds of the interviewees, the researcher interpreted what interviewees said to find out their information needs.

A physician interviewee said:

People went to the market or the place the person was going, and they looked for the person. They looked for the body, but they did not find the bodies. If a person was missing, they called on his cell phone number for two-three days, and if there was no response, they assumed that the person is dead.

The above statement implies that the information needs of people are to find out the whereabouts of family members. She continued, "I saw that my house has fallen due to the earthquake. I understood earthquake. I checked for my family. I did not see my mother at the fallen home." Her information need was to see her mother.

An interviewee said, "After the earthquake, I came down to look around. At 6 a.m. [next day], I went out to see the city. . . . I came to know that my daddy in Miami, Florida is okay." His information need was the curiosity after the earthquake, what is happening, and to find out how was his father. He continued,

My cousin was in the security of the president. He calls his wife between 8 and 1/2 and 9 in the morning. . . . At 3:00-3:30 PM, he was there inside the National Palace. . . . At 4:55 PM, he is dead inside the National Palace. . . . His wife called everybody concerned. His body is inside the National Place and must be rotting. At the National Palace, there is nobody.

The information need of his cousin's wife was to see and have her husband's body.

Johns, Protestant Pastor, said, "In another extended family, 11 family members were missing and they do not know whether they are dead or not." In this case, the information needs of the family were to find out the whereabouts of the 11 missing family members and whether they were alive or dead.

A female interviewee was in Florida at the time of the earthquake. Her mother was living in Haiti. Her information need was to find out the whereabouts of her mother and another information need was to communicate with her mother. She said:

I tried to reach her, I couldn't reach her, the phones were not working, I knew some other people in Haiti, and I tried to call. Lines were busy. . . . A cousin of mine who called and she said that her aunt was running out of the hotel, because my mom has a hotel and then, what I heard was that she died.

At this time, the information need of the interviewee was whether the person died was her aunt or her mother. She continued narrating her story:

Her aunt, could be my mom. . . . It was about 8 o'clock and someone else called and said my dad is dead, my cousin is dead, your mom's dead. Finally, it was confirmed the next day, It wasn't actually confirmed till next day at one o'clock in the afternoon. We tried to get more information like, you know, once you want to know what happened.

Clearly, she had multiple information needs. She continued, "So for the nature of the communication, and we couldn't get back through enough time to find out. So we immediately thought of thinking ways to get to Haiti." Now, her information need changed to information about going to Haiti. She added, "First thing I want to see is my mom's body." Now, her information need was to see her mother's body. She further continued, "We had gone to all the morgues, so that they could store a person." This indicates information need of finding a morgue that will preserve her mother's body. The above narrative shows that information need may change as one information need is fulfilled, another information need may arise, so on and so forth.

She also said about a relative, "That's the body we never found. Oha, that's the body we never found. So that's happening daily." This indicated the information need of the body of her relative and information need of people in general to have human remains of their family members.

A physician working with the Centers for Disease Control and Prevention said, "The location of the bodies are unknown. There are still bodies in collapsed structures."

This indicated the information need to locate bodies and to extricate bodies from collapsed structures, although interviewee did not directly said this.

An Indian Formed Police Unit of the UN officer said, “There were many dead bodies brought and there was no one from their families.” The information need indicated by the police officer is of the next-of-kin who may take human remains for disposition according to the family tradition and religion.

Another Indian Formed Police Unit of the UN officer said, “I saw my son coming alone without his mother.” This indicated information need about the whereabouts of his wife, which was reinforced by his saying, “My son said, daddy my mother is still inside the building because she did not come out. My son could not explain what happened.”

He said,

My son and his mother were together on the first floor before the earthquake. His mother wanted to talk to the principal, whose office is on the second floor. My son went to the bathroom and the earthquake happened. Immediately afterwards, my son went outside. My son is ten-years-old. My son said that he saw nothing.

The information needs of his son were where to look at the school building and find out what happened to the school building. The father-police officer continued, “He turned his face to his school after ten minutes and saw that the school totally collapsed.

. . . I asked big people, muscular people, I asked them but they could not see my wife.”

The information need of the husband-police officer was to see his wife, living or dead.

He also said, “I went to see my mother; I met her in the street.” His information need was to see his mother whom he could see in the street.

He continued narrating his story, “I never found the body of my wife.” According to this sentence, his information need narrowed down from seeing his wife living or

dead, to seeing the body of his wife. He further said,

For two months, nobody did anything. Every second and third day, I was passing through the school to see if there was any change. I also met the principal of the school. But nobody helped. I went many times but never saw my wife's body. My wife died inside the school. No government people ever asked me anything. I asked the school what they plan to do with the bodies inside the school. The director was in the USA, and they said that they cannot do anything. Till now nobody told anything about where they have put the body. I heard that all the bodies were put in Titanyen.

He had an information need to see his wife's body and he did everything possible but could not see his wife's body. At the end, he seems to reconcile that his wife's body is also among the hundreds of thousands of unidentified bodies that were disposed of with the debris of the fallen buildings at Titanyen.

A University of Port-au-Prince administrator said, "Last month the French Army came and took all the mortar and rocks out, and we found out two other bodies, two other bodies. We could not identify them." The information need of the interviewee and thereby of the university was to identify the two bodies the French Army recovered from the debris of the university building.

#### 4.4 Chapter Summary

This chapter presented the findings of this study as related to three research questions. Evidently, there was no fatality management. Affected Haitians reconciled with the lack of management of mass fatalities as something unpleasant, but did not complain. Most of an estimated 316,000 dead were mass buried at Titanyen without any effort for their identification. An interviewee described a gruesome scene of people sleeping with kids on one side of the road and on another side of the road, there were bodies. Moreover, feral dogs were roaming around dead bodies. Because of the

unbearable smell of the decomposing bodies, people doused them with gasoline and burnt them in situ.

People sought information about the whereabouts of their family members by going to the place the person last known to have been, markets, hospitals, contacting other family members and friends, and by media. People were motivated to find the whereabouts of their family members and to communicate with them. To understand the interconnectedness of information flow among various subsystems, a model of information flow in MFM is developed and discussed in the next chapter. The last Chapter 6 covers conclusions, discussions, and recommendations.

## CHAPTER 5

### MODEL OF INFORMATION FLOW IN MASS-FATALITY MANAGEMENT

The dissertation started with introducing the problem of managing mass fatalities and seeking information in managing mass fatalities. Chapter 2 reviewed the literature on mass fatalities as well as information seeking and established the need for research in this area culminating in the research questions. Chapter 3 delineated the research method. Chapter 4 presented findings in response to the three research questions. Based on the findings, a model of information flow in mass-fatality management (MFM) (Figure 11) to delineate relationships among victims, responders, administrators, external and internal factors, and elements of action, articulation, and resulting a new normal is presented.

#### 5.1 Extant Models of Information Seeking

The researcher examined a number of existing information seeking models to develop a model of information flow in MFM. These models included “everyday life information seeking” model of Savolainen (Savolainen, 1995, 2005, 2008), the Bystrom and Juvelin model (Bystrom & Jarvelin, 1995), Krikelas’s model of information seeking (Case, 2012; Krikelas, 1983), Kuhlthau’s information search process (Case, 2012; Kuhlthau, 2005) , and Johnson’s model (Case, 2012; Johnson, 1997; Johnson, Donohue, Atkin, & Johnson, 1995).

The everyday life information seeking model of Savolainen (Case, 2012; Savolainen, 1995, 2005, 2008) is applicable in using information seeking to bring abnormal situation to a new normal. It uses a holistic framework incorporating social as well as psychological factors in people’s choice of using information sources for solving

problems. The Savolainen model takes into account the mastery of life or keeping things in order. His model also takes into account personal factors of the agents like “values, attitudes, and psychological orientation towards life . . . and a variety of situational factors like available time and current state of health” (Case, 2012, p. 151).

Savolainen’s studies suggest that semi-structured interviews are preferable in “analysis of complex relationships between way of life, mastery of life, and information seeking requires nuanced and context-sensitive empirical data” (Savolainen, 2005, p. 147). This dissertation uses partially-structured interviews.

Savolainen labels his model, as “everyday life information seeking” that is different from information seeking in work-related situations. He asserts that everyday life information seeking has become a “subfield of information-seeking studies” (Savolainen, 2008, p. vi). A model of information flow in MFM was developed and its components explained with the data from Haiti earthquake in the following sections.

## 5.2 Model of Information Flow in Mass-Fatality Management

To understand the connection between information seeking and MFM stages the work of several information scientists is useful. For example, Savolainen (2005) has argued that information-seeking behavior tries to bring back “how things are at this moment” to “how they should be” (p. 144). His information-seeking model emphasizes social and cultural factors as it addresses situations “where the order of things has been shaken” (p. 144). Similarly, Bystrom and Jarvelin (1995) asserted that personal factors and situation factors affect not only information needs but also actions involved in information seeking. Thus, those factors enable a distinctive approach to MFM.

Building on the work of Savolainen (Savolainen, 1995, 2005, 2008), Bystrom and Jarvelin (Bystrom & Jarvelin, 1995), Krikelas’s model of information seeking (Case, 2012; Krikelas, 1983), Kuhlthau’s information search process (Case, 2012; Kuhlthau, 2005), and Johnson’s model (Case, 2012); a model of information flow in MFM has been developed that is depicted in Figure 11.

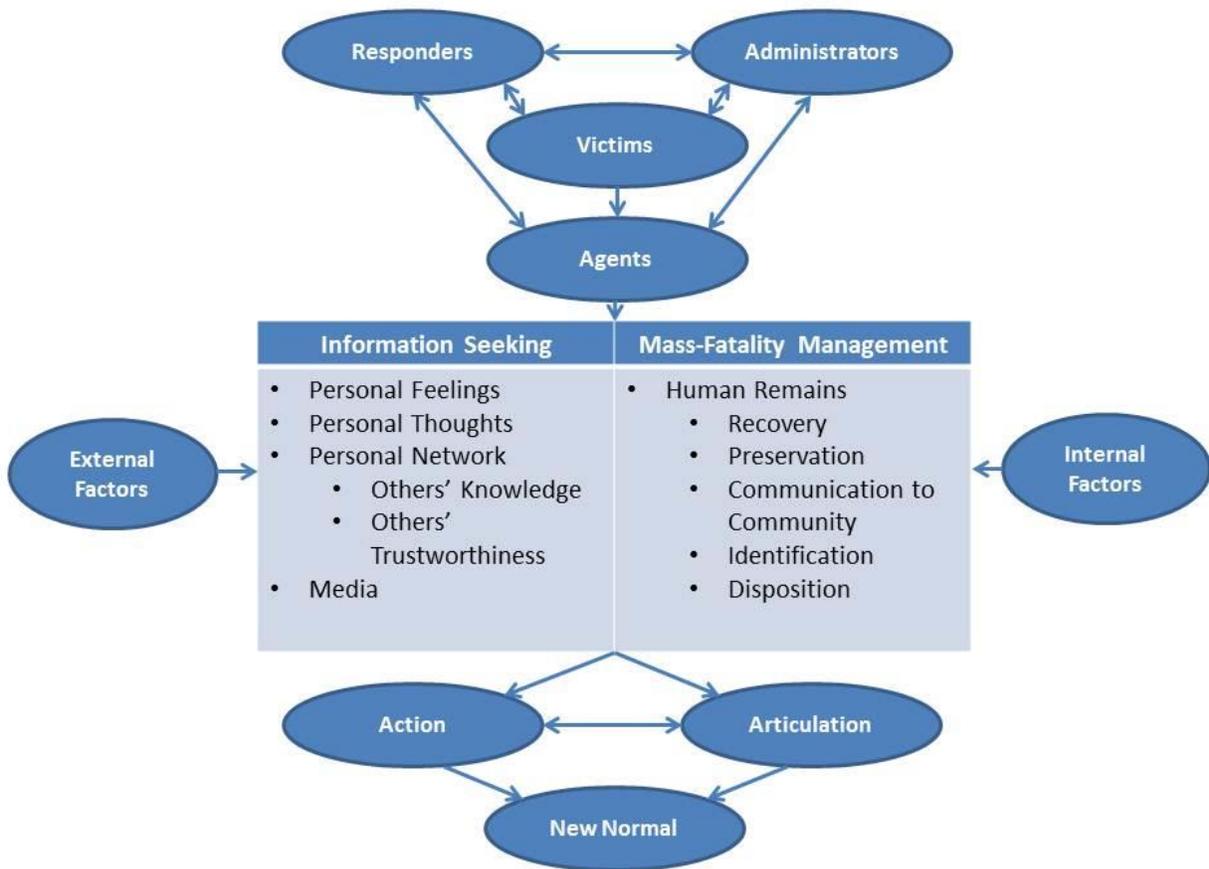


Figure 11. Model of information flow in mass-fatality management.

The context of the model is a catastrophe and the situation involves mass fatalities. The context and the situation make it an abnormal situation. The abnormal situation constitutes external factors. The internal factors are the antecedents. “The

Antecedents provide the underlying imperatives to seek information” asserts Johnson et al. (1995).

Antecedents consist of background (demographics and experience) and personal relevance (salience and beliefs). Belief is an agent’s confidence to make a difference in the situation. Urgency and importance of the conditions make them salient. The agents are the victims, responders, and administrators who are seeking information. In information seeking the agents’ feelings, thoughts, personal network, and media play a role. MFM is difficult without information seeking. MFM involves stages of human remains recovery, preservation, communication to the community, identification, and disposition. This requires action and articulation that may result in a new normal.

The model parsimoniously depicts information flow systems. The importance of information flow among systems is emphasized by Desouza and Johnston (Forthcoming) thus:

Agents (humans), objects (physical artifacts), events and processes, can operate within a system or across systems. To ensure that the system, both the overall infrastructure and each local system is operational, it is vital for information to flow between the various pieces of the infrastructure to flow effectively and efficiently. Failure to promote the optimal flow of information can lead to several negativities from overall breakdown of the system, to misalignment of incentives, high costs of collaboration and integration, etc.

The model and its components are explained below with the help of data from the Haiti earthquake.

### 5.2.1 External Factors

The external factors are the context of the Haiti earthquake catastrophe and the mass fatalities situation. Quarantelli (2000) has given four criteria for a catastrophe. Considering those four criteria reasons the Haiti earthquake was a catastrophe. First,

most of the community built structures were heavily impacted, including government responding offices. Second, many local officials died and remaining were unable to perform because even the hospitals (50) and other facilities were destroyed or damaged. Third, outside agencies took leadership roles, like managing the airport by US. Fourth, most of the community everyday functions were disrupted, for example because of blockage of roads. The context of the catastrophe and the mass fatality situation makes it abnormal (Krikelas, 1983; Kuhlthau, 2005; Savolainen, 2005).

#### 5.2.1.1 Context of the Haiti Earthquake Catastrophe

This subsection puts in context the Haiti 2010 earthquake catastrophe, its magnitude, and impact. According to Government of the Republic of Haiti (2010), the earthquake destroyed an estimated 105,000 houses and damaged 208,000 houses. In addition, 1,300 educational institutions and 50 hospitals and health centers collapsed and were unusable. The estimated loss was US \$7.9 billion or 120% of the nation's GDP in 2009. This is highest loss in terms of the GDP of a nation because of a natural disaster in last 35 years. An estimated 1.5 million people (15% of population) were internally displaced, of which 1.3 million were living in 900 temporary shelters.

Some of verbatim descriptions of the catastrophe by interviewees are:

- We did not have enough facilities, enough machines, means to face such a wide situation, which is [the] worst situation.
- There was total distraction.
- Too big of a disaster.
- 120 percent of the GDP of this nation was destroyed.
- There was no electricity in Haiti.

- No cell phone was working.
- There is no road to drive.
- The airport was also destroyed, so Americans had taken over the airport . . . which was very much essential to prevent the chaos from taking place.
- The nation was shell shocked. . . . they were very, very shocked about this incident.
- We were really traumatized by the situation.
- It was like a solid amount of chaos. . . . In a disaster situation, you will have chaos. You cannot say that you will not have chaos.
- Everybody was running like crazy.
- The government was overwhelmed.
- The government was incapable of handling such a big disaster. The government was overwhelmed.
- Haiti cannot help itself. We cannot do anything for ourselves.
- Even the President of the Haiti was traumatized of the situation. Therefore, probably he was not in control of himself. He did not have the control himself. He said that. Then he found out that everything was broken, and then he did not have his palace. He could not help. He went to police station and stays there about. He stays in a police station but very bad idea.

#### 5.2.1.2 Mass-Fatality Situations

This subsection describes the mass-fatality situations prevailing in the aftermath of the Haiti 2010 earthquake catastrophe. Some of the verbatim descriptions of mass-fatality situations by interviewees are:

- I could not believe. I walked for two miles and I stepped on 1,000 dead bodies.
- I saw dead bodies all around.
- The government was overwhelmed with all these bodies.

- 18,000 of the total of 60,000 public servants had died in the earthquake.
- There were many dead bodies on roads and inside the hospital.
- The government was overwhelmed with all these bodies; they neither had the technology nor the economic means to do anything.
- We were driving our car through here. And as we try and they barricaded this strip. So we can't go through that, and this side of the street people were lined up and sleeping on the street, you know, lined up and just sleeping, because they have been told that don't sleep inside, and this side and how pathetic three here [bodies], two here . . . Immediately you cross the street, and you know.

These roads are so tiny. And I remember thinking it got to be hitting me, because if I am sleeping on this side, even if I am told to sleep on the street, I just could not get it, even if I am told to close the street. I couldn't do it right here, you know. So two here [bodies], three here, four here, and I am on the this side of the road with the rows of the people with the kids and whatever and sleeping on the other side and in the middle the dogs are going through the dead bodies, you know. The dogs are roaming the streets everywhere and over there, you know, and I remember just thinking, I am never going to forget this scene.

- Dead bodies were decomposing.
- Smell was even worse, smell was unbelievable.
- They burnt so many dead bodies.
- On the first day or first night, between say five o'clock to say nine-thirty in the night we had fatalities, which were laying on all the roads. That I'm talking about just the roads of communication. Apart from that, we had fatalities, which were lying inside houses that had collapsed. We had fatalities, which were lying in major hotels where the international stuff was in, and we had our own UN fatalities because our own headquarter collapsed, and we lost about 105 people.

### 5.2.2 Internal Factors

Internal factors are the antecedents that motivate a person to seek information (Johnson, 1997; Johnson et al., 1995). Antecedent factors consist of background (demographics and experience) and personal relevance (salience and beliefs). Among these factors, salience is the key motivator. Urgency and importance makes a matter

salient (Krikelas, 1983). Antecedents lead to characteristics and utility of information channels. Channels, sources, processes, and feelings lead to information seeking action (Case, 2012).

#### 5.2.2.1 Background

A female physician said that the odor of human remains was bothersome and it severely affected her. Another interviewee's experience of earthquake situation was disgusting. More than one interviewee felt very sad. For a female interviewee the earthquake was a disturbing experience because there was no electricity. Many interviewees shared their experience of smelling human remains.

A female interviewee experienced disgust when a funeral home employee casually invited her to see coffin for her mother in a morgue, without any warning, where thousands of bodies were there. She also felt betrayed because the funeral home owner promised that "he could do something, which he could not do."

A UN administrator's respect for the Haitians increased when he saw that, "For seven to eight days people were not having food but still they formed a queue and took food in an orderly manner. Many hungry people waited for three to four hours in the queue."

A university administrator whose cousin died said, "I never visit that family because I do not want to face the reality until now."

#### 5.2.2.2 Personal Relevance

A female physician said that she is a Christian and her belief in God became stronger and she started praying more. Her view of life is changed and now she gives

less importance to material things and more importance to people and life. The earthquake was salient for an interviewee because he has never seen something like this. The earthquake was salient for a female interviewee because she saw people sleeping on one side of the road and another side of the road there were human remains with feral dogs roaming through human remains. Salience motivated her to take some action for bringing abnormal situation to a new normal situation.

A female interviewee whose mother died shared her beliefs:

I didn't go and look bodies. I don't believe that the body, you know, is the personality. I celebrated the life. I have a whole different belief system. I'm not even Catholic anymore. . . . I don't believe you are your body and all that stuff. . . . I celebrate life when someone dies and that's what we typically do. I did not even cry the whole time there.

Another interviewee, whose wife died in the earthquake and her body was never recovered but was presumed to be mass buried at Titanyen, said, "I have never felt like going to Titanyen." The loss of his wife was so salient that he said, "I don't know where I am going. I was out of my mind at first and then I was finally come to my senses."

"Human emotion element and cultural factors are important" according to a physician working with the Centers for Disease Control and Prevention. A UN administrator said, "Every nationality has its own reservations about the customs and traditions to be followed to keep a dead body. As you are aware, the UN lost its own personnel, which included Muslims, Christians, and Hindus." This UN administrator believed that, "It's my lifting bodies was purely in a helping hand in terms that just to break that ice amongst the people who were here that they can also lift bodies."

Johns said, "For me as a pastor, how they feel about God and healthy understanding of feelings about God is important. . . . I help them in the coping skills

amidst loss. How to move forward practically?” A Voodoo priest said, “I talk with family members of the loved ones who were part of the mass burial, it does not devalue the memory for loved one and God's care. God has embraced the loved one as each individual. It does not make any difference because they cannot bury in normal way.”

### 5.2.3 Agents

In the model (Figure 11), the agents are the victims, responders, and administrators as explained in Section 3.12.

### 5.2.4 Information Seeking

Information seeking involves personal feelings and personal thoughts created by the uncertain situation (Case, 2012; Kuhlthau, 2005). In information seeking people use personal network to identify others who are knowledgeable and trustworthy and could be consulted easily (Krikelas, 1983). In a catastrophe, people will also use media, including social media. An explanation of information seeking after the Haiti earthquake is given in Section 4.2.

### 5.2.5 Mass-Fatality Management

MFM involves following stages of dealing with human remains: recovery, preservation, communication with the community, identification, and disposition (Oyola-Yemaiel & Gupta, 2006). The management of the dead begins with recovery of remains, which may be full body or body fragments only. The remains are then transported and preserved to identify. Depending on the facilities available, preservation may be for short duration or prolonged. Different media are used to communicate to the community for identification of human remains. The identified remains are released to the family

members after a legal procedure. Attempts are made to identify the unidentified remains; however, after some time following the local due process, unidentified remains will be disposed of by the local administration. Gupta (2009) developed a model regarding disposition of human remains by authorities (Figure 2). An explanation of MFM in the aftermath of the Haiti earthquake is given in Section 4.1.

#### 5.2.6 Action

Action is “something an agent does that was ‘intentional under some description’” (Wilson & Shpall, 2012, second paragraph). Savolainen (2008) clarifies, “behind the action there is an intention of the actor to achieve something, and this intention makes the action ‘meaningful,’ at least for the actor” (p. 46). He further states that, “From the viewpoint of information action, the main driver is an individual’s intention” (p. 48). In the case of Haiti catastrophe, the intention of the agents is to create a new normal from the abnormal situation.

People trapped in the fallen buildings took action to free them. An interviewee said, “I saw people still trapped in the buildings crying. They were trying to move outside but could not. Everybody was screaming, crying, and there was complete disorder.” He talked about the action he took, “I formed a team of five people and began to help people to move bodies and injured people and moved them to the street and sidewalk till 7:00 p.m. that day [the day of earthquake].”

A UN administrator said about the action he took, “We have taken an aerial survey after one hour of the earthquake.” He also said that they had to remain in the MINUSHTA for seven days since streets were blocked. He lifted and moved 30 to 40

bodies to set an example for other people so that they may also lift bodies to remove.

He said,

I think the first six nights we never slept. . . . The Haiti government has Department of Civil Protection for disaster management and we work in coordination with them. . . . We tried to fortify, and co-unify the front. . . . We tried to direct them. . . . We also sought help because most of the places you had concrete and iron, which had to be cut through and for that you needed specialized equipment to recover the fatalities.

Yakov Kofman, a neurosurgeon from USA said, “When I heard about the Haiti earthquake, my first reaction was to come here. I thought, I had to come here and help.”

He acted on his thinking, went to Haiti, and helped.

A female physician went to her private hospital in the morning after the earthquake. However, it was closed. She then went to the University General Hospital and worked with other doctors in providing emergency medical care for a week, until her hospital re-opened.

A team of Portuguese physicians along with a local non-profit organization, which had five psychologists, provided medical and psychological support for post-traumatic stress disorder and other mental health conditions. A Voodoo priest did counseling to next-of-kin of deceased for his parish. Similarly, Johns, Christian Pastor, said, “I talked to two families who lost one child each. In another extended family, 11 family members were missing and they do not know whether they are dead or not.”

A female student interviewee told a visitor in her house to leave after the earthquake. The interviewee took action to hide below the furniture, and saved her life. However, before the visitor could leave, the debris fell on her and she died. The hosts called the deceased visitor’s family, but her family did not do anything. The researcher

witnessed the body lying in the fallen house. The researcher interviewed the female because he witnessed the body in the fallen house from the road.

A university administrator said, “My first appraisal of the beginning was, what I could do. That was the first question to save the people and this time I did not feel any pain and any sadness. I was enthusiastic what can be done.”

An interviewee said, “In removal of bodies, there was pressure of people and you have to do yourself.” A building contractor said, “We came with hammers, spikes, and other equipment to clean up” the fallen church, where three bodies were somewhere beneath the rubble.

#### 5.2.7 Articulation

Articulation refers to verbal, written, and other (i.e., gesture) modes of communication. In a catastrophic mass fatalities abnormal situation, the agents need to articulate the actions to bring the situation to a new normal. In such a situation, one person can hardly do anything. Government of the Republic of Haiti (2010, p. 5) asserts, “No one can pick themselves up again alone.” To involve other people in the action, the agent need to articulate his feelings, thoughts, and actions required and communicate to others. This author prefers articulation, although Dervin likes verbing; to her verbing is “the way in which people make or use ‘cognition, thoughts and conclusions; attitudes, beliefs and values; feelings, emotions and intuitions; and memories, stories and narratives’” (Savolainen, 2008, p. 7).

An interviewee, whose wife died because of the earthquake told,

I asked big people, muscular people, I asked them but they could not see my wife. . . . I also met the principal of the school. But nobody helped. I went many times but never saw my wife’s body. My wife died inside the school. . . . I asked

the school what they plan to do with the bodies inside the school. The director was in the USA, and they said that they cannot do anything.

A UN administrator said, “The Haiti government has Department of Civil Protection for disaster management and we work in coordination with them.”

### 5.2.8 A New Normal

After a disaster, a “new normal” is a mindset that takes “hold and serves as an objective measure for the process that defines daily life and future decisions. A new normal serves as an uncomfortable but realistic guideline by which further resiliency can be measured” (McCull & Burkle, 2012, p. 33). Smoyak (2006) gives many examples of new normal after 9/11 and Katrina, one of them is “our new normal includes increased time required when we travel by air” (p. 7). In the aftermath of the Haiti earthquake, one of the new normal is that an estimated 390,000<sup>37</sup> internally-displaced people were still living in make-shift camps (30% of the displaced people in aftermath of the earthquake) as of third anniversary of the earthquake (Marking third anniversary of earthquake Ban calls for sustained efforts in Haiti, 2013, January 11).

### 5.3 Chapter Summary

A model of information flow in managing mass-fatality management is developed as depicted in Figure 11. Based on the study this theoretical model appears to indicate connection between seeking information in managing mass fatalities to guide agents in

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<sup>37</sup> The UN gives a figure of 390,000 below the photograph, but 300,000 in the text of the News (Marking third anniversary of earthquake Ban calls for sustained efforts in Haiti, 2013, January 11). The message of the UN Secretary-General contains 300,000 displaced people (Secretary-General's message for staff commemoration of the third anniversary of the earthquake in Haiti, 2013, January 11). The International Organization of Migration states there were more than 350,000 in the camps (Daniel, 2013, January 11; Haitian government to hold subdued ceremony on 3rd anniversary of devastating earthquake, 2013, January 13).

alleviating suffering. Next chapter covers conclusions, discussions and implications in order to establish recommendations for future, including directions for future research.

## CHAPTER 6

### CONCLUSIONS AND RECOMMENDATIONS

*We can view death as an opportunity for awakening to the . . . reality of no-ego as well as an opportunity for enlightenment itself, the ultimate awakening. Confronting death can cultivate a peaceful joy for life.*

E. Mullen

The purpose of this study was to develop an understanding about managing mass fatalities and seeking information in managing mass fatalities. A second purpose was to examine information seeking as a function of information needs. A third purpose was to develop a model of information flow in mass-fatality management (MFM).

At the intersection of information seeking and MFM (Figure 1), the literature review culminated in developing three research questions. The first research question was how were mass fatalities managed in the aftermath of the Haiti 2010 earthquake, an unprecedented disaster in the Western Hemisphere's recorded history (Walk et al., 2012). The researcher made two field visits to Haiti in February 2010 and May-June 2010 funded by National Science Foundation to make ephemeral or perishable data (the earthquake occurred on January 12, 2010) relating to MFM. Subsequently, research questions on how those affected by the Haiti 2010 earthquake sought information about fatalities and what were the needs that motivated those affected to seek information about fatalities were added.

The researcher conducted 28 purposive in-depth interviews, wrote field observation notes, attended United Nations Cluster (see Footnote in Section 1.1) meetings, and collected documents during the field visits. The researcher also conducted research from secondary sources, like Internet, media, journals, and books.

Subsequently, the researcher transcribed interviews, coded the transcripts using MAXQDA qualitative data analysis software (Appendix F and G), analyzed data, and wrote findings given in Chapter 4. A model of information flow in MFM (Figure 12) was developed as discussed in Chapter 5.

This chapter contains major findings in relation to the research questions and literature, model developed revisited, conclusions, significance revisited, discussions and implications, and recommendations.

## 6.1 Major Findings Revisited

The major findings are presented below with respect to three research questions.

### 6.1.1 Mass-Fatality Management

*RQ1: How were mass fatalities managed in the aftermath of the Haiti 2010 earthquake?*

The major finding is that MFM was severely inadequate in the aftermath of the Haiti 2010 earthquake, despite that 93% of the Haitians interviewed ( $n=14$ ) reconciled with the MFM.

People (including children) were sleeping on one side of the roads, while on other side of roads there were dead bodies and feral dogs roaming around dead bodies.

All efforts were made to identify the human remains of foreigners by their respective countries and by the UN for its employees; while almost no effort was made to identify Haitian human remains.

The earthquake caused an estimated 316,000 fatalities according to the Government of Haiti as reported by Brown and Delva (2011) on the Reuters news

agency website. Fatalities included 18,000 (30%) civil servants (Nelson et al., 2011) out of 60,000 (senior UN administrator interviewee). Twenty seven (96 %) of 28 government buildings, including the National Palace – official residence of the President of Haiti – were destroyed (Sims, 2013) and the president sought shelter in a police station (two interviewees and Farmer, 2011). A female interviewee whose mother died because of the earthquake provided the most poignant vignette:

So two here [bodies], three here, four here, and I am on the this side of the road with the rows of the people with the kids and whatever and sleeping on the other side and in the middle the dogs are going through the dead bodies, you know. The dogs are roaming the streets everywhere and over there, you know, and I remember just thinking, I am never going to forget this scene.

Family members, friends, neighbors, relatives, colleagues, and passers-by recovered human remains in Haiti. People kept recovered human remains on sidewalks, parking lots, open spaces, and on parts of the roads.

The government in consultation with UN Stabilization Mission in Haiti and other international partners issued order on January 13, 2010, directing Central National Equipment (CNE), public works agency, to dispose of human remains. CNE with its earth moving equipment collected human remains, made no effort to identify them, and mass buried in Titanyen, an uninhabited barren place about 24 km (15 miles) North-East of Port-au-Prince. Human remains that were not disposed of because of CNE's limited capacity and no capability for this work, started decomposing. Because of the unbearable smell of decomposing human remains, people doused them with gasoline and burnt in situ.

The researcher interviewed five persons whose family members died in the earthquake and human remains of three were not recovered. They had reconciled with

the situation and did not complain.

Considering the number of fatalities hardly any effort was made to preserve human remains, except of foreigners. United Nations employed Kenyon International Emergency Services for fatalities management of its employees. Disaster Mortuary Response Operations Team (DMORT)<sup>38</sup> was deployed first time in the history outside US for mortuary services of Americans who died in Haiti (DMORT official interviewee and Kauffman & McGuire, 2012).

Amidst all the tragedy, people had not forgotten to enjoy. A female interviewee who has agreed to reveal her identity said in a recorded audio-interview:

A man has died while having sex with a woman and a brick fell. But, they made it like the show, people would come in and watch. So, they have been insensitive, but they were experiencing this major thing . . . And they left it exposed...They would tell you, want to come and see. I said, no. It is not funny . . . they made a show out of it. Actually, they put a little video that was being shown all around.

### 6.1.2 Information Seeking

*RQ 2: How did those affected by the Haiti 2010 earthquake seek information about fatalities?*

The affected people were seeking information about the individuals by looking at the locations where they were last seen or supposed to have been.

According to the literature, information technology and social media played a role in how people sought information.

People sought information regarding their family members and friends by going to the places the person last known to have been, market places, hospitals, contacting

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<sup>38</sup> For information on DMORT see a footnote in Section 3.12.

other people who may know about their whereabouts, or through media. Media included Signal FM radio station and social media, like Facebook and Twitter. Signal FM radio station continued round the clock broadcasting despite no electricity and working telephones (Henninger, 2010) helping people to locate missing people and human remains. In seeking information for managing mass fatalities, many international organizations experimented with new emerging technologies, including providing real time GPS maps (Nelson et al., 2011).

### 6.1.3 Information Needs

*RQ3: What were the needs that motivated those affected to seek information about fatalities?*

The need to know the whereabouts of family members, living or dead, motivated people to seek information. The need to communicate with the family members and to reach them (living or dead) also motivated people to seek information. Having found the human remains of family members the need for funeral home facilities, coffin, and for respectful send of motivated to seek information.

Information needs are in the minds of the people, and therefore it cannot be observed (Wilson, 1997). It was interpreted by what interviewees said. For example, at the crushed school building where his wife was before the earthquake, an Indian Formed Police Unit of the UN official said, "I asked big people, muscular people, I asked them, but they could not see my wife." This statement was interpreted as his information need to see his wife, living or dead. The information need to see his wife made him seek information about his wife by going to school that was crushed and seeking help of other people.

#### 6.1.4 Summary of Findings

- MFM in Port-au-Prince:
  - Recovery of human remains was not comprehensive.
  - The authorities did not attempt preservation (see Figure 2) of the Haitian human remains because of the massive number of fatalities.
  - Identification of human remains was almost non-existent, except for human remains of foreigners.
  - Disposition of human remains was primarily by mass burial commingled with debris.
- Information seeking was primarily on finding people. Information was first sought by going to the places the people were supposed to be at the time of the earthquake. If further information was needed, then they went to other places, contacted people, and/or used media.
- The primary information need was to know the whereabouts of individuals. In addition, there were information needs related to the recovery, preservation, identification, and disposition of human remains.

#### 6.2 Model of Information Flow in Mass-Fatality Management

The researcher studied number of existing information seeking models to develop a model of information flow in MFM. Figure 12 depicts the model developed. The data made in this case study of the Haiti earthquake were applied to the model. The theoretical model appears to indicate connection between seeking information in managing mass fatalities to guide agents in alleviating suffering. The model essentially depicts information flow systems (see Chapter 5).

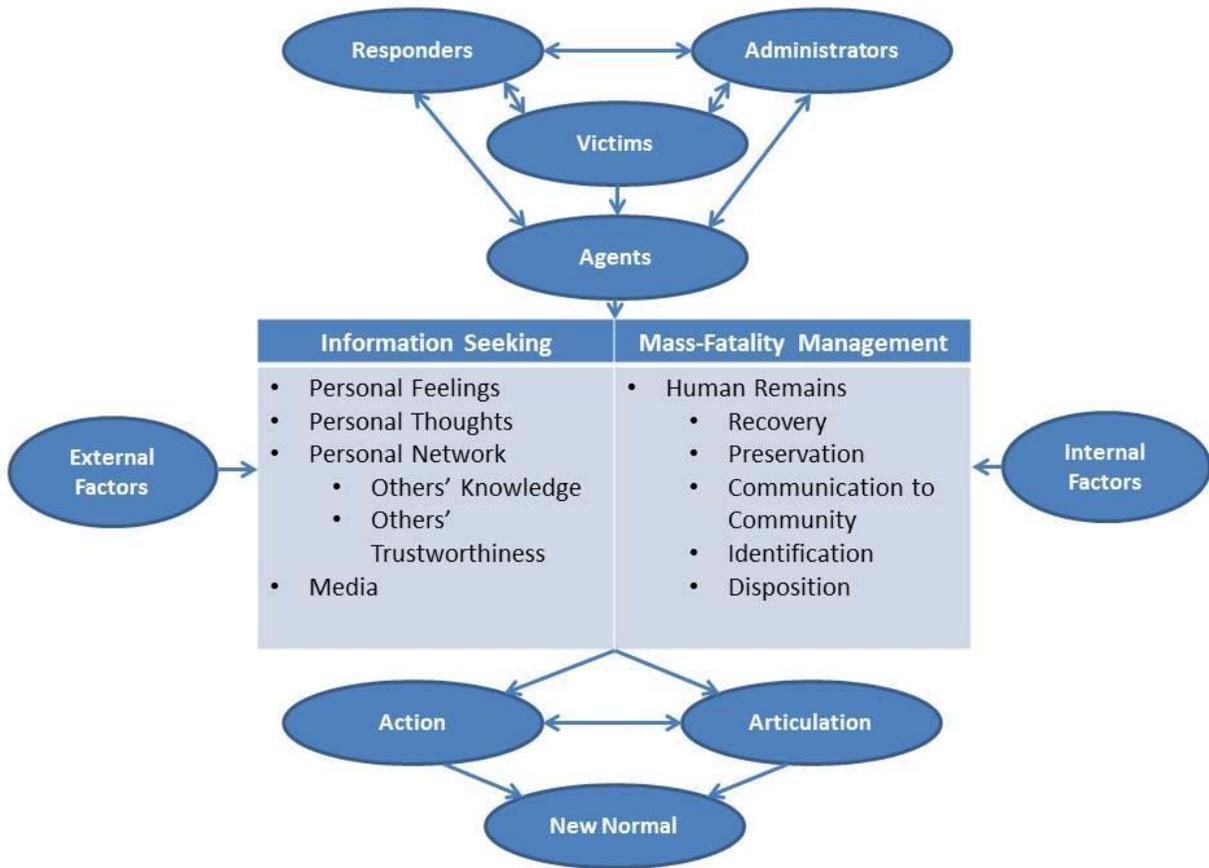


Figure 12. Model of information flow in mass-fatality management (Figure repeated from Chapter 5, Section 5.2).

### 6.3 Conclusions

This study investigated seeking of information in managing mass fatalities in the aftermath of the Haiti 2010 earthquake. Upon interviewing in depth 28 individuals and observing post-earthquake UN cluster meetings, hospitals, morgue, and mass-burial process at Titanyen, the study concluded that MFM was severely ineffective. In other words, there was ineffective management of how the human remains were recovered, preserved, informed to community, identified, and disposed of; the elements of MFM as discussed in Section 2.8.1.

The need to know the whereabouts of family members, living or dead, motivated people to seek information. People sought information by looking at the locations the family members were supposed to have been at the time of the earthquake (4:53 p.m., January 12, 2010). But that information need of the affected people was not fulfilled.

The study reaffirmed the proposition that need for information guided the information seeking (Case, 2012; Wilson, 1997). Finally, the study concluded in developing a model of information flow in MFM (Figure 12).

### 6.3.1 Summary of Conclusions

- Mass-fatality management during the 2010 Haiti earthquake was severely ineffective.
- Seeking information about the fatalities was centered primarily in the places the individuals were supposed to be at the time of the earthquake.
- The information needs of the affected people were primarily about the whereabouts of the family members. If human remains were found then the disposition of the remains was of major concern. However, information needs were largely unmet.
- Haiti needs a MFM plan.

### 6.4 Purpose Revisited

The purpose of the research was measured in two ways: scholarly significance and social significance.

#### 6.4.1 Scholarly Significance

In the complex mass fatality situation, the model of information flow in MFM

(Figure 12) created in this dissertation parsimoniously explains the information flow and interconnectedness of subsystems to a larger social system.

The study reaffirmed the proposition that information needs guide information seeking (Case, 2012; Wilson, 1997).

This study is the first study on information seeking in MFM or emergency management that the author is aware of.

This study is interdisciplinary in nature as it encompasses information science and emergency management and draws briefly from public administration, psychology, and forensics.

The study begins our awareness of the importance of information seeking in MFM and contributes to information science, emergency management, and crisis informatics.

This dissertation represents an effort that could result to transform the response to disasters in better ways by seeking information in managing mass fatalities.

#### 6.4.2 Social Significance

The social significance of the study is that it reveals failure of MFM in Haiti despite pre-existing UN Stabilization Mission in Haiti and inundation of international military, civil, and humanitarian personnel, financial aid, and other resources post-earthquake.

The dissertation exposes vulnerability of built structures to the natural forces. The dissertation is a wakeup call to the national and international emergency managers, humanitarians, and politicians to prevent, prepare for, respond to, and mitigate disasters.

It is imperative that the world learns from the mistakes made in Haiti that lead to increased fatalities and incorporate lessons in planning process.

Another social significance of the study is that it may help in changing policies to make earthquake resilient structures and to improve MFM.

The study will help in education and training of emergency managers, information scientists, students, and in conducting disaster preparedness and response exercises.

## 6.5 Discussions and Implications

MFM and seeking information in managing mass fatalities in the aftermath of the Haiti 2010 earthquake was consistent in some respects and at the same time contrary in other respects when compared to other mass fatality incidents. Although the number of fatalities is disputed (see Section 4.1.1.2), “the exact death toll from the 2010 Haiti earthquake will never be known, it’s clear the loss of life made that disaster the deadliest in the Western Hemisphere during modern times” (Kendra et al., 2012).

Discussions and implications are presented in the subsections of (i) recovery, (ii) preservation, (iii) communication, (iv) identification, (v) disposition, (vi) Zeigarnik effect, (vii) disasters bring change, (viii) international resources for MFM in poor countries, and (ix) use of disaster unidentified human remains for the living.

### 6.5.1 Recovery

Family members, neighbors, relatives, friends, colleagues, passersby, and people who happened to be at the site recovered human remains. This has been documented for mass-fatality incidents for a century. In Haiti, family members reconciled and did not complain even when human remains of their loved once were not

recovered. This is contradictory to what happened after 9/11, “Family members of the disaster victims were equally assertive in their expressed need for investigators to find and identify human remains” (Wachtendorf, 2004, p. 166).

#### 6.5.2 Preservation

Preservation of human remains in Haiti was both consistent and contrary to other mass-fatality incidents. Developed countries generally preserve human remains for identification and giving to next-of-kin. One of the reasons for this is that these countries have financial and technological resources. Another reason is that in these countries fatalities generally do not number as large as in developing countries. “Fatalities in developed countries [because of disasters] have steadily decreased by 75% during the past 50 years,” asserts Mileti (1999, p. 101) and they would have further decreased in the preceding 13 years. For example, in the recent past in US, there have been fewer than 200 fatalities from any one disaster, with three exceptions of 1995 Chicago heat wave, 9/11, and Katrina.

An effort is made in developing countries to preserve human remains after a disaster to the extent it is possible. Generally, human remains are preserved for a limited period in developing countries for identification. Administrators’ dispose of human remains after some time if they are not identified (See Figure 2 for decision tree in the process of finding and disposing of human remains by authorities). This has happened after 2004 tsunami in Thailand, India, and Sri Lanka, 2009 cyclone Aila in Bangladesh and India, and after other disasters in India,

No effort was made to preserve human remains of Haitians (except some isolated individual cases) as was done in Sri Lanka after the 2004 tsunami (Perera,

2006). Consistent with the international practice of preserving and treating human remains of foreigners differently, in Haiti also efforts were made to preserve foreigners' human remains. Foreigners' human remains are preserved for identification and repatriation to their respective countries.

### 6.5.3 Communication

After preserving human remains, community is generally called for identification of human remains by different methods. For example, Papottuvil District Hospital doctor in Sri Lanka used *namaz* prayers public address system for communication of deaths and requesting people to come to the hospital for identification of bodies after the 2004 Indian Ocean tsunami. In Haiti, government and its agencies made no effort to communicate for helping people identify human remains. Communication about human remains in Haiti was by Signal FM radio station, citizens themselves, social media, Haitian diaspora, non-profit organizations, and on the Internet by some business organizations.

### 6.5.4 Identification

CNE made no effort to identify human remains before burying them in the trenches in Titanyen. This is in contrast to the practice after the 9/11. The debris of 9/11 were put in shaker boxes and then on the conveyer belt of shaker machines and human investigators were stationed to pick for further examination debris more than one-quarter inch in size that may be human remains. Four thousand two hundred fifty-seven human remains helped in identification of 300 deceased (Wachtendorf, 2004).

Foreign governments made an effort to identify human remains of their citizens and UN for its employees consistent with the international practice. In Thailand after the tsunami, more than 400 experts from 30 countries came for identification and repatriation (Kent, n.d.). After some initial problems, there was coordination among them and they used Disaster Victim Identification (DVI) protocol of the International Criminal Police Organization (INTERPOL, 2009). The reason for this identification effort is that the tsunami occurred on December 26, the peak foreign tourists holiday period in Thailand, and number of fatalities of foreigners was manageable. In the aftermath of the tsunami 8,345 people died in Thailand that included natives (EM-DAT, 2013).

Rodrigue Darang, professor of medicine, Université d'Etat d'Haiti and forensic pathologist, University General Hospital, Port-au-Prince and Pierre Yves Jovin, chief director, morgue, of the same hospital were interviewed and they agreed to reveal their identities in publications. They were not aware of DVI protocol. As an act of reciprocity, the researcher provided details of DVI protocol to them.

A DMORT official interviewee told the researcher that technology is available for identification of hundreds of thousands of human remains of natural disasters. It is a question of economics and politics, according to the author, whether international community will be willing to invest for this humanitarian cause, if a poor country does not have resources.

#### 6.5.5 Disposition

Disposition of human remains in Haiti was contrary to the disposition practiced after other mass-fatality incidents. The disposition of human remains in Haiti was almost without any effort to identify. This is contrary to what the researcher found after 2004

tsunami in India and Sri Lanka, and after 2009 cyclone Aila in Bangladesh and India. This researcher has not come across any literature-documenting disposition of human remains after a disaster in the way it was done in Haiti in recent times. In Haiti, CNE took human remains with debris of structures commingled in trucks and mass buried in trenches dug at Titanyen (Figures 8, 9, and 10 in Chapter 4). People doused human remains in gasoline and burnt in situ.

It is not only in developing countries, but also in US, after the 1995 Chicago heat wave when there was no claimant of 41 bodies, and 27 non-heat wave related bodies accumulated for more than a month, county officials buried the bodies on August 25 (Klinenberg, 2002). Klinenberg (2002) wrote, “The death of Chicagoans for whom no one came only reinforced and perpetuated the degradation of their lives” (p. 237). Most of the people who died after the 1995 heat wave were poor senior citizens living alone.

Humans are social animals, is a popular saying. Everyone needs a decent send off, and expects it. If after living a whole life raising family, having relatives, friends, neighbors, people who share hobbies, past colleagues, alumni friends, and others, not a single person comes to claim the body and give it a religious, traditional, and respectful disposition, then what social animal are we? May be the researcher’s Eastern worldview is not a proper frame of reference to ask this question for what happened in a Western society.

#### 6.6.6 Zeigarnik Effect

Unidentified human remains mass burial in Haiti may leave Zeigarnik (1967) effect (unfinished closure) and post-traumatic stress disorder on the next-of-kin. Bert Hayslip, professor of psychology, has been teaching Psychology of Death and Dying

undergraduate course for 35 years at the University of North Texas. The researcher interviewed him on March 25, 2010. According to him:

There is no way they are ever going to be able to identify the person who died. So, it is going to interfere with their grieving. . . . If we are using front-loading trucks to move cadavers, the way you move freight, it is pretty depersonalizing. . . . And because the fact that they lacked the resources to deal with each and every person on an individual basis, interferes with the grieving of the individuals . . . It's probably going to . . . leave all sort of reaction among the people who are left behind. . . . [It] probably going to have societal implications down the road.

Knoppers, Saginur, and Cash (2006) support Hayslip in following words, "In a review of literature from 1981 to 2001 describing over 50,000 individuals who experiences eighty different disasters, seventy-four percent showed psychological problems such as post-traumatic stress or depression" (p. 362).

Disaster Research Center contradicts above assertion based on fifty years research findings after disasters. McNeil and Quarantelli (2008) of Disaster Research Center assert, "While the experience of a disaster is a memorable one, and there are differential short-run effects, there does not appear to be too many lasting behavioral consequences" (p. 5). They suggest, "Anyone interested in the issue should recognize there is a controversy and a voluminous literature that provide only ambiguous research support for each position" (p. 5).

A hundred years after the 1911 Triangle West Factory fire in New York city human remains of six people were identified (Berger, 2011; Final six victims identified in 2011, 2011). Thirty-one years after the end of Vietnam war, some family members were reported to be searching for their loved once (Phua, 2006). After finding a grave supposed to be of her husband, a widow was reported to have said, "This is all I have ever wanted. Now I can die happily" (Phua, 2006). These two cases show the

importance of proper closure, otherwise Zeigarnik (1967) effect remains and the memory of the loved one haunts the living.

#### 6.5.7 Disasters bring Change

Disasters catalyze technical, legal, social, and political changes in the world. This has happened after the 1911 Triangle West Factory fire, 1912 Titanic sinking, 1917 Halifax explosion, 1984 Bhopal chemical disaster, 1986 Chernobyl nuclear disaster, 9/11 terrorist attack, and 2011 Fukushima earthquake-tsunami-nuclear radiation disaster. The dissertation, *Catastrophe and Social Change, based on the Sociological Study of the Halifax Disaster* by Prince (1920) is generally accepted as the first dissertation on social science aspects of disasters.

For example, on March 25, 1911, at 4:40 p.m., just before the closing, a fire broke out at the Triangle West Factory, manufacturing shirtwaist (blouse), on the 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> floors of a building in New York City. One hundred forty-six people died in 18 minutes, of which 140 identified. The fire brought “sweeping changes in fire safety codes, workplace regulations and conditions for working women” (Editorial: The fire that changed everything, 2011). Hope is that the world would learn from the Haiti earthquake and there would be some positive changes.

#### 6.5.8 International Resources for MFM in Poor Countries

Gupta (2009) posits, “The way dead bodies are dealt with reflects the way the living are treated and respected” (p. 28). A representative of SPHERE India – a national coalition of humanitarian agencies – told the researcher after 2009 cyclone Aila, “Dignity in death is to be ensured. Life with dignity, dignity in death” (Gupta, 2009, p. 21). Mass

burial is to be avoided in all circumstances, recommends Pan American Health Organization (2004), because human rights of the next-of-kin get violated.

According to Black, Sunderland, Hackman, and Mallet (2011), William Ewert Gladstone (1809–1898), Prime Minister of the United Kingdom, has used the words, “Show me the manner in which a nation cares for its dead, and I will measure with mathematical exactness, the tender mercies of its people, their loyalty to high ideals” (p. v).

This is a fallacy. It is akin to arguing that because Mughal emperor Shah Jahan built the white marble mausoleum, the Taj Mahal, in memory of his wife Mumtaz Mahal, he loved his wife. Does it mean that a poor mason who built Taj Mahal did not love his wife? Taj Mahal is a place where Mumtaz Mahal was buried. Titanyen is a place where most of the estimated 360,000 unidentified Haitians were buried. Taj Mahal and Titanyen, both are burial places, former for human remains of one person and later for human remains of 360,000 people. Probably, comparing mass burial in Haiti from American, British, or a Mughal emperor’s standard is not appropriate, because of culture, poverty, number of fatalities, instantaneous nature of fatalities occurred, non-functioning government, and other factors.

The Pan American Health Organization (2004) recommends against mass burial since it violates human rights of the next-of-kin. However, considering the reality of the Haiti situation, the recommendation was not practicable, as was done after 2004 Indian Ocean tsunami in Sri Lanka. The author is not attempting to defend the mass burial of unidentified human remains in Haiti. He is only asking the reader to think.

King Richard III of England died in August 1485 in a battle. His remains found in a garage in Leicester, England were identified in February 2013. University of Leicester research team with funding from England, US and other countries matched the human remains DNA samples with two of his currently living descendants. Number of groups (one with 1,400 members in US) are arguing for their favorable place for the final resting place for the remains of Richard III after 528 years of his death (Burns & Cowell, 2013; Gross, 2013). The international community needs to think, why it cannot spare resources for the identification and proper disposition of the human remains of the natural disasters in poor countries.

#### 6.5.9 Use of Disaster Unidentified Human Remains for the Living

The author would like to raise a highly emotional, ethical, and preposterous (according to the Centers for Disease Control and Prevention physician interviewee) issue for debate. The thought of this issue may be dreadful. Is it possible to use body parts of disaster unidentified human remains for the survivors of the disaster or other patients? Will it be socially acceptable to use legally unidentified cadavers that have medical and economic value for the patients and for the advancement of medical science?

There is a need for cadavers for education and training of health related students and professionals to advance medicine (Shaikh-Lesko, 2013). The Rajasthan Anatomy Act of 1986 in India provides a procedure for handing over unidentified bodies to anatomy professors of five medical colleges ("Bodies handed over ignoring procedure in Rajasthan," 2010). Different parts of the bodies could be used for transplanting and for saving the lives of injured or for their medical treatment and betterment of their lives.

Yakov Koyfman, a neurosurgeon, told the researcher that bones are preserved for grafting. He added:

Theoretically, preservation is done of fresh material. There may be some time limit after which body parts may be useless. Bodies are harvested in non-sterilized conditions. Some harvesting of the material could be done for long. It depends upon the situation, temperature, local conditions, and the health condition of the deceased.

There are legal and ethical issues of harvesting human bodies and parts. All of this is a gruesome matter. I know surgery with illegal parts exist. I cannot imagine how unidentified bodies of mass-fatalities disasters could be used for patients. Bones could be properly preserved for long periods. Would people do this is a question.

Cheney (2006) and Carney (2010) documented a thriving international illegal trade in cadavers. Investigations reveal that cadavers were illegally sold for about \$10,000. For example, a director of the Willed Body Program of the University of California at Los Angeles was sentenced to four years in prison for stealing body parts and selling to pharmaceutical and medical research companies in 2004 (Shaikh-Lesko, 2013).

Although certain parts of the body will have shorter period for their utility for the living, but there are other parts, like femur bone and teeth of the dead that could be used long after the person died for the living. Could there be some way to find their utility? To find out, the researcher wrote to Mary Roach (2003):

In *Stiff* you wrote, “Cadavers are our superheroes . . . . What a shame to waste . . . not to use them for the betterment of humankind” (p. 10). Do you know of any research anywhere on use of unidentified mass fatality disaster cadavers for humankind? What do you think about the use of mass fatality disaster cadavers for humankind?

She replied in writing:

That's an interesting question. I think a disaster scenario is too emotionally charged and media-saturated for this to go smoothly. It would seem, to many

people, like adding insult to injury. Especially in a country, like Haiti, that probably does not have much tradition of body donation. Perhaps in Europe it would be perceived as a positive, humanitarian practice, but even then, I think it would be tough. (M. Roach, personal communication, February 3, 2013).

The author is only raising these issues for debate; he does not have a position for or against. The question is, will it be socially acceptable. May be somebody could start an experiment in Europe. In raising this question, the researcher is following the advice of Kelman (2005):

At minimum . . . questions should be asked and debated. Researchers should understand what is and is not acceptable by thinking ahead to set appropriate limits in their field of operations. During a disaster and during research, it is too late. (p. 154)

## 6.6 Recommendations

This case study of seeking information in managing the Haiti 2010 earthquake mass fatalities and review of literature when compared for consistencies and contrasts with management of other mass-fatality incidents has many implications and gives directions for future research and practice.<sup>39</sup> The impact of following recommendations is relevant to information science, disaster management, and public administration.

### 6.6.1 Scholarly Recommendations

This dissertation raises several questions that need to be researched and gives directions for future research in the following areas: (i) seeking information in managing mass fatalities; (ii) government response to MFM; (iii) preservation of unidentified human remains; (iv) use of unidentified cadavers for transplant; (v) disposition of human

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<sup>39</sup> Some of the recommendations are built on Gupta (2006, 2009), Gupta and Sadiq (2010), and McEntire et al. (2012).

remains in adverse conditions; (vi) disposal of unidentified human remains; (vii) training in MFM; and (viii) testing of the model of information flow in MFM in other disasters.

#### 6.6.1.1 Further Research in Seeking Information and Managing Mass Fatalities

There is clearly a need for further research on seeking information and managing mass fatalities<sup>40</sup> with more case studies. Researchers need not wait for a mass-fatality disaster to occur, although they will, but research could be done on earlier mass-fatality disasters also. How to deal with thousands of human remains in general and unidentified human remains in particular is imperative. What are the effective, efficient, and legitimate simple ways from recovery of human remains to disposition?

This recommendation for scholarship is to advance research in MFM particularly in developing nations and with a cross-cultural analysis. The reason for this is, “Most of the studies so far undertaken have been done by social scientists in Western type of societies, even though the great majority of disasters occur in developing countries” (McNeil & Quarantelli, 2008, p. 2). Further, deaths because of disasters in the developed countries in the 50 years preceding 1999 were reduced by 75% (Mileti, 1999) and more in 13 years after that.

To bridge the gap between researchers and practitioners and to make the future research on MFM, particularly about disposition of unidentified human remains, a participatory action research involving different stakeholders is recommended.

#### 6.6.1.2 Research in Government Response to MFM

Research is recommended to find out how governments respond to mass-fatality

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<sup>40</sup> For disaster deaths research challenges, see Kelman and Jankman (2007)

incidents, since there was reluctance on the part of informants to share their perspective on this sensitive subject. For example, this researcher made all the efforts to interview a CNE or any other Haitian government representative in both the field visits, without any success. The researcher understood that during the first field visit response was priority compared to research or researcher. The researcher along with other two researchers attempted during the second field visit, 20 weeks after the earthquake, to meet any official of the CNE. The office of director, CNE, informed the researchers that director would meet them. However, after waiting for two and half hours the director or any other CNE official refused to meet the researchers.

#### 6.6.1.3 Research in Preservation of Unidentified Human Remains

Cremation of unidentified human remains needs to be avoided, because it closes the possibility of identification of human remains forever. However, in some religion, culture, and tradition, “attempt to preserve a corpse is seen as a fundamental error” (Mullen, 2009, p. 170). Research is required to understand this issue.

#### 6.6.1.4 Research in Use of Unidentified Cadavers for Transplant

The discussions and implications in Section 6.5.9 gives direction for research on use of unidentified cadavers of a natural disaster for transplant in a European nation.

#### 6.6.1.5 Research in Disposition of Human Remains in Adverse Conditions

After 2009 cyclone Aila in North 24 Parganas district of West Bengal state in India, some human remains could not be dispose of for about 15 days because of water inundation all around them (Gupta, 2009). Dry wood is generally used for cremation in South Asian countries. However, after a disaster because of hydraulic natural forces,

dry wood may not be locally available for cremation. Further, it is not possible to dispose of mass fatalities human remains in winter in the Canadian arctic according to Scanlon, professor emeritus, Emergency Communications Unit, Carlton University, Canada (J. Scanlon, personal communication, July 16, 2010). These situations provide direction for research on what to do with mass fatality human remains in such conditions.

#### 6.6.1.6 Research in Disposal of Unidentified Human Remains

Scanlon wrote to the researcher, “I know of no specific research on this topic [disposal of unidentified bodies]” (J. Scanlon, July 16, 2010). Subsequently, the researcher co-published, *Unidentified Bodies and Mass-fatality Management in Haiti: A Cross-Cultural Comparison* (McEntire et al., 2012). Further research is required on disposition of unidentified human remains.

#### 6.6.1.7 Research in Training in MFM

Death is perceived in most cultures as a taboo (Bertman, 1974). Although death is inevitable but in most cultures people do not like to talk about death directly, because it scares them. Research findings have revealed that initial response after a disaster, including in mass-fatality disasters (Haiti being one of them) is by people, who happened to be at the site of disaster, passersby, and injured survivors (McNeil & Quarantelli, 2008). The challenge is how to train people in MFM. The Amsterdam “model” gives a direction.

Amsterdam with leadership from the fire department is not only stressing that plans must include the role of ordinary citizens but is even doing emergency exercises in which the first responders are not police, fire, or ambulance but whoever happens to be around when the staged incident occurs (Scanlon, 2013, p. 13).

Research is needed to examine the efficacy of the Amsterdam model and to find out if this could be emulated in other cultures.

#### 6.6.1.8 Testing of the Model of Information Flow in Mass-Fatality Management

The model of information flow in MFM (Figure 12) needs to be tested with data, including with a statistical correlational analysis.

#### 6.6.1.9 Summary of Scholarly Recommendation

The scholarly understanding gained by this research will help in planning, education, and training of professionals and students, and in improvement of MFM practices.

### 6.6.2 Recommendations for Practice

This dissertation raises several questions that need to be addressed and makes recommendations for mitigation, preparation, and response to future disasters in the following areas: (i) preparedness training, (ii) need for strong government administration, (iii) need for international cooperation for effective response to MFM, (iv) develop plans for human remains recovery, (v) develop plans for preservation, (vi) develop plans for identification, (vii) develop plans for disposition, (viii) use of newer technologies in MFM, and (ix) develop policy in MFM.

#### 6.6.2.1 Preparedness Training

People need to be trained for preparedness to earthquake. The researcher interviewed a women undergraduate student in whose house body of a visitor was there

at the time of the interview. The interviewee hid below the furniture at the time of the earthquake and saved her life, while rubble fell on the visitor to her home and died.

#### 6.6.2.2 Need of Strong Government Administration

One of the main reasons governments exist is to provide safety to its people. The need for a strong state was recommended by an Indian Formed Police Unit of the UN official whose teacher wife's human remains were not recovered after she died because of destruction of a school building:

Normally, the state moves big machines, trucks, three or four hours after the earthquake. They are supposed to save everybody. They should have put everything to save people. If you don't have support of the government, you can't do anything. You may imagine help coming after three or four hours and then they try to do everything but can't. It was too big of a disaster. We need strong state.

#### 6.6.2.3 Need for International Cooperation for Effective Response to MFM

A university administrator recommended for calling for international help:

Our government should . . . called for help, as soon as possible, but they did not do, and then maybe, we could save more lives. . . . If that happened in your country in the United States for example, they would have been millions of bunks specially made for that to put bodies and then put them in a vault somewhere after trying to identify each body, but . . . treatment is really different here.

Barriers have to be overcome so that foreign governments can quickly extract and return human remains to their countries of origin. International agreements and domestic policies need to be put in place so that organizations like the DMORT can operate more efficiently after disasters abroad.

It should be possible to send international support teams to developing nations when major mass-fatality disasters occur. US Army Corps of Engineers have been managing activities of the Civil Military Emergency Preparedness Program in many

countries (Hecker & Bruzewicz, 2008). They are recommended to include in their portfolio, MFM in developing countries.

#### 6.6.2.4 Develop Plans for Human Remains Recovery

The quote of the university official given in the earlier subsection suggests that the international community need to help developing nations extract human remains from collapsed structures quickly and safely.

A physician who saw a human body dangling from a building and a skull lying nearby after 20 weeks of the earthquake in Port-au-Prince recommended, “They should make efforts to remove bodies.”

#### 6.6.2.5 Develop Plans for Preservation

Preservation of human remains when they quickly outstrip resources of morgues and hospitals is a problem. Nations need to develop plans for preservation of human remains. If they cannot be identified immediately, they need to be preserved in morgue, cold storage, or even marked shallow temporary-burial for identification. Unidentified human remains are quickly disposed of and not preserved because of the myth that dead bodies spread disease. National Disaster Management Authority (2010) asserts,

There has never been a documented case of an epidemic occurring after a natural disaster that could be traced to exposure to dead bodies. This is attributed to the fact that those killed by natural disasters are generally healthy at the time of their death. (p. 1-2)

#### 6.6.2.6 Develop Plans for Identification

Identification of human remains when disposition is urgently needed is yet another problem. A physician from the Centers for Disease Control and Prevention recommended:

The approach should have been to leave the body as it is, take a photo, address where the body was found, and write a descriptive note. . . . GPS coordinates may be recorded, where the body was found and buried. . . . Public health assessment could ideally be done by assessing the bodies wherever they are and by educating by media that dead bodies don't spread disease. UN and other organizations could have divided jurisdiction among themselves and begin using GPS street by street. A coding system of bodies could have been devised, for example by taking the first three letters to represent the number of the street, photo, and putting a tag on photo to identify. . . . Bodies could have been put in cold large warehouses. . . . Potentially the community may be used for identifying dead, because it is difficult for government/UN/NGOs, to do that. . . . Dead bodies don't spread disease.

When asked for suggestions, Darang, professor of medicine at the Université d'Etat d'Haiti and forensic pathologist at the University General Hospital suggested:

My suggestion to the government is to identify all the bodies . . . The authorities did not apply [their mind] to identify the bodies, they acted rashly, and they did not make the [good] decision. There is technology available for identifying the bodies, and there should have been trucks where they would have loaded the bodies, and moved them from the damaged structures and then called on through the doctors and the experts to identify the bodies and then bury them. This should have been done in every block, in every street, where there were cadavers.

Jovin, chief director, morgue of the University General Hospital recommended:

Even in the mass grave situation, the bodies should have been tagged and registered and a record kept. So that later . . . in the future, from registration number they could know the location where the body was buried. An attempt for body identification could be made by future investigation.

Hayslip, professor of psychology, University of North Texas recommended:

I would advise them to make every effort to identify bodies even if they were in the process of decomposing, develop more resources to the identification and respectful and dignified burial to the individuals. . . . It is going to cost more, it will require more resources . . . devoting more efforts and resources to the identification of people even if it requires more time.

A DMORT official recommended:

Deceased human beings should also be treated with respect. There is technology available for positive identification for use in multiple mass deaths of tens of thousands. After Katrina RFID [radio frequency identification] chips were

implanted, so that later the identity of the person may be find out. To identify the cadaver, multiple methods may be used. RFID could be used in large scale in US, but cannot be used in Haiti.

A female physician recommended:

Government should have made efforts to identify the cadavers by photographs and fingerprints. Government could have provided the photographs to the family members for identification. Forensic medicine could have been used for identification. DNA samples could have been taken for identification.

On asking her, “Do you think RFID technology should have been used?” She replied, “Yes.” It is recommended to implant RFID chips quickly in human remains for identification in future (See Appendix I).

The research shows multiple methods available for identification of human remains: clothing, appearance, tattoos, jewelry, photograph, RFID chip, forensic including DNA, and others. The important thing is that all efforts should be made for identification of human remains.

It is recommended to improve record keeping for unidentified human remains. Tracking methods or computer programs that could be utilized for this need to be developed. Decision support tool developed for identification of mass fatality victims by de Cosmo (2012) need to be experimented. Jovin recommended:

Even in the mass grave situation, the bodies should have been tagged and registered and a record kept. So that later on in the future from registration number they could know the location where the body was buried. An attempt for body identification could be made by future investigation.

Digital photographs need to be taken immediately before human remains become deformed (blacken) to provide photographic evidence for those seeking information about the deceased.

#### 6.6.2.7 Develop Plans for Disposition

It is recommended to avoid immediate cremation of unidentified human remains, since cremation closes the possibility of identifying human remains forever.

Two funeral home administrators recommended, "They could have tried to identify the bodies, else they could have provided dignified, respectful, burial." There is no institution of funeral home in South Asia. After a person dies, family members complete all the rituals from death until disposition of human remains. Gupta (2009) recommended, "In case of a major mass fatalities event in USA, if the government resources are stretched to the limit, handling of dead bodies by the families may be thought of" (p. 23). This recommendation is not only for USA, but also for other countries where funeral homes are the default choice for disposition of human remains after deaths, not related to disasters.

#### 6.6.2.8 Use of Newer Technologies in MFM

After the Haiti earthquake, different governments, international government and non-government organizations, businesses including information technology business, and individuals used diverse established and emerging technologies for response. Many times, there was a lack of coordination. There is a need for harnessing and coordination of the use of emerging technologies, but it is challenging.

New relevant technologies that may be used for MFM are emerging. For example, *CitySourced*<sup>41</sup> application is available to all citizens for reporting civic

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<sup>41</sup> <http://www.citysourced.com>

problems. The researcher thinks that CitySourced could be creatively<sup>42</sup> used for MFM, although probably not yet tried. A citizen could take a photo of the human remains by his smart phone and submit textual description. A citizen may also submit the details on the Internet. The city administrator may get the details with the GPS location of the human remains and could take appropriate action for recovery, preservation, communication, identification, and disposition of human remains.

#### 6.6.2.9 Develop Policy in MFM

The National Disaster Management Authority in India, an organization similar to the Federal Emergency Management Agency in US, issued *National Disaster Management Guidelines: Management of the Dead in the Aftermath of Disasters* (National Disaster Management Authority, 2010). It is recommended that other countries develop policies to provide guidelines on what information about mass-fatality is to be collected and what information is not to be collected, how the information is to be collected, how to process the information, and with whom the information should be shared. Policies regarding information seeking in MFM should be available before a disaster strikes.

#### 6.6.2.10 Summary of Recommendations for Practice

In essence, it is imperative that countries around the world learn from the experience in Haiti and prepare for mass fatality incidents. This may require planning for information seeking, recovery of human remains, preservation, communication,

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<sup>42</sup> Creativity is "Figuring out how to use what you already know in order to go beyond what you currently think" (Bruner, 1983, p. 183).

identification, and disposition of unidentified human remains based on the demands required in catastrophic disasters.

## 6.7 Chapter Summary

Recent disaster trends suggest that disasters causing mass fatalities are increasing in intensity and number and likely to increase in future because of urbanization and moving of people towards coastal areas, apart from other reasons. Holzer and Savage (2013) estimate that 3.5 million people may die because of catastrophic earthquakes between 2001 and 2100.

Mass-fatality management (MFM) is becoming prominent because of globally connected 24x7 live media coverage. The author attempted to give a vicarious experience to the reader to get the feel of the Haiti earthquake, the place, the time, the situation, and the circumstances. The researcher hopes that the reader not only gets the understanding or awareness of the information seeking in MFM and MFM, but also feels it and has empathy and concern. MFM incidents have political implications, apart from social, psychological, financial, and legal. "Management of the dead is an important concern after a disaster and it is a major social responsibility of the community and the government," asserts National Disaster Management Authority (2010, p. 2).

Events like the Haiti earthquake and other mass fatality incidents reveal that research is imperative on MFM. There is a significant need to improve MFM, including unidentified human remains in developing nations and about how international community could augment in this effort.

Denzin and Lincoln (2011) assert that qualitative researchers investigate struggles of the people to formulate public issues and then recommend social policy with the aim to bring positive changes in the world. It is hoped that this dissertation will bring about specific policy and management changes in dealing with mass fatality incidents consistent with the recommendations described in Section 6.6.

Implementation of the recommendations can alleviate psychological impacts related to Zeigarnik effect and post-traumatic stress disorder and help rebuild the devastated community. This study contributed to the advancement of our knowledge of the MFM and seeking information in managing mass fatalities and to the improvement of our ability to respond to mass-fatality disasters.

APPENDIX A

RESEARCHER IDENTITY

(Discussion: Section 3.4 and Section 3.22)

I have always been inquisitive about life. In classes I took, if I did not understand something, I would promptly raise my hand. I held the distinction of asking the most questions in all of my classes. Later, upon completing a Post-Graduate Diploma in Business Administration (equivalent to an MBA) in 1971 from the Indian Institute of Management (IIM), Ahmedabad, I wished to pursue a doctorate in Business Administration in the United States because at that time, no Indian university offered a doctoral degree in business administration; even the MBA degree was relatively new in India. But I had no money to mail applications to America.

My father died when I was four. I had four siblings. I earned a bachelor's degree in electrical engineering from the University of Rajasthan, as well as the diploma from IIM, both on scholarships and loans. When I completed the IIM diploma, I was already married with two children. My desire to pursue a doctorate in 1971 was postponed because of family responsibilities.

Today, I feel ecstatic that I have achieved my dream of 42 years.

Along the way, natural disasters have transformed my professional interests. For example, I was in Baroda, in the state of Gujarat, India, on January 26, 2001, — Republic Day — when the earth shook in a 7.7-scale earthquake. Some 20,000 people were killed as homes collapsed and the earth fissured.

With a team of nine amateur radio operators (my call sign then was VU2KIZ that is still valid until 2019 and later, in the United States, KG6SQR valid until October 2013) with their own radios, antennas and batteries, I set out that evening to establish amateur radio emergency communications. On reaching Gandhinagar, the capital, we split into four sub-teams for Bhuj, Bacho, Anjur, and Gandhinagar respectively.

I was at the state capital emergency operations center, where international search and rescue teams and disaster experts were pouring in, but I noticed a failure of command and control. If this was happening in the capital city, I shuddered to think what the situation could be in far-flung villages. Disaster management, I reflected, should not be left to politicians and bureaucrats. In that experience, I had found my calling. I decided to do something about natural disasters. My constitution had changed from business manager to disaster manager.

Cut to 2004: I was a doctoral student in emergency management at North Dakota State University, Fargo – the first university to offer a doctoral program in Emergency Management – when the Indian Ocean tsunami occurred. I was one of the “nineteen researchers from five nationalities and seven disciplines – emergency management, engineering, journalism, geography, language studies, medicine, and sociology...an international and interdisciplinary team” (Fischer, 2008, p. 175), who received a Small Grant for Exploratory Research (Award # 0522362) from the National Science Foundation (NSF) after the 2004 tsunami. I did MFM research in Sri Lanka and India after the 2004 Indian ocean tsunami (Gupta, 2005b, 2005c, 2006; Oyola-Yemaiel & Gupta, 2005, 2006).

My field research in India and Sri Lanka, following the tsunami, evoked in me passion for mass-fatality management. From being inquisitive about life, I became inquisitive about death.

I applied and received a quick response research grant from the Natural Hazards Center (NHC) of the University of Colorado at Boulder funded by the NSF to study MFM after the 2009 cyclone Aila in Bangladesh and India. By the time of completion of my

cyclone Aila research, I had completed 158 interviews of victim, physicians, administrators, military personnel, responders, volunteers, researchers, and others in mass-fatality incidents in Bangladesh, India, and Sri Lanka.

In 2010, the Haiti earthquake happened. It was an unprecedented disaster, causing unimaginable destruction, mayhem and suffering. My prior research experience about MFM helped me in deciding the Haitian earthquake setting for my dissertation research, because it involved maximum number of fatalities following a sudden onset natural disaster in a single location in recent times. Mass-fatality research in “international catastrophes is one of the most professionally, technically, and emotionally demanding areas of emergency management research” (J. Kendra, personal communication, February 11, 2010) asserted Kendra, director, Disaster Research Center of University of Delaware. My experience helped me in understanding information seeking in MFM in Haiti.

I am trained in fieldwork involving mass-fatality management (MFM) through the courses I have completed and the mentorship I received. A list of methods courses I completed are in Table A.1. I have done field research on MFM in Bangladesh, Haiti, India, and Sri Lanka, in disasters caused by cyclone, earthquake, fire, floods, landslide, and tsunami, and killing from 41 (March 23, 2010, Stephen Court Building fire, Kolkata, India) to 316,000 people (January 12, 2010, earthquake in Haiti).

Twenty-eight interviews, replete with stories of death, survival and suffering, all conducted in Haiti during two field visits following the earthquake, gave me data to produce this dissertation. I successfully proposed the dissertation to my committee well after I had made or collected the data. But even before those interviews, I had learned

and honed my interviewing skills while collecting data from 158 other affected people following the 2004 Indian Ocean tsunami in India and Sri Lanka and the 2009 Cyclone Aila in Bangladesh and India. I remain indebted to all of those interviewees for sharing with me not only their time but also their suffering.

Table A. 1

*Methods Courses Completed*

#	Sem	Course #	Course Title	Description
1 <sup>43</sup>	'05 Sp	SOC 700	Qualitative Methods	Including research design, interviewing and focus group exercises.
2	'05 Sp	EMGT 795	FE/EMGT/PRACT/LOGISTICS/INFRAS TR	Survey research to find 50 most recommended books for emergency management graduate students by faculty and researchers funded by US Federal Emergency Management Agency. Findings are on FEMA web site <a href="http://www.training.fema.gov/emiweb/edu/readinglist.asp">http://www.training.fema.gov/emiweb/edu/readinglist.asp</a> .
3	'05 Su	EMGT 795	FE/INTERNSHIP	Fieldwork in Sri Lanka and India for Cross-Cultural Analysis of Responses to Mass Fatalities following the Indian Ocean Tsunami of December 26, 2004 funded by US National Science Foundation.
4	'05 Su	EMGT 795	FE/INTERNSHIP	Internship with Prof. S. Parsuraman, Director, Tata Institute of Social Sciences, Mumbai on impact of the tsunami on Nagapattinam district, Tamil Nadu, India funded by Action Aid.
5	'05 Fa	SOC 701	Quantitative Methods	Including use of SPSS.
6	'05 Fa	EMGT 793	Individual Study	Report on Cross-Cultural Analysis of Responses to Mass Fatalities following the Indian Ocean Tsunami of

<sup>43</sup> I studied courses 1 to 7 at North Dakota State University, Fargo, and the rest at the University of North Texas, Denton.

				December 26, 2004
7	'05 Fa	EMGT 795	Field Experience	Nagapattinam District Tsunami Report
8	'08 Fa	PADM 6710	Social Science Inquiry	
9	'09 Su	PADM 6940	Directed Research	Cross-Cultural Analysis of Responses to Mass Fatalities following 2009 Cyclone Aila in Bangladesh and India funded by NSF. QR216 on Natural Hazards Center website <a href="http://www.colorado.edu/hazards/research/qr/qrpubs00s.html">http://www.colorado.edu/hazards/research/qr/qrpubs00s.html</a> .
10	'09 Fa	PADM 5500	Research Methods I	
11	'10 Sp	PADM 6940	Directed Research	Responses to Mass Fatalities in the aftermath of 2010 Haiti Earthquake funded by NSF. QR 219 on Natural Hazards Center website <a href="http://www.colorado.edu/hazards/research/qr/qrpubs10s.html">http://www.colorado.edu/hazards/research/qr/qrpubs10s.html</a> .
13	'10 Fa	SLIS 6940	Inquiry and Research Design	

The present research was in continuation of my earlier research on MFM (Gupta, 2005b, 2005c, 2006, 2009, 2010b; Oyola-Yemaiel & Gupta, 2005, 2006). The research in Haiti resulted in the following publications: Gupta (2010a, 2010c); Gupta and Sadiq (2010); McEntire et al. (2011, 2012). In addition, I presented in international conferences at the:

- (i) 17th Annual Conference of the International Emergency Management Society, Beijing, China, June 2010;
- (ii) XVII World Congress of Sociology, Gothenburg, Sweden, July, 2010;
- (iii) 4th Australasian Hazards Management Conference, Te Papa, Wellington, New Zealand, August 2010 (in absentia);

- (iv) 4th Information Systems for Crisis Response and Management Summer School for Emergency Improvement on Humanitarian Information Management and Logistics: The Case of the Haiti Earthquake, Tilburg University, the Netherlands, August 2011;
- (v) Grounded theory co-developer Barney Glaser (Glaser & Strauss, 1967) lead Grounded Theory Troubleshooting Seminar, New York City, October 2012; and
- (vi) Information Science Schools' iConference 2013, Fort Worth, TX, February 2013.

Despite the required copyright notice at the beginning of this document, I can claim no monopoly on any *knowledge* I have produced. My knowledge was built on others' findings and experiences and through a process of social interaction. Therefore, everybody – including you, my reader, whether or not you directly interacted with me – living or dead, co-owns this little knowledge in some or other way. I stand on the shoulders of not only giants but also minions.

As a child, I learned in school a poem in Hindi that is ingrained in my mind:

*Saraswati ke bhandar ki  
Badi apurva baat  
Jo jo kharche  
Thew thew badhe  
Bin karche ghati jat.*

Translated, it means the storehouse of Saraswati (the deity of learning and knowledge) has a surprising way. The more one spends from it, the more knowledge it seems to have. If not spent, the knowledge only decreases. I fervently hope that you will, in your turn, spend the little knowledge I have tried to present in this dissertation.

## APPENDIX B

### ACCESS TO FIELDWORK SITES

(Discussion: Sections 3.11.3, 3.11.4, 3.21, and Appendix D-Footnote)

In the fall of 2009, I submitted a quick response research (QRR) proposal to the Natural Hazards Center (NHC) of the University of Colorado at Boulder for “pre-approval”<sup>44</sup> to do research in sudden, catastrophic, mass-fatality, disaster-hit areas anywhere in the world, in response to the NHC’s NSF-funded QRR Program. The program intended to enable researchers quick travel to disaster-affected areas in 2010. I learned of the approval of my proposal by telephone on January 12, 2010, and coincidentally, later that same day the Haiti earthquake happened. The next day, I asked NHC to activate the grant, which would enable me to go to Haiti. The NHC informed me that because of the scale of the Haiti earthquake, a graduate student could go if teamed with a faculty member. Consequently, I as the principal investigator (PI), teamed with Abdul-Akeem Sadiq, then lecturer in the Department of Public Administration at the University of North Texas (UNT). With Sadiq, I completed the fieldwork in February of 2010. Subsequently, I was also a Co-PI along with Sadiq in a separate NSF Rapid Research Grant with McEntire as PI to do follow-up research in Haiti. I traveled to Haiti for fieldwork for the second time in May-June 2010 with McEntire and again with Sadiq.

I prepared thoroughly to conduct interviews in Haiti. For negotiating the research relationships in Haiti, I tried to source all my contacts for getting leads. I tried to tap all internal resources within UNT and outside research institutions and professional organizations. At UNT, from the international office, I tried to find if there was any student, faculty, or staff originally from Haiti. There was none. Nikhil Moro, associate

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<sup>44</sup> From 2011 there is no “pre-approval” of proposals. An applicant has to submit a complete proposal as soon as possible after a disaster occurs.

professor of journalism (not my advisor yet) introduced me to some of his colleagues and other journalists for possible leads.

I could find a faculty member associated with a humanitarian organization in Haiti and he did provide contacts in Haiti. I was also able to get contact details of an alumnus who was from Haiti and living in Dallas Fort-Worth area<sup>45</sup>. Another alumnus had just returned from Haiti after doing humanitarian work in Haiti after the earthquake.

Outside UNT, I contacted Earthquake Engineering Research Institute (EERI), located in Oakland, California. I am a member of EERI and it had sent a delegation for reconnaissance. Similarly, I also contacted a researcher from the Disaster Research Center of the University of Delaware who had returned after research in Haiti. In addition, I contacted other grantees<sup>46</sup> of QRR from NHC, who had been to Haiti. These efforts helped me better prepare for my field experience by learning from the experiences of the researchers who were recently in Haiti after the earthquake. These researchers also explained me the real conditions in Port-au-Prince, logistic facilities, and other details.

From the news media, I became aware of an UNT alumnus who was in Haiti. He had returned to Dallas-Fort Worth Metropolitan area in late January 2010. I contacted him and he came to meet me. He helped me in establishing a relationship with one of his friends who was still in Haiti. That person had worked in Haiti for a number of years and was knowledgeable about the culture and the earthquake situation. I hired him as

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<sup>45</sup> This alumnus later transcribed an audio-recorded interview in which the interviewee spoke in Creole and a local translator helped in conducting the interview. The transcript, I prepared from the English in audio-recorded interview and the transcript prepared by this alumnus by hearing in Creole and transcribing in English were almost identical.

<sup>46</sup> A list of grantees of quick response research program 2010 is available at <http://www.colorado.edu/hazards/research/qr/winners.html>

our local consultant, and he arranged for my translator, who was also my taxi driver. My consultant was briefed about my research, who I was, and what type of interviewees I was looking for. The consultant was also to help in local logistics, such as hotel accommodation.

The consultant had pre-arranged interviews before my researching Port-au-Prince. On reaching Port-au-Prince International Airport, the consultant and the translator-cum-driver met me and took me to the hotel. The next day, finalized the terms and conditions of their assignment and payment terms.

## APPENDIX C

### APPROVAL OF INTERVIEW PROTOCOL AND INFORMED CONSENT FORM

(Discussion: Sections 3.11.4, 3.20, and Appendix H)



OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC DEVELOPMENT  
Office of Research Services

March 6, 2009

Kailash Gupta  
Department of Public Administration  
University of North Texas

Re: Human Subjects Application No. 09090

Dear Kailash Gupta:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "Cross Cultural Analysis of Responses to Sudden Catastrophic Mass Mortalities." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, March 6, 2009 to March 5, 2010.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. Please mark your calendar accordingly. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourms, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,

Patricia L. Kaminski, Ph.D.  
Associate Professor  
Chair, Institutional Review Board

PK:sb

CC: David McEntire

## University of North Texas Institutional Review Board

### Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study:** Cross Cultural Analysis of Responses to Sudden Catastrophic Mass Mortalities

**Principal Investigator:** Kailash Gupta, a graduate student in the University of North Texas (UNT) Department of Public Administration, Denton, Texas, USA

**Purpose of the Study:** You are being asked to participate in a research study which involves how the dead bodies were dealt with in the disaster.

**Study Procedures:** You will be asked to explain how the bodies were recovered, moved, stored, identified, information about bodies disseminated, how bodies were given to the family members, and how the unclaimed bodies were dealt with? It may take about 20 minutes of your time.

**Foreseeable Risks:** The potential risk involved in this study is that you may feel slightly uncomfortable about talking of dead bodies.

**Benefits to the Subjects or Others:** We expect the project to benefit you as sharing may be therapeutic to you. Your sharing will help in evolving policy and procedures for dealing with disaster mass mortalities situations in future.

**Procedures for Maintaining Confidentiality of Research Records:** The confidentiality of your individual information will be maintained in any publications or presentations regarding this study. Your identity will be kept anonymous. The information collected from you, including audio and / or video recording will not have your name or other identifiable data, and shall be coded. Your signed consent form and the coded survey results will be kept separately. Nobody other than the Principal Investigator will have access to them. The survey results are required to be kept for three years. After completion of the study, when the data will be no longer required, they will be discarded by appropriate means.

**Questions about the Study:** If you have any questions about the study, you may contact Kailash Gupta, Principal Investigator by email at [kailashgupta@my.unt.edu](mailto:kailashgupta@my.unt.edu) or at telephone number +1 408 876 0136, If you may so like you may also contact faculty advisor, Dr. David McEntire, UNT Department of Public Administration, at [mcentire@unt.edu](mailto:mcentire@unt.edu) or at telephone number + 1 940 565 2996.

Office of Research Services  
University of North Texas  
Last Updated: August 9, 2007

1 of 2

**Review for the Protection of Participants:** This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at shelia.bourms@unt.edu or (940) 565-3940 with any questions regarding the rights of research subjects.

**Research Participants' Rights:** Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Kailash Gupta has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and you may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

\_\_\_\_\_  
Printed Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

**For the Principal Investigator:** I certify that I have reviewed the contents of this form with the participant signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

\_\_\_\_\_  
Signature of Principal Investigator

\_\_\_\_\_  
Date

APPROVED BY THE UNT IRB  
FROM 3/16/09 TO 3/5/10

APPENDIX D

TIMING OF RESEARCH FIELD ENTRY

(Discussion: Section 3.11.4)

I submitted quick response research proposal in fall 2009 to Natural Hazards Center for quick travel to any mass-fatality disaster field in 2010. In the morning of January 12, 2010, I called program officer of NHC to know the status of my application and I was informed that I proposal was approved. Same day in the evening earthquake happened in Haiti. I contacted NHC on January 13, 2010, to activate my grant and travel to Haiti. The NHC advised me to begin the fieldwork relatively early as the condition of the grant. Some other awardees from NHC had gone to Haiti by first flying to the Dominican Republic and then traveling by road to Haiti, as all commercial flights to Haiti were cancelled after the earthquake on January 12, 2012. The TV media, such as CNN and other channels, continuously gave live coverage of horrible pictures of the Haiti earthquake from January 12, 2010, onwards.

I was concerned about where would I stay, because I saw disturbing images in the media and the reports of the havoc in Haiti. I was wondering should I carry tent, water, food, and other supplies. I was also concerned about my safety, security, and the establishment of communication links once I would be in Haiti. US government and International Office of the UNT issued an advisory against visiting Haiti unless absolutely necessary.

I prepared for the fieldwork with the help of a local consultant<sup>47</sup> to conduct interviews. I also prepared for any eventuality or worst-case scenario. I booked the flights from Dallas Fort-Worth airport to Port-au-Prince. However, flights were repeatedly cancelled. As soon as commercial flights resumed, I departed on February 23, 2010. I remained in Haiti for six days (Gupta & Sadiq, 2010).

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<sup>47</sup> See Appendix B on Access.

In retrospect, I was over-prepared for the fieldwork in Haiti. However, in a catastrophic disaster it is better to be over-prepared than under-prepared and suffer the consequences. For example, I carried sleeping bag, foldable water containers, water purification liquid and chlorine tablets, headlamps, and other material, which were not required. I was able to stay safely in Ideal Villa Apart-Hotel,<sup>48</sup> located in Delmas 53 area of Port-au-Prince. During my stay, it was fully functioning air-conditioned hotel. I was able to get bottled water, some fruits, milk, cereals, and rice preparations in the hotel. In a fast food restaurant, I was able to get pizza and Coco-Cola. Whenever I was at the United Nations Stabilization Mission in Haiti, I was able to eat different varieties of international cuisine. I was able to move in and around Port-au-Prince in a taxi I hired without any difficulty.

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<sup>48</sup> In the building adjoining to the hotel, five people died because of the earthquake.

APPENDIX E  
INTERVIEW QUESTIONNAIRE USED IN FIELDWORK  
(Discussion: Section 3.15)

1. How were bodies removed from collapsed buildings?
2. Who moved bodies from their original location and to what locations?
3. What was the waiting period for the disposition of the unidentified bodies?
4. What records were kept, if any, of unidentified bodies before disposition? What is the final body count and how accurate is the estimate?
5. Was public notice given about last rites?
6. What rituals were performed, if any? Were religious leaders present during last rites? If yes, of which religious faith(s)?
7. Were the unidentified bodies buried or cremated?
8. Is it possible that buried bodies could be exhumed for possible identification in future?
9. What lessons do we learn from MFM in Haiti?

*Note: The questionnaire comprises queries listed in two successful project proposals submitted to the Natural Hazards Center and the National Science Foundation on January 13, 2010, and March 5, 2010, respectively.*

APPENDIX F  
QUALITATIVE DATA ANALYSIS SOFTWARE  
(Discussion: Sections 3.0, 3.18, and 6.0)

I studied literature on the use of computer-assisted qualitative data analysis software (CAQDAS), including Bazeley (2007); Lewins and Silver (2007); Richards (2005); and Saldana (2009).

The working of computer-assisted qualitative data analysis software<sup>49</sup> vary from program to program, but the idea is pretty much the same in full-featured text management software, like Atlas.ti or NVivo or MAXQDA. The codes are linked to chunks of text or to points in the text, and the codes and memos are all linked. You build a codebook as you go, highlighting a chunk of text and assigning it a code by opening up a codebook window. If the code exists already (if you are used it before for some other chunk of text), you just click on the code and the highlighted chunk of text (or the point in the text) is then associated with that code. If you need a new code, you name it and add it to the codebook.

As you code, you think of things to say about the text—memos. Whenever you like, you indicate the presence of a memo. A window opens and you start typing your observations. Memos are hyperlinked to the text so that later, as you read through your marked-up text, you can click on any memo indicator and the memo will pop up in a window. You can add, delete, or edit memos as your analysis progresses.

CAQDAS have been in use for over 20 years and they have improved and are continuing to improve. As a result, the use of CAQDAS is also increasing. There are many CAQDAS, among them Atlas.ti, NVivo, and MAXQDA are the leaders. I studied articles and material available on the leading CAQDAS software Atlas.ti, NVivo, and

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<sup>49</sup> The working of CAQDAS in second and third paragraphs is reproduced with minor change from *Analyzing Qualitative Data: Systematic Approaches* by Bernard and Ryan (2010), pp. 91 & 93.

MAXQDA websites. Then I examined and worked on trial version of the Atlas.ti, NVivo, and MAXQDA. I also consulted people who have used CAQDAS software.

I found MAXQDA to be relatively more user friendly compared to other two leading NVivo and Atlas.ti CAQDAS. The interface of the MAXQDA is better. After a comprehensive evaluation, I purchased MAXQDAplus version 10 (for the sack of brevity MAXQDA is used in this dissertation and not MAXQDAplus version 10) in 2011. In 2012, MAXQDA 11 was released and I purchased MAXQDA 11. Corbin and Strauss (2008) explain qualitative research with a real example using MAXQDA.

## APPENDIX G

### AN EXAMPLE OF CODING IN MAXQDA

(Discussion: Sections 3.0, 3.18, and 3.19)

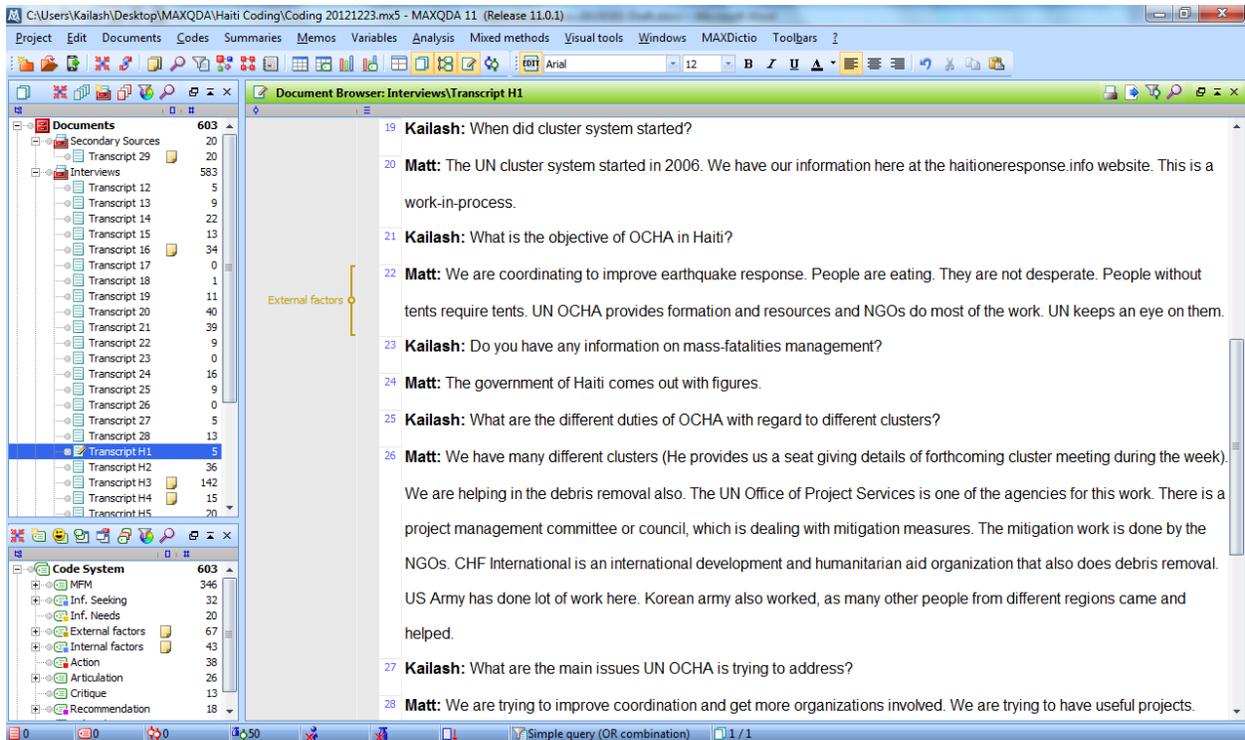


Figure G.1. Sample screen shot of coding in MAXQDA.

A screen shot from MAXQDA, the qualitative data analysis software, shows three windows. The left top Documents window shows numbered interview transcripts. The number towards right side of the transcript number is the number of segments coded of that transcript. For an example, five segments were coded from Transcript 12. The figure on top left indicates 603, the total number of segments of all the transcripts coded.

The left bottom window shows Code System. In this window towards left is list of primary codes, followed by number of coded segments. The plus sign before a code indicates that there are codes within that code. At the top, this window again shows 603, the total number of segments of all the codes.

The right hand window is Document Browser window. By clicking on the transcript in the Documents window, the transcript may be seen in Document Browser window.

The screen shot shows the transcript of the interview with Matthew Hewett. At the time of the interview Matthew Hewett was Manager, Information Management Unit, Office of the Coordination of Humanitarian Affairs (OCHA), United Nations in Port-au-Prince. The Documents window shows that five segments of his transcript were coded. The Document Browser shows part of the transcript of the interview. The Document Browser also shows that “People without tents require tents” was coded in external factors.

APPENDIX H  
ETHICAL CONSIDERATIONS  
(Discussion: Section 3.20)

Section 7009 of the America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act of 2007 mandates each institution that receives National Science Foundation (NSF) grant to provide training and oversight in the responsible and ethical conduct of research by graduate students. A federal policy mandates protection of human subjects.<sup>50</sup> The Institutional Review Board (IRB) of UNT administers that policy.

The Natural Hazards Center (NHC) invited quick response research (QRR) grant proposals in the fall of 2008 from researchers for “pre-approval”<sup>51</sup> to enable quick travel during 2009 to disaster-affected areas to capture perishable data. On November 14, 2008, the author submitted a QRR proposal for pre-approval to do research in sudden, catastrophic, mass-fatality, disaster-affected area(s) anywhere in the world. The proposal was approved on January 22, 2009. One of the conditions to activate the grant or travel to one or more disaster fields was to submit an official copy of the IRB approval to the NHC. The author completed an online course on ethical conduct of research and received a Certificate Number 189947 on February 21, 2009. He submitted an application for IRB approval on February 23, 2009, with that certificate. The IRB approval was granted on March 6, 2009, for a period of one year (Appendix C).

The researcher again submitted a QRR application to NHC that was approved on January 12, 2010. The informed consent form was translated into Creole, the local

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<sup>50</sup> See, Office for Human Research Protection, US Department of Health & Human Services website <http://www.hhs.gov/ohrp/>. Human subjects are interviewees. See Section 3.6 for discussion n of the terms subject, informant, respondent, and interviewee.

<sup>51</sup> Post 2011 there is no "pre-approval" of proposals. An applicant has to submit a complete proposal as soon as possible after a disaster occurs.

language, for use in Haiti with English version. Seventeen interviews were conducted in February 2010 after obtaining signatures on the informed consent forms.

The IRB approval is valid for one year and the principal investigator (PI) has to submit an annual progress report. The original IRB approval was set to expire on March 5, 2010. The researcher submitted a renewal request to the IRB on February 16, 2010. The same day, the IRB extended the approval of the informed consent form until March 5, 2011.

After the Haiti earthquake, the researcher expected NSF to issue a Dear Colleague letter inviting for Rapid Research Grant (RAPID) proposals. The researcher started preparing the grant proposal right after the earthquake, but he as a graduate student could not have been a PI for the RAPID proposal. He submitted a modification application to IRB to change the PI from Gupta to McEntire and to add Sadiq and Gupta as Co-PIs. The IRB approved the request on March 3, 2010 approving the project from March 6, 2010 to March 5, 2011. A RAPID: Cross-Cultural Analysis of the Disposition of Unidentified Bodies in Haiti (proposal # 1034799) was submitted to NSF on March 5, 2010. UNT received the approval of NSF for this project on March 11, 2010. Under this approval, eleven interviews were conducted after getting informant signatures on the informed consent forms in Haiti in May-June 2010.

After traveling to the disaster field, the researchers (Gupta and Sadiq in February 2010; Gupta, McEntire, and Sadiq in May-June 2010) explained to prospective interviewees that their research might help in managing future mass-fatality incidents. They did not have any explicit agreement or implicit understanding with the interviewees about the research reporting, except promising that their identity would not be disclosed

unless the interviewee agreed. In all, nine of the 28 interviewees gave consent to release their identity in publications.

In making awareness of the local culture, the consultant and the translator helped the researcher. The consultant and the translator also helped researchers in getting quality information. The researcher made sure that interviewees felt that they were important. The researcher thinks that in the interview process, his training as a certified psychological counselor using Krokoff model of Counseling and Transactional Analysis knowledge, apart from Rational Emotive Therapy and Gestalt Therapy also helped. Some of the participants who lost their family members in the earthquake felt that the interview was therapeutic for them. This is the interpretation based on researcher's reading of interviewees nonverbal signals. McEntire and Sadiq corroborated this, as they were present during three interviews of second phase and Sadiq was present during all the 17 interviews in the first phase.

The researcher believes that there was no ethical challenge during the fieldwork. This is particularly important when the interviewees did not speak English. There is sometimes a possibility of communication loss in translation, because there may be words in vernacular that are untranslatable in English.

## APPENDIX I

### USE OF RFID CHIPS FOR IDENTIFICATION OF HUMAN REMAINS

(Discussion: Sections 4.1.5.5 and 6.6.2.6)

“Management of the dead is an important concern after a disaster and is a major social responsibility of the community and the government” (National Disaster Management Authority, 2010, p. 2). Identification of the dead is important for compensation from government, insurance, inheritance, and remarriage. If an unidentified body is cremated, buried without markings, or otherwise disposed of without proper records, it may never be possible to identify the body. Identifications of cadavers are also important because otherwise it leads to the failure of closure (Zeigarnik effect) that could have major consequences. Disposition of cadavers without identification could lead to the Zeigarnik (1967) effect on bereaving family and surviving community.

The family members or neighbors have traditionally done identifications of cadavers by the appearance, body identification marks, clothing, possessions on the body, and photographs. Forensic methods involving use of post-mortem tissues, fingerprints, dental records, and DNA testing have also been used. However, these require anti-mortem records for matching that may not be available.

According to an official of Disaster Mortuary Operations Response Team interviewed in Port-au-Prince, radio-frequency identification (RFID) chips were used after Katrina. The RFID implantable microchip, of VeriChip Corporation received Food and Drug Administration clearance in October 2004. VeriChip was later acquired by PositiveID Corporation (PositiveID Corporation, 2012). Harrison County, Mississippi, Coroner Gary T. Hargrove, who oversees Disaster Mortuary Operational Recovery Team, used RFID Chips on 48 unidentified bodies (See Figure I.1) (Block, 2005; O'Connor, 2007) said, "It's better enabled me to do my job as the coroner — tracking and getting people's loved ones back to them quickly" (MSN, 2005).

RFID chip information technology method is used in the body before temporary internments. Crabtree (2009) explains:

Temporary internments are where bodies are wrapped or bagged with accompanying documentation and laid respectfully in rows 1.5 m deep (trenches are OK). The ground temperature remains 50–55°F (10–12°C) and good documentation will allow for future disinterment and reburial if necessary. (p. 44)

## REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Archibold, R. C. (2012, September 13). Palace in Haiti, damaged by quake, is being razed, *The New York Times*. Retrieved from [http://www.nytimes.com/2012/09/14/world/americas/haitis-national-palace-being-demolished.html?\\_r=0](http://www.nytimes.com/2012/09/14/world/americas/haitis-national-palace-being-demolished.html?_r=0)
- Arguirre, B. E. (2002). *Information seeking behavior in collective surges: Testing alternative collective behavior formulations. Preliminary Paper 323*. <http://dspace.udel.edu:8080/dspace/handle/19716/732>
- Aswalap, S. (2009). *Tsunami disaster response: A case analysis of the information society in Thailand*. (Doctoral dissertation). ProQuest Dissertation and Thesis database. (UMI Number 3399390)
- Atkin, C. (1973). Instrumental utilities and information seeking. In P. Clarke (Ed.), *New models for mass communication research*. Oxford, England: SAGE.
- Babbie, E. (2010). *The practice of social research* (12th ed.). Belmont, CA: Wadsworth.
- Babbie, E. (2011). *The basics of social research* (5th ed.). Belmont, CA: Wadsworth.
- Bates, M. J. (1999). The invisible substrate of information science. *Journal of the American Society of Information Science*, 20(12), 1043-1050.
- Bates, M. J. (2010). Information Behavior. In M. J. Bates & M. N. Maack (Eds.), *Encyclopedia of library and information sciences* (3rd ed., pp. 2381-2391). New York: CRC Press.
- Bazeley, P. (2007). *Qualitative data analysis with NVivo*. Thousand Oaks, CA: SAGE.
- Belkin, N. J. (1980). Anomalous states of knowledge as a basis for information retrieval. *Canadian Journal of Science*, 5, 133-143.
- Belkin, N. J., Oddy, R. N., & Brooks, H. M. (1982). ASK for information retrieval: Part I. Background and theory. *Journal of Documentation*, 38(2), 61-71.
- Belkin, N. J., & Robertson, S. E. (1976). Information science and the phenomenon of information. *Journal of the American Society for Information Science*, 27(4), 197-204. doi: 10.1002/asi.4630270402
- Berger, J. (2011, February 20). 100 years later, the roll of the dead in a factory fire is complete, *The New York Times*. Retrieved from [http://www.nytimes.com/2011/02/21/nyregion/21triangle.html?pagewanted=1&\\_r=0](http://www.nytimes.com/2011/02/21/nyregion/21triangle.html?pagewanted=1&_r=0)

- Bernard, H. R., & Ryan, G. W. (2010). *Analyzing qualitative data: Systematic approaches*. Thousand Oaks: SAGE.
- Bertman, S. L. (1974). Death education in the face of a taboo. In E. A. Grollman (Ed.), *Concerning death: A practical guide for the living* (pp. 334). Boston, MA: Beacon Press.
- Black, A. (2006). Information history. *Annual Review of Information Science and Technology*, 40(1), 441-473. doi: 10.1002/aris.1440400118
- Black, S. M., Sunderland, G., Hackman, L., & Mallet, X. (Eds.). (2011). *Disaster victim identification: Experience and practice*. Boca Raton, FL: Taylor and Francis
- Blanchard, B. W. (2008). *Guide to emergency management and related terms, definitions, concepts, acronyms, organizations, programs, guidance, executive orders & legislation: A tutorial on emergency management, broadly defined, past and present* (pp. 1366). Retrieved from <http://training.fema.gov/EMIWeb/edu/docs/terms%20and%20definitions/Terms%20and%20Definitions.pdf>
- Block, M. (Producer). (2005, November 29, 2010). *Mississippi coroner describes effort to recover bodies*. Retrieved from <http://www.npr.org/templates/story/story.php?storyId=4835174>
- Bodies handed over ignoring procedure in Rajasthan. (2010, March 30). *The Indian Express*. Retrieved from <http://www.indianexpress.com/news/bodies-handed-over-ignoring-procedure-in-rajasthan/597664/0>
- Borko, H. (1968). Information science: What is it? *American Documentation*, 19(1), 3-5.
- Brenner, C. H. (2006). Some mathematical problems in the DNA identification of victims in the 2004 tsunami and similar mass fatalities. *Forensic Science International*, 157(2-3), 172-180.
- Brown, T., & Delva, J. G. (2011). *Haiti revises quake death toll up to over 316,000*, p. 1. Retrieved from <http://www.reuters.com/article/2011/01/12/haiti-quake-toll-idUSN1223196420110112>
- Bruner, J. (1983). *In search of mind*. New York: Harper.
- Bryant, A., & Charmaz, K. (2007). *The SAGE handbook of grounded theory*. Thousand Oaks, CA: SAGE.
- Buckland, M. K. (1991). Information as thing. *Journal of the American Society for Information Science*, 42(5), 351-360.
- Burns, J. F., & Cowell, A. (2013, February 5). Identifying Richard III took more than a hunch., *San Jose Mercury News*.

- Bystrom, K., & Jarvelin, K. (1995). Task complexity affects information-seeking and use. *Information Processing & Management*, 31(2), 191-213. doi: 10.1016/0306-4573(94)00041-z
- Capurro, R., & Hjørland, B. (2003). The concept of information. *Annual Review of Information Science and Technology*, 37(1), 343-411. doi: 10.1002/aris.1440370109
- Carney, S. (2010). *The red market: On the trail of the world's organ brokers, bone thieves, blood farmers, and child traffickers* New York: HarperCollins.
- Case, D. O. (2007). *Looking for information: A survey of research on information seeking, needs, and behavior* (2nd ed.). Bingley, UK: Emerald Group Publishing.
- Case, D. O. (2012). *Looking for information: A survey of research on information seeking, needs and behavior* (3rd ed.). Bingley, UK: Emerald Group Publishing.
- Celik, S., & Corbacioglu, S. (2010). Role of information in collective action in dynamic disaster environments. *Disasters*, 34(1), 137-154. doi: 10.1111/j.0361-3666.2009.01118.x
- Charles, J. (2012, August 22). Decision to demolish Haiti National Palace draws strong criticism, *The Miami Herald*. Retrieved from <http://www.miamiherald.com/2012/08/22/v-fullstory/2963776/haiti-national-palace-decision.html>
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: SAGE.
- Cheney, A. (2006). *Body brokers: Inside America's underground trade in human remains*. New York: Broadway Books.
- Chertoff, M. (2012). Forward. In E. A. Gursky & M. F. Fierro (Eds.), *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Choi, S. O. (2008). Emergency management: Implications from a strategic management perspective. *Journal of Homeland Security and Emergency Management*, 5(1).
- Comfort, L. K., Cigler, B. A., & Waugh, W. L., Jr. (2012). Emergency management research and practice in public administration: Emergence, evolution, expansion, and future directions. *Public Administration Review*, 72(4). doi: 10.1111/j.1540-6210.2012.02549.x
- Corbin, J., & Morse, J. M. (2003). The unstructured interactive interview: Issues of reciprocity and risks when dealing with sensitive topics. *Qualitative Inquiry*, 9(3), 335-354. doi: 10.1177/1077800403009003001

- Corbin, J. M., & Strauss, A. C. (2008). *The basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: SAGE.
- Crabtree, J. (2009). Emergency management and mass fatalities: Who owns the dead? *Journal of Business Continuity & Emergency Planning*, 4(1), 33-46.
- Creswell, J. W. (2006). *Qualitative inquiry and research design: Choosing among five traditions* (3rd ed.). Thousand Oaks, CA: SAGE.
- Creswell, J. W. (2007). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Printice Hall.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: SAGE.
- Crews, D. T. (1999). Why emergency management as a profession? *Journal of the American Society of Professional Emergency Planners*, 6, 23-25.
- Cwiak, C. L. (2012). *Shaping the future: A status report on emergency management higher education*. Paper presented at the 15th Annual Emergency Management Higher Education Conference, Emmitsburg, MD.  
<http://training.fema.gov/emweb/edu/12conf/presentations/Cwiak>
- Daniel, T. (2013, January 11). Haitian government to hold subdued ceremony on 3rd anniversary of devastating earthquake. *Newser: Read less know more*. Reterieved from <http://www.newser.com/article/da3octr00/haitian-government-to-hold-subdued-ceremony-on-3rd-anniversary-of-devastating-earthquake.html>
- Davis, H., & Scraton, P. (1999). Institutionalised conflict and the subordination of 'loss' in the immediate aftermath of UK mass fatality disasters. *Journal of Contingencies and Crisis Management*, 7(2), 86-97. doi: 10.1111/1468-5973.00102
- Davis, R. A., & Bailey, C. A. (1964). *Bibliography of use studies*. Philadelphia: Drexel Institute of Technology, Graduate School of Library Science.
- de Cosmo, S. (2012). *Decision support tool for mass fatality victim identification*. (Doctoral dissertation). ProQuest Dissertation and Thesis database. (UMI Number 3494492)
- Debons, A. (2008). *Information science 101*. Lanham, MD: The Scarecrow Press.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The SAGE handbook of qualitative research*. Thousand Oaks, CA: SAGE.

- Dervin, B. (1983). Information as a user construct: The relevance of perceived information needs to synthesis and interpretation. In S. A. Ward & L. J. Reed (Eds.), *Knowledge structure and use: Implications for synthesis and interpretation* (pp. 153-184). Philadelphia: Temple University Press.
- Dervin, B. (1992). From the mind's eye of the "user": The sense-making qualitative-quantitative methodology. In J. D. Glazier & R. R. Powell (Eds.), *Qualitative research in information management* (pp. 61-84). Englewood Cliffs, CO: Libraries Unlimited.
- Desouza, K. C., & Johnston, E. W. (Forthcoming). *Conceptualizing policy informatics*. Cambridge, MA: MIT Press.
- Detlor, B. (2010). Information management. *International Journal of Information Management*, 30(2), 103-108. doi: 10.1016/j.ijinfomgt.2009.12.001
- Disaster Research Center. (2012). Quick response studies. <http://www.udel.edu/DRC/projects/Quick%20Response.html>
- Dochartaigh, N. O. (2012). *Internet research skills* (3rd ed.). London: SAGE.
- Drabek, T. E. (2003). *Strategies for coordinating disaster response*. Boulder, CO: Institution of Behavioral Science, University of Colorado.
- Drabek, T. E., & McEntire, D. A. (2002). Emergent phenomena and multiorganizational coordination in disasters: Lessons from the research literature. *International Journal of Mass Emergencies and Disasters*, 20(2), 197-224.
- Dresing, T., Phel, T., & Schmieder, C. (2012). *Manual (on) transcription: Transcription conventions, software guides and practical hints for qualitative researchers* T. Dresing, T. Phel & C. Schmieder (Eds.), Retrieved from <http://www.audiotranskription.de/english/transcription-practicalguide.htm>
- Dretske, F. I. (1981). *Knowledge and the flow of information*. Cambridge, MA: MIT Press.
- Dror, Y. (1988). Decision making under disaster conditions. In L. K. Comfort (Ed.), *Managing disaster: Strategies and policy perspectives*. Durham, NC: Duke University Press.
- Dynes, R. R., & Quarantelli, E. L. (1993). The place of the 1917 explosion in Halifax harbor in the history of disaster research: The work of Samuel H. Prince. (Preliminary Paper # 189). <http://dspace.udel.edu:8080/dspace/handle/19716/576>
- Earthquake Engineering Research Institute. (2010). *Learning form earthquake - The Mw 7.0 Haiti Earthquake of January 12, 2010: Report #2* Retrieved from [https://www.eeri.org/site/images/eeri\\_newsletter/2010\\_pdf/Haiti\\_Rpt\\_2.pdf](https://www.eeri.org/site/images/eeri_newsletter/2010_pdf/Haiti_Rpt_2.pdf)

- Editorial: The fire that changed everything. (2011, February 23). *The New York Times*, p. A18.
- Eisenhardt, K. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 562-550.
- EM-DAT. (2013). *EM-DAT: The OFDA/CRED International Disaster Database*. Retrieved from: <http://www.emdat.be>
- Farmer, P. (2011). *Haiti after the earthquake*. New York: PublicAffairs.
- Fidel, R. (1992). The case study method: A case study. In J. D. Glazier & R. R. Powell (Eds.), *Qualitative research in information management*. Englewood, CO: Libraries Unlimited.
- Final six victims identified in 2011. (2011). Remembering the 1911 Triangle Factory Fire. Retrieved from <http://www.ilr.cornell.edu/trianglefire/victimsWitnesses/unidentifiedVictims.html>
- Finn, J. A. (2005). *Getting a PhD: An action plan to help manage your research, your supervisors and your project*. London: Routledge.
- Fischer, H. W. I. (2008). *Response to disaster: Fact versus fiction and its perpetuation, the sociology of disaster* (3rd ed.). Lanham, MD: University Press Of America.
- Fritz, C. E. (1961). Disaster. In R. K. Merton & R. A. Nisbet (Eds.), *Contemporary social problems* (pp. 651-694). New York: Harcourt.
- Fritz, C. E., & Marks, E. S. (1954). The NORC studies of human behavior in disaster. *Journal of Social Issues*, 10(3), 26-41. doi: 10.1111/j.1540-4560.1954.tb01996.x
- Frodeman, R., Klein, J. T., & Mitcham, C. (Eds.). (2010). *The Oxford handbook of interdisciplinarity*. Oxford: Oxford University Press.
- Ghosh, B. (2010, January 27). Haiti's mass graveyard of old and new nightmares. *TIME Magazine*.
- Glaser, B., & Strauss, A. C. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Glazier, J. D., & Powell, R. R. (1992). *Qualitative research in information management*. Libraries Unlimited Englewood.
- Gleick, J. (2011). *The information: A history, a theory, a flood*. New York: Pantheon Books.

- Government of the Republic of Haiti. (2010). *Action plan for national recovery and development of Haiti: Immediate key initiatives for the future*. Retrieved from [http://www.haiticonference.org/Haiti\\_Action\\_Plan\\_ENG.pdf](http://www.haiticonference.org/Haiti_Action_Plan_ENG.pdf).
- Gross, J. (2013, January 19-20). Bones of contention: If the skelton is Richard III, where to bury it?, *The Wall Street Journal*, pp. A1-7.
- Grover, R. (1992). Qualitative research in library and information professional education. In J. D. Glazier & R. R. Powell (Eds.), *Qualitative research in information management*. Englewood, CO: Libraries Unlimited.
- Gu, Q., & Mendonca, D. (2005). Patterns of group information-seeking in a simulated emergency response environment. In B. V. d. Walle & B. Carlé (Eds.), *Proceedings of the 2nd International ISCRAM Conference Brussels, Belgium, April 2005*. Brussels, Belgium: International Community on Information Systems for Crisis Response & Management.
- Guha-Sapir, D., Hargitt, D., & Hoyois, P. (2004). *Thirty years of natural disasters 1974-2003: The numbers*. Brussels, Belgium: Centre for Research on the Epidemiology of Disasters.
- Gupta, K. (2005a). *Body of knowledge: Graduate level - fifty most recommended books for graduate students by graduate faculty of emergency management in USA*. Retrieved from: <http://www.training.fema.gov/emiweb/edu/readinglist.asp>
- Gupta, K. (2005b). *Nagapattinam district tsunami report*. Department of Sociology, Anthropology, and Emergency Management. North Dakota State University.
- Gupta, K. (2005c). *A report on India and Sri Lanka's response to mass fatalities following 2004 tsunami*. Department of Sociology, Anthropology, and Emergency Management. North Dakota State University.
- Gupta, K. (2006). Handling the tsunami dead. In National Institute of Disaster Management (Ed.), *First Indian Disaster Management congress abstracts* (pp. 132). New Delh: National Institute of Disaster Management.
- Gupta, K. (2009). *Cross-cultural analysis of response to mass-fatalities following 2009 Cyclone Aila in Bangladesh and India. Quick Response Report Number 216* [http://www.colorado.edu/hazards/research/qr/submitted/gupta\\_2009.pdf](http://www.colorado.edu/hazards/research/qr/submitted/gupta_2009.pdf)
- Gupta, K. (2010a). A cross-cultural analysis of the disposition of unidentified bodies following sudden catastrophic disasters. In T. Nagai, L. Conly, E. Fontanilla, D. Miller, M. Ruben & K. Stevens (Eds.), *XVII World Congress of Sociology, Gothenburg, Sweden, 11-17 July, 2010, Conference Abstracts* (pp. 183). Gothenburg, Sweden: International Sociology Association.

- Gupta, K. (2010b, June). *Cross-cultural analysis of the disposition of unidentified bodies in Haiti: Preliminary findings*. Paper presented at the 17th Annual Conference of The International Emergency Management Society, Beijing.
- Gupta, K. (2010c). Disposition of earthquake unidentified bodies in Haiti. In C. Stewart (Ed.), *From warning to effective response and recovery: Proceedings of the 4th Australasian Hazards Management conference, Te Papa, Wellington, New Zealand, 11-12 August 2010* (pp. 23). Wellington, New Zealand: Institute of Geological and Nuclear Sciences Limited.
- Gupta, K. (2010d). Higher education and certification opportunities in emergency management. In S. Knezic, N. Rosmuller, L. Xue, J. Li, G. Qu & J. Zhang (Eds.), *Proceedings of the International Emergency Management Society (TIEMS), 17th annual conference, June 8-11, 2010* (pp. 250-260). Beijing, China: TIEMS China Chapter.
- Gupta, K. (2011). INTERPOL. In K. B. Pennel & M. Staler (Eds.), *Encyclopedia of disaster relief* (pp. 361-362). Thousand Oaks, CA: SAGE.
- Gupta, K., & Sadiq, A.-A. (2010). *Responses to mass-fatalities in the aftermath of 2010 Haiti earthquake. Quick Response Report Number 219*.  
[http://www.colorado.edu/hazards/research/gr/submitted/gupta\\_2010.pdf](http://www.colorado.edu/hazards/research/gr/submitted/gupta_2010.pdf)
- Gursky, E. A. (2012a). The policy of mass fatality. In E. A. Gursky & M. F. Fierro (Eds.), *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Gursky, E. A. (2012b). Preface. In E. A. Gursky & M. F. Fierro (Eds.), *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Gursky, E. A., & Fierro, M. F. (2012). *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Haitian government to hold subdued ceremony on 3rd anniversary of devastating earthquake. (2013, January 13). *The Washington Post*. Retrieved from [http://www.washingtonpost.com/world/the\\_americas/haitian-government-to-hold-subdued-ceremony-on-3rd-anniversary-of-devastating-earthquake/2013/01/11/f7ec034c-5c54-11e2-b8b2-0d18a64c8dfa\\_story.html](http://www.washingtonpost.com/world/the_americas/haitian-government-to-hold-subdued-ceremony-on-3rd-anniversary-of-devastating-earthquake/2013/01/11/f7ec034c-5c54-11e2-b8b2-0d18a64c8dfa_story.html)
- Hand, D., Mannila, H., & Smyth, P. (2001). *Principles of data mining*. Cambridge, MA: MIT Press.
- Heath, R. (1999). The Kobe earthquake: some realities of strategic management of crises and disasters. *Disaster Prevention and Management*, 4(5), 11-24.

- Hecker, E. J., & Bruzewicz, A. J. (2008). Emergency management internationalL  
Improving national and international disaster preparedness and response. *International Journal of Emergency Management*, 5(3/4), 250-260.
- Henninger, E. (Producer). (2010). Haiti's Signal FM radio to be honored at NABEF's service to America awards. Retrieved from [http://www.signalfmhaiti.com/index.php?option=com\\_content&view=article&id=2327:haitis-signal-fm-radio-to-be-honored-at-nabefs-service-to-america](http://www.signalfmhaiti.com/index.php?option=com_content&view=article&id=2327:haitis-signal-fm-radio-to-be-honored-at-nabefs-service-to-america)
- Holzer, T. L., & Savage, J. C. (2013). Global Earthquake Fatalities and Population. *Earthquake Spectra*, 29(1), 155-175. doi: 10.1193/1.4000106
- International Federation of Red Cross and Red Crescent Societies. (2005). *World Disasters Report 2005: Focus on information in disasters*. Geneva: Author.
- INTERPOL. (2009). *Disaster victim identification guide* Retrieved from <http://www.interpol.int/INTERPOL-expertise/Forensics/DVI>
- iSchools. (2012a). *About the information field*. <http://www.ischools.org/site/about/>
- iSchools. (2012b). *Meet the iSchools*. <http://www.ischools.org/site/descriptions/>
- Jensen, R. A. (2000). *Mass fatality and casualty incidents: A field guide*. Boca Raton, FL: CRC Press.
- Johnson, J. D. (1997). *Cancer-related information seeking*: Hampton Press Cresskill, NJ.
- Johnson, J. D., Donohue, W. A., Atkin, C. K., & Johnson, S. (1995). A comprehensive model of information seeking: Tests focusing on a technical organization. *Science Communication* 16(3), 274-303. doi: 10.1177/1075547095016003003
- Johnston, E. W., & Kelley, T. M. (2013, February). *An introduction to policy informatics*. Paper presented at the iConference 2013, Fort Worth, TX.
- Jones, M., & Sugden, R. (2001). Positive confirmation bias in the acquisition of information. *Theory and Decision*, 50(1), 59-99. doi: 10.1023/a:1005296023424
- Kauffman, P. J., & McGuire, J. R. (2012). The role of the Disaster Mortuary Operational Response Team (DMORT) in mass fatality events. In E. A. Gursky & M. F. Fierro (Eds.), *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Kelman, I. (2005). Operational ethics for disaster research. *International journal of Mass Emergencies and Disasters*, 23(3), 141-158.
- Kelman, I., & Jankman, S. N. (2007). *Disaster deaths research challenges*. In Natural Hazards Center (Ed.), *Hazards and Disasters Researchers Meeting* (pp. 18-21).

Boulder, CO: Natural Hazards Center. Retrieved from  
[http://128.138.129.98/hazards/workshop/hdrm\\_proceedings.pdf#page=21](http://128.138.129.98/hazards/workshop/hdrm_proceedings.pdf#page=21).

- Kendra, J., Thomas, D., & Miles, S. (2012). Lessons from the Haiti and Japan disasters. In Natural Hazard Center (Ed.), *37th annual natural hazards research and applications workshop* (pp. 19-20). Broomfield, CO: Natural Hazards Center.
- Kent, K. (n.d.). TTVI operations, Thailand: Disaster victim identification response to Thailand following the Indian ocean tsunami of 26 December 2004 Reterieved from  
[http://www.who.int/hac/events/tsunamiconf/presentations/2\\_16\\_forensic\\_kent\\_pp\\_t.pdf](http://www.who.int/hac/events/tsunamiconf/presentations/2_16_forensic_kent_pp_t.pdf)
- Klein, J. T. (1990). *Interdisciplinarity: History, theory, and practice*. Detroit, MI: Wayne State University Press.
- Klinenberg, E. (2002). *Heat wave: A social autopsy of disaster in Chicago*. Chicago: University of Chicago Press.
- Knoppers, B. M., Saginur, M., & Cash, H. (2006). Ethical issues in secondary uses of human biological materials from mass disasters. *Journal of Law, Medicine & Ethics*, 34(2), 352-365. doi: 10.1111/j.1748-720X.2006.00040.x
- Krathwohl, D. R. (2009). *Methods of education and social science research: The logic of methods* (3rd ed.). Long Grove, IL: Waveland.
- Krathwohl, D. R., & Smith, N. L. (2005). *How to prepare a dissertation proposal: Suggestions for students in education and the social and behavioral sciences*. Syracuse, N.Y: Syracuse University Press.
- Kreps, G. A. (1998). Disaster as systemic events and social catalyst. In E. L. Quarantelli (Ed.), *What is a disaster? Perspectives on the question* (pp. 31-55). London: Routledge.
- Krikelas, J. (1983). Information-seeking behavior: Patterns and concepts. *Drexel Library Quarterly*, 19, 5-20.
- Kuhlthau, C. C. (1994). Students and information search process: Zones of intervention for librarians. *Advances in Librarianship*, 18, 57-72.
- Kuhlthau, C. C. (2004). *Seeking meaning: A process approach to library and informaiton services* (2nd ed.). Westport, CT: Libraries Unlimited.
- Kuhlthau, C. C. (2005). Kuhlthau's information seeking process. In K. E. Fisher, S. Erdelez & L. E. F. McKechnie (Eds.), *Theories of information behavior* (pp. 230-234). Medford, NJ: Information Today.

- Kuhn, T. S. (1996). *The structure of scientific revolutions* (3rd Kindle ed.). Chicago: The University of Chicago Press.
- LeCompte, M. D., & Goetz, J. P. (1982). Problems of reliability and validity in ethnographic research. *Review of Educational Research*, 52(1), 31-60.
- Lewins, A., & Silver, C. (2007). *Using software in qualitative research: A step-by-step guide*. Thousand Oaks, CA: SAGE.
- Lichtman, M. (2006). *Qualitative research in education: A user's guide*. Thousand Oaks, CA: SAGE.
- Lloyd, A. (2010). Framing information literacy as information practice: Site ontology and practice theory. *Journal of Documentation*, 66(2), 245-258. doi: 10.1108/00220411011023643
- Locke, L. F., Spirduso, W. W., & Silverman, S. J. (2007). *Proposals that work: A guide for planning dissertations and grant proposals*. Thousand Oaks, CA: SAGE.
- Losee, R. M. (1997). A discipline independent definition of information. *Journal of the American Society for Information Science*, 48(3), 254-269. doi: 10.1002/(sici)1097-4571(199703)48:3<254::aid-asi6>3.0.co;2-w
- Lynch, C. (2010). Top U.N. aid official critiques Haiti aid efforts in confidential email. Retrieved from [http://turtlebay.foreignpolicy.com/posts/2010/02/17/top\\_un\\_aid\\_official\\_critiques\\_haiti\\_aid\\_efforts\\_in\\_confidential\\_email](http://turtlebay.foreignpolicy.com/posts/2010/02/17/top_un_aid_official_critiques_haiti_aid_efforts_in_confidential_email)
- Machlup, F. (1983). Semantic quirks in studies of information. In F. Machlup & U. Mansfield (Eds.), *The study of information: Interdisciplinary messages* (pp. 641-671). New York: John Wiley & sons.
- Macpherson, J. R. (2005). *Implications of the inclusion of document retrieval systems as actors in a social network*. (Doctoral dissertation). ProQuest Dissertations and Thesis database. (UMI Number 3206093)
- Madden, A. D. (2000). A definition of information. *Aslib Proceedings*, 52(9), 343-349.
- Marchionini, G. (1995). *Information seeking in electronic environments*. New York: Cambridge University Press.
- Marion, N., & Scanlon, J. (2011). Mass death and mass illness in an isolated Canadian town: Coping with pandemic influenza in Kenora, Ontario in 1918-1921. *Mortality*, 16(4), 325-342.
- Marking third anniversary of earthquake Ban calls for sustained efforts in Haiti. (2013, January 11). *UN News Center*. Reterieved from

<http://www.un.org/apps/news/story.asp?NewsID=43912&Cr=haiti&Cr1=#.UPFnEmfLn2g>

- Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research*. Thousand Oaks, CA: SAGE.
- Maxwell, J. A. (2005). *Qualitative research design: An interactive approach*. Thousand Oaks, CA: SAGE.
- McColl, G. J., & Burkle, F. M., Jr. (2012). The new normal: Twelve months of resiliency and recovery in Christchurch. *Disaster Medicine and Public Health Preparedness*, 6(1), 33-43.
- McEntire, D. A. (2002). Coordinating multi-organisational responses to disaster: lessons from the March 28, 2000, Fort Worth tornado. *Disaster Prevention and Management*, 11(5), 369 - 379. doi: 10.1108/09653560210453416
- McEntire, D. A. (2007). *Disaster response and recovery: Strategies and tactics for resilience*. Hoboken, NJ: John Wiley & Sons.
- McEntire, D. A., Sadiq, A.-A., & Gupta, K. (2011, July 9-12). *Unidentified bodies and mass fatality management in Haiti: A case study of the January 2010 earthquake with a cross-cultural comparison*. Paper presented at the 36th Annual Natural Hazards Research and Applications Workshop, Broomfield, CO.
- McEntire, D. A., Sadiq, A.-A., & Gupta, K. (2012). Unidentified bodies and mass-fatality management in Haiti: A case study of the January 2010 earthquake with a cross-cultural comparison. *International Journal of Mass Emergencies and Disasters*, 30(3), 301-327.
- McNeil, S., & Quarantelli, H. (2008). *Past, present and future: Building an interdisciplinary disaster research center on half-century of social science disaster research. Preliminary Paper #362*. Newark, DE: University of Delaware, Disaster Research Center.
- Menzel, H. (1966). Information needs and uses in science and technology. *Annual Review of Information Science and Technology*, 1, 41-69.
- Meyer, H. J. (2003). The Kaprun cable car fire disaster—Aspects of forensic organisation following a mass fatality with 155 victims. *Forensic Science International*, 138, 1-7.
- Michaels, S. (2003). Perishable information, enduring insights? Understanding quick response research. In Natural Hazards Research and Applications Information Center, Public Entity Risk Institute & Institute for Civil Infrastructure Systems (Eds.), *Beyond September 11th: An account of post-disaster research*. Special Publication No. 39 (pp. 15-48). Boulder, CO: Natural Hazards Research and

- Applications Information Center, University of Colorado. Retrieved from <http://www.colorado.edu/hazards/publications/sp/sp39/>.
- Mileti, D. S. (1999). *Disasters by design: A reassessment of natural hazards in the United States*. Washington, D.C.: Joseph Henry.
- Morgan, O. W., Sribanditmongkol, P., Perera, C., Sulasmi, Y., & Van, A. D. (2006). Mass fatality management following the South Asian tsunami disaster: Case studies in Thailand, Indonesia, and Sri Lanka. *PLoS Med*, 3(6), 195. <http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pmed.0030195>
- Morillo, F., Bordons, M., & Gomez, I. (2003). Interdisciplinarity in science: A tentative typology of disciplines and research areas. *Journal of the American Society for Information Science and Technology*, 54(13), 1237-1249. doi: 10.1002/asi.10326
- MSN (Producer). (2005). RFID chips help track Katrina dead: Donated technology helps Miss. coroner with body identification. Retrieved from <http://www.msnbc.msn.com/id/9514138/>
- Mullen, E. (2009). Buddhist perspectives in death, grief, and loss. In K. J. Doka & A. S. Tucci (Eds.), *Diversity and end-of-life care* (pp. 169). Washington, DC: Hospice Foundation of America.
- Mutchnick, R. J., Berg, B. L., & Ireland, C. (2009). *Research methods for criminal justice and the social sciences: Practice and applications*. Upper Saddle River, NJ: Prentice Hall.
- National Commission on Terrorist Attacks Upon the United States. (2004). *The 9/11 Commission report: Final report of the National Commission on Terrorist Attacks Upon the United States*. New York: W. W. Norton & Company.
- National Disaster Management Authority. (2010). *National disaster management guidelines - Management of the dead in the aftermath of disasters*. New Delhi: Author.
- National Institute of Justice. (2006). Lessons learned from 9/11: DNA identification in mass fatality incidents. <http://www.massfatality.dna.gov/>
- National Science Foundation. (2010). Responsible conduct of research. In National Science Foundation (Ed.), *Proposal and award policies and procedures guide: Part II - Award & administration guide* (pp. IV-3). Arlington, VA: Arlington, Virginia.
- Natural Hazards Center. (2012). *Quick response reports*. Retrieved from: <http://www.colorado.edu/hazards/research/qr/qrpubs10s.html>

- Natural Hazards Center (Ed.). (2006). *Learning from catastrophe: Quick response research in the wake of hurricane Katrina*. Boulder, CO: Author.
- Nelson, A., Sigal, I., & Zambrano, D. (2011). *Media, information systems and communities: Lessons from Haiti*. Retrieved from <http://www.pbs.org/mediashift/Haiti%20Report%20English%2001.10.11-4.pdf>
- Nissani, M. (1997). Ten cheers for interdisciplinarity: The case for interdisciplinary knowledge and research. *Social Science Journal*, 34(2), 201-216. doi: 10.1016/s0362-3319(97)90051-3
- Nollet, K. E., & Kayser, R. P. (2003). Disaster telecommunications: Bottlenecks, breakthroughs, and the amateur radio service. *Transfusion*, 43(9), 154A-154A.
- O'Connor, M. C. (2007). VeriChip's VeriTrace platform sees sales boost: The system, which employs implantable tags to identify and track the remains of deceased individuals, is seeing gains in sales as states acquire it for disaster preparedness. *RFID Journal* (Nov. 05).
- O'Connor, M. R. (2012, January 12). Two years later, Haitian earthquake death toll in dispute. Retrieved from [http://www.cjr.org/behind\\_the\\_news/one\\_year\\_later\\_haitian\\_earthqu.php?page=all](http://www.cjr.org/behind_the_news/one_year_later_haitian_earthqu.php?page=all)
- OCHA. (n.d.). Cluster coordination. <http://www.unocha.org/what-we-do/coordination-tools/cluster-coordination>
- Oppenheim, C., Stenson, J., & Wilson, R. M. S. (2003). Studies on information as an asset - I: definitions. *Journal of Information Science*, 29(3), 159-166. doi: 10.1177/01655515030293003
- Oyola-Yemaiel, A., & Gupta, K. (2005). *Response to mass-fatalities by India and Sri Lanka following the 2004 tsunami*. Paper presented at the annual conference of the International Association of Emergency Managers, Phoenix, AZ. In CD Format.
- Oyola-Yemaiel, A., & Gupta, K. (2006). India and Sri Lanka's response to mass fatalities following the Tsunami. In W. J. Ammann, J. Haig, C. Huovinen & M. Stocker (Eds.), *Proceedings of the international disaster reduction conference* (Vol. 2, pp. 413-416). Davos, Switzerland: Swiss Federal Research Institute WSL.
- Pan American Health Organization. (2004). *Management of dead bodies in disaster situations*. Washington, DC: Pan America Health Organization and World Health Organization.
- Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: SAGE.

- Pearce, L. D. R. (2001). *An integrated approach for community hazard, impact, risk and vulnerability analysis: HIRV*. (Doctoral dissertation). ProQuest Dissertation and Thesis database. (AAT NQ61155)
- Peralta, E. (2011, May 31). *Death toll of Haiti earthquake much lower than government said*. Retrieved from <http://www.npr.org/blogs/thetwo-way/2011/05/31/136832070/report-death-toll-in-haiti-earthquake-much-lower-than-government-estimates>
- Perera, C. (2005). After the tsunami: Legal implications of mass burials of unidentified victims in Sri Lanka. *PLoS Med*, 2(6). doi: 10.1371/journal.pmed.0020185
- Perera, U. C. P. (2006). Efficacy of mass burial in the management of mass disasters – Sri Lanka post tsunami experience in retrospect. In W. J. Ammann, J. Haig, C. Huovinen & M. Stocker (Eds.), *Proceedings of the international disaster reduction conference* (Vol. 2, pp. 428-432.). Davos, Switzerland: Swiss Federal Research Institute WSL.
- Perrow, C. (1999). *Normal accidents: Living with high-risk technologies*. Princeton, NJ: Princeton University Press.
- Peter, T., & Waterman, R. (1982). *In search of excellence*. New York: Warner Books.
- Phillips, B., Neal, D., Wikle, T., Subanthore, A., & Hyrapiet, S. (2008). Mass fatality management after the Indian Ocean tsunami. *Disaster Prevention and Management*, 17(5), 681 - 697. doi: 10.1108/09653560810918685
- Phua, J. (Producer). (2006). Although the Vietnam War ended in 1975, some families are still searching for loved ones missing in action and are turning to psychics for help. Retrieved from [http://news.bbc.co.uk/2/hi/programmes/this\\_world/4989480.stm](http://news.bbc.co.uk/2/hi/programmes/this_world/4989480.stm)
- Piantanida, M., & Garman, N. B. (2009). *The qualitative dissertation: A guide for students and faculty*. Thousand Oaks, CA: Corwin Press.
- Pickard, A. J. (2007). *Research methods in information*. London: Facet Publishing.
- Pine, V. R. (1969). Normal death processes are put aside in mass death incidents. *The Director*, XXXIX(8), 11-13.
- Pipes, T. S. (2007). Information disaster and disaster information: Where information science meets emergency management. In D. A. McEntire (Ed.), *Disciplines, disasters, and emergency management: The convergence and divergence of concepts, issues and trends from the research literature*. Imprint Springfield, IL: Charles C Thomas.
- PositiveID Corporation. (2012). About Us. Retrieved from <http://www.positiveidcorp.com/about.html>

- Prince, S. H. (1920). *Catastrophe and social change, based upon a sociological study of the Halifax disaster*. (Doctoral dissertation). ProQuest Dissertations and Thesis database. (AAT 0109662)
- Quarantelli, E. L. (1993). The environmental disasters of the future will be more and worse but the prospect is not hopeless. *Disaster Prevention and Management*, 2(1), 11-25.
- Quarantelli, E. L. (1994). *Draft of a sociological disaster research agenda for the future: Theoretical, methodological, and empirical issues. Preliminary Paper #228*. Newark, DE.: Disaster Research Center, University of Delaware.
- Quarantelli, E. L. (1997). Ten criteria for evaluating the management of community disasters. *Disasters*, 21(1), 39-56. doi: 10.1111/1467-7717.00043
- Quarantelli, E. L. (2000). *Emergencies, disasters and catastrophes are different phenomena. Preliminary Paper # 304*. Newark, DE: Disaster Research Center, University of Delaware.
- Quarantelli, E. L. (2005). A social science research agenda for the disasters of the 21st century: Theoretical, methodological, and empirical issues and thier professional implications. In R. W. Perry & E. L. Quarantelli (Eds.), *What is a disaster?: New answers to old questions*. Philadelphia, PA: Xlibris. .
- Quarantelli, E. L. (Ed.). (1998). *What is a disaster?: Perspectives on the question* London: Routledge.
- Richards, L. (2005). *Handling qualitative data: A practical guide*. London: SAGE.
- Richards, L., & Morse, J. M. (2007). *Readme first for a user's guide to qualitative methods* (2nd ed.). Thousand Oaks, CA: SAGE.
- Ritchie, E. C., & Benedek, D. M. (2012). Psychological issues and mass fatality. In E. A. Gursky & M. F. Fierro (Eds.), *Death in large numbers: The science, policy, and management of mass fatality events*. Chicago: American Medical Association.
- Roach, M. (2003). *Stiff: The curious lives of human cadavers*. New York: W. W. Norton & Co.
- Rodriguez, H., Quarantelli, E. L., & Dynes, R. R. (Eds.). (2007). *Handbook of disaster research*. New York: Springer.
- Roseman, G. B., & Rallis, S. F. (2003). *Learning in the field: An introduction to qualitative research* (2nd ed.). Thousand Oaks, CA: SAGE.
- Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks, CA: SAGE.

- Sagun, A., Bouchlaghem, D., & Anumba, C. J. (2009). A scenario-based study on information flow and collaboration patterns in disaster management. *Disasters*, 33(2), 214-238. doi: 10.1111/j.1467-7717.2008.01071.x
- Saldana, J. (2009). *The coding manual for qualitative researchers*. London: SAGE.
- Salkind, N. J. (2012). *100 questions (and answers) about research methods*. Thousand Oaks, CA: SAGE.
- Saracevic, T. (1999). Information science. *Journal of the American Society of Information Science*, 50(12), 1051-1063.
- Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life". *Library & Information Science Research*, 17(3), 259-294. doi: [http://dx.doi.org/10.1016/0740-8188\(95\)90048-9](http://dx.doi.org/10.1016/0740-8188(95)90048-9)
- Savolainen, R. (2005). Everyday life information seeking. In K. E. Fisher, S. Erdelez & L. McKechnie (Eds.), *Theories of information behavior* (pp. 143-148). Medford, NJ: Information Today.
- Savolainen, R. (2007). Information behavior and information practice: Reviewing the "umbrella concepts" of information-seeking studies. *Library Quarterly*, 77(2), 109-132.
- Savolainen, R. (2008). *Everyday information practices: A social phenomenological perspective*. Lanham, MD: Scarecrow Press.
- Scanlon, J. (1988). Disaster's little known pioneer: Canada's Samuel Henry Prince. *International Journal of Mass Emergencies and Disasters*, 6(3), 213-232.
- Scanlon, J. (1998). Dealing with mass death after a community catastrophe: handling bodies after the 1917 Halifax explosion. *Disaster Prevention and Management*, 7(4), 288-304. doi: 10.1108/09653569810230139
- Scanlon, J. (2006a). Dealing with the tsunami dead: Unprecedented international cooperation. *Australian Journal of Emergency Management*, 21(2), 57-61.
- Scanlon, J. (2006b). Identifying the victims of the Indian Ocean tsunami: The role of the private sector. *Journal of Business Continuity and Emergency Planning*, 1(3), 1-12.
- Scanlon, J. (2008). Identifying the tsunami dead in Thailand and Sri Lanka: multi-national emergent organizations. *International Journal of Mass Emergencies and Disasters*, 26(1), 1-18.
- Scanlon, J. (2009). Lessons from the Irish Response to the Air India Crash. *Homeland1*. <http://www.homeland1.com/homeland-security-products/search-rescue->

[equipment-sar/articles/530921-lessons-from-the-irish-response-to-the-air-india-crash/](http://equipment-sar/articles/530921-lessons-from-the-irish-response-to-the-air-india-crash/)

- Scanlon, J. (2013). So what do we really learn from experience? *Natural Hazards Observer*, XXXVII(3), 13.
- Scanlon, J., & Hunsberger, A. (2011). Dealing with the dead in disasters: A professional and international process. *Brown Journal of World Affairs*, XVII(II), 99-111.
- Scanlon, J., & McMahon, T. (2011). Dealing with mass death in disasters and pandemics: Some key differences but many similarities. *Disaster Prevention and Management*, 20(2), 172-185. doi: 10.1108/09653561111126102
- Scanlon, J., McMahon, T., & Haastert, C. V. (2007). Handling mass death by integrating the management of disasters and pandemics: Lessons from the Indian ocean tsunami, the Spanish flu and other incidents. *Journal of Contingencies and Crisis Management*, 15(2), 80-94. doi: 10.1111/j.1468-5973.2007.00511.x
- Schrader, A. M. (1983). *Toward a theory of library and information science*. (Doctoral dissertation). ProQuest Dissertaion and Thesis database. (UMI Number 8401534)
- Secretary-General's message for staff commemoration of the third anniversary of the earthquake in Haiti. (2013, January 11). Reterieved from <http://www.un.org/sg/statements/index.asp?nid=6543>
- Shaikh-Lesko, R. (2013, January 20). Cadavers are making a comeback, *San Jose Mercury News*, pp. B1-7.
- Shaler, R. C. (2005). *Who they were: Inside the World Trade Center DNA story: The unprecedented effort to identify the missing*. New York: Free Press.
- Shrivastava, P. (1986). *Bhopal: Anatomy of a disaster*: New York: Basic Books.
- Simon, H. A. (1997). *Models of bounded rationality: Empirically grounded economic reason* (Vol. 3). Cambridge, MA: The MIT Press.
- Simpson, D. M., & Stehr, S. (2003). Victim management and identification after the World Trade Center collapse. In Natural Hazard Research and Applications Information Center, Public Entity Risk Institute & Institute for Civil Infrastructure Systems (Eds.), *Beyond September 11th: An account of post-disaster research*. Boulder, CO: Natural Hazard Research and Applications Information Center, University of Colorado.
- Sims, P. (2013). Haiti earthquake third anniversary: British Red Cross community-led project rebuilds neighbourhood from the rubble. Reterieved from <http://www.redcross.org.uk/About-us/Media-centre/Press-releases/2013/January/Haiti-earthquake-third-anniversary>

- Smith, K. (1996). *Environmental hazards - assessing risk and reducing disaster* (2nd ed.). London: Routledge.
- Smoyak, S. A. (2006). Defining and working with the "New normal" - After 9/11 & Katrina. *Journal of Psychosocial Nursing and Mental Health Services*, 44(10), 6-7.
- Spence, E. H. (2011). Information, knowledge and wisdom: Groundwork for the normative evaluation of digital information and its relation to the good life. *Ethics and Information Technology*, 13(3), 261-275. doi: 10.1007/s10676-011-9265-7
- Stallings, R. A. (2007). Methodological issues. In H. Rodriguez, Quarantelli, E. L., & Dynes, R. R. (Ed.), *Handbook of Disaster Research*. New York, NY: Springer.
- Stanley, S. A. R. (2010). Building mass fatality management at the regional level for pandemic and catastrophic response. *Journal of Homeland Security and Emergency Management*, 7(1).
- Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision*, 39(7), 551-555.
- Stoddard, F. J., Pandya, A. A., & Katz, C. L. (2011). *Disaster psychiatry: Readiness, evaluation, and treatment*. Arlington, VA: Amer Psychiatric Pub Incorporated.
- Stoney, C., Scanlon, J., Kramar, K., Peckmann, T., Brown, I., Cormier, C. L., & van Haastert, C. (2011). Steadily increasing control: The professionalization of mass death. *Journal of Contingencies and Crisis Management*, 19(2), 66-74. doi: 10.1111/j.1468-5973.2011.00635.x
- Talja, S. (2006). The domain analytic approach to scholars information practices. In K. E. Fisher, S. Erdelez & L. McKechnie (Eds.), *Theories of information behavior* (pp. 123-127). Medford, NJ: Information Today.
- Taylor, R. S. (1986). Question-negotiation and information seeking in libraries. *College and Research Libraries*, 29(3), 178-194.
- Taylor, S. J., & Bogdan, R. (1984). *Introduction to qualitative research methods: The search for meaning*. New York: John Wiley & Sons.
- Teahen, P. R. (2012). *Mass fatalities: Managing the community response*. Boca Raton, FL: CRC Press.
- Tun, K., Butcher, B., Sribanditmongkol, P., Brondolo, T., Caragine, T., Perera, C., & Kent, K. (2005). Forensic aspects of disaster fatality management. *Prehospital and Disaster Medicine*, 20(6), 455-458.
- Turoff, M., & Hiltz, S. R. (2008). *Information seeking behavior and viewpoints of emergency preparedness and management professionals concerned with health*

- and medicine: Final report prepared for the National Library of Medicine.*  
<http://web.njit.edu/~turoff/Papers/FinalReportNLMTuroffHiltzMarch11.htm>
- U.S. Geological Survey. (2012). *Earthquake glossary - earthquake.*  
<http://earthquake.usgs.gov/learn/glossary/?term=earthquake>
- United Nations Foundation. (2011). *Disaster relief 2.0: The future of information sharing in humanitarian emergencies.* Washington, DC: Author.
- United Nations International Strategy for Disaster Reduction. (2011). Terminology on Disaster Risk Reduction. <http://www.unisdr.org/we/inform/terminology>
- Wachtendorf, T. (2004). *Improvising 9/11: Organizational improvisation following the World Trade Center disaster.* (Doctoral dissertation). ProQuest Dissertations & Theses database. (UMI Number 3133851)
- Walk, R. M., Donahue, T. F., Stockinger, Z., Knudson, M. M., Cubano, M., Sharpe, R. P., & Safford, S. D. (2012). Haitian earthquake relief: Disaster response aboard the USNS Comfort. *Disaster Medicine and Public Health Preparedness*, 6(4), 370-377. doi: 10.1001/dmp.2012.67
- Weick, K., & Roberts., K. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly*, 38(3), 357-381.
- White, P. (2009). *Developing research questions: A guide for social scientists.* New York: Palgrave Macmillan.
- Wilson, G., & Shpall, S. (2012). Action. In E. N. Zalta (Ed.), *The Stanford encyclopedia of philosophy*. Retrieved from <http://plato.stanford.edu/archives/sum2012/entries/action/>.
- Wilson, M. C., & Edelman, H. (1996). Collection development in an interdisciplinary context. *Journal of Academic Librarianship*, 22(3), 195-200.
- Wilson, T. D. (1981). On user studies and information needs. *Journal of Documentation*, 37(1), 3-15.
- Wilson, T. D. (1997). Information behavior: An interdisciplinary perspective. *Information Processing & Management*, 33(4), 551-572.
- Wilson, T. D. (2005). Evolution in information behavior modeling: Wilson's model. In K. E. Fischer, S. Erdelez & L. McKechnie (Eds.), *Theories of information behavior* (pp. 31-36). Medford, NJ: Information Today.
- Wilson, T. D. (2009). The behaviour/practice debate: a discussion prompted by Tom Wilson's review of Reijo Savolainen's everyday information practices: A social phenomenological perspective. *Information Research-an International Electronic Journal*, 14(2).

- Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation*. Thousand Oaks, CA: SAGE.
- World Bank. (2011). *Population projection tables by country and group: Haiti*. <http://go.worldbank.org/KZHE1CQFA0>
- World Bank and United Nations. (2010). *Natural hazards, unnatural disasters: The economics of effective prevention*. Washington, DC: The World Bank.
- Yandek, C. (Producer). (2011). *Disaster expert David Neal: 8.9 Japan quake much worse than Katrina*. [Audio interview] Retrieved from <http://www.cyinterview.com/2011/03/disaster-expert-david-neal-8-9-japan-quake-much-worse-than-katrina/>
- Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Thousand Oaks, CA: SAGE.
- Zeigarnik, B. V. (1967). On finished and unfinished tasks. In W. D. Ellis (Ed.), *A sourcebook of Gestalt psychology*. New York, NY: Humanities Press
- Zins, C. (2007a). Conceptions of information science. *Journal of the American Society of Information Science and Technology*, 58(3), 335-350. doi: 10.1002/asi.20507
- Zins, C. (2007b). Conceptual approaches for defining data, information, and knowledge. *Journal of the American Society for Information Science and Technology*, 58(4), 479-493. doi: 10.1002/asi.20508